ENGLISH

AP-876 / IP-420
INSTRUCTION MANUAL

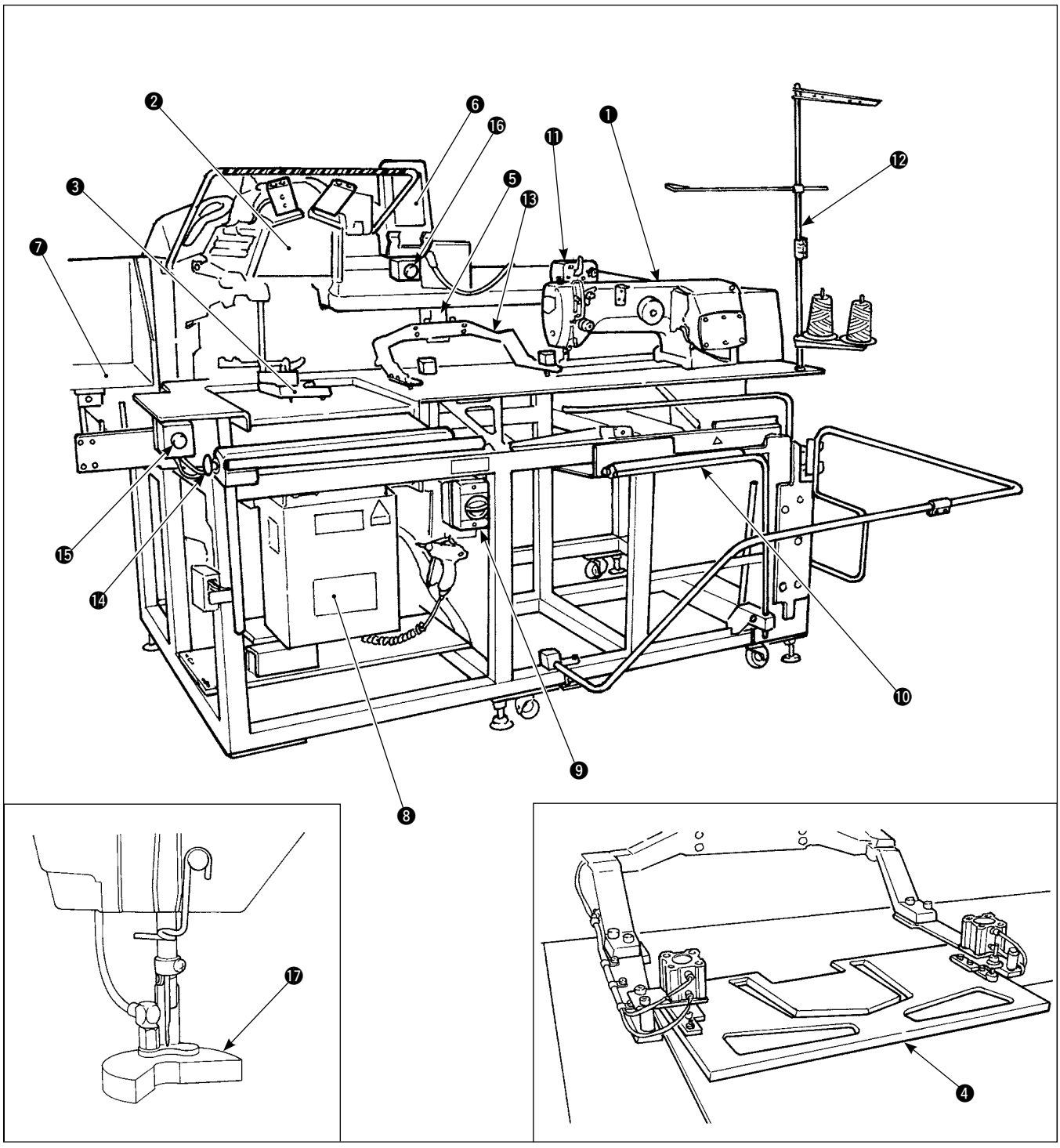
CONTENTS

Ⅰ. MECHANICAL SECTION (WITH REGARD TO THE SEWING MACHINE)

1. SPECIFICATIONS

1) Sewing area : X (lateral) direction 250 mm, Y (longitudinal) direction 250 mm
2) Max. sewing speed : 4,000 sti/min (according to sewing specifications)
3) Stitch length : 0.1 to 6.0 mm (Minimum resolution: 0.05 mm)
4) Main shaft of machine head drive unit : AC servo motor
5) Presser plate travel : Continuous feed (Stepping motor with an encoder)
6) Needle bar stroke : 35 mm
7) Needle : SCHMETZ 134 SERV 7 Nm : 130
8) Hook : Full-rotary exclusive hook (forced lubrication)
9) Bobbin case : Bobbin case exclusively designed for a full-rotary 1.7-fold hook (provided with an idling prevention spring)
10) Lubrication oil : Machine head : JUKI New Defrix Oil No. 1
11) Thread trimming mechanism : Scissors cutting mechanism using a counter knife and a moving knife (Driven by grooved cam motor)
12) Pattern data stored in memory : Main body and a media
    · Main body: Max. 999 patterns
    · Media: Max. 999 patterns
13) Dimensions : 1,890 mm (W) x 1,510 mm (L) x 1,155 mm (H) (excluding the thread stand)
14) Temporary stop function : It is possible to stop the sewing machine during sewing.
15) Bobbin counter : Up/down method (0 to 9999)
16) Sewing counter : Up/down method (0 to 9999)
17) Stitch number counter : Up/down method (0 to 9999)
18) Memory backup amount : Patterns are automatically stored in memory at the time of power shutdown.
19) Mass (Total weight) : 558 kg
20) Power consumption : 650 VA
21) Working temperature range : 5°C to 35°C
22) Working humidy range : 35% to 85% (with no dew condensation)
23) Supply voltage : Rating ±10% 50 / 60 HZ
24) Compressed air : 0.5 MPa
25) Air consumption : 220 dm 3/min (ANR)
26) Noise : - Equivalent continuous emission sound pressure level (L_{pA}) at the workstation :
    A-weighted value of 83.0 dB; (Includes K_{pA} = 2.5 dB); according to ISO 10821- C.6.3 -ISO 11204 GR2 at 4,000 sti/min.
    - Sound power level (L_{WA}) ;
    A-weighted value of 90.5 dB; (Includes K_{WA} = 2.5 dB); according to ISO 10821- C.6.3 -ISO 3744 GR2 at 4,000 sti/min.

2. CONFIGURATION

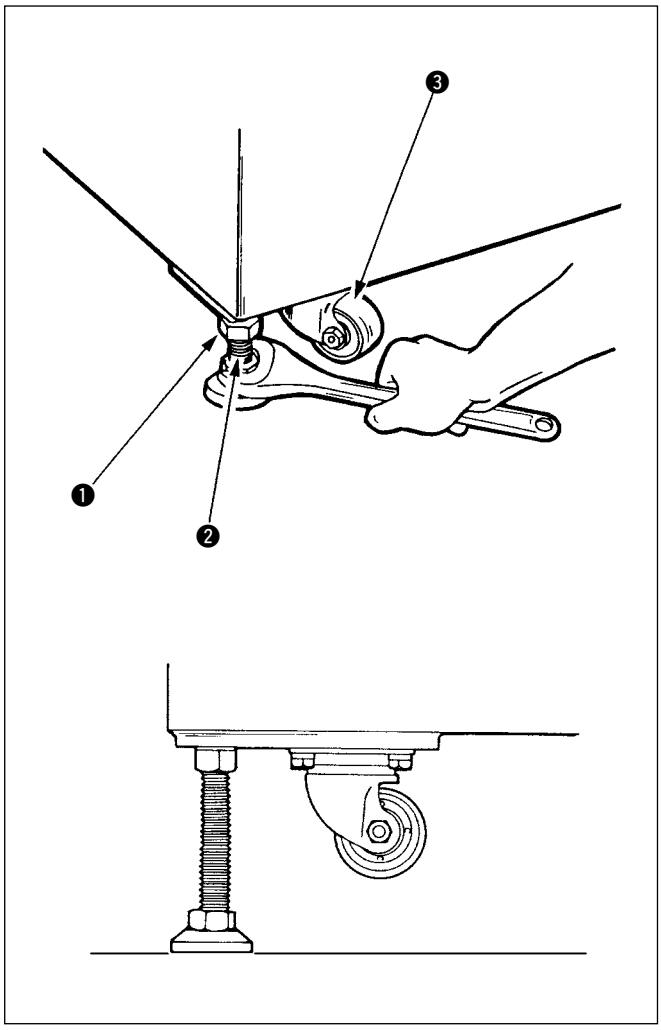


❶ Sewing machine head
❷ Crease folding unit
❸ Pattern plate
❹ Presser plate
❺ Conveyor and X-Y unit
❻ Operation panel
❼ Pocket cloth holding board
❽ Electrical box
❾ Power switch
❿ Stacker
⓫ Bobbin winder
⓬ Thread stand
⓭ Presser arm
⓮ Start switch
⓯ Emergency stop switch
⓰ Temporary stop switch
⓱ Presser plunger

*** If emergency stop switch ⓯ is pressed while the device is in operation, the blower motor will not stop, but the power to the device will be turned OFF and the device will stop.**

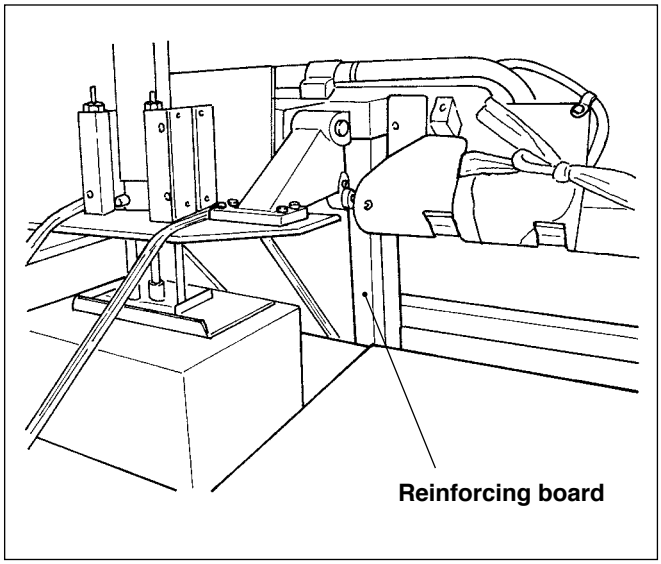
3. INSTALLATION

3-1. Setting up the machine



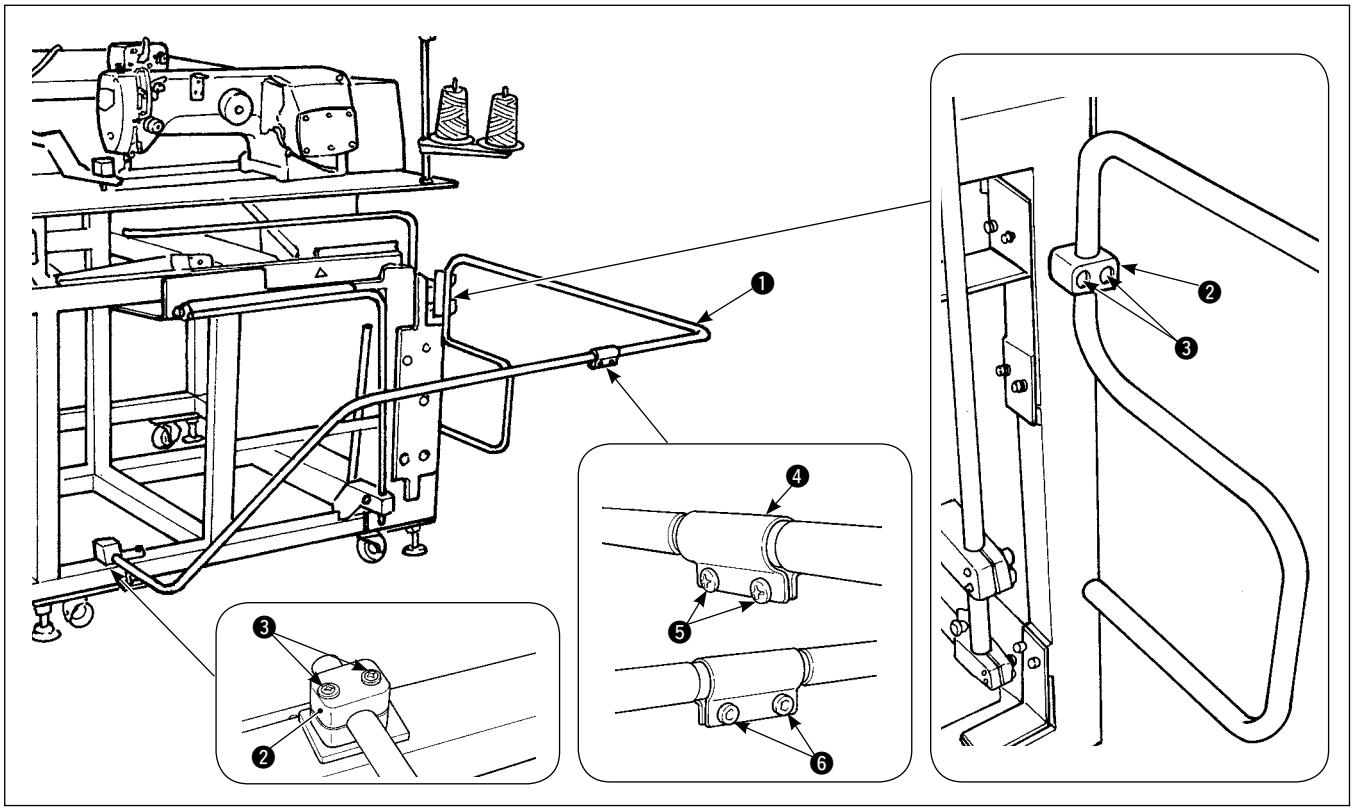
1) Install the machine on a flat place with leveled.
2) Loosen nut ❶ and turn level adjuster ❷ to lift the machine until caster ❸ idles.
3) After the machine has been set up properly, tighten nut ❶ and fix level adjuster ❷.

3-2. Removing the reinforcing board of the folding unit



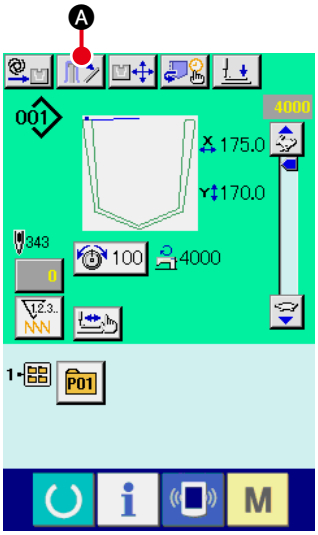
Remove the reinforcing board of the folding unit.

3-3. Assembling the stacker safety pipe

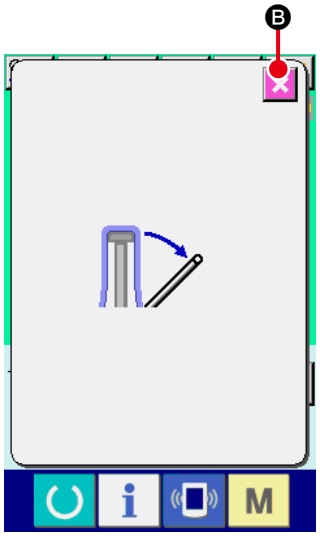


1） Fix stacker safety pipe ❶ on the main body by means of pipe clamp ❷ and setscrews ❸.
2） Insert two pipes into pipe joint ❹ and fix with screws ❺ and nuts ❻.

(1) Removing the sewing product

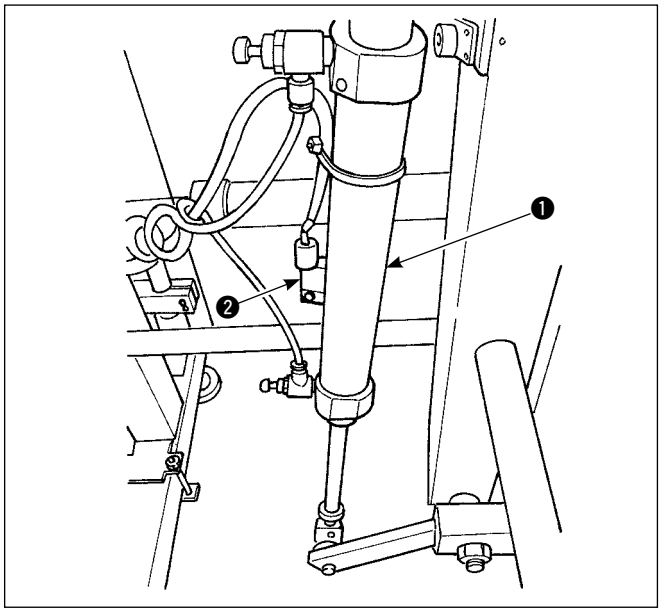


Sewing screen



Stacker release screen

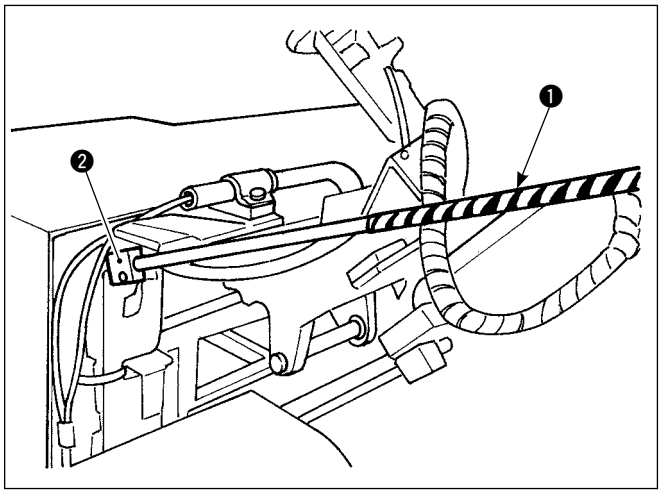
1） To remove the sewing product from the sewing machine, press stacker lever release button  Ⓐ on the sewing screen to release the stacker presser lever.
The screen changes over to “stacker release screen”.
When the cancel butto  Ⓑ is pressed after the removal of the sewing product, the screen is changed over to the sewing screen and the stacker presser lever closes.

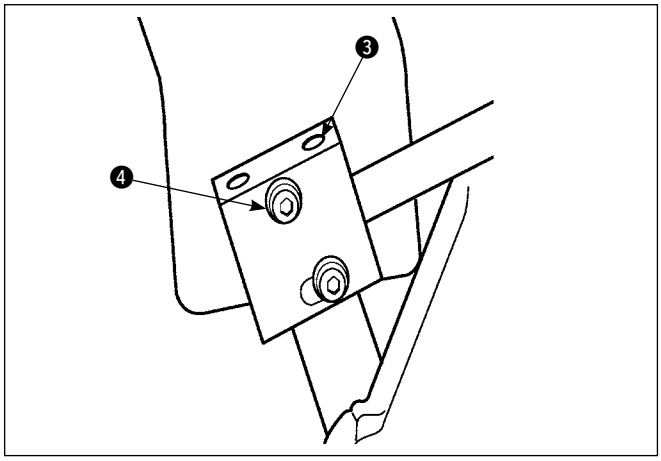


2) Adjust the stacking quantity by loosening the screw of sensor ❷ of work clamp cylinder ❶ and changing the sensor position. Stacking quantity will be increased by moving the sensor position upward.

The sensor should be adjusted so that approximately 60 sewing products are stacked on the stacker.

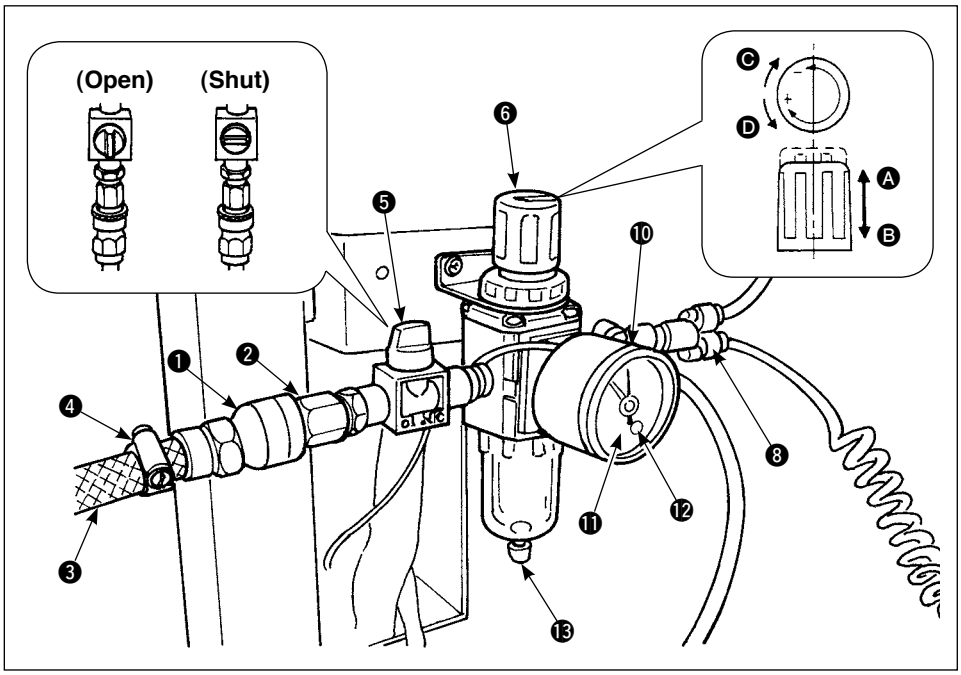
3-4. Assembling the safety pipe for the folding unit





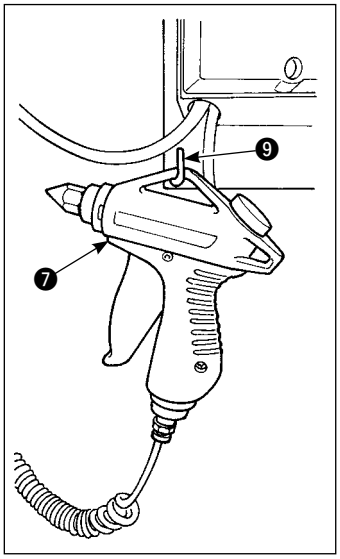
Insert safety pipe ❶ for the folding unit into pipe fixing block ❷ and secure with setscrew ❸.
Adjust the height of the safety pipe and secure with setscrew ❹.

3-5. Installing the air hose and air gun and adjusting the pressure



(1) Connecting the air hose

1) Connect fitting ❶ to plug ❷. At this time, wrap sealing tape or the like round the screw.
2) Insert air hose ❸ into fitting ❶ and fasten them with hose band ❹.
   (Use the correct air hose to match the fitting.)



(2) Connecting the air gun

Insert the coil tube of air gun ❼ into quick-coupling joint ❽ and put the air gun on L-shaped fitting ❾.

(3) Opening/closing the valve

To open/close valve ❺, turn the valve until it will go no further (by 90 degrees of an angle).

(4) Adjusting the supply air pressure

1) The operating air pressure should be set to 0.5 MPa.
2) Deliberately open valve ❺.
3) Lift regulator knob ❻ in direction Ⓐ. Turning it in this state will change the supply air pressure. Turn knob in direction Ⓒ (+) or in direction Ⓓ (–) so that black point of pressure gauge ❿ indicates 0.5 MPa. After the adjustment, lower knob ❻ in direction Ⓑ to securely lock it.

When opening valve ❺, be aware that the air-supplied mechanism is partly activated.

(5) Pressure drop signal adjustment

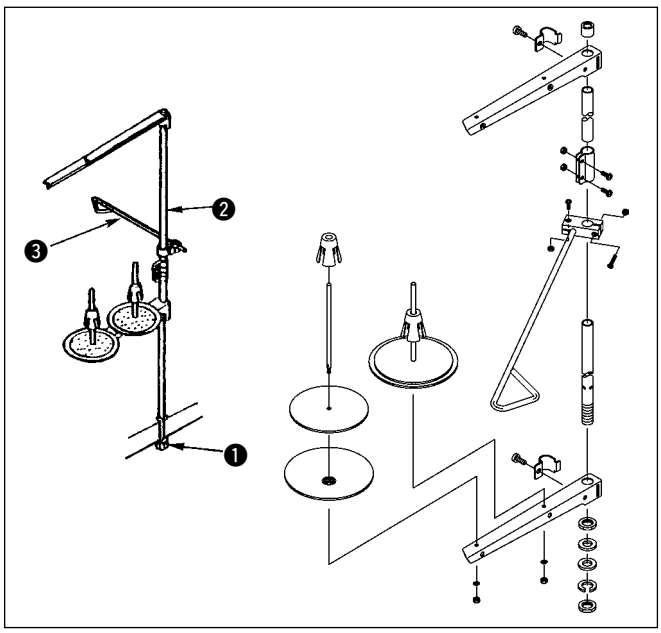
1) Set the pressure at which an emergency signal will go off if the pressure drops below it.
2) The normal setting value is 0.4 MPa.
3) Insert a small screwdriver into cap ⓫ of pressure gauge ❿, and adjust screw ⓬ which is inside. Turn the screw with the screwdriver until the green pointer points to 0.4 MPa.

If the air supply source pulse is too large, even at the above setting value the emergency signal might go off.

(6) Discharging the drainage

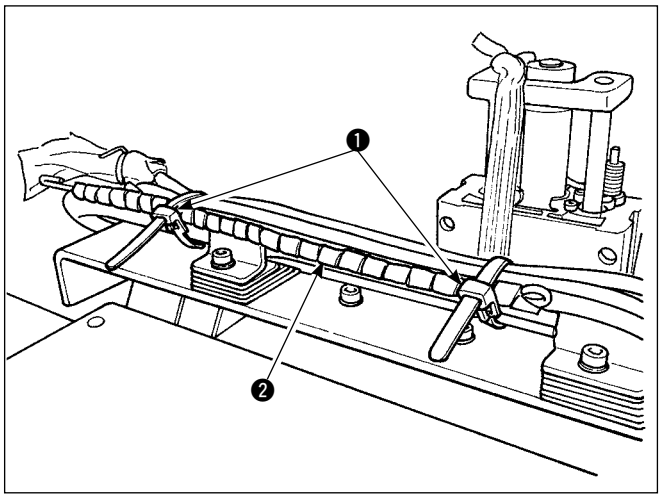
1) Remove the drain from regulator before use to discharge water (by loosening knob ⓭).
2) Water adversely affects the air control components. It is therefore necessary to carefully remove the water.
3) If the air pressure in regulator drops, the pressure gauge switch comes on to cause an error.

3-6. Thread stand assembly

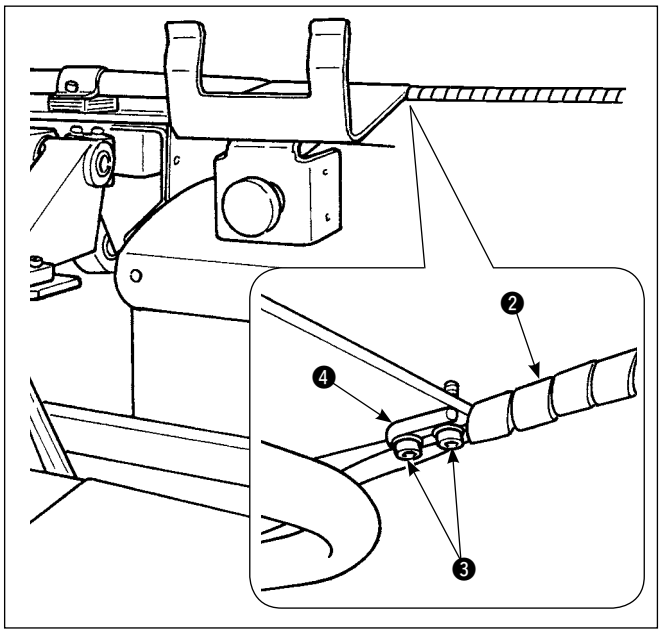


1) Set the thread stand in the hole at the right corner of the table.
2) Insert thread stand rob ❸ into thread stand thread guide ❷.
3) Tighten lock nut ❶ so that the thread stand will not be able to move.
4) If ceiling wiring is possible, pass the power cord through thread stand rod ❷.

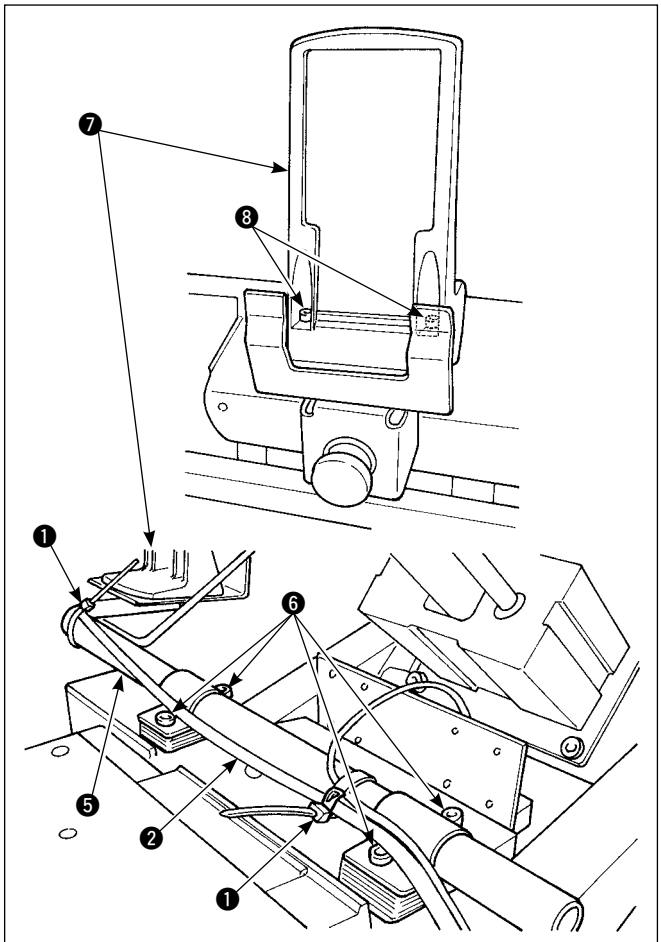
3-7. Installing the operation panel



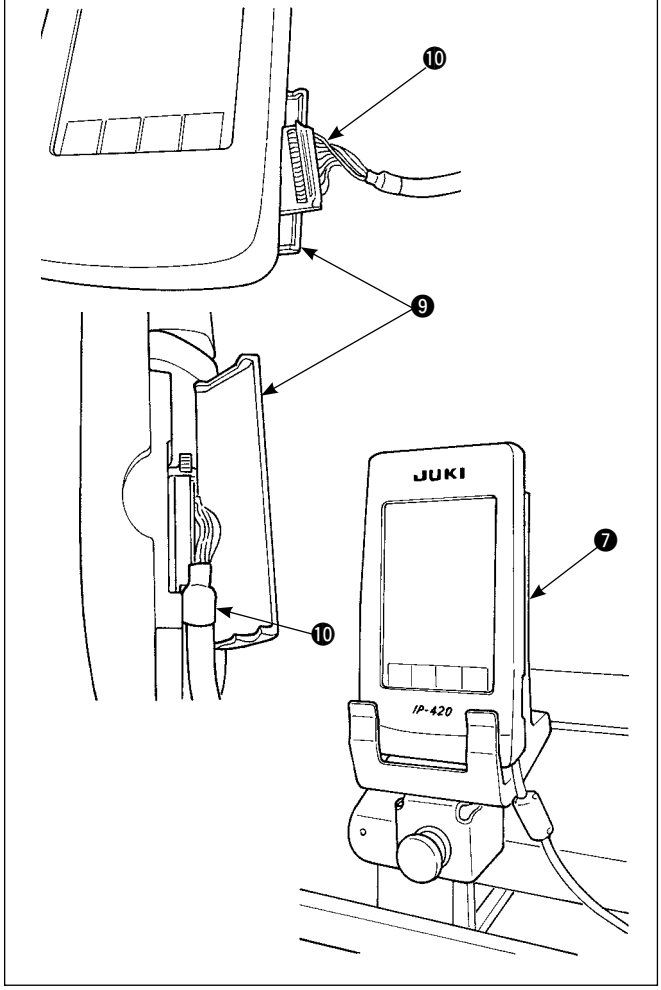
1) Loosen cord clamp ❶. Remove panel cord ❷.



2) Remove setscrews ❸. Fix operation panel cable support bar ❹ with setscrews ❸.



3) Loosen setscrews ❻ of operation panel mounting pipe ❺. Determine the position of operation panel mounting base ❼ and fix it that position with setscrews ❻.
Bundle operation panel cord ❷ with cord clamp ❶.
Fix operation panel mounting base ❼, supplied with the unit, in position with setscrews ❽.



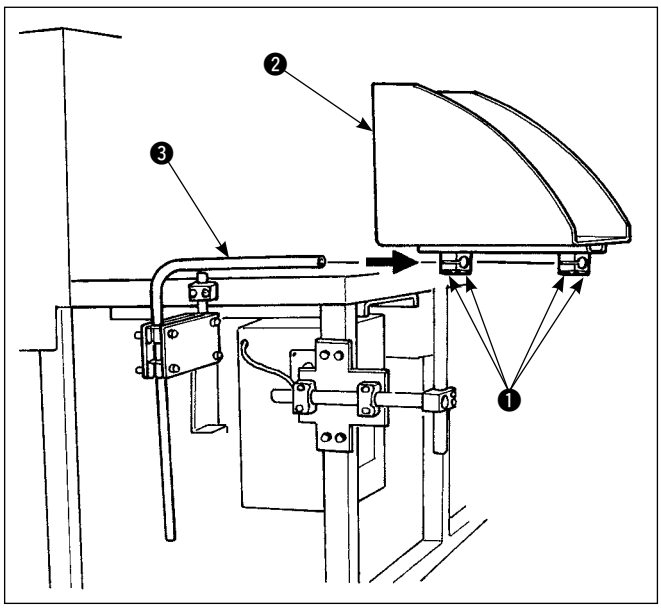
4) Open cover ❾ of the IP-420. Insert cable ❿ into the IP-420.

5) Route cable ❿ down along the IP-420 and close cover ❾.

6) Place the IP-420 on operation panel mounting base ❼.

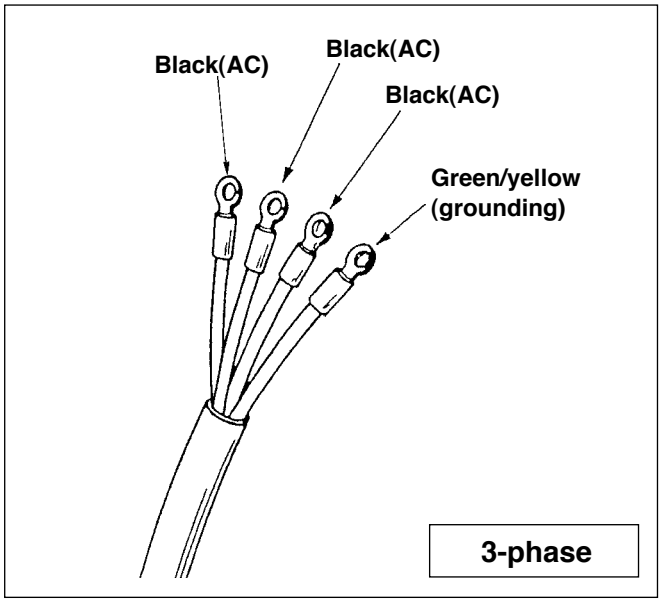
If the IP-420 screen is not easily visible, loosen setscrews ❻ and adjust the position of the operation panel mounting base.

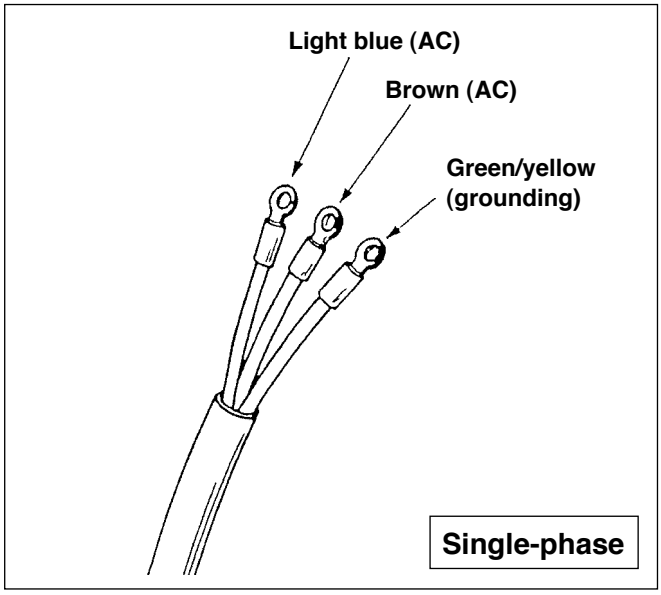
3-8. Locking the Pocket Folding Board



1) Mount the pocket folding board ❷ on the pocket folding board pipe ❸.
2) Lock the pipe to the pocket folding board using the pipe setscrew ❶.

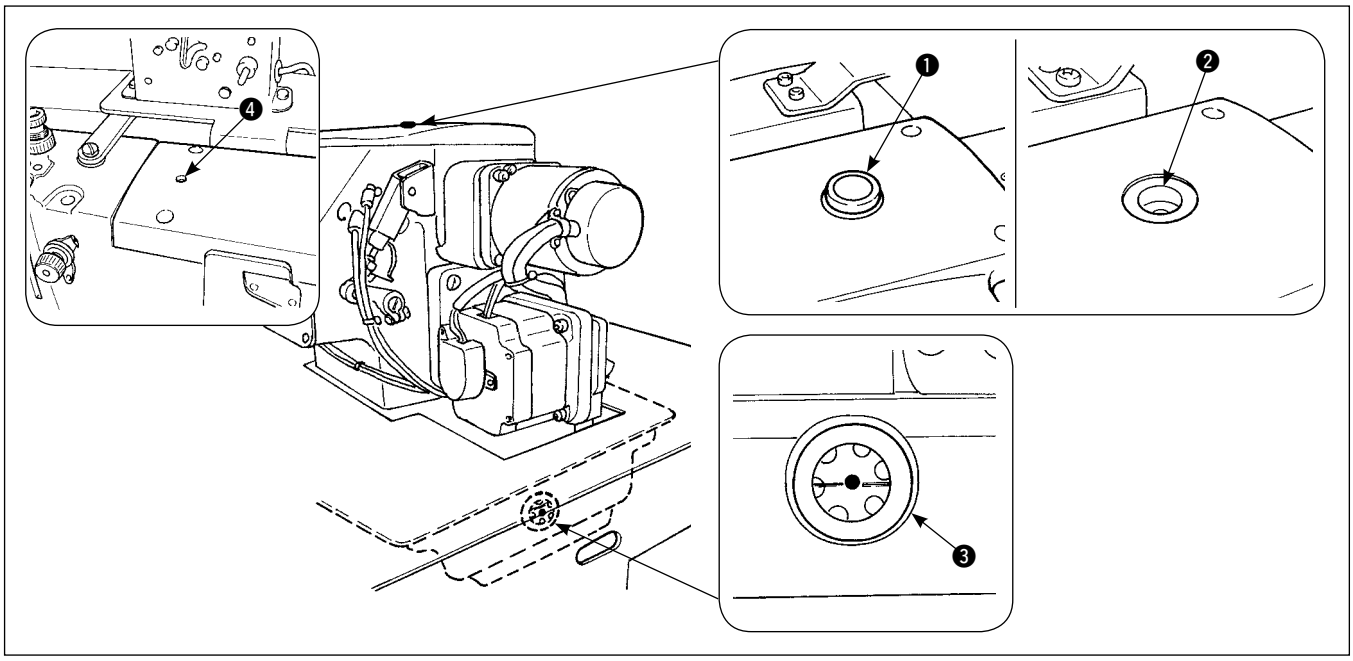
3-9. Connecting the power supply





1) The machine is not supplied with a power plug. It is therefore necessary for you to select a plug that matches the receptacle available under a given operating environment and attach it to the power cable.
2) Two different kinds of power sources, i.e.,, the 3-phase one and the single-phase one are prepared for this machine. Use the power source which matches the electric voltage specification of the machine.

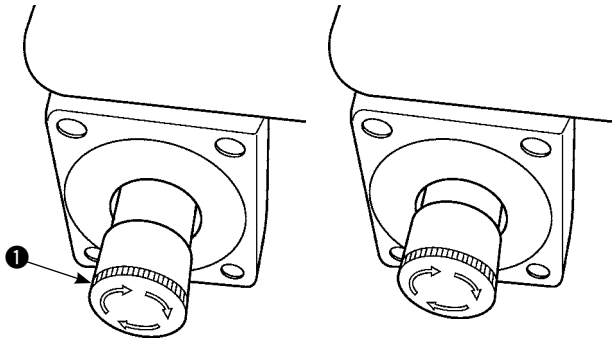
3-10. Lubrication



Remove filler cap ❶. Add JUKI New Defrix Oil No. 1 through fill opening ❷ until the oil level reaches the center of oil gauge ❸. In addition, when you bring a new machine into use, be sure to supply oil through fill opening ❹ by approximately 10 cc beforehand.

Be sure to use JUKI genuine oil. If you use any oil other than the specified oil, a trouble can result.

3-11. Checking the emergency stop switch



Emergency stop switch OFF state

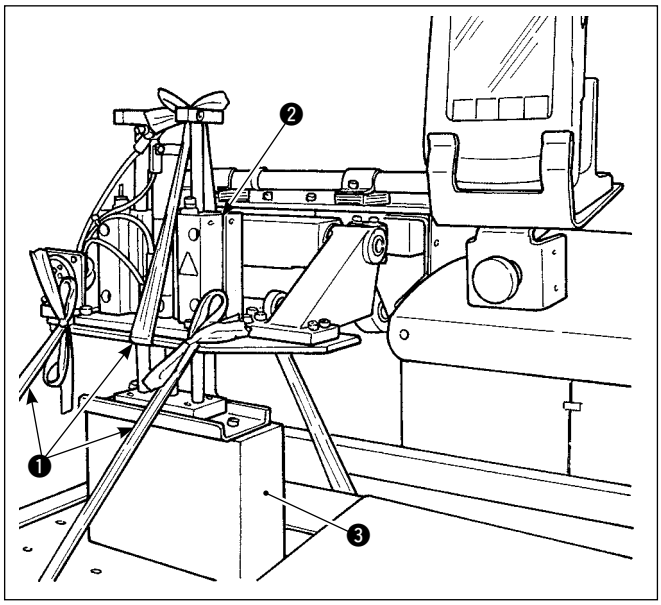
Emergency stop switch ON state

When the red button of emergency stop switch ❶ is strongly pressed as far as it goes, the switch is placed in its ON state. When the button is turned clockwise, the switch is placed in its OFF state.

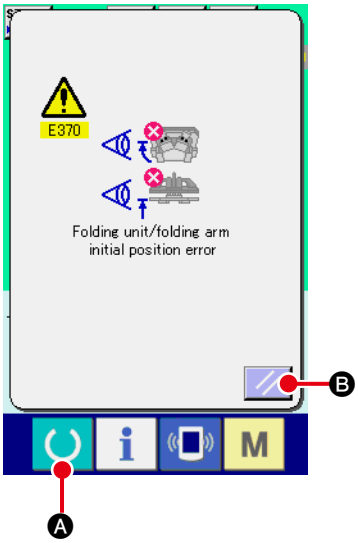
Check to be sure that emergency stop switch ❶ is in its OFF state.

If emergency stop switch ❶ is in its ON state, the operation panel screen will not light up even if the power switch is turned ON.

3-12. Removing the foamed polystyrene from the folding unit



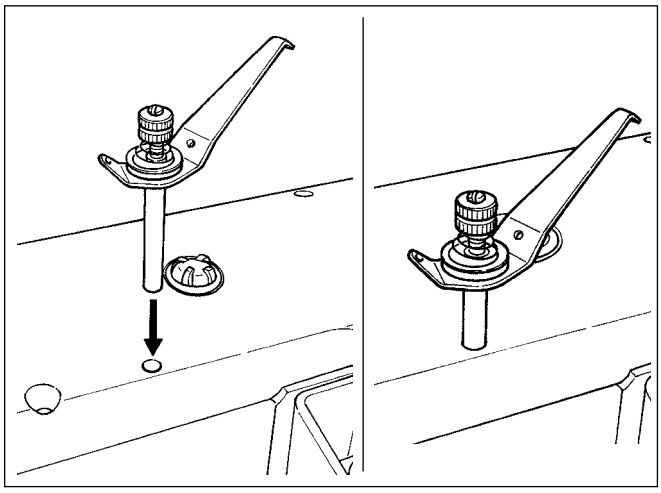
1) Remove binding cord ❶. Supply air to the machine and turn the power ON.
2) Press Set Ready key  Ⓐ.
3) If error No. 370 is displayed on the operation panel, press Reset button  Ⓑ.
4) After folding unit ❷ goes up, remove foamed polystyrene ❸ from the folding unit and turn the power OFF.



3-13. Mounting the Pattern

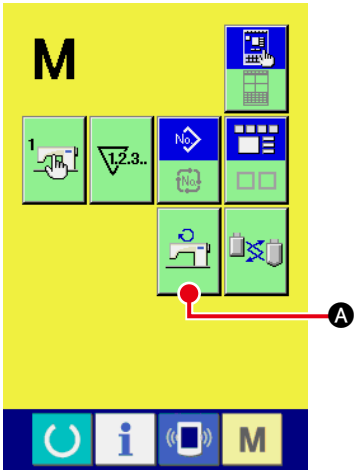
For the mounting of pattern, refer to **"Ⅱ-2-5. Replacing the pattern" p.36**.

3-14. Installing the guide bar



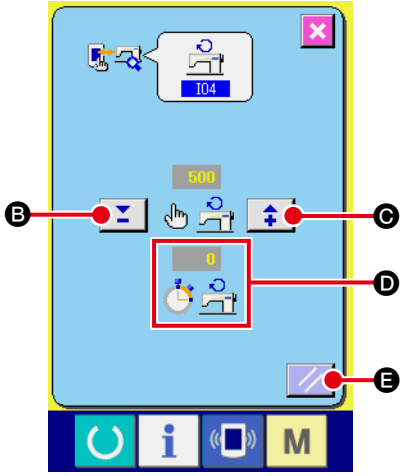
Securely insert the thread guide bar into the hole in the top cover in the orientation as shown in the figure at the left.

3-15. Break-in operation



1) Display the main motor revolutions check screen.

Press the M key. The main motor revolutions check button Ⓐ appears on the screen. Press this button to display the main motor revolutions check screen.



2) Run the main motor to break in the machine.

It is possible to set the number of revolutions by means of + and − buttons Ⓑ and Ⓒ.

Press the key to run the machine at the number of revolutions you have set.

At this time, the number of revolutions measured by the machine is displayed on Ⓓ.

Press reset button Ⓔ to stop the sewing machine.

Set the number of revolutions for the break-in operation at 2000.

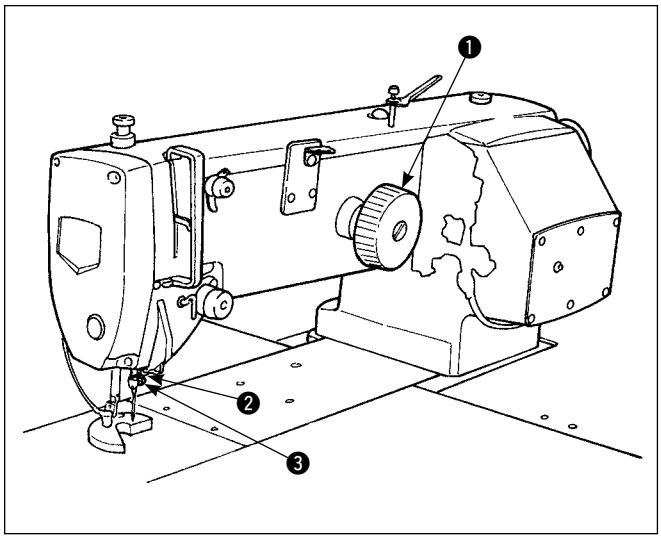
Caution

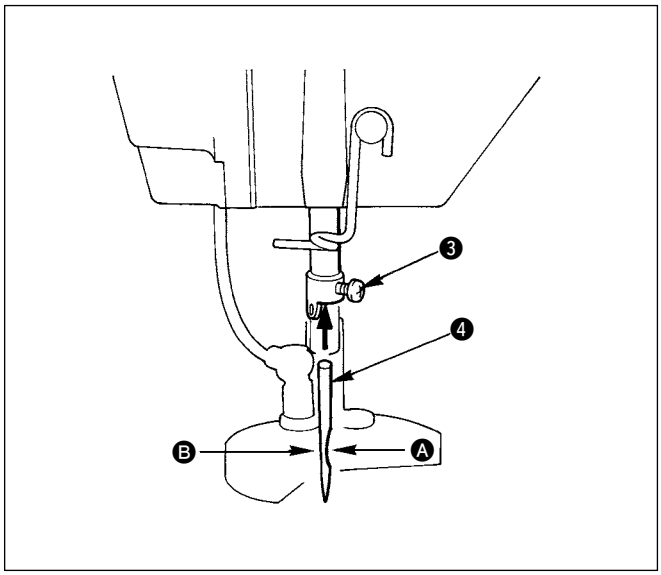
To use a new machine or the machine after an extended time of disuse, be sure to run in the machine for approximately 30 seconds to one minutes.

4. OPERATION

4-1. How to install the needle

WARNING :
Turn OFF the power before starting the work so as to prevent accidents caused by abrupt start of the sewing machine



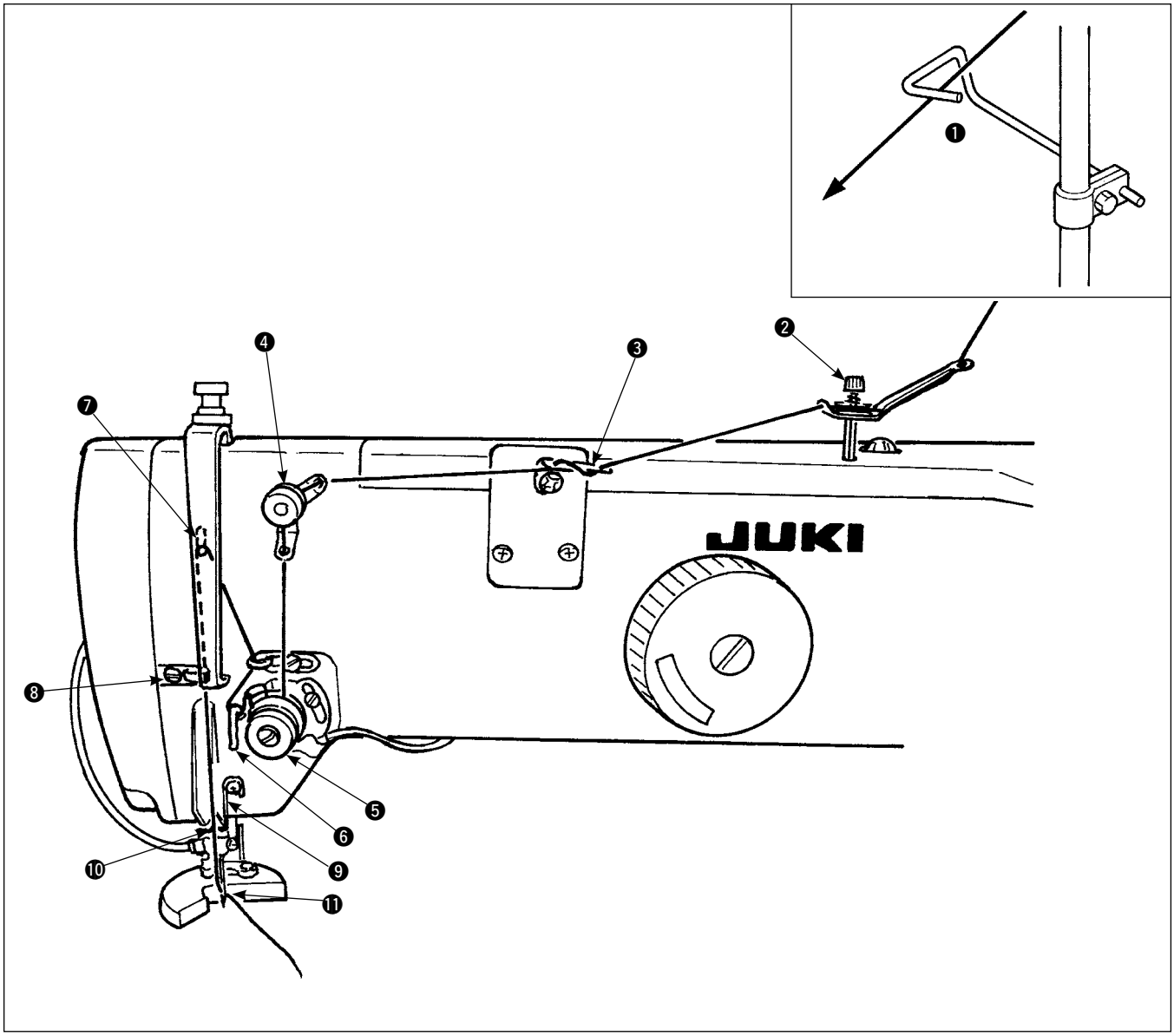


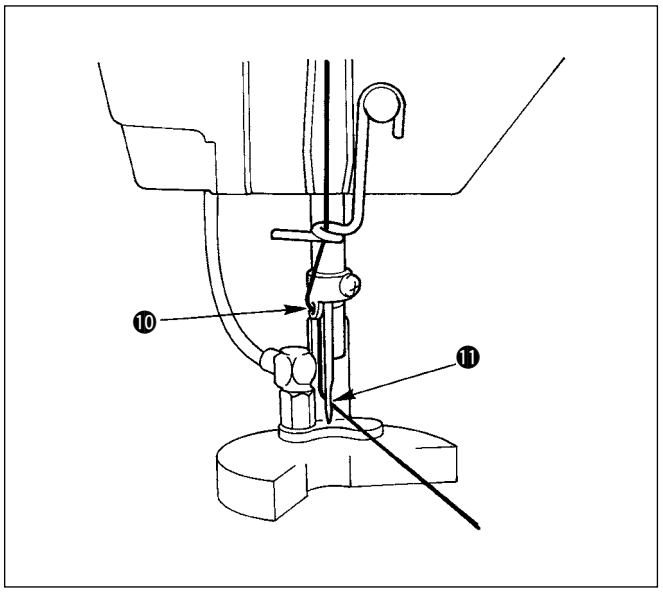
Use a SCHMETZ 134 SERV 7 Nm : 130 needle

1) Turn handwheel ❶ to lift needle bar ❷ to its highest position.
2) Loosen needle setscrew ❸ and turn needle ❹ so that its indentation Ⓐ is on the handwheel side.
3) Push the needle deeply into the hole in the needle bar, in the direction of the arrow, until it hits the surface at the far end of the hole.
4) Tighten the needle setscrew very tightly.
5) Check to make sure that long groove Ⓑ of the needle is on the face plate side.

4-2. Threading the needle thread

WARNING :
Turn OFF the power before starting the work so as to prevent accidents caused by abrupt start of the sewing machine



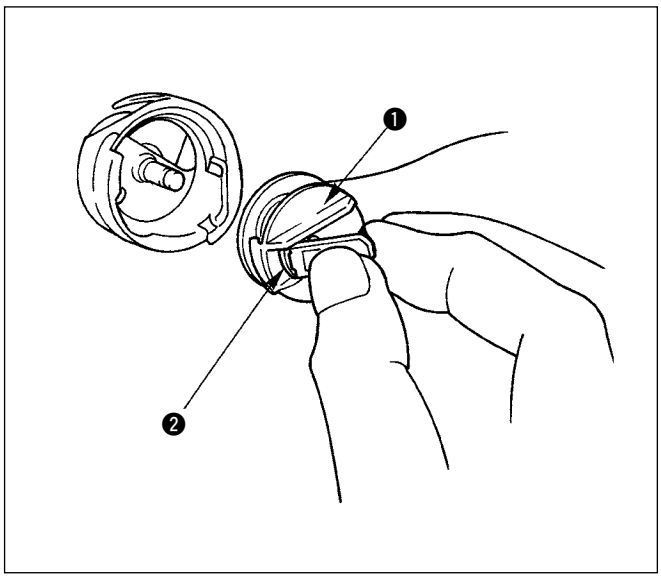


1) Thread the needle thread through the points shown in the figure, in the order of the numbers.
2) Pull out about 10 cm of the thread that passes through the needle.
3) For threading the thread while power is ON, please refer to the section on threading.

Pass the thread over the front side of the disc of thread guide ❷.

4-3. Installing / removing the bobbin case

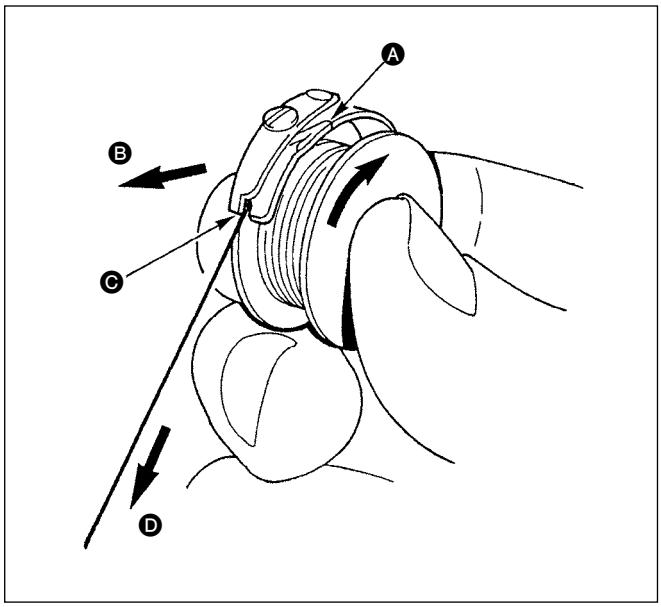
WARNING :
Turn OFF the power before starting the work so as to prevent accidents caused by abrupt start of the sewing machine



1) Fully raise latch ❷ of bobbin case ❶ until it stops, and take the bobbin case out of the hook. The bobbin fitted in bobbin case ❶ will not come off the bobbin case by holding latch ❷ with fingers.
2) To install the bobbin case in the hook, be sure to raise latch ❷ and fully fit the bobbin case over the hook driving shaft. Then release latch ❷ to let it down.

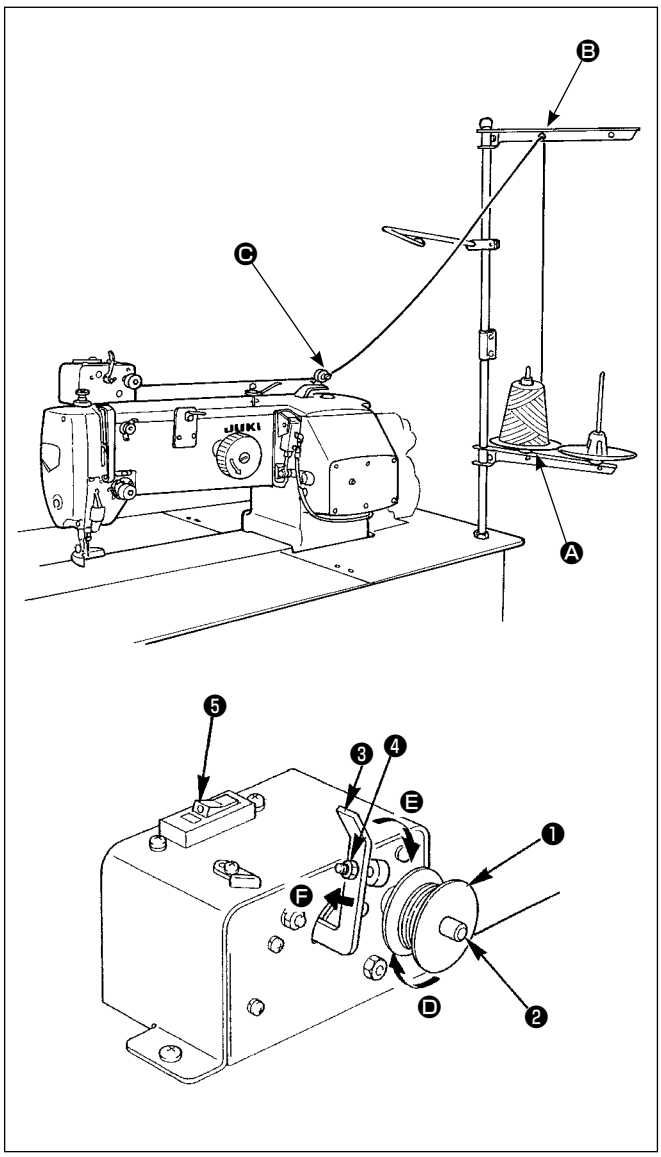
Please use the accessory exclusive bobbin case. Also, if it is not pushed in far enough, bobbin case ❶ might fall out during sewing. So, be careful.

4-4. Setting a bobbin into the bobbin case



1) Hold the bobbin in a way that the thread open end is directed to the right as observed from you, and set the bobbin into the bobbin case.
2) Pass the thread through thread slit Ⓐ, and pull the thread in direction Ⓑ. By so doing, the thread will pass under the thread tension spring and come out from notch Ⓒ.
3) Check that the bobbin rotates in the direction of the arrow when bobbin thread Ⓓ is pulled.

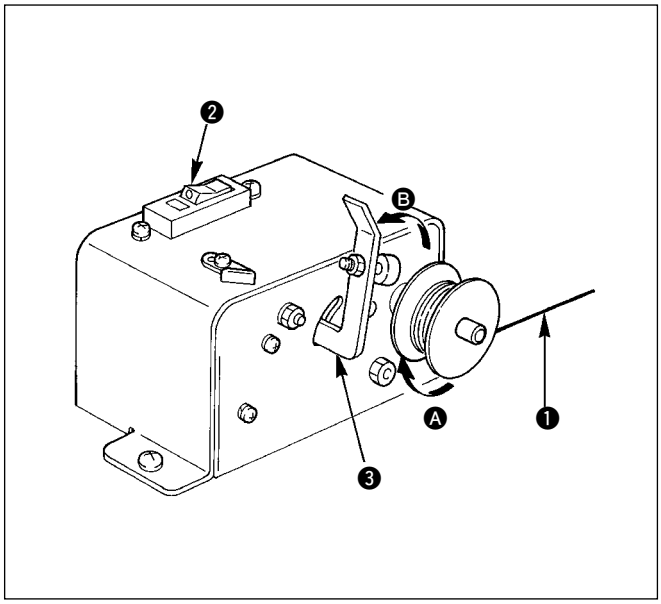
4-5. Winding a bobbin



Pass thread coming from the thread stand through tension controller Ⓒ and wind the thread on the bobbin.

1) Fit bobbin ❶ over bobbin winding shaft ❷ .
2) Pass the thread as illustrated in the figure, and wind the thread round bobbin four or five times in the direction of arrow Ⓓ.
3) Push bobbin presser ❸ toward the bobbin (in the direction of arrow Ⓔ), and the bobbin winder will start winding the bobbin. It will automatically stop winding the bobbin when the predetermined amount of thread has been wound round the bobbin (80% of the outside diameter of bobbin).
4) To adjust the amount of thread to be wound round the bobbin, loosen screw ❹ and change the position of the bobbin presser. (Moving the bobbin presser in the direction of arrow Ⓕ will increase the amount of thread to be wound round the bobbin.)

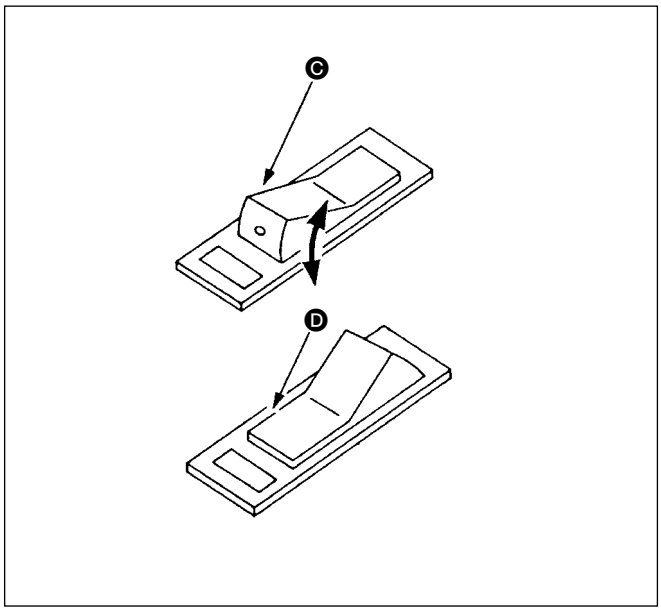
1. The bobbin winder will not actuate unless breaker ❺ of the seesaw type switch is in its ON state (where the white engraved marker dot can be observed). It means that you can use breaker ❺ as the bobbin winder switch.
2. Use the sewing machine while leaving breaker ❺ ON. If the bobbin winder fails to operate even when breaker ❺ is put in the ON state (the white marker dot is visible), turn OFF the breaker ❺ once, and then, return it ON.
3. Be sure to use the JUKI' s genuine bobbins and bobbin cases.
4. When threading the bobbin thread from thread guide arm Ⓑ to tension controller Ⓒ, fix thread stand disc Ⓐ in such a position that the disc Ⓐ and arm do not interfere with the bobbin thread path between Ⓑ and Ⓒ.



(1) Bobbin winder circuit protector

1) When the bobbin winder is operated, it sometimes happens that thread ❶ catches on something, producing a force that tends to stop it from winding (Ⓐ direction).

2) In such a case, to prevent the motor from burning out, circuit protector ❷ operates to temporarily break the circuit inside the bobbin winder, stopping the winder.



(2) Restoring the bobbin winder to operation after it stops

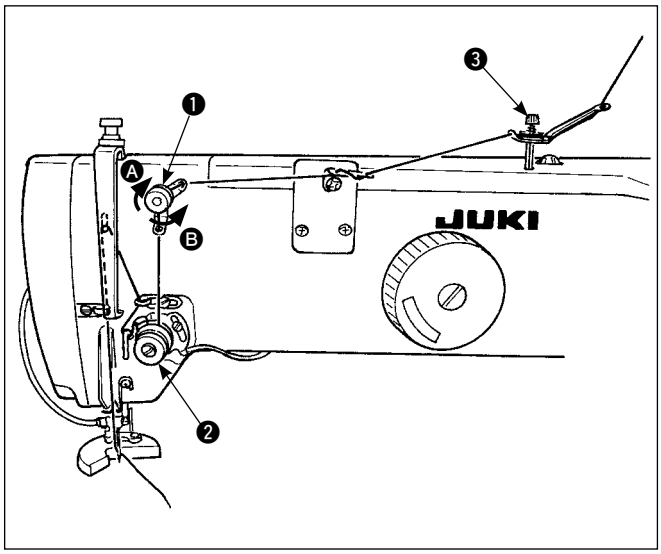
1) First flip bobbin presser ❸ in the direction of arrow Ⓑ, then turn the bobbin winder switch OFF.

2) Remove the cause of the force that tends to stop the thread from winding.

3) Temporarily flip the circuit protector switch from position Ⓒ to Ⓓ , then return it to Ⓒ.

4) Step 3) restores the circuit protector to its original status. When bobbin presser ❸ is flipped back to the bobbin side and the bobbin winder switch is turned ON, the winder resume operation.

4-6. Thread tension

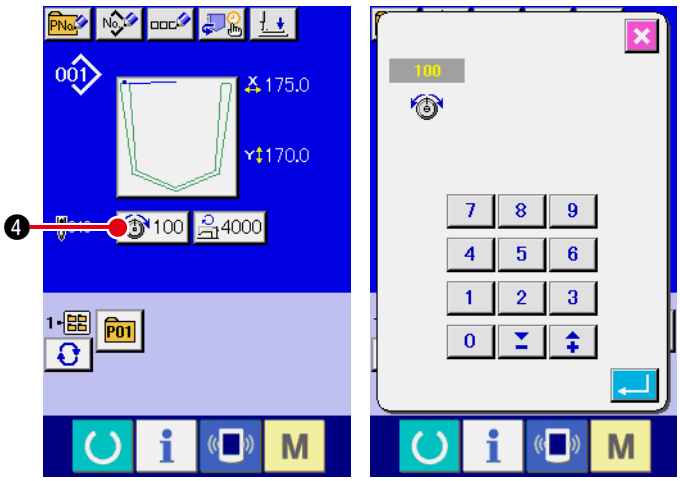


(1) Adjusting the needle thread tension

1) When No.1 tension controller ❶ is turned clockwise (arrow Ⓐ), the amount of thread left on the needle tip after thread trimming is reduced.

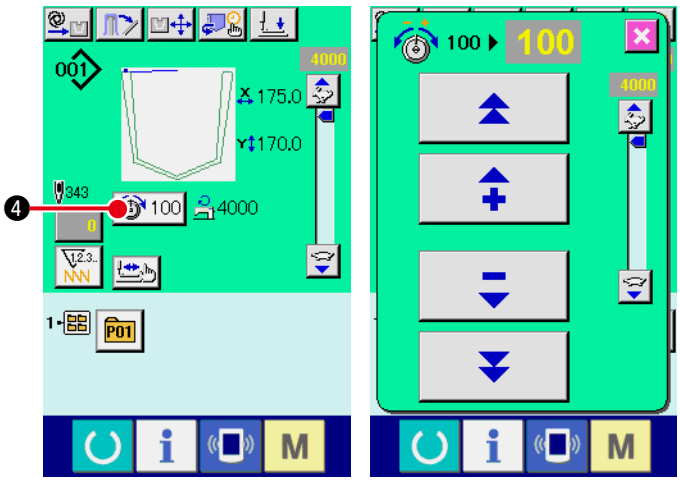
2) When the tension controller is turned counterclockwise (arrow Ⓑ), the amount of thread remaining is increased.

3) Thread guide rod ❸ should apply as little tension as possible.

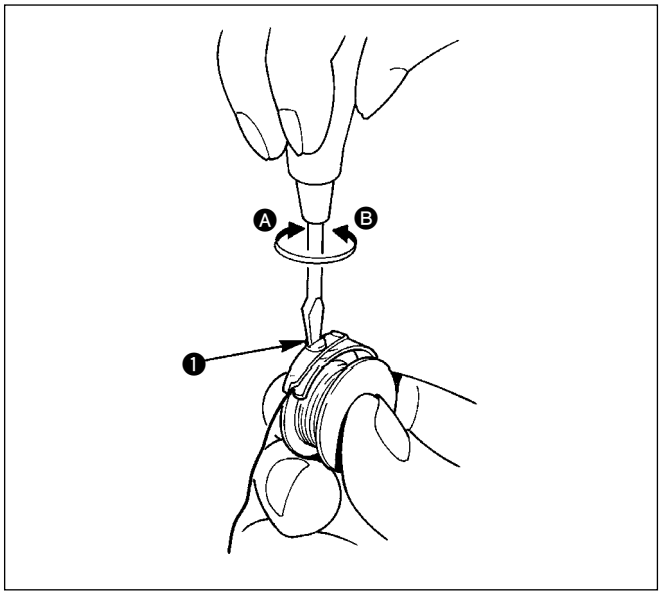


Data input screen

4) Tension controller No. 2 ❷ is an AT thread controller. Thread tension controlled by this controller is changed on the operation panel. It can be changed on the data input screen (blue background) and the sewing screen (green background).
The thread tension can be changed by means of tension change button 100 ❹ (0 to 200).



Sewing screen

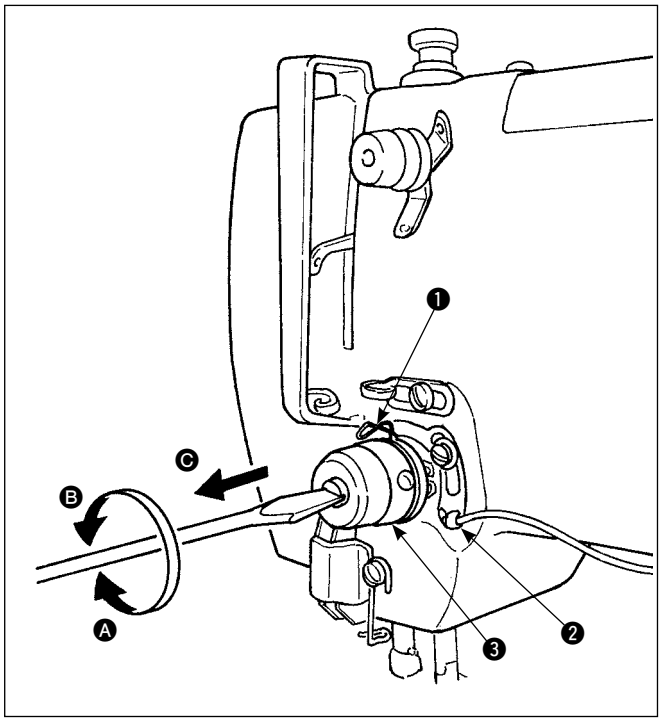


(2) Adjusting the bobbin thread tension

1) Turning tension controller ❶ clockwise (in direction Ⓐ) will increase the bobbin thread tension.

2) Turning the tension controller counterclockwise (in direction Ⓑ) will decrease the bobbin thread tension.

4-7. Thread take-up spring



(1) Adjusting the stroke of thread take-up spring

1) The standard stroke of the thread take-up spring is 6 to 11 mm.

2) To change the stroke of thread take-up spring ❶, loosen screw ❷ in the tension post socket, fit a flat-bit screwdriver in the groove in tension post ❸ and turn the post with the screwdriver. Turning the post clockwise (in direction Ⓐ) will increase the stroke. Turning it counterclockwise (in direction Ⓑ) will decrease it.

(2) Adjusting the pressure of thread take-up spring

1) The pressure of the thread take-up spring should be adjusted to 0.15 to 0.25N when it starts pulling the thread.

2) Fit a flat-bit screwdriver in the groove in tension post ❸, and turn the tension post clockwise (in direction Ⓐ) to increase the pressure of thread take-up spring, or counterclockwise (in direction Ⓑ) to decrease it.

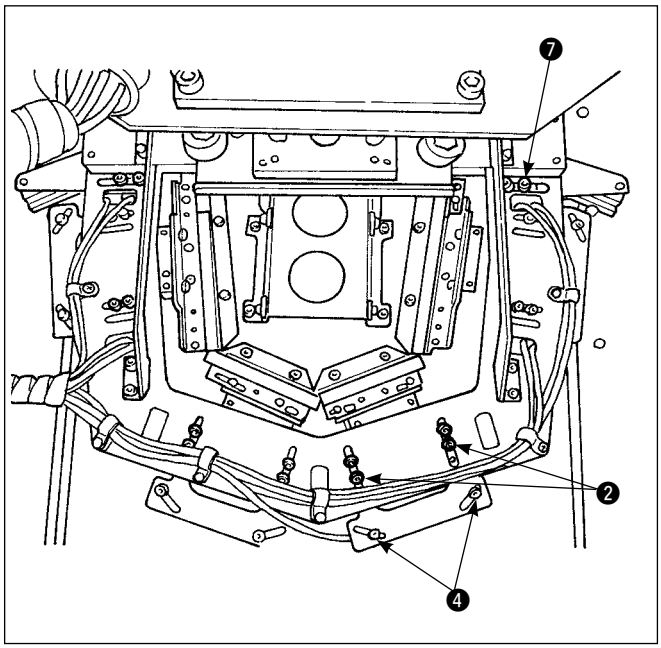
1. When adjusting the stroke of thread take-up spring, the position of the thread breakage detecting plate should also be adjusted. Adjust the position of the thread breakage detecting plate so that it always comes in contact with the thread take-up spring when the thread take-up spring is not threaded. (Deflection of the spring is approximately 0.5 mm)

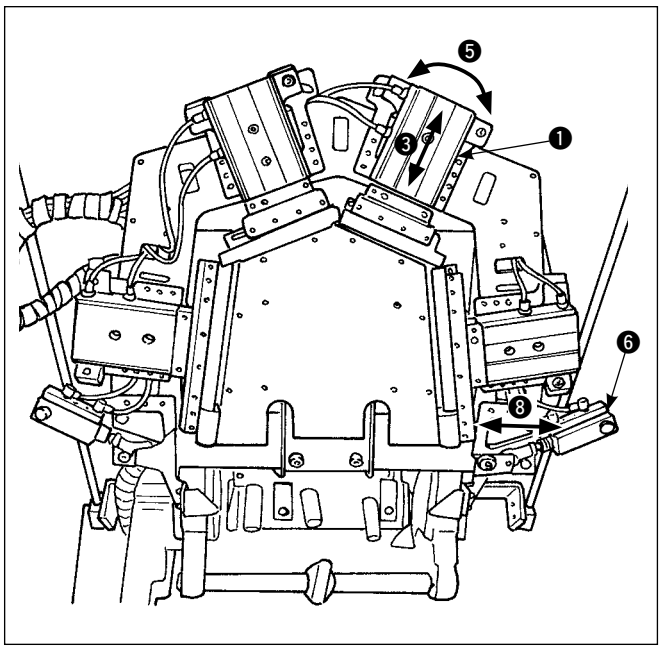
Caution

*** Do not adjust the stroke of thread take-up spring using the thread breakage detecting plate. Doing so may result in thread take-up spring breakage.**

2. Confirm that the tension disc comes in close contact with the thread take-up spring after the stroke of thread take-up spring after the stroke of thread take-up spring has been adjusted. If the tension disc does not come in close contact with the thread take-up spring, loosen sorew ❷ in the tension post socket, and draw the tension post in direction ❹ to make the adjustment.

4-8. How to adjust the folding unit

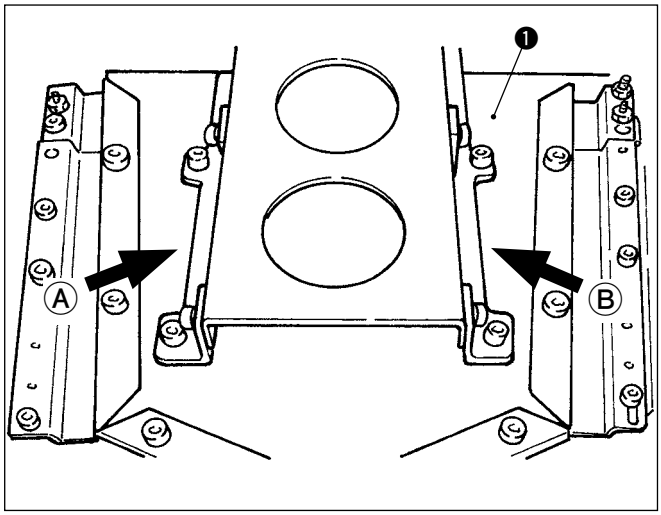




(1) Adjusting the cylinder

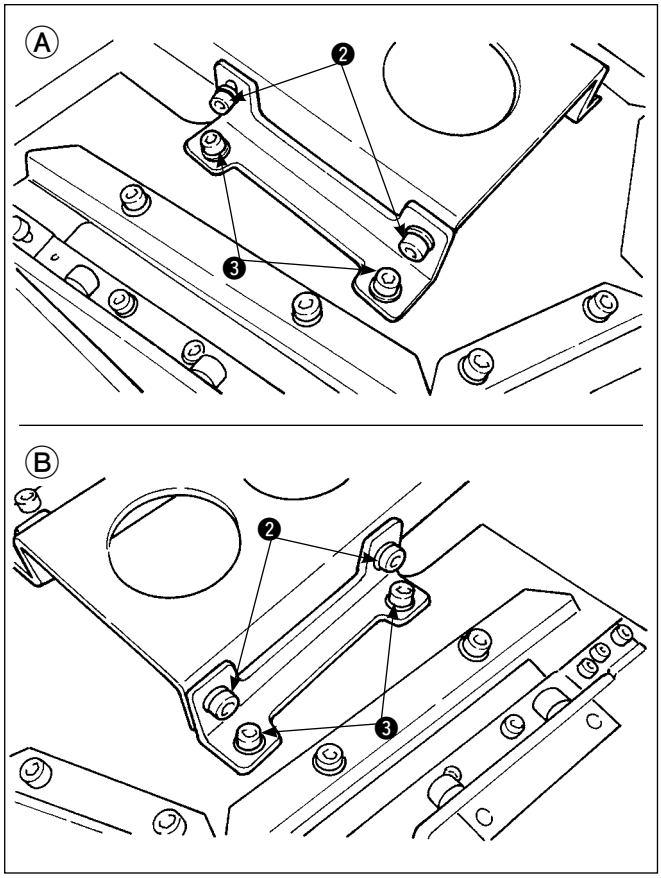
1) Folding blade drive cylinder ❶ can be adjusted in the direction of arrow ❸ (longitudinal direction of the cylinder) by loosening setscrews ❷.
   In addition, it can be adjusted in the direction of arrow ❺ (direction of rotation) by loosening setscrews ❹.

2) Pocket lip folding cylinder ❻ can be adjusted in the direction of arrow ❽ (lateral direction) by loosening setscrew ❼.

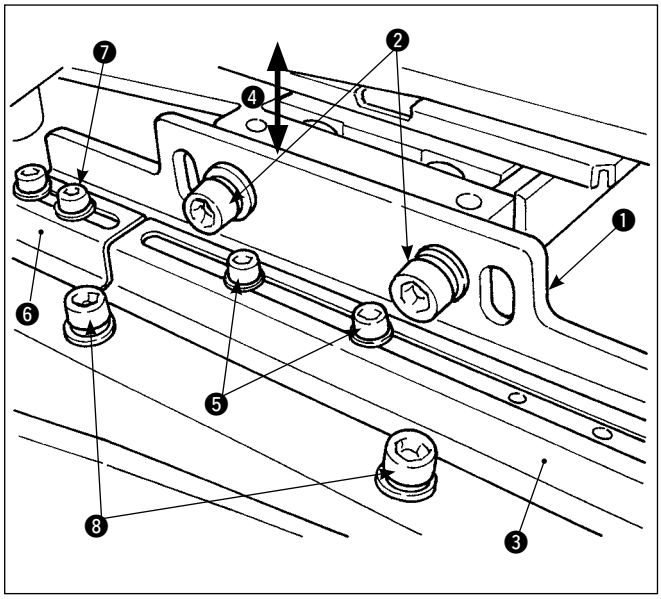


(2) Adjusting the position of the pocket presser plate

1) Press the start switch under the step mode to lower the folding unit before carrying out adjustment.
→ Refer to **"Ⅱ-2-10. Setting the MANUAL/AUTOMATIC/STEP" p.44**.



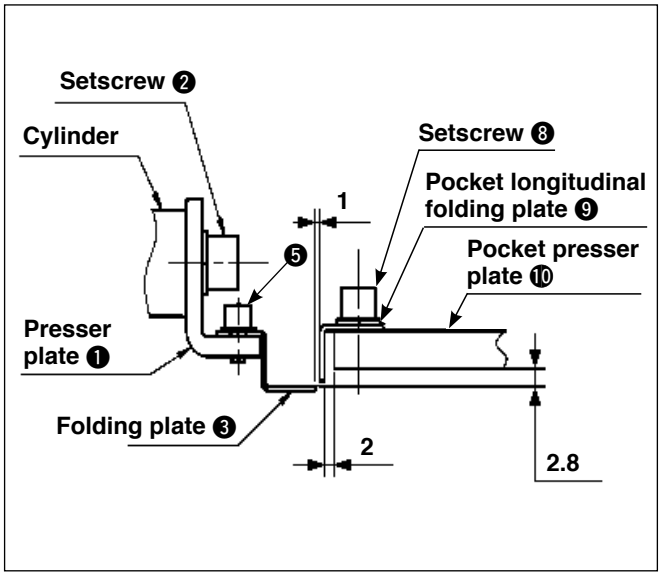
2) Pocket presser plate ❶ can be adjusted in height by loosening setscrews ❷.
Carry out the aforementioned adjustment to adjust the clearance provided between the pattern plate and the pocket presser plate.
In addition, the longitudinal clearance between the pattern plate and the pocket presser plate can be adjusted by loosening setscrews ❸.



(3) Adjusting the folding plate

1) Adjusting the folding plate in terms of the longitudinal direction.
   Loosen presser plate ❶ setscrews ❷. Adjust folding plate ❸ mounted on presser plate ❶ in the direction of arrow ❹ (vertical direction).

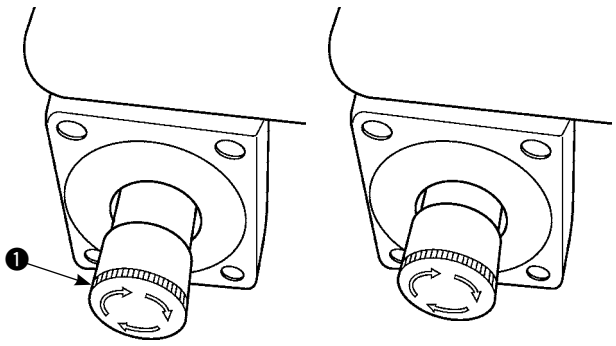
2) Adjusting the folding plate in terms of the thrust direction.
   Loosen setscrews ❺ of folding plate ❸. Adjust the folding plate in terms of the thrust direction.
   In addition, loosen setscrew ❼ of folding plate (pocket lip folder) ❻. Adjust the folding plate in terms of the thrust direction.



3) For the fixing position of pocket longitudinal folding plate ❾, fix it by means of pocket longitudinal plate setscrews ❽ with spaced 2 mm from the pocket presser plate.

4) Adjust the height of folding plate ❸ so that it is approximately 2.8 mm above the bottom of pocket presser plate ❿.
   When adjusting the longitudinal position of the cylinder, provide a clearance of an approximately 1 mm between folding plate ❸ and pocket longitudinal folding plate ❾.

5. Emergency stop switch



Emergency stop switch OFF state (normal) **Emergency stop switch ON state**

(1) How to operate the emergency stop switch

When the red button of emergency stop switch ❶ is strongly pressed as far as it goes, the switch is placed in its ON state. When the button is turned clockwise, the switch is placed in its OFF state.

When emergency stop switch ❶ is placed in its ON state, the power to the machine parts excluding the blower motor is disconnected to stop them.

If the emergency stop switch ❶ which is in its ON state is turned OFF, the power to the machine parts is re-turned ON. Be careful about abrupt restoration of the power.

To disconnect the power for any purpose other than turning OFF of the emergency stop switch, operate the power switch.

(2) Precautions for use of the emergency stop switch

If emergency stop switch ❶ is in its ON state, the operation panel screen will not light up even if the power switch is turned ON.

Ⅱ. OPERATION SECTION (WITH REGARD TO THE PANEL)

1. PREFACE

1) Kind of sewing data handled with IP-420

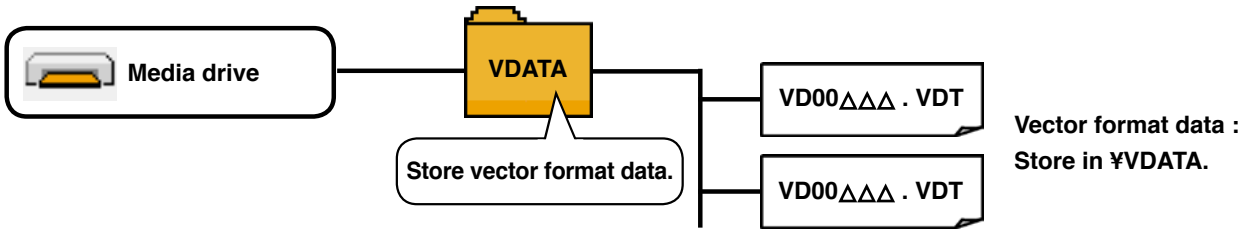
Pattern name	Description
Users' pattern	Pattern that can be stored in the body. Max. 999 patterns can be registered.
Vector format data	File that extension is ".VDT" Read from media. Max. 999 patterns can be used.

2) To use the sewing data (M3 data) used by the AVP-875 for the AP-876, it is necessary to convert the data into vector format data by means of the PM-1.

Change to the vector format data with PM-1. (For the details, refer to Help of PM-1.)
Copy the changed vector format data to ¥VDATA folder of the media.
Insert the media to IP-420 and select Pattern No.

3) Folder structure of the media

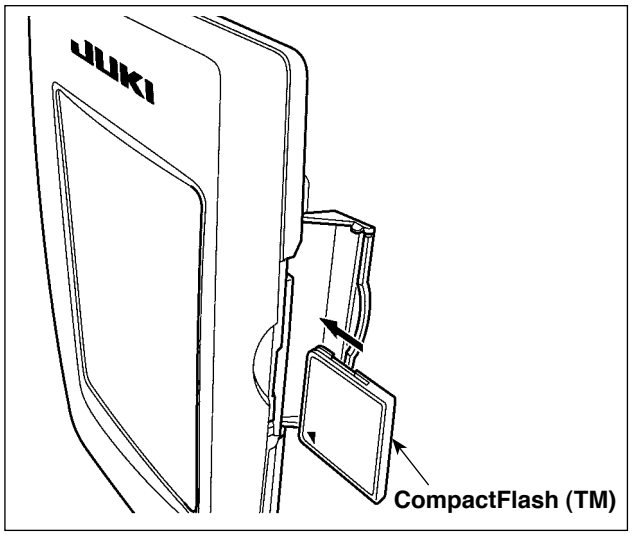
Store each file in the directories below of the media.



Caution **Data that are not stored in the directories above cannot be read. So, be careful.**

4) CompactFlash (TM)

■ Inserting the CompactFlash (TM)

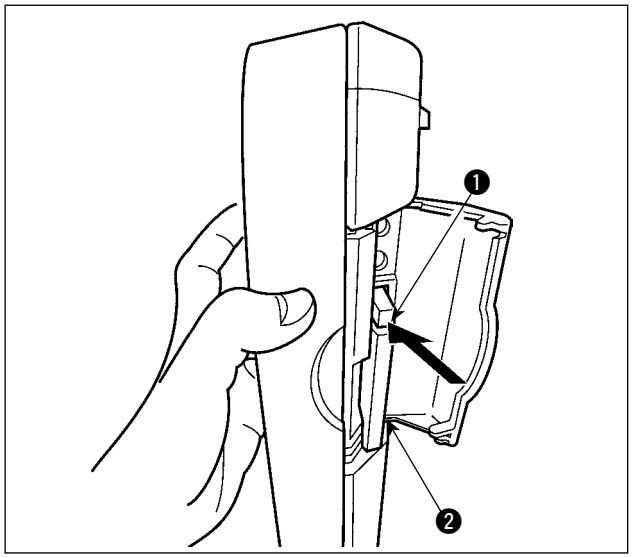


1) Turn the label side of the CompactFlash(TM) to this side (place the notch of the edge to the rear.) and insert the part that has a small hole into the panel.
2) After completion of setting of the CompactFlash(TM), close the cover. By closing the cover, it is possible to access. If the CompactFlash(TM) and the cover come in contact with each other and the cover is not closed, check the following matters.
   - Check that the CompactFlash(TM) is securely pressed until it goes no further.
   - Check that the inserting direction of the CompactFlash(TM) is proper.

Caution

1. **When the inserting direction is wrong, panel or CompactFlash (TM) may be damaged.**
2. **Do not insert any item other than the CompactFlash (TM).**
3. **The media slot in the IP-420 accommodates to the CompactFlash (TM) of 2 GB or less.**
4. **The media slot in the IP-420 supports the FAT16 which is the format of the CompactFlash (TM). FAT32 is not supported.**
5. **Be sure to use the CompactFlash (TM) which is formatted with IP-420. For the formatting procedure of the CompactFlash (TM), see "Ⅱ-2-32. Performing formatting of the media", p.95.**

■ Removing the CompactFlash (TM)



1) Hold the panel by hand, open the cover, and press the CompactFlash(TM) ❷ removing lever ❶. The CompactFlash(TM) is eject.

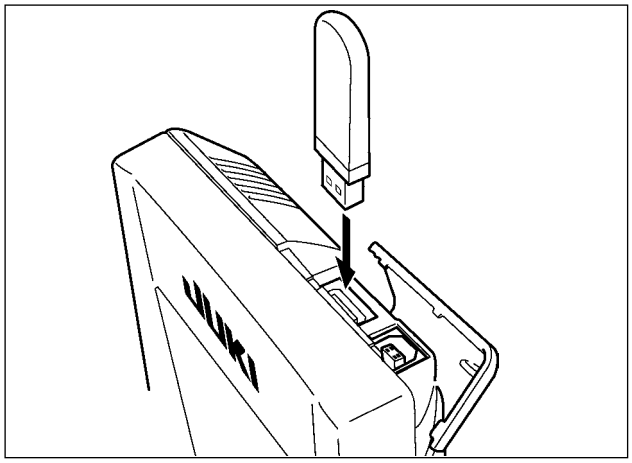
Caution

When the lever ❶ is strongly pressed, the CompactFlash (TM) ❷ may be broken by protruding and falling.

2) When the CompactFlash(TM) ❷ is drawn out as it is, removing is completed.

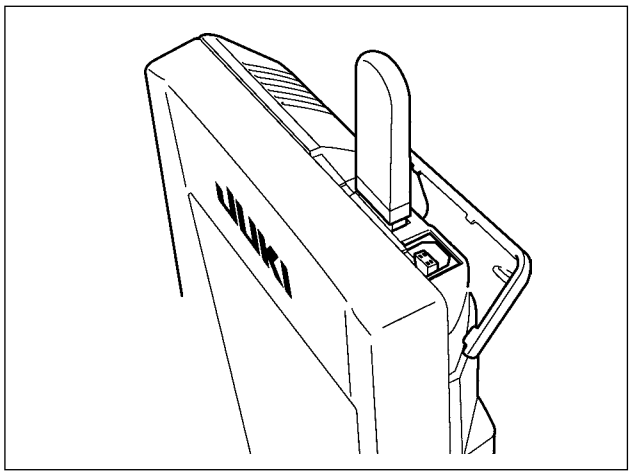
5) USB port

■ Inserting a device into the USB port



Slide the top cover and insert the USB device into the USB port. Then, copy data to be used from the USB device onto the main body.
After completion of copying the data, remove the USB device.

■ Disconnecting a device from the USB port



Remove the USB device. Put the cover back in place.

Cautions when using the media

- **Do not wet or touch it with wet hands. Fire or electric shock will be caused.**
- **Do not bend, or apply strong force or shock to it.**
- **Never perform disassembling or remodeling of it.**
- **Do not put the metal to the contact part of it. Data may be disappeared.**
- **Avoid storing or using it in the places below.**
  Place of high temperature or humidity / Place of dew condensation /
  Place with much dust / Place where static electricity or electrical noise is likely to occur

① Precautions to be taken when handling USB devices

- Do not leave the USB device or USB cable connected to the USB port while the sewing machine is in operation. The machine vibration can damage the port section resulting in loss of data stored on the USB device or breakage of the USB device or sewing machine.
- Do not insert/remove a USB device during reading/writing a program or sewing data.
  It may cause data breakage or malfunction.
- When the storage space of a USB device is partitioned, only one partition is accessible.
- Some type of the USB device may not be properly recognized by this sewing machine.
- JUKI does not compensate for loss of data stored on the USB device caused by using it with this sewing machine.
- When the panel displays the communication screen or pattern data list, the USB drive is not recognized even if you insert a medium into the slot.
- For USB devices and media such as CF cards, only one device/medium should be basically connected/inserted to/into the sewing machine. When two or more devices/media are connected/inserted, the machine will only recognize one of them. Refer to the USB specifications.

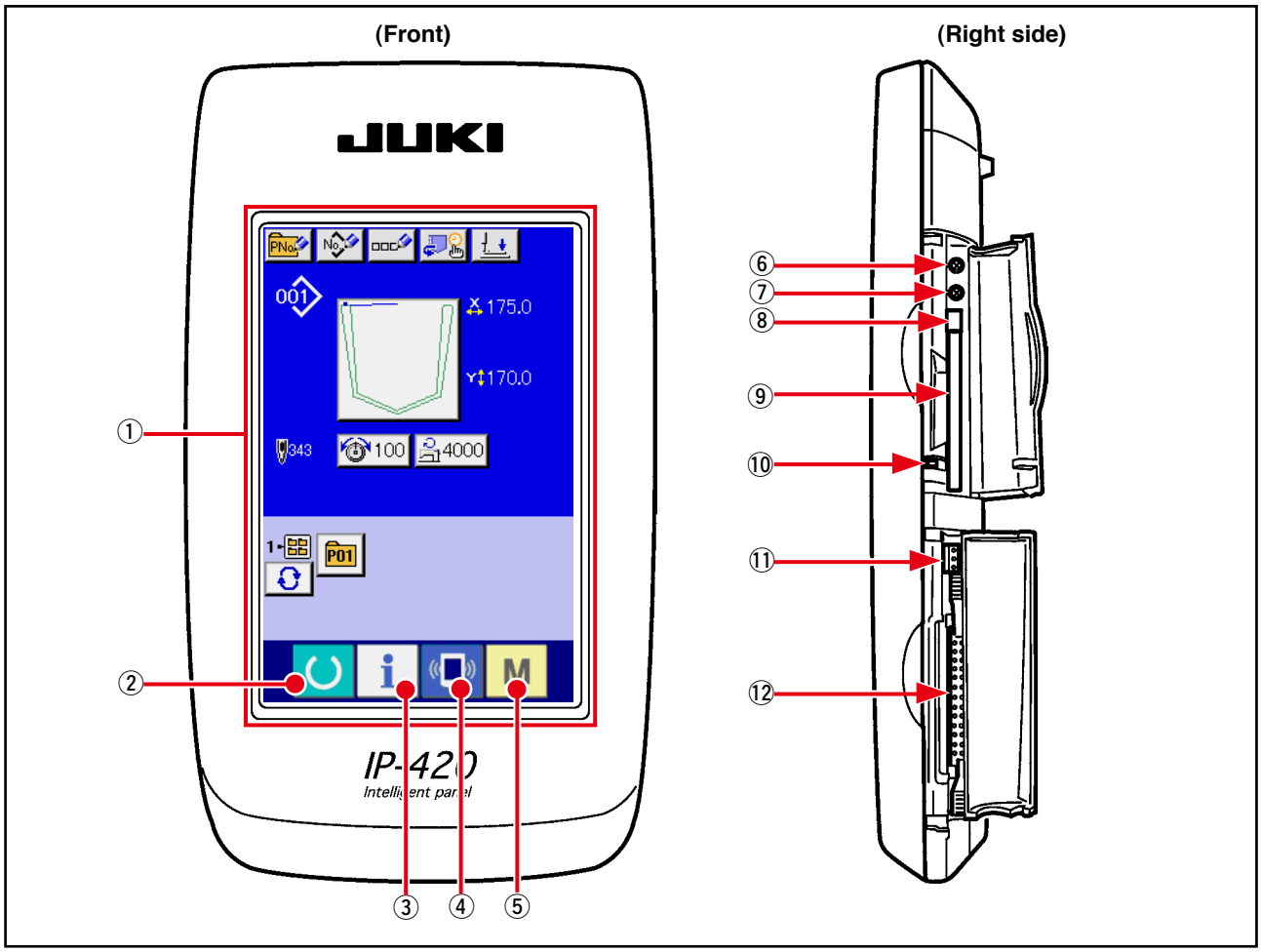
② USB specifications

- Conform to USB 1.1 standard
- Applicable devices *1 — Storage devices such as USB memory, USB hub, FDD and card reader
- Not-applicable devices — CD drive, DVD drive, MO drive, tape drive, etc.
- Format supported — FD (floppy disk) FAT 12
  Others (USB memory, etc.), FAT 12, FAT 16, FAT 32
- Applicable medium size — FD (floppy disk) 1.44MB, 720kB
  Others (USB memory, etc.), 4.1MB ~ (2TB)
- Recognition of drives — For external devices such as a USB device, the device which is recognized first is accessed. However, when a medium is connected to the built-in media slot, the access to that medium will be given the highest priority. (Example: If a medium is inserted into the media slot even when the USB memory has already been connected to the USB port, the medium will be accessed.)
- Restriction on connection — Max. 10 devices (When the number of storage devices connected to the sewing machine has exceeded the maximum number, the 11th storage device and beyond will not be recognized unless they are once disconnected and re-connected.)
- Consumption current — The rated consumption current of the applicable USB devices is 500 mA at the maximum.

*1: JUKI does not guarantee operation of all applicable devices. Some device may not operate due to a compatibility problem.

2. WHEN USING IP-420

2-1. Name of each section of IP-420



① Touch panel · LCD display section

② READY key → Changeover of the data input screen and the sewing screen can be performed.

③ INFORMATION key → Changeover of the data input screen and the information screen can be performed.

④ COMMUNICATION key → Changeover of the data input screen and the communication screen can be performed.

⑤ MODE key → Changeover of the data input screen and the mode changeover screen which performs various detail settings can be performed.

⑥ Contrast control
⑦ Brightness control
⑧ CompactFlash (TM) eject button
⑨ CompactFlash (TM) slot
⑩ Cover detection switch
⑪ Connector for external switch
⑫ Connector for control-box connection

2-2. Buttons to be used in common

The buttons which perform common operations in each screen of IP-420 are as follows :


CANCEL button → This button closes the pop-up screen.
In case of the data change screen, the data being changed can be cancelled.


ENTER button → This button determines the changed data.


UP SCROLL button → This button scrolls the button or the display in the upward direction.


DOWN SCROLL button → This button scrolls the button or the display in the downward direction.


RESET button → This button performs the release of error.


NUMERAL INPUT button → This button displays ten keys and input of numerals can be performed.


CHARACTER INPUT button → This button displays the character input screen.
→ Refer to **“Ⅱ-2-18. Naming users' pattern” p.59**.

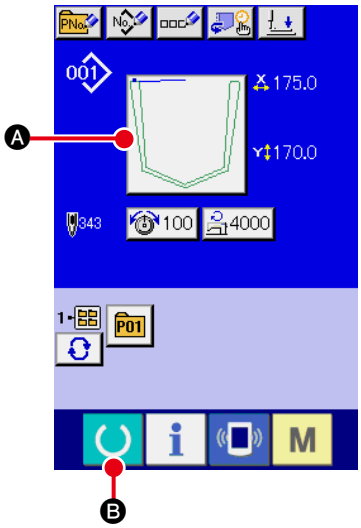

RESSER LOWERING button → Presser is lowered, and the presser lowering screen is displayed. To lift presser, press presser lift button displayed in the presser lowering screen.

2-3. Basic operation of IP-420

① **Turn ON the power switch**

When the power is turned ON first, the language selection screen is displayed. Set the language you use. (It is possible to change with Memory switch U500.)

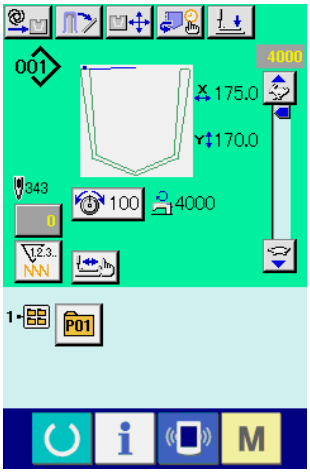
When ending the selection screen with CANCEL button or ENTER button without performing the language selection, the language selection screen is displayed whenever the power is turned ON.



② **Select the pattern No. you desire to sew.**

When the power is turned ON, the data input screen is displayed. If pattern select button Ⓐ which indicates the shape which is currently selected is shown on the center section of the screen, you can select the sewing pattern by pressing the button. Refer to "Ⅱ-2-6. How to select the sewing pattern" p.38 for how to select the sewing pattern.

When READY key Ⓑ is pressed, the back color of LCD display is changed to green, and the sewing machine is set to the sewing possible state.



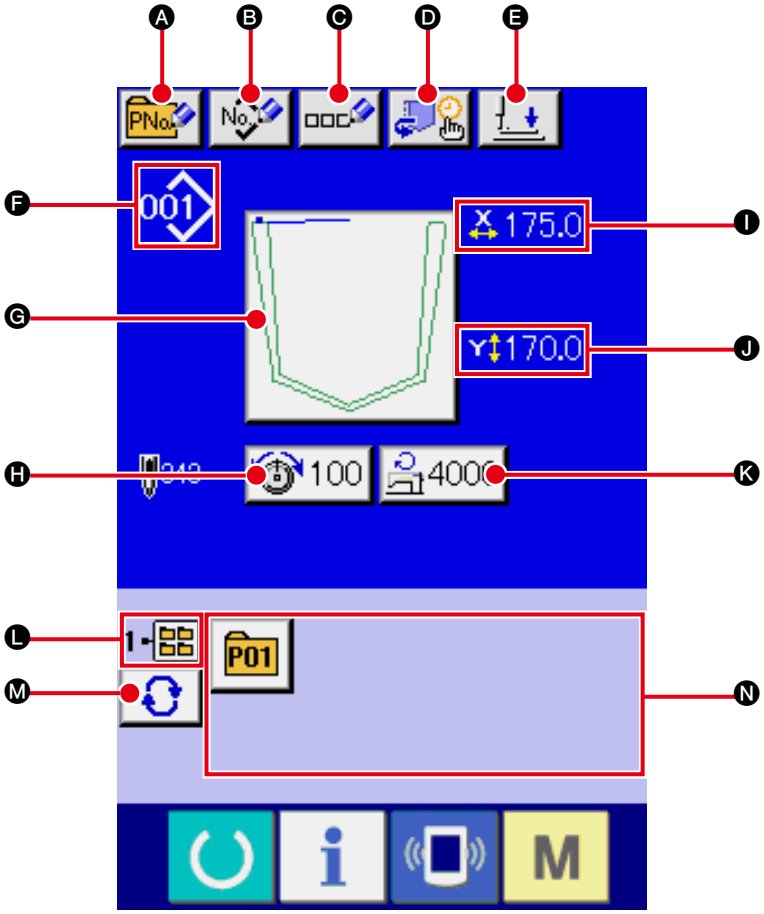
③ **Start sewing.**

* For the screen, refer to "Ⅱ-2-4. Liquid crystal display at the time of sewing pattern selection" p.32.

1. **Confirm the pattern shape before sewing. Should the pattern protrude from the presser plate, needle interferes with the presser plate during sewing, and there is a danger of needle breakage or the like.**
2. **When the presser plate is at its upper position, it moves after coming down. Take care not to allow your fingers to be caught under the presser plate.**
3. **When turning OFF the power without pressing READY key , the set value of "Pattern No.", "Max. sewing speed" or "Thread tension" is not stored in memory.**
4. **Do not turn the power off while the data is being written. If you turn the power off, the data in storage can be lost and the selected pattern number can be lost.**

2-4. Liquid crystal display at the time of sewing pattern selection

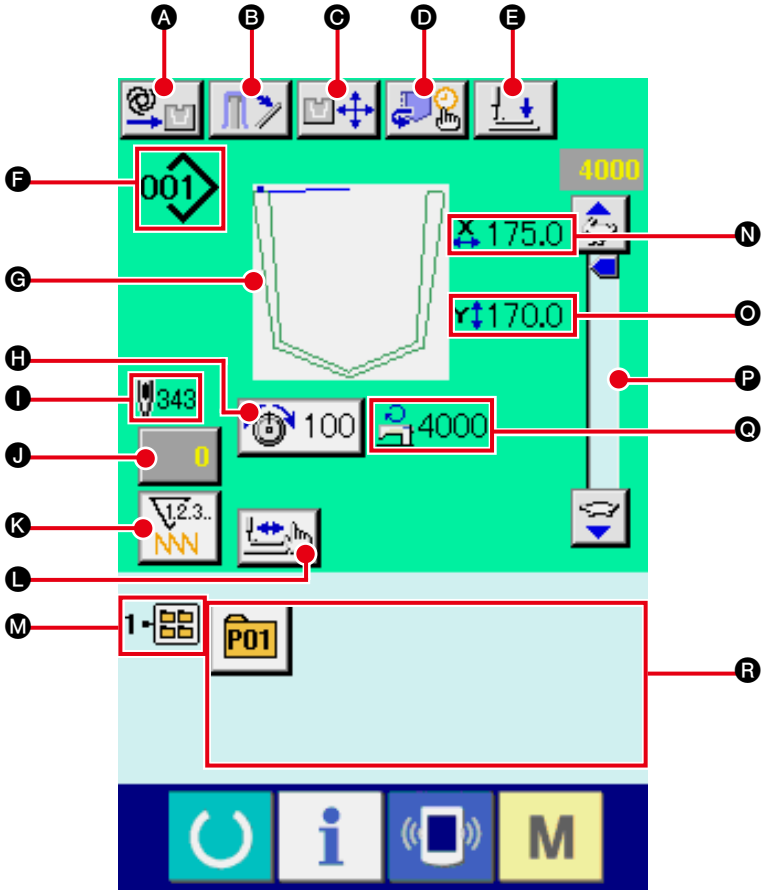
(1) Sewing pattern data input screen



	Button and display	Description
Ⓐ	PATTERN BUTTON NEW REGISTER button	Pattern button new register screen is displayed. → Refer to **"Ⅱ-2-19. Performing new register of pattern button" p.60**.
Ⓑ	USERS' PATTERN NEW REGISTER button	Users' pattern new register screen is displayed. → Refer to **"Ⅱ-2-17. Performing new register of users' pattern" p.58**.
Ⓒ	PATTERN BUTTON NAME SETTING button	Pattern button name input screen is displayed. → Refer to **"Ⅱ-2-18. Naming users' pattern" p.59**.
Ⓓ	FOLDING UNIT SETTING button	The folding timing setting screen is displayed. → Refer to **"Ⅱ-2-11. Changing the folding timing" p.45**.
Ⓔ	PRESSER DOWN button	The presser plunger comes down, and the presser down screen is displayed. → Refer to **"Ⅱ-2-14. Lowering the presser" p.52**.
Ⓕ	SEWING PATTERN NO. display	The type and number of the currently-selected sewing pattern are displayed. The following two types of sewing patterns exit. 001 : Users' pattern VDT : Vector format data * Be sure to use the media that has been formatted with IP-420. For the formatting procedure of the media, refer to **"Ⅱ-2-32. Performing formatting of the media" p.95**.

	Button and display	Description
Ⓖ	SEWING PATTERN SELECT button	This button indicates the currently-selected sewing pattern on it. When it is pressed, the sewing pattern selection screen is displayed. → Refer to **"Ⅱ-2-6. How to select the sewing pattern" p.38**.
Ⓗ	NEEDLE THREAD TENSION SETTING button	Needle thread tension value which is set to the pattern data being selected at present is displayed on this button and when the button is pressed, the item data change screen is displayed. → Refer to **"Ⅱ-2-8. Changing item data" p.41**.
Ⓘ	X ACTUAL SIZE VALUE display	Actual size value in X direction of sewing shape being selected at present is displayed.
Ⓙ	Y ACTUAL SIZE VALUE display	Actual size value in Y direction of sewing shape being selected at present is displayed.
Ⓚ	MAX. SPEED LIMITATION	Maximum speed limitation which is set at present is displayed on this button and when the button is pressed, the item data change screen is displayed. (However, maximum speed limitation which is displayed is different from the maximum number of revolutions in the pattern.) → Refer to **"Ⅱ-2-8. Changing item data" p.41**.
Ⓛ	FOLDER NO. display	Folder number in which the displayed pattern register button is stored is displayed.
Ⓜ	FOLDER SELECTION button	Folders to display the patterns are displayed in order.
Ⓝ	PATTERN REGISTER button	PATTERN REGISTER buttons stored in Ⓛ FOLDER NO display are displayed. → Refer to **"Ⅱ-2-19. Performing new register of pattern button" p.60.** * This button is not displayed unless the new register to the pattern button is performed.

(2) Sewing screen

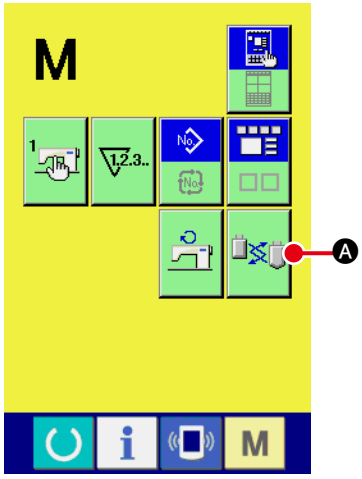


	Button and display	Description
Ⓐ	MANUAL/AUTOMATIC/ STEP setting	Operation mode is changed over among the automatic, manual and step every time this button is pressed. → Refer to **"Ⅱ-2-10. Setting the MANUAL/AUTOMATIC/STEP" p.44.**
Ⓑ	STACKER presser button	When this button is pressed, the stacker presser lever will be released and the stacker release screen is displayed. In the case the stacker operation is disabled by means of the memory switch U876, the stacker presser button will not be displayed. → Refer to **"Ⅱ-2-15. Stacker operation (taking out the material)" p.53.**
Ⓒ	FOLDING POSITION CHANGE button	The folding position change screen is displayed. → Refer to **"Ⅱ-2-12. Changing the folding position" p.48.**
Ⓓ	FOLDING UNIT SETTING button	The folding timing setting screen is displayed. → Refer to **"Ⅱ-2-11. Changing the folding timing" p.45**.
Ⓔ	PRESSER DOWN button	The presser arm, presser plate presser plunger come down, and the presser down screen is displayed. → Refer to **"Ⅱ-2-14. Lowering the presser" p.52.**

	Button and display	Description
Ⓕ	SEWING PATTERN NO. display	The type and number of the currently-selected sewing pattern are displayed. The following two types of sewing patterns exit.  : Users' pattern  : Vector format data * Be sure to use the media that has been formatted with IP-420. For the formatting procedure of the media, refer to **"Ⅱ-2-32. Performing formatting of the media" p.95**.
Ⓖ	Sewing pattern display	Currently-selected sewing pattern is displayed.
Ⓗ	NEEDLE THREAD TENSION SETTING button	Needle thread tension value which is set to the pattern data being selected at present is displayed on this button and when the button is pressed, the item data change screen is displayed. → Refer to **"Ⅱ-2-8. Changing item data" p.41**.
Ⓘ	SEWING PATTERN TOTAL NO. OF STITCHES display	The total number of stitches of the currently-selected sewing pattern is displayed.
Ⓙ	COUNTER VALUE CHANGE button	Existing counter value is displayed on this button. When the button is pressed, the counter value change screen is displayed. → Refer to **"Ⅱ-2-16. Using counter" p.54**.
Ⓚ	COUNTER CHANGE OVER button	The counter display can be changed over among the sewing counter, No. of pcs. counter and bobbin counter. → Refer to **"Ⅱ-2-16. Using counter" p.54**.
Ⓛ	STEP SEWING button	Step sewing screen is displayed. Checking of the pattern shape can be performed. → Refer **"Ⅱ-2-7. Pattern checking procedure" p.40**.
Ⓜ	FOLDER NO. display	Pattern register button which is displayed indicates the folder No. which has been stored.
Ⓝ	X ACTUAL SIZE VALUE display	Actual size value in X direction of sewing shape being selected at present is displayed.
Ⓞ	Y ACTUAL SIZE VALUE display	Actual size value in Y direction of sewing shape being selected at present is displayed.
Ⓟ	SPEED variable resistor	Number of rotations of the sewing machine can be changed.
Ⓠ	MAX. SPEED LIMITATION display	Maximum speed limitation which is set at present is displayed. However, the display is different from the maximum number of revolutions in the pattern. However, the display is different from the maximum number of revolutions in the pattern.
Ⓡ	PATTERN REGISTER button	Pattern register buttons stored in Ⓜ FOLDER NO. display are displayed. → Refer to **"Ⅱ-2-19. Performing new register of pattern button" p.60**. * This button is not displayed in the initial state.

2-5. Replacing the pattern

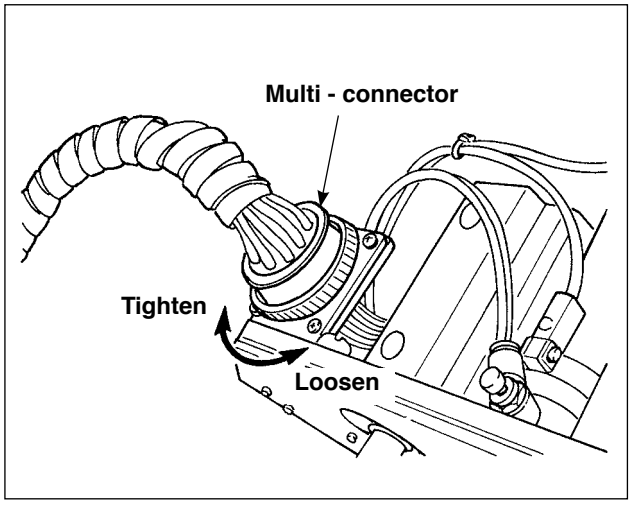
WARNING :
To avoid possible accidents caused by abrupt start of the machine, check to be sure that no one places hand, finger and face or any tool in the moving part of the main unit before operating the switches (keys).



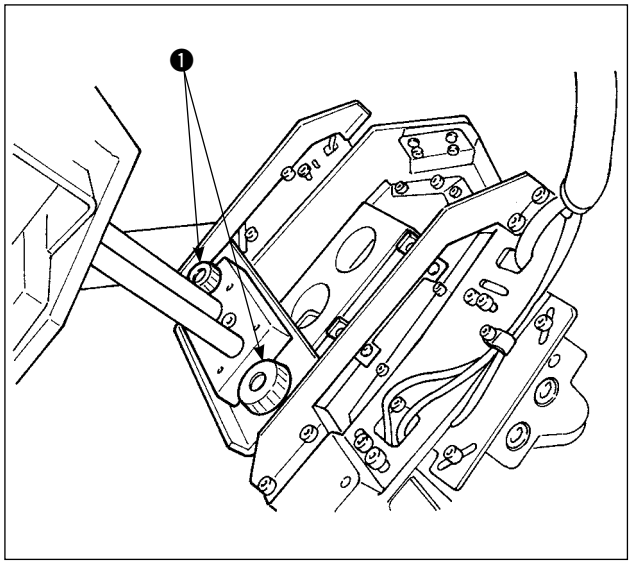
1) **Activating the pattern change mode**

When the MODE key M is pressed, the pattern change mode button Ⓐ is displayed on the screen. When this button is pressed, the pattern change mode screen is displayed. At this time, the presser plate goes up to the intermediate standby position after the origin retrieval (*1), the pattern plate and the folding unit move to the change position and the air supply to the folding cylinder is disconnected.

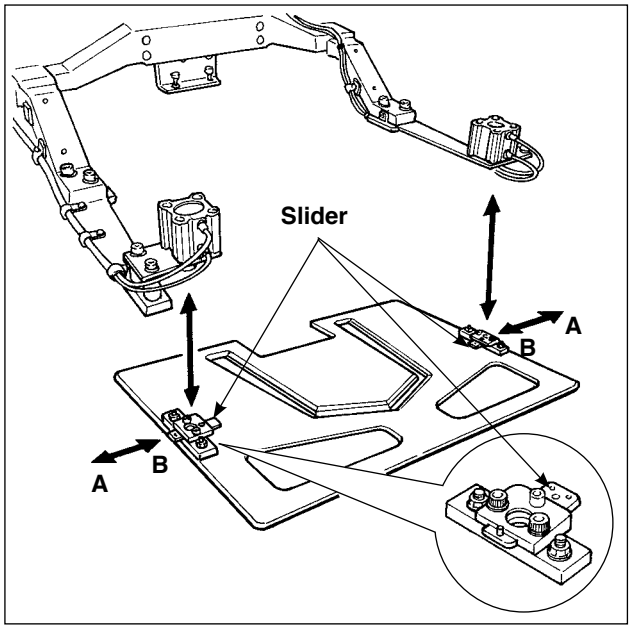
(*1) Once the READY key is pressed and the origin retrieval operation is carried out, the origin retrieval operation will not be carried out under the pattern change mode.



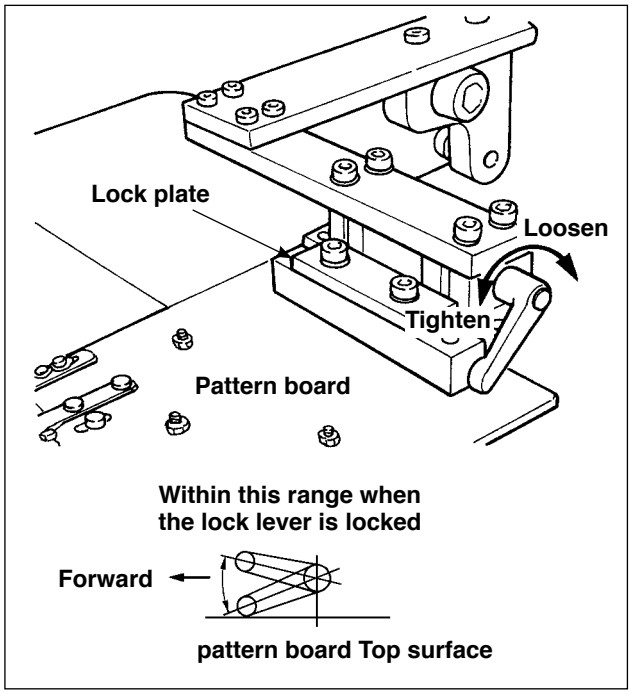
2) Disconnect the pattern folding air supply (multi-connector).



3) Remove setscrews ❶, and remove the pattern folding unit in the direction of the arrow. Then, replace it with another pattern folding unit and tighten setscrews ❶. After you have replaced the pattern folding unit with another one, connect the multi-connector.

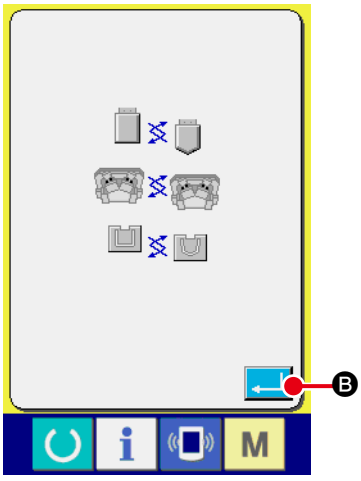


4) Move the sliders in **B** direction, and replace the presser plate with another one.
when the slider is moved in **A** direction, it is in the “lock” state.



5) Remove the current pattern and change it with another one. Then, lock the lock lever.

1. If the lock lever is not placed within the illustrated range when it is locked, the lock lever can come in contact with other components, resulting in a sensor error and defective folding. Carefully determine the position of the lock lever. Turning the lock lever while drawing it sideways can change the position of the lock lever in the locked state.
2. Be sure to press in the lock plate until its side face comes in contact with lock lever.

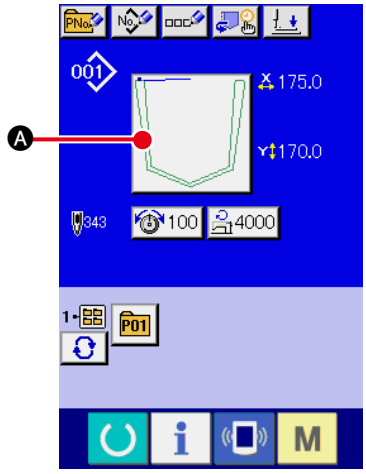


6) When enter button Ⓑ is pressed after the pattern changing, the presser plate comes down, the pattern board moves to the far side, the folding unit returns to the upper position, and the air to the folding cylinder will be supplied.

7) Input the pattern number of the pattern attached in place of the previous one referring to **"Ⅱ-2-6. How to select the sewing pattern" p.38**

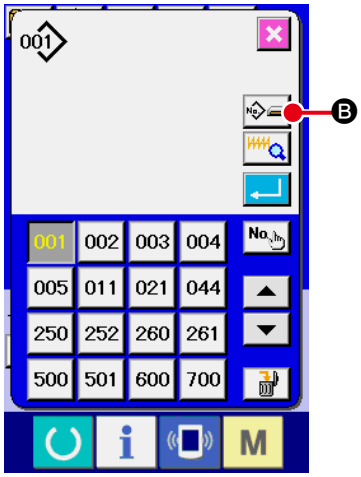
If you have changed the pattern, check to be sure that the pattern groove on the holder matches the sewing pattern referring to the description given in "Ⅱ-2-7. Pattern checking procedure" p.40.

2-6. How to select the sewing pattern

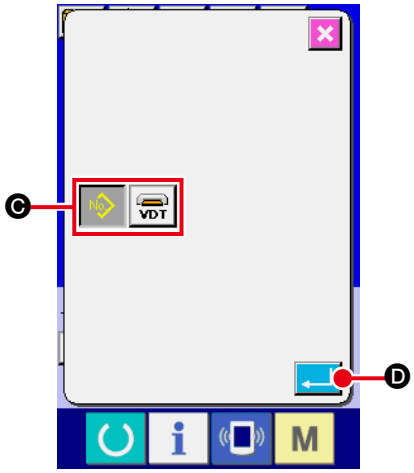


① **Display the data input screen.**
Only in case of the data input screen (blue), the selection of sewing shape can be performed. In case of the sewing screen (green), press READY key and display the data input screen (blue).

② **Call the sewing shape selection screen.**
Press SEWING SHAPE button Ⓐ and the sewing shape selection screen is displayed.



③ **Select the sewing shape.**
There are 2 kinds of the sewing shape.
Press SEWING SHAPE SELECTION button Ⓑ.

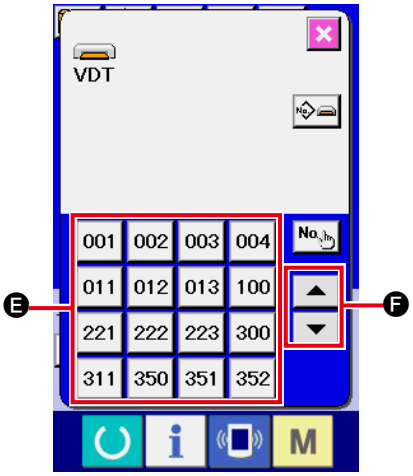


④ **Determine the kind of sewing shape.**
There are 2 kinds below of the sewing shape. Select the kind you desire from among them.

Pictograph	Name	Maximum number of patterns
001	Users' pattern	999
VDT	Vector format data	999

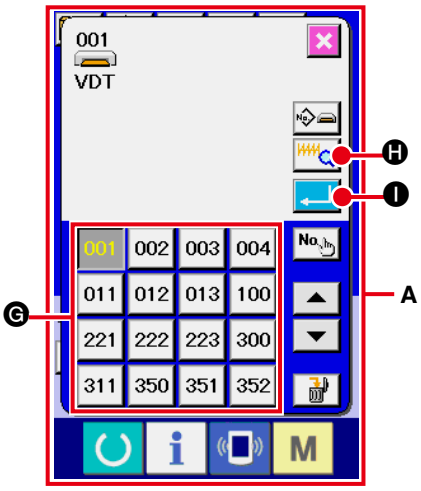
Be sure to use the media that has been formatted with IP-420.
For the formatting procedure of the media, refer to
"Ⅱ-2-32. Performing formatting of the media" p.95.

Select the sewing shape you desire from SEWING SHAPE SELECTION buttons Ⓒ and press ENTER Ⓓ button.
The sewing shape list screen corresponding to the kind of sewing shape you selected is displayed.



⑤ **Select the sewing shape.**

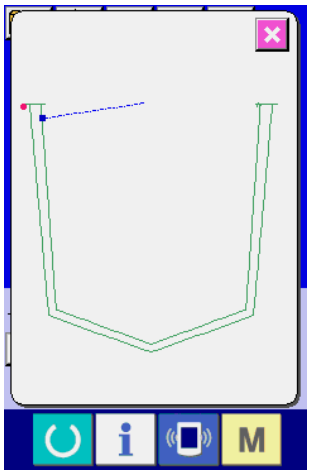
When UP or DOWN SCROLL button  Ⓕ is pressed, the SEWING SHAPE buttons Ⓔ are changed over in order.



⑥ **Determine the sewing shape.**

When ENTER button  Ⓘ is pressed, the sewing shape is determined and the data input screen is displayed.

When the sewing shape is users' pattern, the screen as **A** is displayed.
PATTERN NO. SELECTION button Ⓖ that is registered to users' pattern is displayed. Press the button of PATTERN NO. you desire to select.

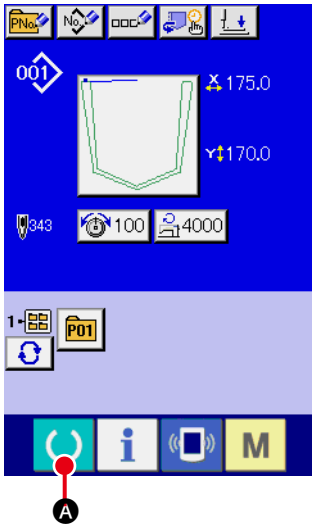


When VIEWER button  Ⓗ is pressed, the shape of the pattern No. selected is displayed and you can confirm it.

2-7. Pattern checking procedure

WARNING :
Be sure to check the pattern shape after the pattern selection or the pattern changing. If the pattern goes out of the pattern slit in the presser plate, the needle can interfere with the presser plate during sewing, incurring danger such as needle breakage.

In prior to the driving of the machine, check that the work clamp pattern matches the sewing pattern.



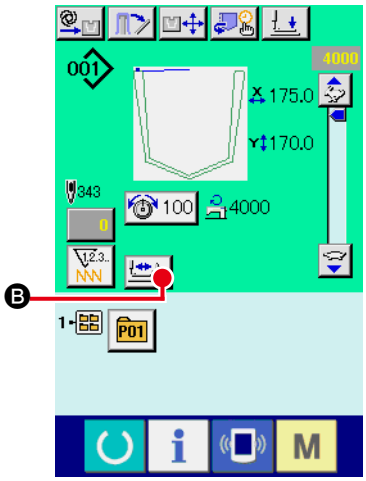
① **Display the sewing screen.**

Display the data input screen (blue) and press READY key . Then the back-light of LCD changes to green and sewing is possible. At this time, the presser plate moves to the intermediate standby position after the origin retrieval (*1).

(*1) When you press the set ready key after having turned ON the power to the machine, the origin retrieval is carried out and the machine enters the sewing mode. Once this sequence is completed, the machine will not carry out the origin retrieval when it subsequently enters the sewing mode.

② **Display the step sewing screen.**

When STEP SEWING button B is pressed, the step sewing screen is displayed



When the step sewing screen is displayed, the presser plate comes down. Take care not to allow your fingers to be caught under the presser plate.

③ **Carry out sewing.**

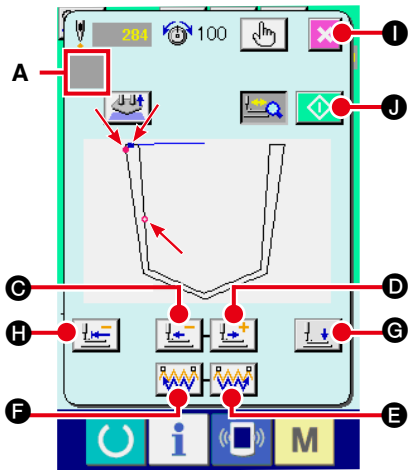
The sewing shape is displayed at the center of the screen. The current point, sewing start position and sewing end position are respectively represented by (pink circle), (blue dot) and (pink dot). Check the sewing shape using ONE-STITCH BACKWARD button C and ONE-STITCH FORWARD button D. If two or more commands including the thread trimming commend have been entered, the feed will not move when the ONE-STITCH BACKWARD/FORWARD button is pressed, but the command shown on the command display **A** will be changed over. When you keep pressing the ONE-STITCH FORWARD or BACKWARD button, the moving speed increases.

When the COMMAND SEARCH FORWARD button E is pressed, the feed automatically moves to the sewing end position. When the COMMAND SEARCH BACKWARD button F is pressed, the feed automatically moves to the sewing start position.

To stop the feed, press button C, D, E, F, G or H.

When PRESSER PLATE INITIAL POSITION button H is pressed, the presser plate moves to the sewing start position.

When the PRESSER DOWN button G is pressed, the presser plunger goes up or comes down.

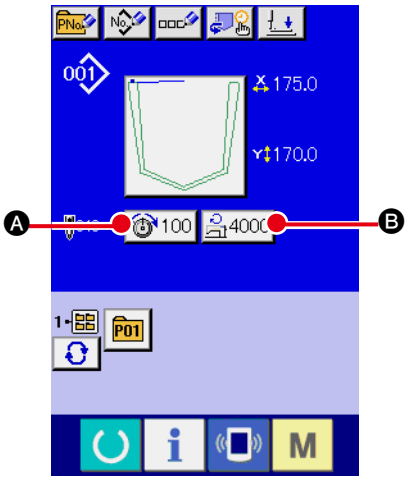


Step sewing screen

④ **Finish the pattern confirmation.**

When CANCEL button I is pressed, the presser plate moves to the standby position and the screen is returned to the sewing screen. When START button J is pressed, the screen is returned to the sewing screen and the sewing machine starts sewing from the current confirmation position.

2-8. Changing item data



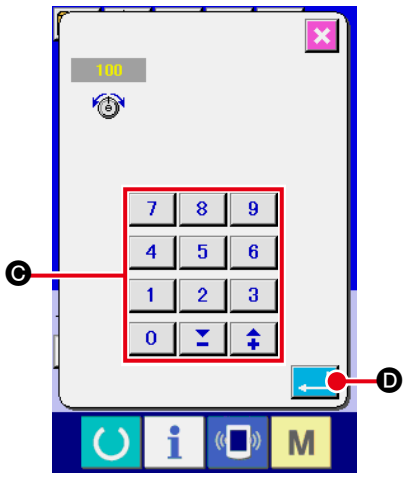
① **Display the data input screen.**
In case of the data input screen, the change of item data can be changed. In case of the sewing screen (green), press READY switch to display the data input screen (blue).

* **The thread tension can also be changed on the sewing screen.**

② **Display the item data input screen.**
When the button of the item data you desire to change is pressed, the item data input screen is displayed.
Item data are 2 items below.

	Item range	Input range	Initial value
Ⓐ	Thread tension	0 to 200	Pattern set value
Ⓑ	Max. speed limitation	500 to 4,000 (sti/min)	4,000 (sti/min)

* Thread tension differs with the pattern to be selected.
* The maximum entry range and the initial value of the maximum sewing speed Ⓑ are determined by the Memory switch U001 .

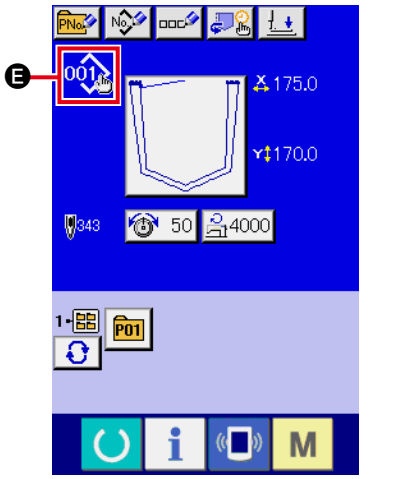


For example, input a thread tension.
Press 100 Ⓐ to display the item data input screen.

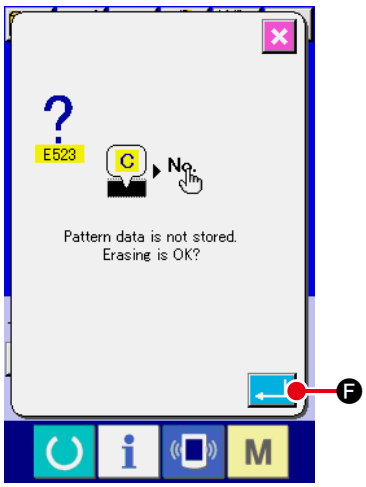
③ **Input the data.**
Input the value you desire with ten keys and + / – keys Ⓒ.

④ **Determine the data.**
When ENTER button Ⓓ is pressed, the data is determined.

If you turn the power OFF without pressing the READY key , the set values of the "thread tension" and the "maximum number of revolutions" will not be stored in memory.



If the thread tension value of the user pattern or media pattern or the thread tension command is added or deleted, setting change display Ⓔ is shown on the pattern type section.

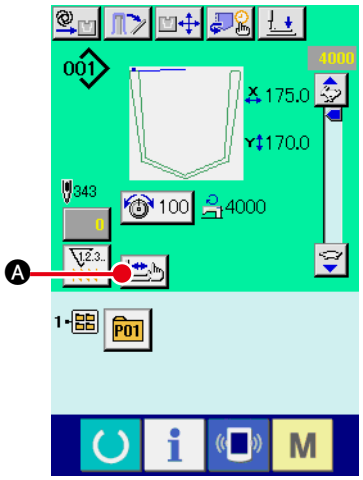


In the case of change display Ⓔ, the change confirmation screen is displayed at the time of changing the pattern number.

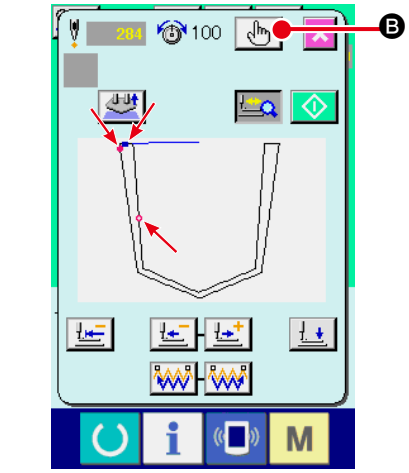
When ENTER button Ⓕ is pressed, the information on the current pattern is invalidated and the pattern No. is changed.

To store the changed pattern, refer to **“Ⅱ-2-17. Performing new register of users’ pattern” p.58**.

2-9. Performing modification of needle entry point



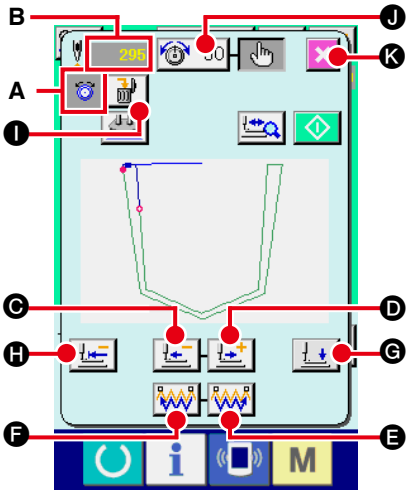
Press STEP SEWING button [ ] Ⓐ on the sewing screen to display the step sewing screen.



The sewing shape is displayed at the center of the screen. The current point, sewing start position and sewing end position are respectively represented by ◘ (pink circle), ▪ (blue dot) and ▪ (pink dot).

Press the MODE SELECT button [ ] Ⓑ to select the thread tension mode.

When ONE-STITCH BACKWARD button [ ] Ⓒ or FORWARD button [ ] Ⓓ is pressed, the feed (current point ◘) moves backward or forward by one stitch.
If two or more commands including the thread trimming commend have been entered, the feed will not move when the ONE-STITCH BACKWARD/FORWARD button is pressed, but the command shown on the command display **A** will be changed over.
If the ONE-STITCH BACKWARD/FORWARD button is held pressed for a longer time, the feed moving speed will increase. The value **B** displayed represents the number of stitches.

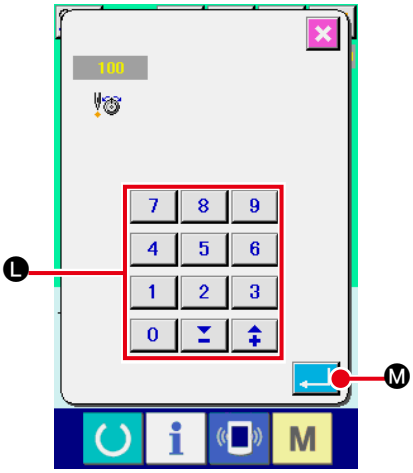


When COMMAND SEARCH FORWARD button [ ] Ⓔ or BACKWARD button [ ] Ⓕ is pressed, the feed moves forward or backward from the current point to reach the needle entry point where the first thread tension command is found. To stop the feed, press button Ⓒ, Ⓓ, Ⓔ, Ⓕ, Ⓖ or Ⓗ.

When PRESSER DOWN button [ ] Ⓖ is pressed, the presser plunger goes up or comes down. When CANCEL button [ ] Ⓚ is pressed, the presser plate moves to the intermediate standby position and the screen is returned to the sewing screen.

When PRESSER INITIAL POSITION button [ ] Ⓗ is pressed, the presser plate directly moves to the sewing start position.

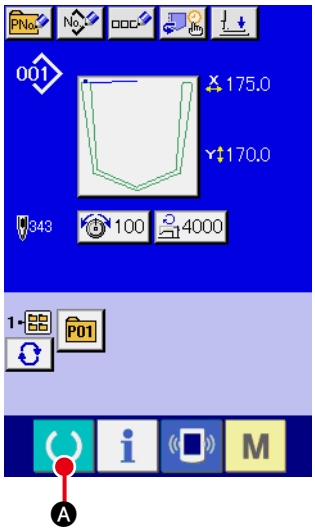
When COMMAND DELETE button [ ] Ⓘ is pressed, the screen for deleting the command as shown in **A** is displayed.



When [100] Ⓙ is pressed, the thread tension value increase/decrease input screen is displayed.
Input a desired value on the thread tension value increase/decrease input screen using numeric keypad and +/– keys Ⓛ.
When ENTER button [ ] Ⓜ is pressed, the data is confirmed.

2-10. Setting the MANUAL/AUTOMATIC/STEP

WARNING :
To avoid possible accidents caused by abrupt start of the machine, check to be sure that no one places hand, finger and face or any tool in the moving part of the main unit before operating the switches (keys).



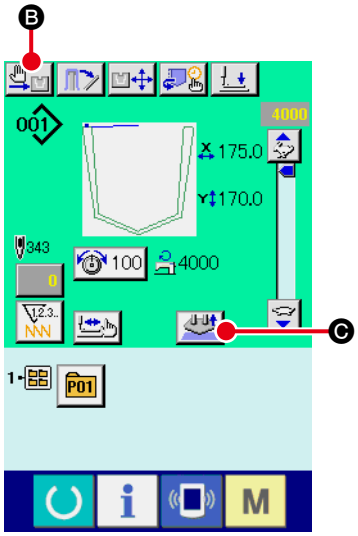
① **Display the sewing screen.**

Display the data input screen (blue) and press READY key  Ⓐ. Then the back-light of LCD changes to green and sewing is possible. At this time, the presser plate moves to the intermediate standby position after the origin retrieval (*1).

(*1) When you press the set ready key after having turned ON the power to the machine, the origin retrieval is carried out and the machine enters the sewing mode. Once this sequence is completed, the machine will not carry out the origin retrieval when it subsequently enters the sewing mode.

② **Set the MANUAL/AUTOMATIC/STEP.**

When OPERATION CHANGEOVER button  Ⓑ is pressed, the pictograph is changed over to enable selection of the function.



 AUTOMATIC mode

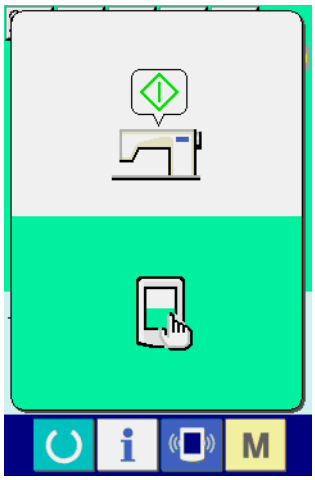
After the START switch is pressed, a series of operation up to the stacking is carried out.
SETTING RELEASE button  Ⓒ is not displayed.

 MANUAL mode

The device stops once at the time when the folding is completed.
When the machine is in the re-start standby state, the operation panel displays the "start standby screen". When you touch any part of the operation panel, the device will re-start and the display changes over to the sewing screen.
The material placed on the machine is released by pressing SETTING RELEASE button  Ⓒ.

 STEP mode

When the START switch is pressed, the folding unit comes down and the unit stops there.
Every time the start switch is pressed, the air cylinder sequence of the folding unit will advance by one step. When the machine comes into the standby state before the presser plate moves, the operation panel displays the "start standby screen". When you touch any part of the operation panel, the device will re-start and the display changes over to the sewing screen.
The material placed on the machine is released by pressing SETTING RELEASE button  Ⓒ.



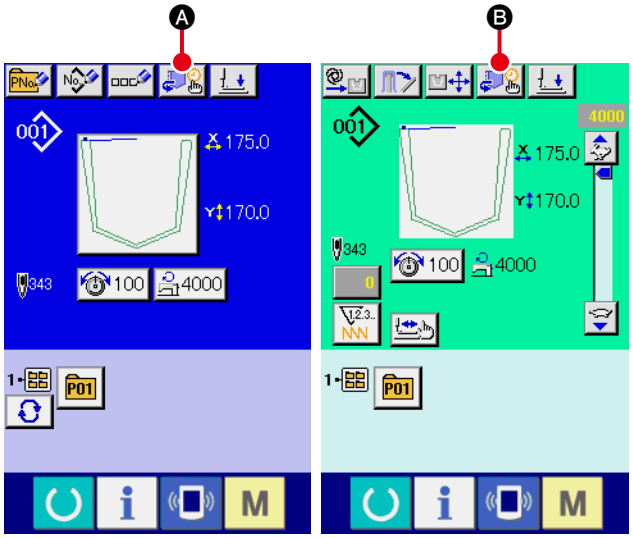
Start standby screen

In order to protect the machine, turn OFF the power switch at the end of operation after the completion of the operation sequence (after the stacker completes its operation).

2-11. Changing the folding timing

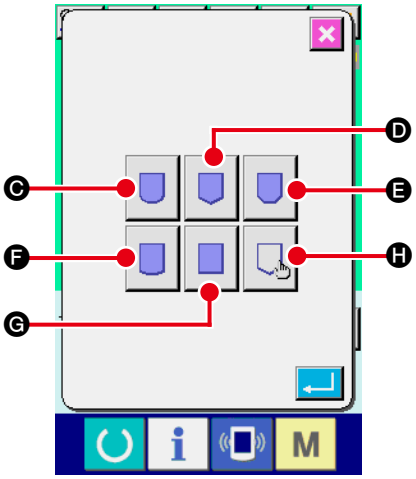
WARNING :
To avoid possible accidents caused by abrupt start of the machine, check to be sure that no one places hand, finger and face or any tool in the moving part of the main unit before operating the switches (keys).

This function is used to change the operating order of the folding cylinder or stop the cylinder.



Data input screen　　Sewing screen

① **Display the data input screen or the sewing screen.**
When the FOLDING UNIT SETTING button  Ⓐ on the data input screen or FOLDING UNIT SETTING button  Ⓑ on the sewing screen is pressed, the sewing shape input screen is displayed.



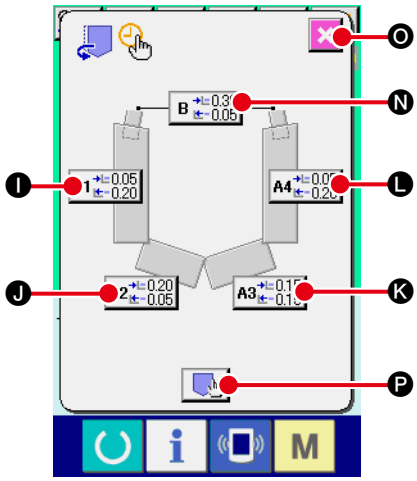
Sewing shape input screen

② **Select the pattern shape.**

Once the pattern is selected, the sewing shape input screen will not be displayed from the next sewing and beyond. Instead, the folding timing input screen for the sewing shape selected in the previous operation will be displayed.

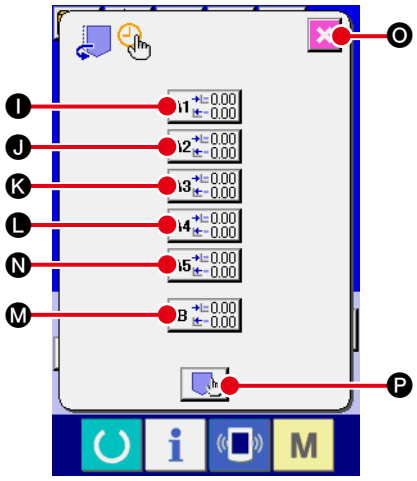
	Button/display
Ⓒ	Ship bottom shape
Ⓓ	Blade shape
Ⓔ	Chamfered shape
Ⓕ	Round shape
Ⓖ	Square shape
Ⓗ	No selection of pattern type

Example) In the case BLADE button  Ⓓ is pressed

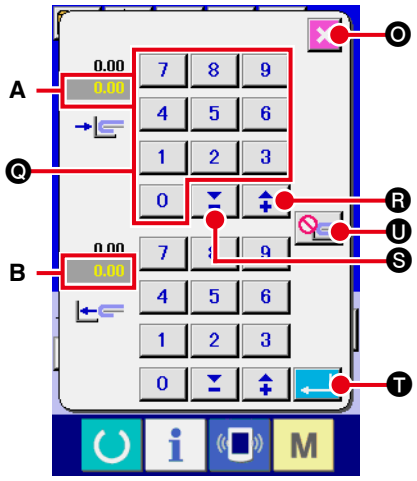


Folding timing input screen for the blade shape

Example) In the case NO PATTERN SELECTION button  Ⓗ is pressed



Folding timing input screen for the case no pattern type is selected



Folding timing input screen

③ **Select the folding blade timing for which is to be set.**

When ON/OFF TIMING SETTING button Ⓘ, Ⓙ, Ⓚ, Ⓛ, Ⓜ or Ⓝ is pressed, the ON/OFF timing setting screen for the blade which corresponds to the location indicated by the button.

	Name	Function overview
Ⓘ	FOLDING BLADE A1 ON/OFF TIMING SETTING button	The folding blade A1 ON/OFF timing setting screen is displayed.
Ⓙ	FOLDING BLADE A2 ON/OFF TIMING SETTING button	The folding blade A2 ON/OFF timing setting screen is displayed.
Ⓚ	FOLDING BLADE A3 ON/OFF TIMING SETTING button	The folding blade A3 ON/OFF timing setting screen is displayed.
Ⓛ	FOLDING BLADE A4 ON/OFF TIMING SETTING button **(*1)**	The folding blade A4 ON/OFF timing setting screen is displayed.
Ⓜ	FOLDING BLADE A5 ON/OFF TIMING SETTING button **(*1)**	The folding blade A5 ON/OFF timing setting screen is displayed.
Ⓝ	FOLDING BLADE B ON/OFF TIMING SETTING button **(*1)**	The folding blade B ON/OFF timing setting screen is displayed.
Ⓞ	CANCEL button	The screen is returned to the previous screen.
Ⓟ	SEWING SHAPE INPUT button	The sewing shape input screen is displayed to allow the change of the sewing shape.

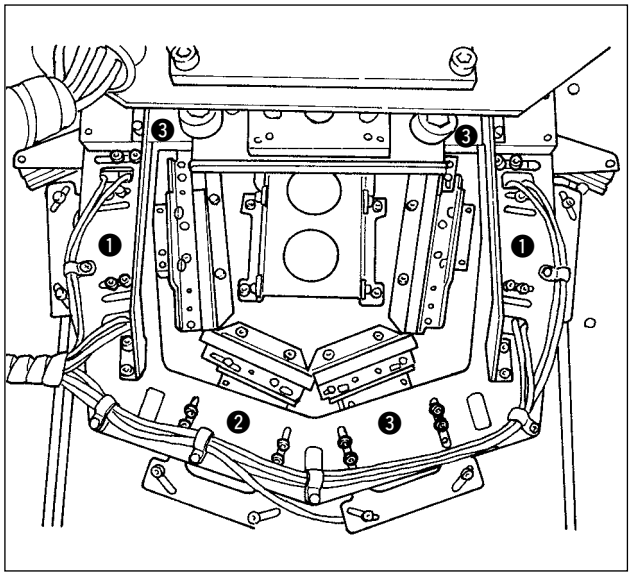
(*1) This button may not be displayed for some sewing shapes.

④ **Set the timing.**

The setting time is set by pressing numeric keypad Ⓠ. To disable the timing setting, press DISUSE button  Ⓤ. When you press ENTER butto  Ⓣ, the numeric value you have set is stored in memory.

	Name	Function overview
A	The timing at which the folding blade is turned ON (activated) is displayed	It represents the waiting time (in seconds) from the start of folding to the activation of the cylinder.
B	The timing at which the folding blade is turned OFF (returned to its home position) is displayed	It represents the waiting time (in seconds) from the end of folding to the return of the cylinder.
Ⓠ	Numeric keypad	This button can be used to input data within the range from 0.00 to 9.95. **(*2)**
Ⓡ	+ button	This button is used to increase the set value in increments of 0.05 (sec).
Ⓢ	− button	This button is used to decrease the set value in increments of 0.05 (sec).
Ⓣ	ENTER button	This button is used to confirm the input value and close the screen.

(*2) A set value can be input in increments of 0.01 sec by means of the numeric keypad. When the set value is recorded by means of the ENTER key, the value is rounded down to 0.00 when the first decimal plate is less than 0.05 or rounded down to 0.05 when it is in the range from 0.06 to 0.09.



[Folding timing (reference)]

For the folding timing, activate the cylinder in the order of parts ❶, ❷ and ❸.

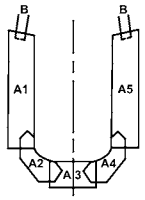
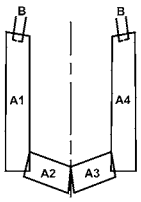
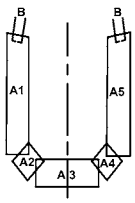
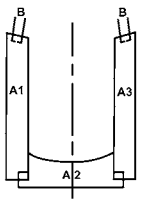
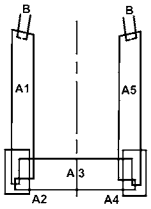
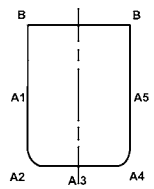
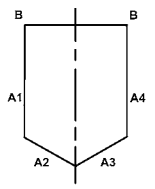
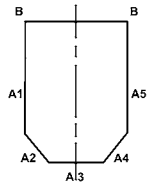
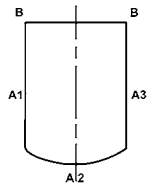
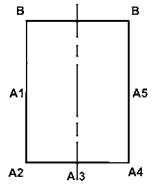
❶ → Right and left parts folding

❷ → Lower left part folding

❸ → Lower right part folding + pocket lip folding

For the timing to take out the folding plate, activate the cylinder in the order of parts ❸, ❷ and ❶.

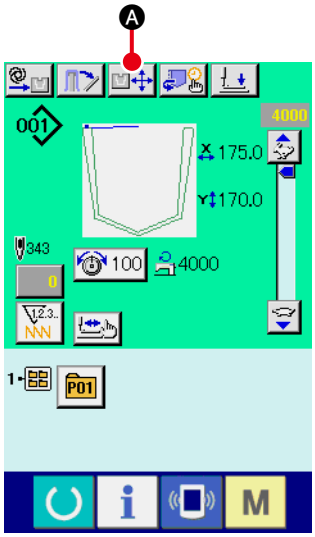
Folding sequence (reference value)

Round shape			Blade shape			Chamfered shape			Ship-bottom shape			Square shape		
														
	ON	OFF		ON	OFF		ON	OFF		ON	OFF		ON	OFF
A1	0.05	0.1	A1	0.05	0.2	A1	0.1	0.2	A1	0.1	0.2	A1	0.05	0.2
A2	0.1	0.2	A2	0.2	0.1	A2	0.05	0.1	A2	0.05	0.1	A2	0.2	0.05
A3	0.1	0.2	A3	0.1	0.15	A3	0.1	0.2	A3	0.1	0.2	A3	0.1	0.1
A4	0.1	0.2	A4	0.05	0.2	A4	0.05	0.1	A4	–	–	A4	0.2	0.05
A5	0.05	0.1	A5	–	–	A5	0.1	0.2	A5	–	–	A5	0.05	0.2
B	0.15	0.05	B	0.3	0.1	B	0.2	0.05	B	0.2	0.05	B	0.15	0.05
														

2-12. Changing the folding position

WARNING :
To avoid possible accidents caused by abrupt start of the machine, check to be sure that no one places hand, finger and face or any tool in the moving part of the main unit before operating the switches (keys).

The position of the pattern board and the holder can be adjusted in increments of 0.1 mm up to the back and forth and right and left within 9.9 mm.

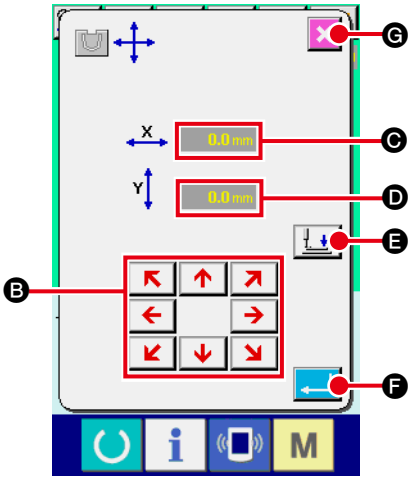


Sewing screen

① **Display the sewing screen.**

Press FOLDING POSITION CHANGE button Ⓐ on the sewing screen, the presser moves to the folding position and waits there, and the folding position adjusting screen is displayed.

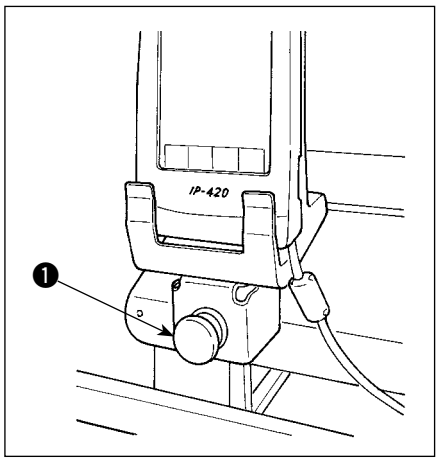
The machine automatically performs the aforementioned procedure. Do not play your hand or any matter on the table.



Folding position adjusting screen

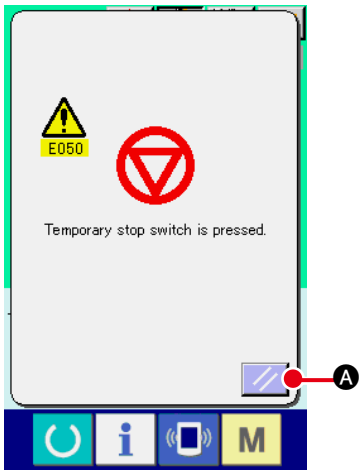
	Name	Function overview
Ⓑ	PRESSER TRAVEL buttons	This buttons are used to move the presser in the direction of the arrow of the button pressed in increments of 0.1 mm when the presser is in the upper position. When one of the buttons is held pressed for a longer time, the presser moves continuously. If the presser is in the lower position, it will not move even if one of the buttons is pressed.
Ⓒ	X-DIRECTION POSITION	When this button is pressed, the correction value is displayed.
Ⓓ	Y-DIRECTION POSITION	When this button is pressed, the correction value is displayed.
Ⓔ	PRESSER DOWN/UP button	This button is used to lower the presser. When this button is pressed again, the presser goes up.
Ⓕ	ENTER button	This button is used to confirm the correction value and close the screen. The presser moves to the intermediate standby position.
Ⓖ	CANCEL button	This button is used to cancel the correction value and close the screen. The presser moves to the intermediate standby position.

2-13. How to use temporary stop



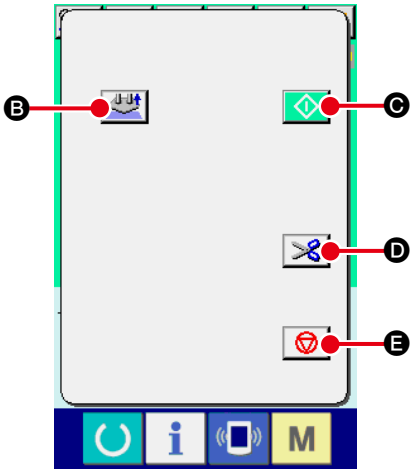
When TEMPORARY STOP switch ❶ is pressed during sewing, the sewing machine can be stopped. At this time, the error screen is displayed to inform that the stop switch has been pressed.

(1) To continue performing sewing from some point in sewing



① **Release the error.**

Press RESET button ❹ to release the error.



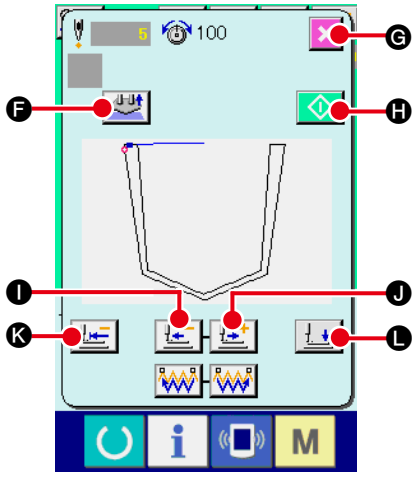
② **Perform thread trimming.**

Press THREAD TRIM button ❹ to perform thread trimming.

When thread trimming is performed, the FEED FORWARD/BACKWARD screen is displayed.

Key functions list

	Name	Function overview
❷	FOLDING UNIT RELEASE button	This button is used to stop the pocket crease folding operation and release the folding unit.
❸	SEWING OPERATION START button	This button is used to activate the machine head which is at rest, and complete the sewing sequence.
❹	THREAD TRIMMING button	This button is used to perform thread trimming and display the feed forward/backward screen.
❺	SEWING PRODUCT RELEASE button	This button is used to stop sewing and move the presser to the intermediate standby position.



③ **Adjust the presser to the re-sewing position.**

When FEED BACK button ❶ is pressed, the presser returns stitch by stitch and when FEED FORWARD button ❶ is pressed, it advances stitch by stitch. Move the presser to the re-sewing position.

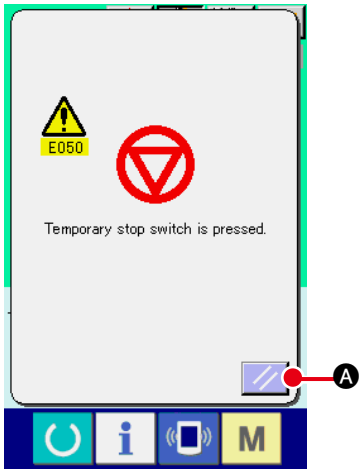
④ **Re-start the sewing.**

When SEWING OPERATION START button ❶ is pressed, the machine head is activated. If it is pressed during thread trimming, the folding operation is continued.

Key functions list

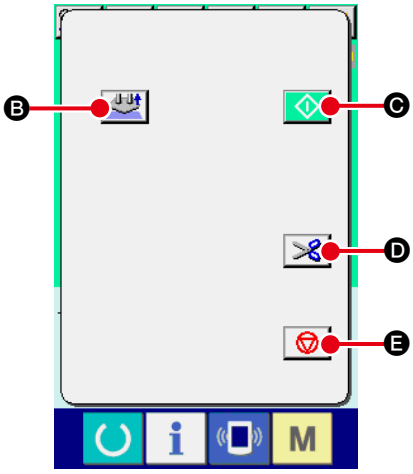
	Name	Function overview
❶	FOLDING UNIT RELEASE button	This button is used to stop the pocket crease folding operation and release the folding unit.
❶	CANCEL button	This button is used to stop sewing and move the presser to the intermediate standby position.
❶	SEWING OPERATION START button	This button is used to activate the machine head which is at rest, and complete the sewing sequence.
❶	FEED BACKWARD button	This button is used to move the presser in the backward direction by one stitch.
❶	FEED FORWARD button	This button is used to move the presser in the forward direction by one stitch.
❶	RETURN TO START POSITION button	This button is used to move the presser to the sewing start position.
❶	PRESSER UP/ DOWN button	This button is used to bring the presser to the upper or lower position.

(2) To perform re-sewing from the start



① **Release the error.**

Press RESET button ❶ to release the error.



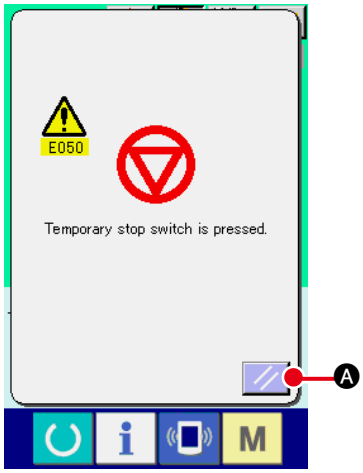
② **Return to the origin.**

When SEWING PRODUCT RELEASE button ❶ is pressed, the popup screen is closed, the sewing screen is displayed and the work clamp is returned to the intermediate standby position. In addition, the folded pocket is released.

Key functions list

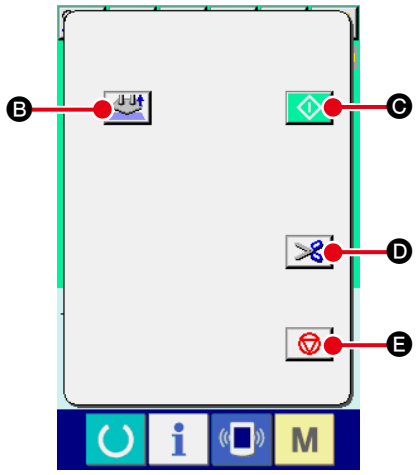
	Name	Function overview
❶	FOLDING UNIT RELEASE button	This button is used to stop the pocket crease folding operation and release the folding unit.
❶	SEWING OPERATION START button	This button is used to activate the machine head which is at rest, and complete the sewing sequence.
❶	THREAD TRIMMING button	This button is used to perform thread trimming and display the feed forward/backward screen.
❶	SEWING PRODUCT RELEASE button	This button is used to stop sewing and move the presser to the intermediate standby position.

(3) To carry out the folding operation again



① **Release the error.**

Press RESET button Ⓐ to release the error.



② **Release folding unit.**

The pocket folding operation which is being carried out can be stopped and can be re-started from the beginning again by pressing folding unit release button Ⓑ.

Caution: THREAD TRIMMING button Ⓓ will not be displayed unless the sewing operation is being carried out.

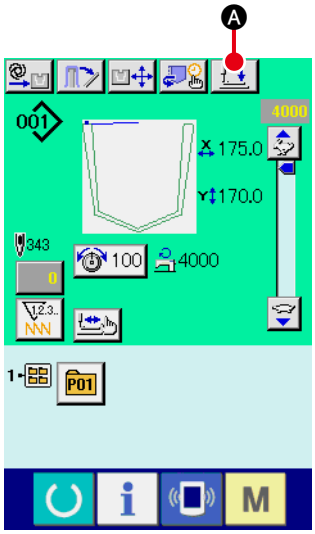
Key functions list

	Name	Function overview
Ⓑ	FOLDING UNIT RELEASE button	This button is used to stop the pocket crease folding operation and release the folding unit.
Ⓒ	SEWING OPERATION START button	This button is used to activate the machine head which is at rest, and complete the sewing sequence.
Ⓓ	THREAD TRIMMING button	This button is used to perform thread trimming and display the feed forward/backward screen.
Ⓔ	SEWING PRODUCT RELEASE button	This button is used to stop sewing and move the presser to the intermediate standby position.

2-14. Lowering the presser

WARNING :
To avoid possible accidents caused by abrupt start of the machine, check to be sure that no one places hand, finger and face or any tool in the moving part of the main unit before operating the switches (keys).

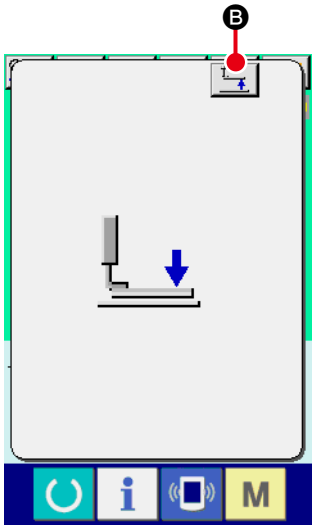
In this procedure, the presser arm, presser plate and presser plunger are to be lowered.



Sewing screen

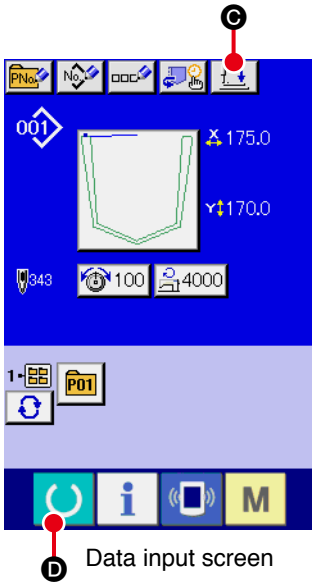
① Lowering the presser on the sewing screen

When PRESSER DOWN button Ⓐ is pressed, the presser arm, presser plate and the presser plunger come down and the presser down screen is displayed.



Presser down screen

When PRESSER UP button Ⓑ is pressed on the presser down screen, the presser arm, presser plate and presser plunger that are in their lower positions go up and the screen is returned to the previous one.



Data input screen

② Lowering the presser on the data input screen

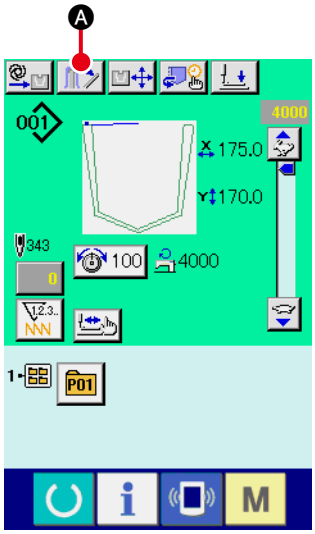
When PRESSER DOWN button Ⓒ is pressed, the presser plunger comes down and the presser down screen is displayed.

When PRESSER UP butto Ⓑ is pressed on the presser down screen, the presser plunger which is in the lower position goes up and the screen is returned to the previous one.

2-15. Stacker operation (taking out the material)

The sewing products stacked by the stacker can be taken out.

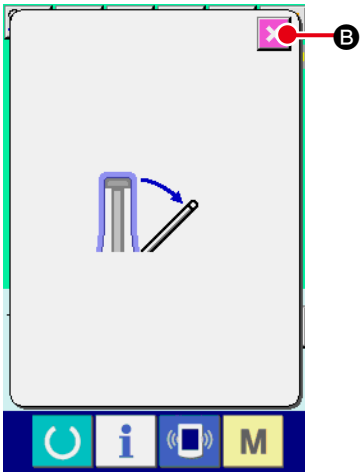
(1) Taking out the material from the stacker



Sewing screen

① **Release the stacker presser of the stacker.**

When MATERIAL RELEASE button Ⓐ is pressed on the sewing screen, the stacker presser of the stacker opens to allow the sewing product in the stacker to be taken out. At the same time, the stacker release screen is displayed.



Stacker release screen

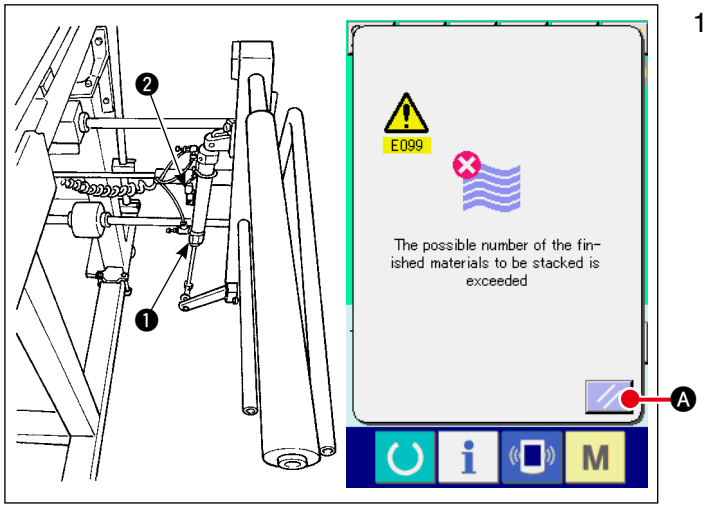
② **Return the stacker presser of the stacker**

When the CANCEL button Ⓑ is pressed, the screen is closed and the stacker presser of the stacker returns to its home position.

Sewing cannot be started while the stacker release screen is displayed.

(2) Adjusting the stack-full sensor

The stacker of this device is provided with the function that detects the stacking height of sewing products stacked on the cloth stacking board and stops the operation of the device.

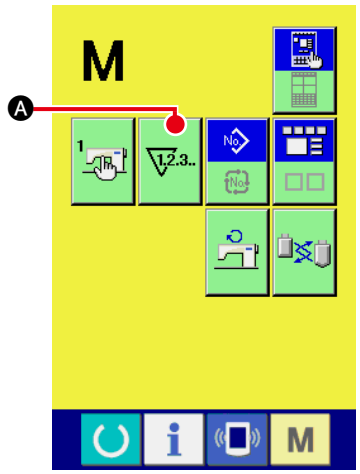


1) When sensor ❷ installed on work clamp cylinder ❶ detects that the height of the stacked products reaches the limit, the stack-full error "E099" is displayed on the operation panel. After that, the START switch is disabled.

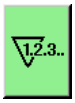
To reset, press the RESET button Ⓐ on the error screen.

2-16. Using counter

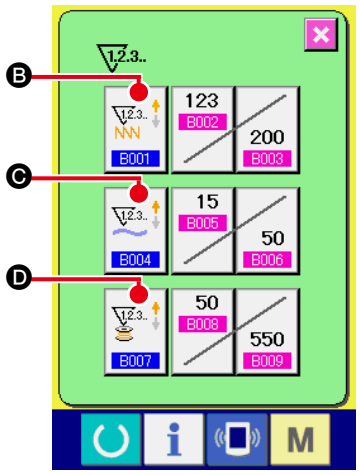
(1) Setting procedure of the counter



① **Display the counter setting screen.**

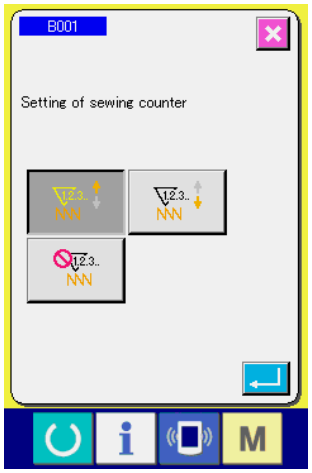
Press M switch and the COUNTER SETTING button 

Ⓐ is displayed on the screen. When this button is pressed, the counter setting screen is displayed.

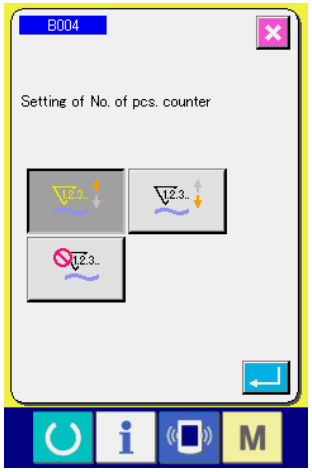


② **Selection of kinds of counters**

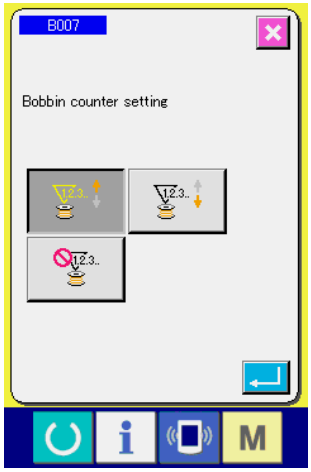
This sewing machine has three different counters; i.e., the sewing counter, No. of pcs. counter and bobbin counter. When SEWING COUNTER TYPE SELECT button  Ⓑ, NO. OF PCS. COUNTER TYPE SELECT button  Ⓒ or BOBBIN COUNTER TYPE SELECT button  Ⓓ is pressed, the corresponding counter type select screen is displayed. On this screen, the counter type can be selected individually.



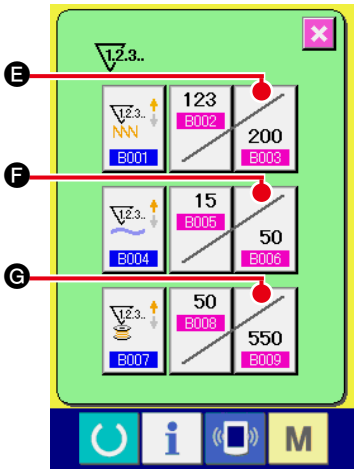
[Sewing counter]	
	**UP counter :** Every time the sewing of one shape is performed, the existing value is counted up. When the existing value is equal to the set value, the count-up screen is displayed.
	**DOWN counter :** Every time the sewing of one shape is performed, the existing value is counted down. When the existing value is reached to “0”, the count-up screen is displayed.
	**Counter disuse :** The sewing counter does not count a finished shape even when the machine has sewn the shape. The counter screen of the sewing counter is not displayed.



[No. of pcs. Counter]	
	**UP counter :** Every time one combination sewing is performed, the existing value is counted up. When the existing value is equal to the set value, the count-up screen is displayed.
	**DOWN counter :** Every time one combination sewing is performed, the existing value is counted down. When the existing value is reached to “0”, the count-up screen is displayed.
	**Counter disuse:** The No. of pcs. counter does not perform counting. The counter screen of the No. of pcs. counter is not displayed.

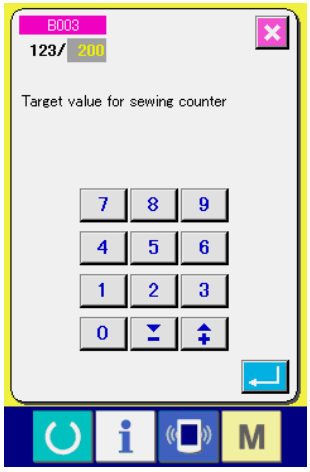


[Bobbin counter]	
	**UP counter :** The counter increases the existing value by one every time the machine has sewn 10 stitches. When the existing value is equal to the set value, the count-up screen is displayed.
	**DOWN counter :** The counter decreases from the existing value by one every time the machine has sewn 10 stitches. When the existing value is reached to “0”, the count-up screen is displayed.
	**Counter disuse:** The bobbin counter does not perform counting. The counter screen of the bobbin counter is not displayed.

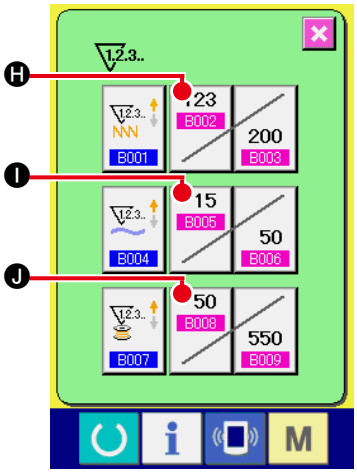


③ Change of counter set value

Press button  Ⓔ for the sewing counter, button  Ⓕ for the No. of pcs. counter or button  Ⓖ for the bobbin counter to display the corresponding counter set value input screen.

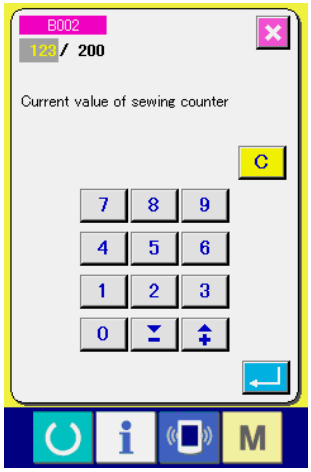


Here, input the set value.
When “0” is inputted in the set value, the display of count-up screen is not performed.



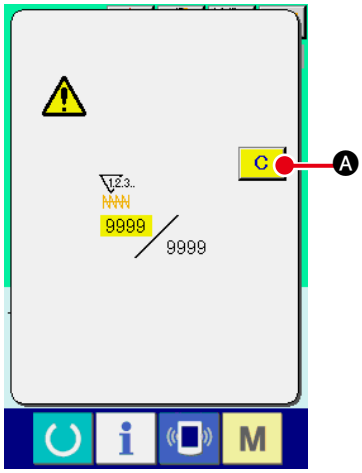
④ Change of counter existing value

Press button  Ⓗ for the sewing counter, button  Ⓘ for the No. of pcs. counter or button  Ⓙ for the bobbin counter to display the corresponding counter current value input screen.



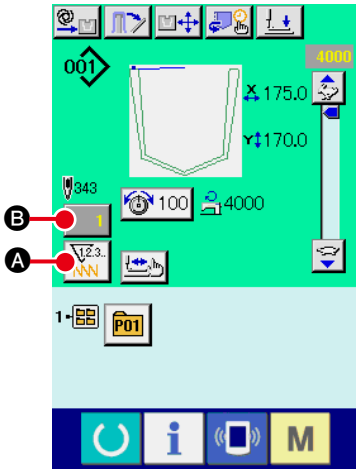
Here, input the existing value.

(2) Count-up releasing procedure



When the count-up condition is reached during sewing work, the count-up screen is displayed and the buzzer beeps. Press CLEAR button C Ⓐ to reset the counter and the screen returns to the sewing screen. Then the counter starts counting again.

(3) How to change the counter value during sewing



Sewing screen

① **Select the type of counter.**

When COUNTER CHANGEOVER button Ⓐ is pressed on the sewing screen, the type of counter is changed over. The count value of the selected type of counter is displayed on Ⓑ.

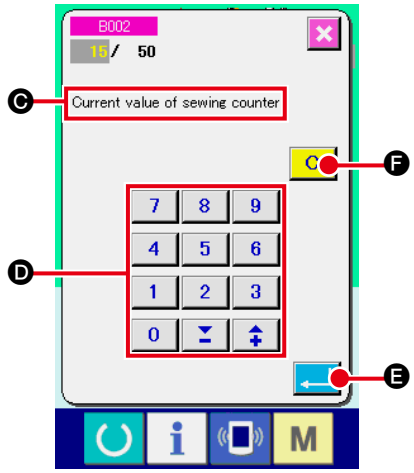
: Sewing counter

: No. of pcs. counter

: Bobbin counter

② **Display the counter value change screen.**

When you desire to revise the counter value during sewing work due to the mistake or the like, press COUNTER VALUE CHANGE button 1 Ⓑ on the sewing screen. The counter value change screen is displayed.



Counter value change screen

③ **Counter value change screen**

The type of counter is displayed on Ⓒ.

④ **Change the counter value.**

Input the value you desire with ten keys, or “+” or “–” key Ⓓ.

⑤ **Determine the counter value.**

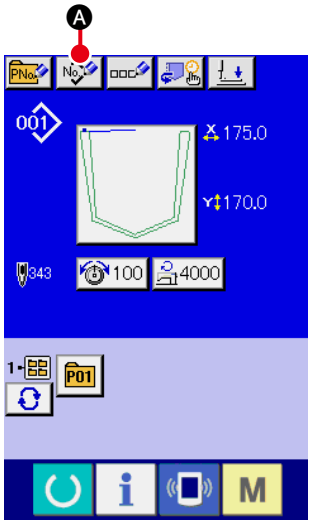
When ENTER button Ⓔ is pressed, the data is determined.

When you desire to clear the counter value, press CLEAR button C Ⓕ.

2-17. Performing new register of users' pattern

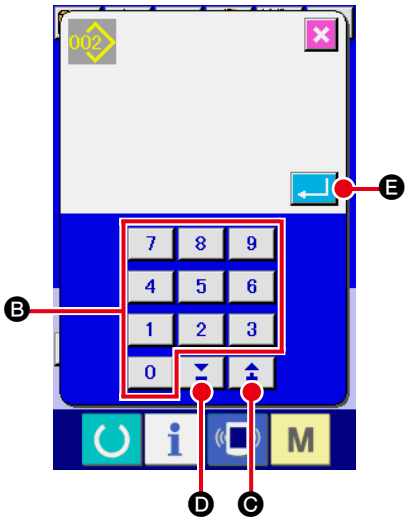
① **Display the data input screen.**

Only in case of the data input screen (blue), new register of the pattern can be performed. In case of the sewing screen (green), press READY switch and display the data input screen (blue).



② **Call the new register of users' pattern screen.**

Press NEW REGISTER button Ⓐ and the new register of users' pattern screen is displayed.



③ **Input the users' pattern No.**

Input the users' pattern No. you desire to newly register with the ten keys Ⓑ. It is possible to retrieve the users' pattern No. which has not been registered with the + or – button (Ⓒ and Ⓓ).

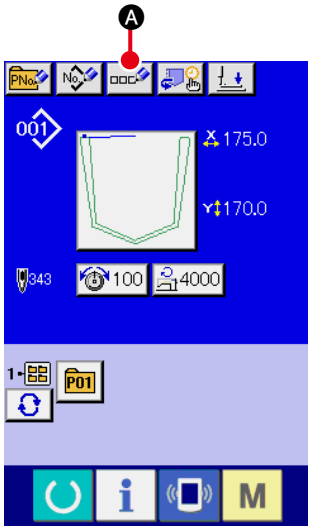
④ **Determine the users' pattern No.**

Press ENTER button Ⓔ to determine the users' pattern NO. to be newly registered and the data input screen at the time of users' pattern selection is displayed.

When the existing users' pattern No. is inputted and ENTER button is pressed, the overwriting confirmation screen is displayed.

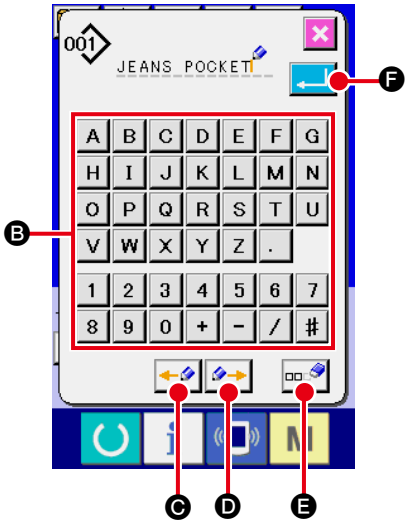
2-18. Naming users' pattern

As many as 255 characters can be input for each user's pattern.



① **Display the data input screen.**
Only in case of the data input screen (blue) at the time of pattern button selection, it is possible to input the name of pattern button. In case of the sewing screen (green), press READY switch to display the data input screen (blue).

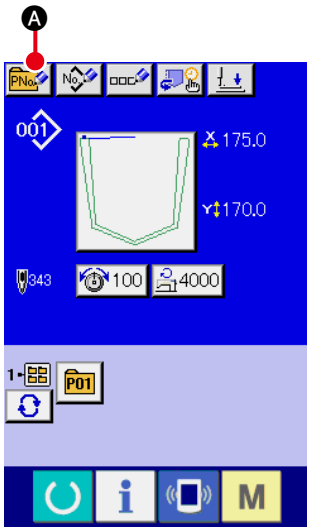
② **Call the character input screen.**
When CHARACTER INPUT button Ⓐ is pressed, the character input screen is displayed.



③ **Input the character.**
Press CHARACTER button Ⓑ you desire to input and the input of character can be performed.
As many as 255 characters (A to Z and 0 to 9) and symbols(+ , - , / , # , .) can be input. The cursor can be moved with CURSOR LEFT TRAVEL button Ⓒ and CURSOR RIGHT TRAVEL button Ⓓ. When you desire to delete the inputted character, adjust the cursor to the position of the character you desire to delete and press DELETE button Ⓔ.

④ **Finish the input of character.**
When ENTER button Ⓕ is pressed, the input of character is finished. After the finish, the inputted character is displayed on the upper part of the data input screen (blue).

2-19. Performing new register of pattern button

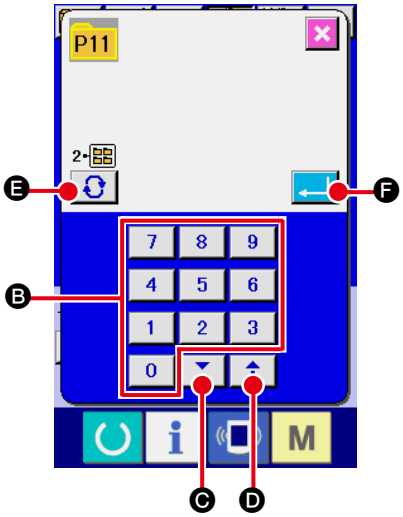


① **Display the data input screen.**

Only in case of the data input screen (blue), new register of the pattern button can be performed. In case of the sewing screen (green), press READY switch and display the data input screen (blue).

② **Call the new register of pattern button screen.**

Press NEW REGISTER button Ⓐ and the new register of pattern button screen is displayed.



③ **Input the pattern button No.**

Input the pattern button No. you desire to newly register with the ten keys Ⓑ. New register to the pattern button No. which has been already registered is prohibited.

It is possible to retrieve the pattern button No. which has not been registered with the “+” or “–” button (Ⓒ and Ⓓ).

④ **Select the folder to be stored.**

It is possible for the pattern buttons to be stored in five folders. As many as 10 pattern buttons can be stored for one folder. The folder to store the button can be selected with FOLDER SELECTION button Ⓔ.

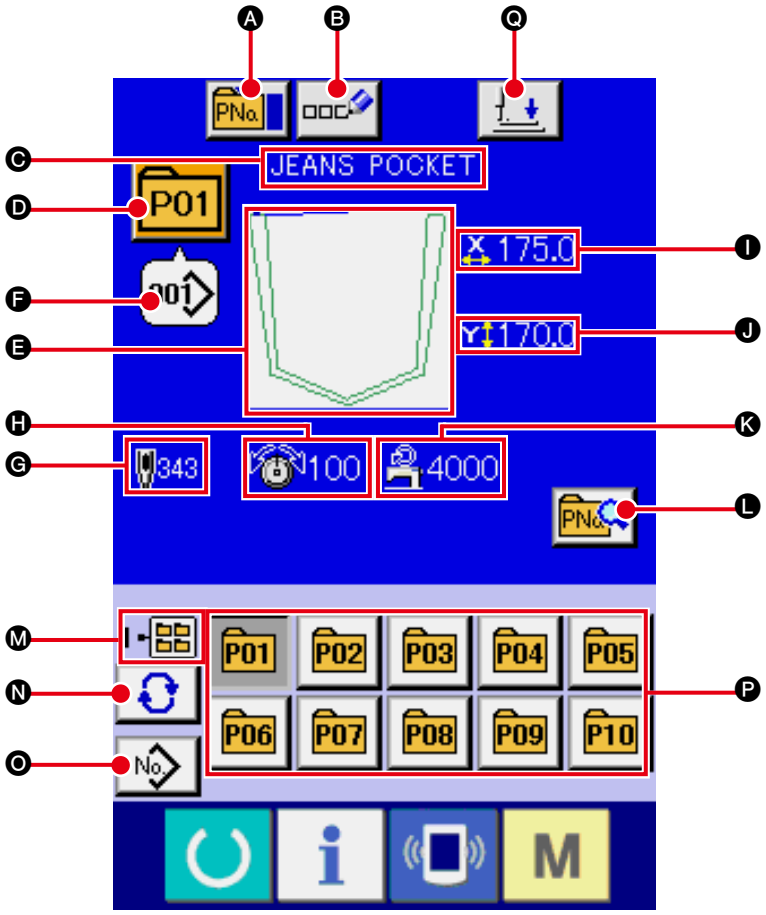
⑤ **Determine the pattern No.**

When ENTER button Ⓕ is pressed, the pattern number is confirmed. The display screen is changed over to the data input screen at the time of pattern button selection.

→ Refer to **"Ⅱ-2-20 LCD display section at the time of pattern button selection" p.61.**

2-20. LCD display section at the time of pattern button selection

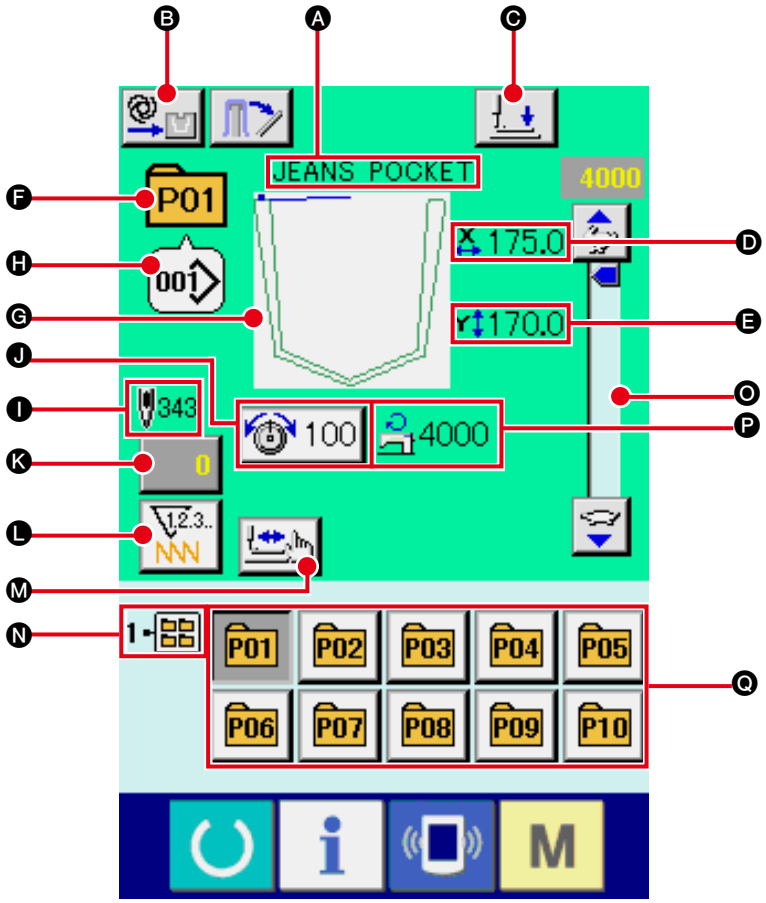
(1) Pattern button data input screen



	Button and display	Description
Ⓐ	PATTERN BUTTON COPY button	Pattern button copy screen is displayed. → Refer to **"Ⅱ-2-23. Copying pattern button" p.68**.
Ⓑ	PATTERN BUTTON NAME SETTING button	Pattern button name input screen is displayed. → Refer to **"Ⅱ-2-18. Naming users' pattern" p.59**.
Ⓒ	PATTERN BUTTON NAME display	Character which is registered to the pattern button No. being selected is displayed.
Ⓓ	PATTERN BUTTON NO. display	Pattern button No. being selected at present is displayed on this button and when the button is pressed, the pattern button No. selection screen is displayed. → Refer to **"Ⅱ-2-21. Performing pattern button No. selection" p.65**.
Ⓔ	SEWING SHAPE	Sewing shape which is registered to the pattern button No. being selected is displayed.

	Button and display	Description
Ⓕ	SEWING PATTERN NO. display	The type and number of the currently-selected sewing pattern are displayed. The following two types of sewing patterns exit.  : Users' pattern  : Vector format data * Be sure to use the media that has been formatted with IP-420. For the formatting procedure of the media, refer to **"Ⅱ-2-32. Performing formatting of the media" p.95**.
Ⓖ	TOTAL NO. OF STITCHES	Total number of stitches of the pattern which is registered to the pattern button No. being selected is displayed.
Ⓗ	THREAD TENSION display	Thread tension value which is registered to the pattern button No. being selected is displayed.
Ⓘ	X ACTUAL SIZE VALUE display	X actual size value which is registered to the pattern button No. being selected is displayed.
Ⓙ	Y ACTUAL SIZE VALUE display	Y actual size value which is registered to the pattern button No. being selected is displayed.
Ⓚ	MAX. SPEED LIMITATION	Maximum speed limitation which is registered to the pattern button No. being selected is displayed.
Ⓛ	PATTERN BUTTON EDIT button	Pattern button edit screen is displayed.
Ⓜ	FOLDER NO. display	Folder No. in which the displayed pattern buttons are stored is displayed.
Ⓝ	FOLDER SELECTION button	Folders to display the pattern button are displayed in order.
Ⓞ	SEWING SHAPE SELECTION DATA INPUT SCREEN DISPLAY button	Sewing shape data input screen is displayed. → Refer to **"Ⅱ-2-4.(1) Sewing pattern data input screen" p.32**.
Ⓟ	PATTERN button	Pattern buttons stored in Ⓜ Folder No. are displayed. → Refer to **"Ⅱ-2-19. Performing new register of pattern button" p.60**.
Ⓠ	PRESSER DOWN button	The presser plunger comes down, and the presser down screen is displayed. → Refer to **"Ⅱ-2-14. Lowering the presser" p.52**.

(2) Sewing screen

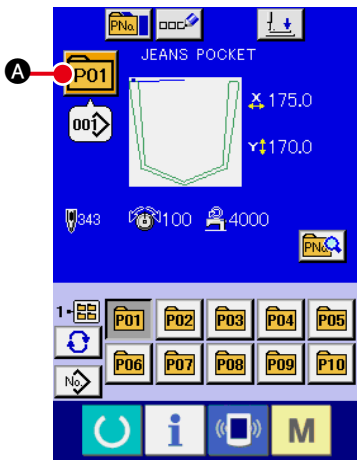


	Button and display	Description
Ⓐ	PATTERN BUTTON NAME display	Character which is registered to the pattern button No. being sewn is displayed.
Ⓑ	MANUAL/AUTOMATIC/ STEP setting display	Every time this button is pressed, the mode is changed over in the order of "→ →STEP". → Refer to "Ⅱ-2-10. Setting the MANUAL/AUTOMATIC/STEP" p.44.
Ⓒ	PRESSER DOWN button	The presser arm, presser plate presser plunger come down, and the presser down screen is displayed. → Refer to "Ⅱ-2-14. Lowering the presser" p.52.
Ⓓ	X ACTUAL SIZE VALUE display	Actual size value in X direction which is registered to the pattern button No. being sewn is displayed.
Ⓔ	Y ACTUAL SIZE VALUE display	Actual Y size value which is registered to the pattern button No. being selected is displayed.
Ⓕ	PATTERN NO. display	Pattern button No. being sewn is displayed.

	Button and display	Description
Ⓖ	SEWING SHAPE display	Sewing shape being sewn is displayed.
Ⓗ	SEWING SHAPE NO. display	Kind of sewing and sewing shape No. which are registered to the pattern being sewn are displayed.
Ⓘ	TOTAL NO. OF STITCHES OF SEWING SHAPE display	Total number of stitches of sewing shape which is registered to the pattern button No. being sewn is displayed.
Ⓙ	NEEDLE THREAD TENSION SETTING button	Needle thread tension value which is set to the pattern data being selected at present is displayed on this button and when the button is pressed, the item data change screen is displayed. → Refer to. **“Ⅱ-2-8. Changing item data” p.41**.
Ⓚ	COUNTER VALUE CHANGE button	Existing counter value is displayed on this button. When the button is pressed, the counter value change screen is displayed. → Refer to **“Ⅱ-2-16. Using counter” p.54**.
Ⓛ	COUNTER CHANGEOVER button	The counter display can be changed over among the sewing counter, No. of pcs. counter and bobbin counter.→ Refer to **“Ⅱ-2-16. Using counter” p.54**.
Ⓜ	STEP SEWING button	The step sewing screen is displayed. Checking the pattern shape can be performed. → Refer to **“Ⅱ-2-7. Pattern checking procedure” p.40**.
Ⓝ	FOLDER NO. display	Folder No. in which the displayed pattern register buttons are stored is displayed.
Ⓞ	SPEED variable resistor	Number of revolutions of the sewing machine can be changed.
Ⓟ	MAX. SPEED LIMITATION display	Maximum speed limitation which is registered to the pattern button No. being sewn is displayed.
Ⓠ	PATTERN REGISTER button	Pattern button which is stored in Ⓝ FOLDER NO. is displayed. → Refer to **“Ⅱ-2-19. Performing new register of pattern button” p.60**.

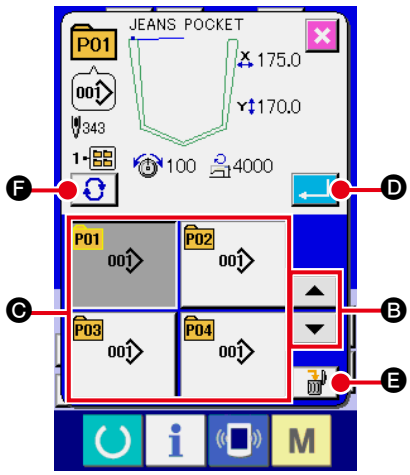
2-21. Performing pattern button No. selection

(1) Selection from the data input screen



① **Display the data input screen.**
In case of the data input screen (blue), it is possible to select the pattern button No. In case of the sewing screen (green), press READY switch to display the data input screen.

② **Call the pattern button No. selection screen.**
When PATTERN BUTTON NO. SELECTION button P01 Ⓐ is pressed, the pattern button No. selection screen is displayed. Pattern button No. which is selected at present and the contents are displayed on the upper part of the screen, and the list of the pattern button No. buttons which have been registered is displayed on the lower part of the screen.



③ **Select the pattern button No.**
When UP or DOWN SCROLL button Ⓑ is pressed, pattern button No. button Ⓒ which have been registered are changed over in order. The contents of sewing data which have been inputted in the pattern button No. are displayed in the button. Here, press the pattern button No. button Ⓒ you desire to select.

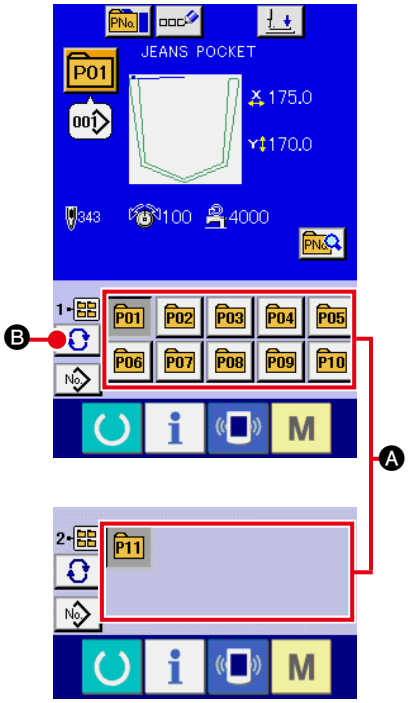
④ **Determine the pattern button No.**
When ENTER button Ⓓ is pressed, the pattern button No. selection screen is closed and the selection is finished. However, the pattern buttons which are registered to the combination sewing cannot be deleted.

* When you desire to delete the pattern button which has been registered, press DELETE Ⓔ button. However, the pattern buttons which are registered to the combination sewing cannot be deleted.

* For the pattern No. to be displayed, press FOLDER SELECTION Ⓕ button and pattern button Nos. which have been stored in the specified folder are displayed in the list. When the folder No. is not displayed, all pattern Nos. which have been registered are displayed.

(2) Selection by means of the shortcut button

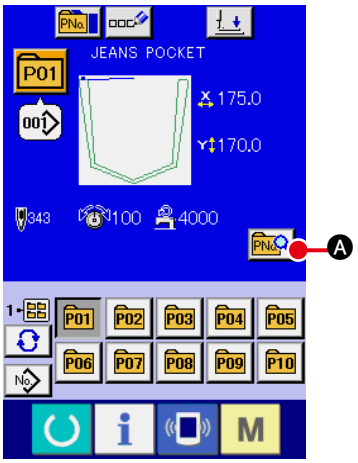
WARNING :
Be sure to check the pattern shape after the pattern selection. If the pattern goes out of the pattern slit in the presser plate, the needle can interfere with the presser plate during sewing, incurring danger such as needle breakage.



① **Display the data input screen or the sewing screen.**
When the pattern is registered to the folder, pattern buttons Ⓐ are surely displayed on the lower side of the screen of the data input screen or sewing screen.

② **Select the pattern No.**
Pattern button is displayed with every folder which is specified when the pattern is newly created.
When FOLDER SELECTION button  Ⓑ is pressed, the pattern button to be displayed is changed. Display and press the button of the pattern button No. you desire to sew. When it is pressed, the pattern button No. is selected.

2-22. Changing contents of pattern button

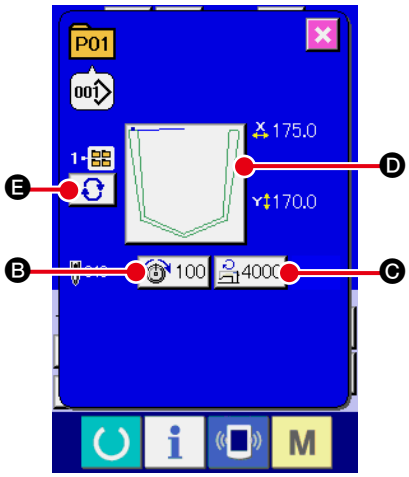


① **Display the data input screen at the time of pattern button selection.**

Only in case of the data input screen (blue) at the time of pattern selection, it is possible to change the contents of pattern. In case of the sewing screen (green), press READY switch to display the data input screen at the time of pattern button selection.

② **Display the pattern button data change screen.**

When PATTERN BUTTON DATA CHANGE button Ⓐ is pressed, the pattern button data change screen is displayed.



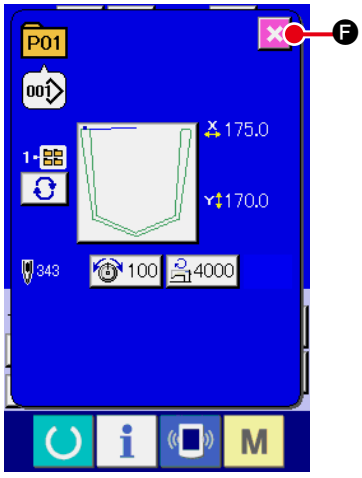
③ **Display the input screen of the item data you desire to change.**

Data that can be changed are 4 items below.

	Item	Input range	Initial value
Ⓑ	Thread tension	0 to 200	Pattern set value
Ⓒ	Max. speed limitation	500 to 4000(sti/min)	4000
Ⓓ	Sewing shape	-	-
Ⓔ	Folder No.	1 to 5	-

When pressing each button of Ⓑ, Ⓒ and Ⓓ, the item data input screen is displayed. When the buttons of Ⓔ is pressed, Folder Nos. and With/without thread clamp are changed over.

* Max. input range and initial value of max. speed limitation Ⓒ are determined with memory switch U001 .



④ **Close the pattern button data change screen.**

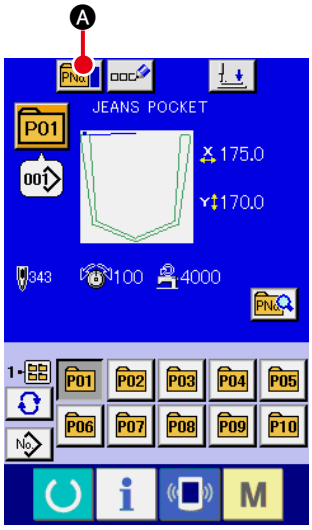
When the change is over, press CLOSE button Ⓕ. The pattern button data change screen is closed and the screen returns to the data input screen.

* It can be performed to change the other item data by the same operation.

2-23. Copying pattern button

The sewing data of the pattern button No. which has already been registered can be copied to the pattern button No. which is not registered. Overwriting copy of the pattern button is prohibited. When you desire to overwrite, perform it after deleting the pattern button once.

→ Refer to **"Ⅱ-2-21. Performing pattern button No. selection" p.65**.

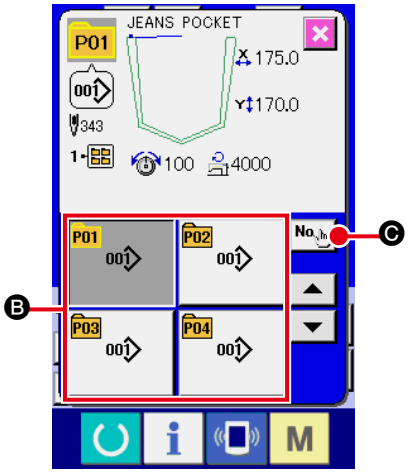


① **Display the data input screen.**

Only in case of the data input screen (blue) at the time of pattern button selection, it is possible to copy. In case of the sewing screen (green), press READY switch to display the data input screen (blue).

② **Call the pattern copy screen.**

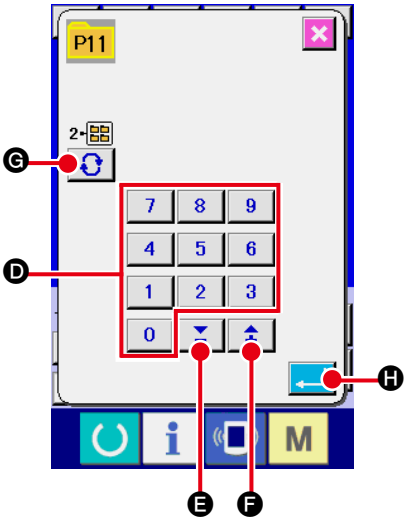
When PATTERN BUTTON COPY button Ⓐ is pressed, the pattern button copy (copy source selection) screen is displayed.



③ **Select the pattern No. of copy source.**

Select the pattern button No. of copy source from the pattern button list button Ⓑ.

Next, press COPY DESTINATION INPUT button Ⓒ and the copy destination input screen is displayed.



④ **Input the pattern No. of copy destination.**

Input the pattern button No. of copy destination with ten keys Ⓓ.

Pattern button No. which is not used yet can be retrieved with – and + buttons (Ⓕ and Ⓔ).

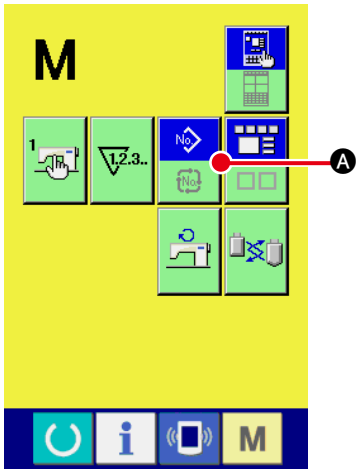
In addition, the folder to be stored can be selected with FOLDER SELECTION button Ⓖ.

⑤ **Start copying.**

When ENTER button Ⓗ is pressed, copying starts. The copied pattern button No. in the selection state returns to the pattern button copy (copy source selection) screen after approximately two seconds.

* Combination data can be copied in the same way.

2-24. Changing sewing mode



① **Select the sewing mode.**

When M switch is pressed in the state that the pattern has been registered, SEWING MODE SELECTION button is displayed on the screen. When this button is pressed, the sewing mode changes alternately the individual sewing and the combination sewing. (When the pattern button is not registered, the sewing mode cannot be changed to the combination sewing even when the button is pressed.)

* The image of the button of sewing mode selection button changes according to the sewing mode which is selected at present.

When individual sewing is selected :

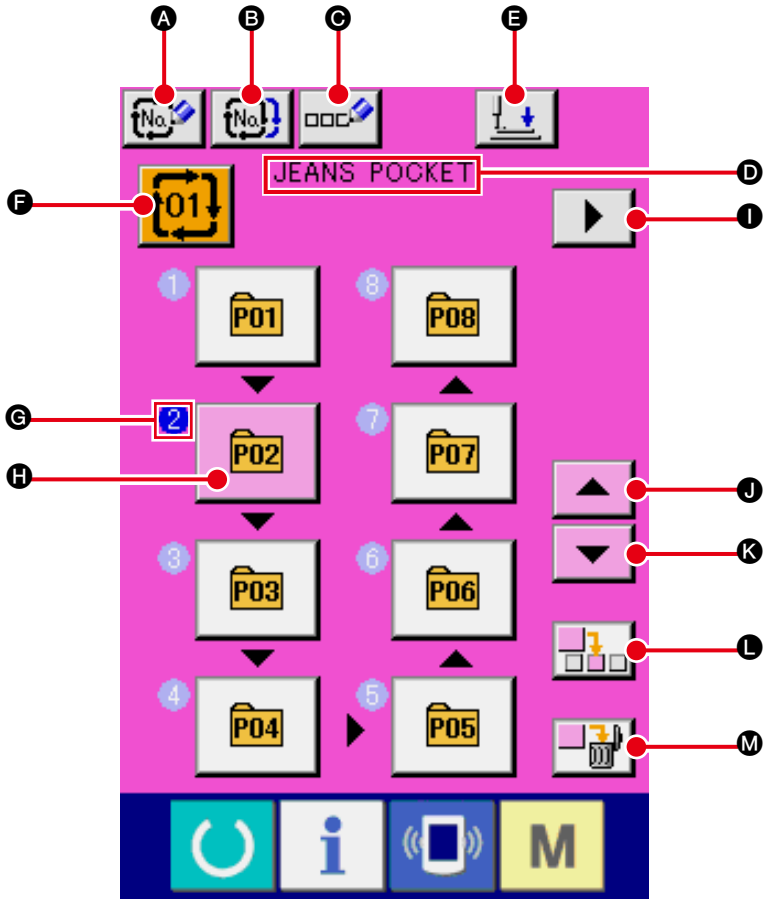
When combination sewing is selected :

2-25. LCD display section at the time of combination sewing

The sewing machine is capable of sewing in order by combining the plural pattern data. As many as 30 patterns can be inputted. Use this function when sewing plural different shapes on the sewing product. In addition, it is possible to register as many as 20 of the combination sewing data. Use this function for new creation and copying in case of need.

→ Refer to **"Ⅱ-2-19. Performing new register of pattern button" p.60** and **"Ⅱ-2-23. Copying pattern button" p.68**.

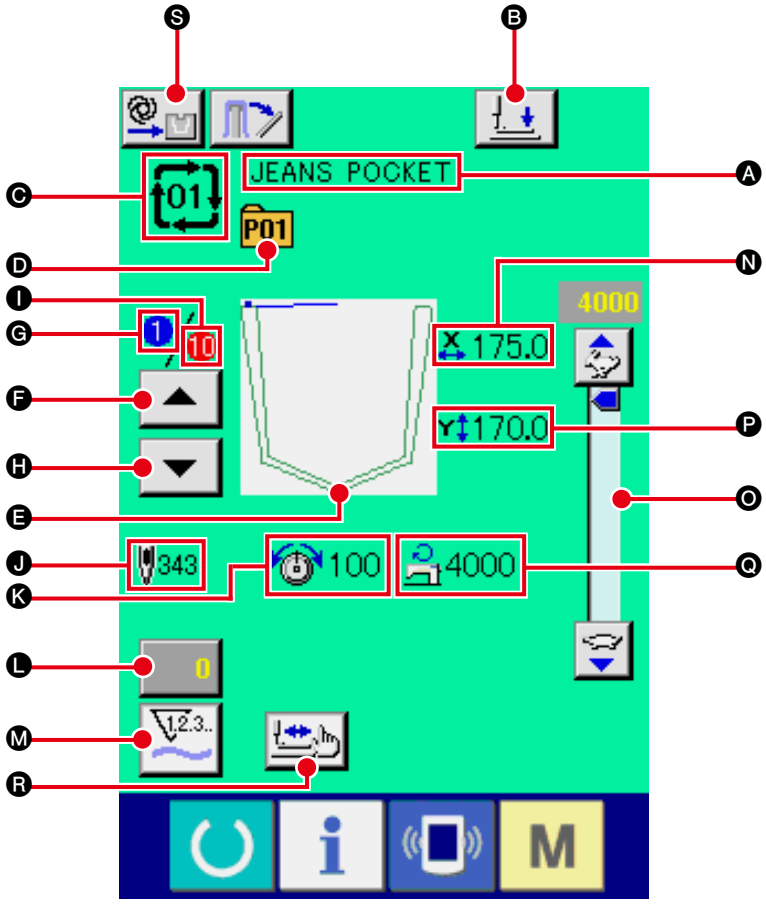
(1) Pattern input screen



	Button and display	Description
Ⓐ	COMBINATION DATA NEW REGISTER button	Combination data No. new register screen is displayed. → Refer to **"Ⅱ-2-19. Performing new register of pattern button" p.60**.
Ⓑ	COMBINATION DATA COPY button	Combination pattern No. copy screen is displayed. → Refer to **"Ⅱ-2-23. Copying pattern button" p.68**.
Ⓒ	COMBINATION DATA NAME INPUT button	Combination data name input screen is displayed. → Refer to **"Ⅱ-2-18. Naming users' pattern" p.59**.
Ⓓ	COMBINATION DATA NAME display	Name which is inputted in the combination data being selected is displayed.
Ⓔ	PRESSER DOWN button	The presser plunger comes down, and the presser down screen is displayed. → Refer to **"Ⅱ-2-14. Lowering the presser" p.52**.

	Button and display	Description
Ⓕ	COMBINATION DATA NO. SELECTION button	Combination data No. being selected is displayed in the button. When the button is pressed, the combination data No. selection screen is displayed.
Ⓖ	SEWING ORDER display	Sewing order of the inputted pattern data is displayed. When the screen is changed over to the sewing screen, the pattern which is sewn first is displayed in blue color. * As many as the number of inputted patterns is displayed in Ⓖ and Ⓗ, display and button.
Ⓗ	PATTERN SELECTION button	Pattern No., shape, number of stitches, etc. which are registered in Ⓖ SEWING ORDER are displayed on the button. When the button is pressed, the pattern selection screen is displayed. * As many as the number of inputted patterns is displayed in Ⓖ and Ⓗ, display and button.
Ⓘ	NEXT PAGE DISPLAY button	This button is displayed when the number of patterns registered to combination data has reached eight or more.
Ⓙ	UP SCROLL button	The pattern No. which is previous to the current one is selected.
Ⓚ	DOWN SCROLL button	The pattern No. which is next to the current one is selected.
Ⓛ	STEP INSERT button	A step is inserted before the pattern No. which is being selected.
Ⓜ	STEP DELETE button	A step which is being selected is delete.

(2) Sewing screen



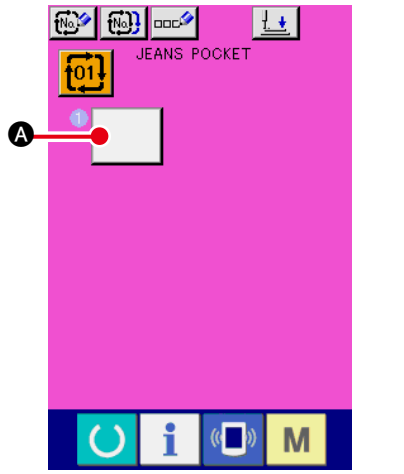
	Button and display	Description
Ⓐ	COMBINATION DATA NAME display	Name which is inputted in the combination data being selected is displayed.
Ⓑ	PRESSER DOWN button	The presser arm, presser plate presser plunger come down, and the presser down screen is displayed. → Refer to "Ⅱ-2-14. Lowering the presser" p.52.
Ⓒ	COMBINATION DATA NO. display	Combination data No. being selected is displayed.
Ⓓ	PATTERN BUTTON NO. display	Pattern button No. being sewn is displayed.
Ⓔ	SEWING SHAPE display	Sewing shape which is registered to pattern button No. being sewn is displayed.
Ⓕ	SEWING ORDER RETURN button	Pattern to be sewn can be returned by one.
Ⓖ	SEWING ORDER display	Sewing order being sewn at present is displayed.
Ⓗ	SEWING ORDER ADVANCE button	Pattern to be sewn can be advanced by one.

	Button and display	Description
❶	TOTAL NUMBER OF REGISTERS display	Total number of patterns which is registered to combination No. being sewn is displayed.
❷	TOTAL NUMBER OF STITCHES display	Total number of stitches of sewing shape being sewn is displayed.
❸	THREAD TENSION display	Thread tension value which is registered to pattern button No. being sewn is displayed.
❹	COUNTER VALUE CHANGE button	Existing counter value is displayed on this button. When the button is pressed, the counter value change screen is displayed. → Refer to **"Ⅱ-2-16. Using counter" p.54**.
❺	COUNTER CHANGEOVER button	The counter display can be changed over among the sewing counter, No. of pcs. counter and bobbin counter. → Refer to **"Ⅱ-2-16. Using counter" p.54**.
❻	X ACTUAL SIZE AMOUNT display	Actual X size value of the sewing shape which is registered to the pattern button No. being sewn is displayed.
❼	SPEED variable resistor	Number of revolutions of the sewing machine can be changed.
❽	Y ACTUAL SIZE AMOUNT display	Actual Y size value of the sewing shape which is registered to the pattern button No. being sewn is displayed.
❾	MAX. SPEED LIMITATION display	Maximum speed limitation which is registered to pattern button No. being sewn is displayed.
❿	STEP SEWING button	The step sewing screen is displayed. Checking the pattern shape can be performed. → Refer to **"Ⅱ-2-7. Pattern checking procedure" p.40**.
⓫	MANUAL/AUTOMATIC/ STEP setting display	Every time this button is pressed, the mode is changed over in the order of "  ". → Refer to **"Ⅱ-2-10. Setting the MANUAL/AUTOMATIC/STEP" p.44**.

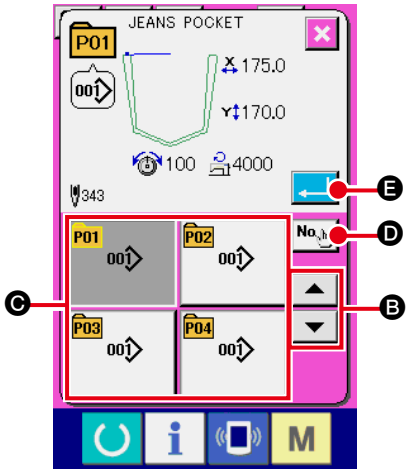
2-26. Performing combination sewing

First, change the sewing mode to the combination sewing before performing setting.
→ Refer to “Ⅱ-2-24. Changing sewing mode” p.69.

(1) How to create new combination data

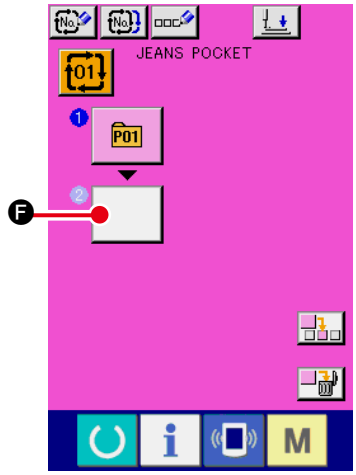


① **Display the data input screen.**
Only in case of the data input screen (pink) it is possible to input the combination data. In case of the sewing screen (green), press READY switch to display the data input screen (pink).
When new combination sewing data is registered by means on the new combination data registration button on the data input screen, the screen at left is displayed. → Refer to “Ⅱ-2-19. Performing new register of pattern button” p.60.



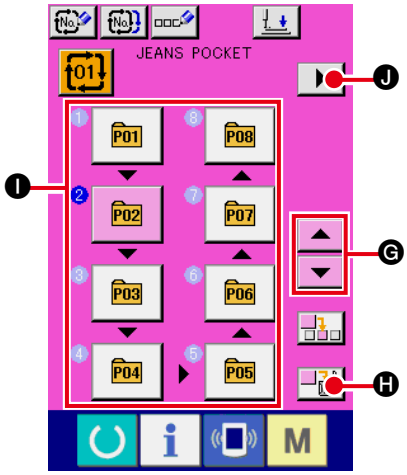
② **Display the pattern No. selection screen.**
When PATTERN SELECTION button Ⓐ is pressed, the pattern No. selection screen is displayed.

③ **Select the pattern No.**
When UP/DOWN SCROLL button Ⓑ is pressed, pattern No. buttons Ⓒ which have been registered are changed over in order.
It is also possible to display the pattern No. input screen by means of NUMBER INPUT button Ⓓ and input a pattern No. directly. The contents of pattern data are displayed in the buttons. Here, press the pattern No. buttons you desire to select.



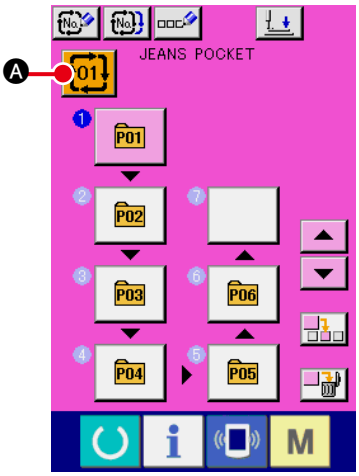
④ **Determine the pattern No.**
When ENTER button Ⓔ is pressed, the pattern No. selection screen is closed and the selection is finished.

⑤ **Repeat steps ② through ④ as many as the number of pattern Nos. you desire to register.**
When the first register is determined, the second pattern selection button Ⓕ is displayed.
Repeat steps ② through ④ as many as the number of pattern Nos. you desire to register.



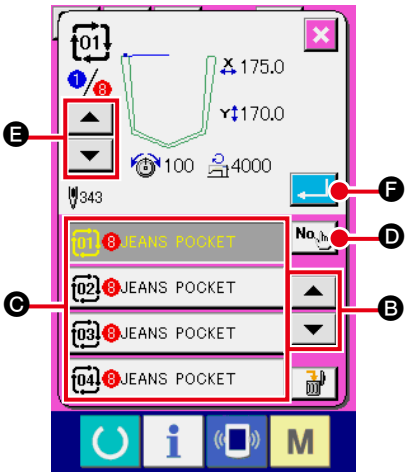
When UP or DOWN SCROLL button ▲ ▼ Ⓖ is pressed, the PATTERN NO. button can be selected. The selected PATTERN NO. button is displayed in pink P01 .
When the PATTERN NO. INSERT button Ⓗ is pressed, a step is inserted before the pattern No. being selected (displayed in pink). When PATTERN NO. button Ⓘ being displayed is pressed to select a different pattern No., the pattern No. is changed over.
If the programmed combination data extends over two or more screens, the next screen can be displayed by means of SCREEN SCROLL button ▶ Ⓙ.

(2) How to add combination data



① **Display the data input screen.**
Only in case of the data input screen (pink), it is possible to select the combination data No.
In case of the sewing screen (green), press READY switch ↻ to display the data input screen (pink).

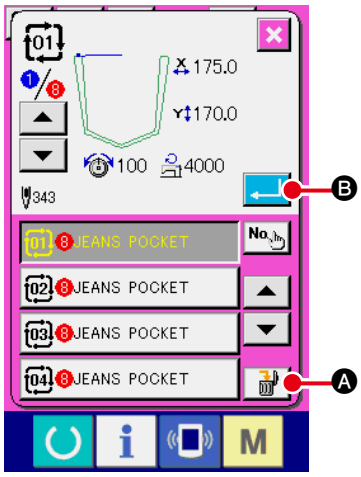
② **Call the combination data No. screen.**
When COMBINATION DATA NO. button 01 Ⓐ is pressed, the combination data No. selection screen is displayed. Combination data No. which is selected at present and the contents are displayed in the upper part of the screen, and other combination data No. buttons which have been registered are displayed in the lower part of the screen.



③ **Select the combination data No.**
When UP/DOWN button ▲ ▼ Ⓑ is pressed, combination data No. buttons Ⓒ which have been registered are changed over in order.
It is also possible to display the combination data No. input screen using NUMBER INPUT button No. Ⓓ and input a combination data No. directly.
Here, press the combination data No. buttons Ⓒ you desire to select.
When STEP CONFIRMATION button ▲ ▼ Ⓔ is pressed, the sewing shapes of patterns which have been registered in the combination data and the like are changed over in order and displayed.

④ **Determine the combination data No.**
When ENTER button ↵ Ⓕ is pressed, the combination data No. selection screen is closed and the selection is finished.

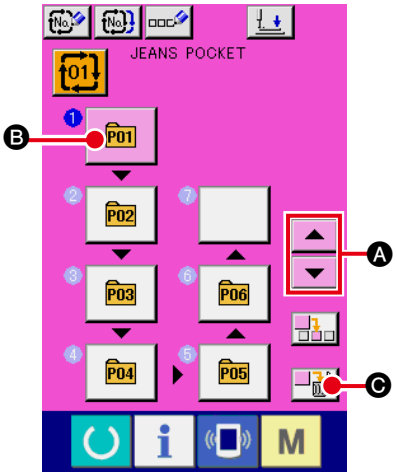
(3) Deleting procedure of the combination data



① **Select the combination data No.**
Perform steps ① to ③ of **"Ⅱ-2-26. (1) Selection of combination data" p.74** to display the combination data to be deleted.

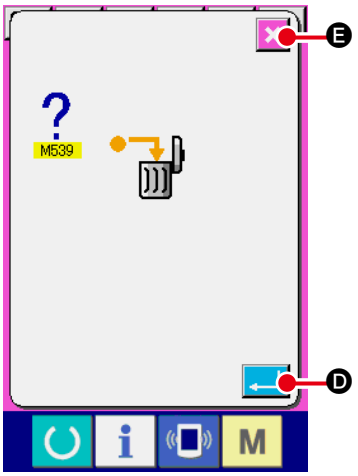
② **Performing deleting the combination data.**
When DATA DELETION button  Ⓐ is pressed, the combination data deletion confirmation pop-up is displayed. Here, press ENTER button  Ⓑ, and the selected combination data is deleted.

(4) Deleting procedure of the step of the combination data



① **Select the combination data No.**
Perform steps ① to ② of **"Ⅱ-2-26. (1) Selection of combination data" p.74** to make the state that the combination data including the step you desire to delete has been selected.

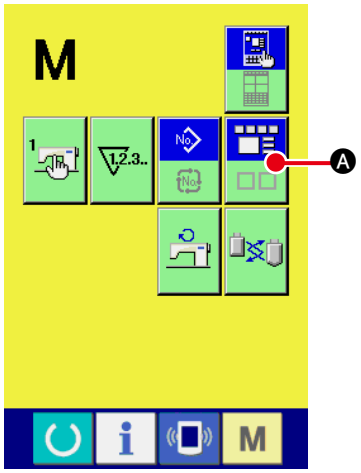
② **Display the pattern No. selection screen.**
Press UP/DOWN SCROLL button  Ⓐ to bring the PATTERN SELECT button for the step to be deleted under the selected state  Ⓑ. Then, when STEP DELETE button  Ⓒ is pressed, the data step delete popup window is displayed.



③ **Performing deleting the step of the selected combination data.**
When ENTER button  Ⓓ is pressed, the selected combination data step is deleted.
When the CANCEL button  Ⓔ is pressed, no data is deleted and the screen is restored to the data input screen.

2-27. Using the simple operation mode

With IP-420, the SIMPLE OPERATION mode is available.



① **Select the sewing mode.**

When the M key is pressed, SCREEN MODE SELECT button Ⓐ is displayed on the screen. When this button is pressed, the screen mode is changed over between the normal operation and the simple operation.

When the normal operation is selected:

When the simple operation is selected:

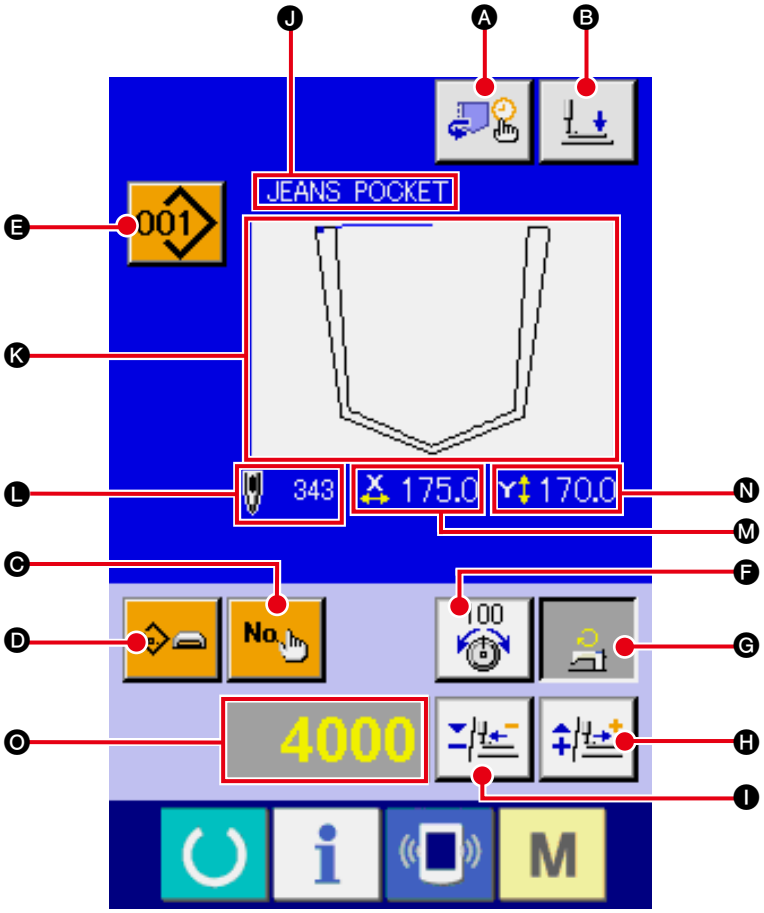
2-28. LCD display when the simple operation is selected

(1) Data input screen (individual sewing)

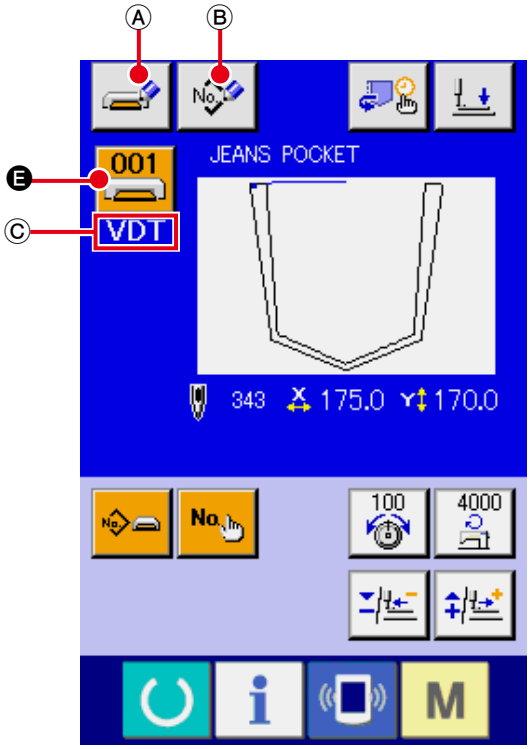
The display is changed over among the user pattern display, the media pattern display and the direct pattern display by press pattern-type setting button  ❶ and pressing plus button  ❽ or minus button  ❾.

The user patterns are those stored on the memory in the main body of the device.
The media patterns are those stored on the media (CompactFlash card (TM), USB thumb drive, etc.).
The direct patterns are those stored and registered with the pattern buttons.

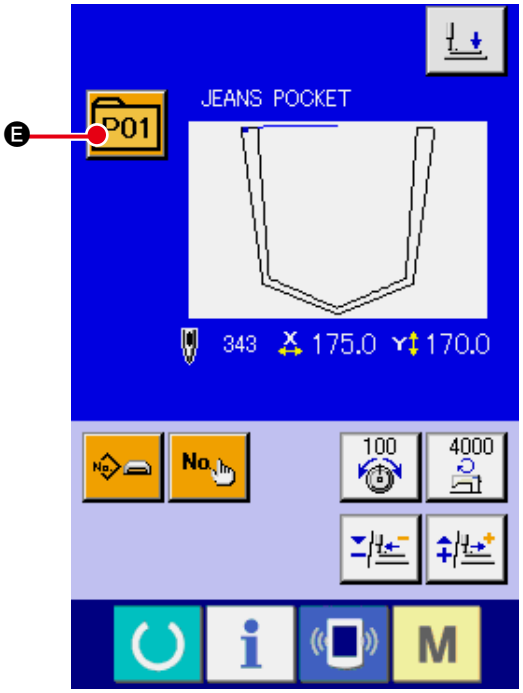
[User's pattern]



[Media pattern]



[Direct pattern]

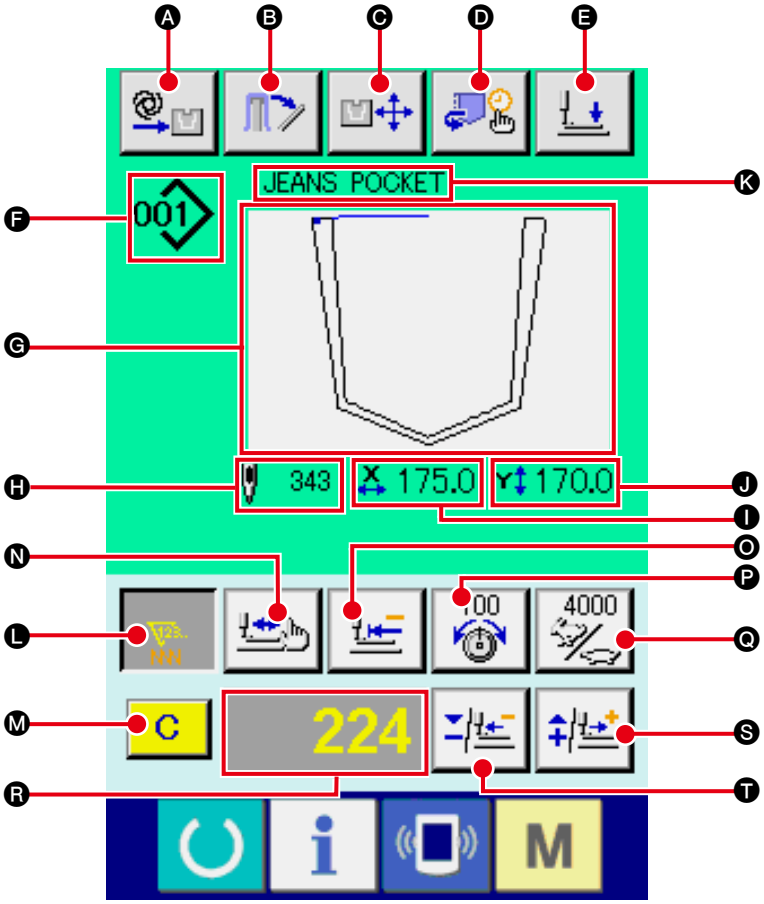


	Button and display	Description
Ⓐ	FOLDING TIMING CHANGE button	This is the button to change the order of folding-timing operation and to change enable/disable of the folding unit. → Refer to "Ⅱ-2-11. Changing the folding timing" p.45.
Ⓑ	PRESSER DOWN button	The presser plunger comes down, and the presser down screen is displayed. → Refer to "Ⅱ-2-14. Lowering the presser" p.52.
Ⓒ	PATTERN NO. SETTING button	Pattern No. is set. Registered pattern No. is retrieved using PLUS button Ⓗ and MINUS button Ⓘ.
Ⓓ	PATTERN TYPE SETTING button	Pattern type is specified. The pattern type is changed over among the following three different ones using PLUS button Ⓗ and MINUS button Ⓘ to select a desired one. No. : User's pattern No. VDT : Vector form data PNo. : Direct pattern The selected pattern type is indicated on edit data display Ⓞ. *A type to which no pattern is registered cannot be selected.
Ⓔ	PATTERN LIST button	Pattern No. and type which are currently selected are indicated on the button. When the button is pressed, the selected pattern list screen is displayed for the pattern selection.
Ⓕ	NEEDLE THREAD TENSION SETTING button	The current needle thread tension reference value is indicated on the button. When the button is pressed, the thread tension reference value can be changed. During the setting procedure, the thread tension reference value is indicated on edit data display Ⓞ. The thread tension value is increased/decreased in increments of 1 using PLUS button Ⓗ or MINUS button Ⓘ. → Refer to "Ⅱ-2-8. Changing item data" p.41.

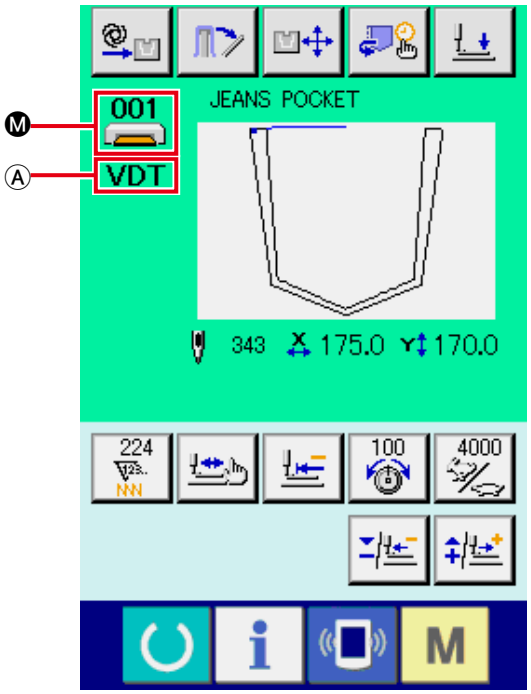
	Button and display	Description
ⓖ	MAX SPEED LIMITATION SETTING button	The current max. speed limitation is indicated on the button. When the button is pressed, the max. speed limitation can be changed. During the setting procedure, the max. speed limitation is indicated on edit data display ⓞ. The max. speed limitation is increased/decreased in increments of 100 sti/min using PLUS button ⓗ or MINUS button ⓘ. → Refer to **"Ⅱ-2-8. Changing item data" p.41**.
ⓗ	PLUS button	The value for the selected item is increased in increments of the reference unit.
ⓘ	MINUS button	The value for the selected item is decreased in increments of the reference unit.
ⓙ	PATTERN NAME display	The name of the currently selected pattern is displayed.
ⓚ	SEWING SHAPE display	The sewing shape of the currently selected pattern is displayed
ⓛ	NUMBER OF STITCHES display	The number of stitches for the currently selected pattern is displayed.
ⓜ	X ACTUAL SIZE VALUE display	The actual X size value of the sewing shape which is being selected is displayed.
ⓝ	Y ACTUAL SIZE VALUE display	The actual Y size value of the sewing shape which is being selected is displayed.
ⓞ	EDIT DATA display	The data which is being edited on the currently selected edit item is displayed. * When no edit item is selected, this display is not given.
Ⓐ	MEDIA PATTERN WRITE button	Data on a media pattern is written. When this button is pressed, the new media pattern registration screen is displayed. * This button is displayed when the media pattern is selected.
Ⓑ	USER'S PATTERN WRITE button	Data on a user's pattern is written. When this button is pressed, the new user's pattern registration screen is displayed. * This button is displayed when the media pattern is selected.
Ⓒ	SEWING DATA TYPE display	The type of data read from a medium is displayed. VDT : Vector form data * This display is given when the media pattern is selected.

(2) Sewing screen (individual sewing)

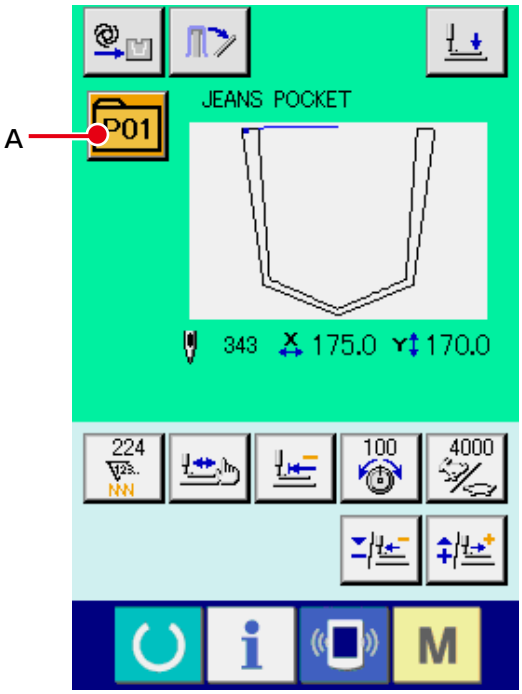
[User's pattern]



[Media pattern]



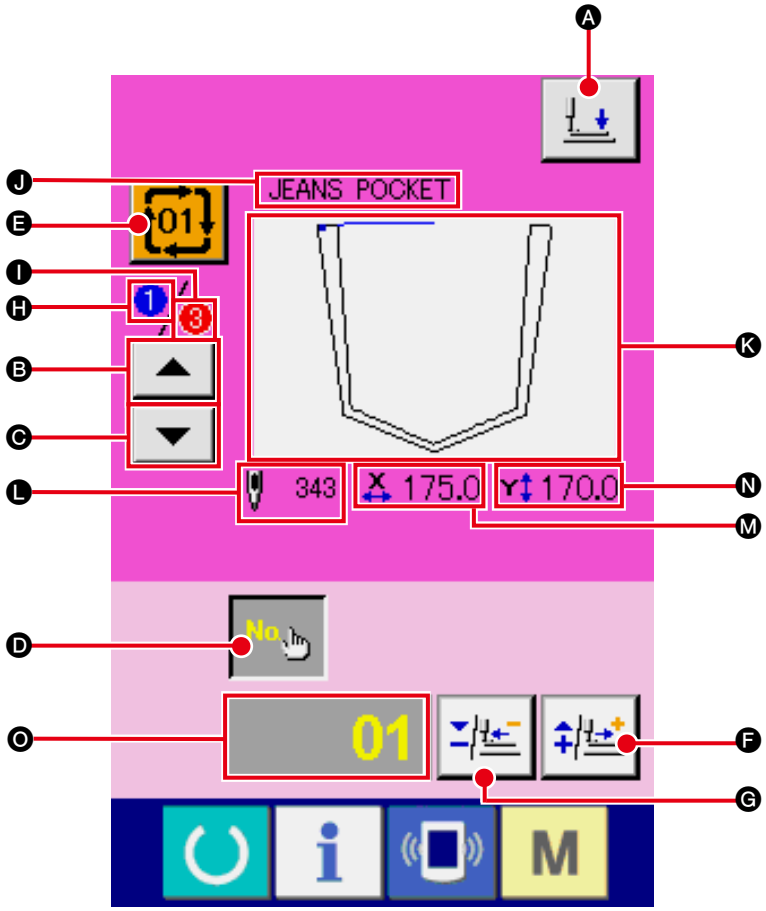
[Direct pattern]



	Button and display	Description
Ⓐ	MANUAL/AUTOMATIC/ STEP setting display	Every time this button is pressed, the mode is changed over in the order of "  ". → Refer to **"Ⅱ-2-10. Setting the MANUAL/AUTOMATIC/STEP" p.44**.
Ⓑ	MATERIAL RELEASE button	The material presser of the stacker opens to allow the sewing product in the stacker to be taken out. →Refer to **"Ⅱ-2-15. Stacker operation (taking out the material)" p.53**.
Ⓒ	FOLDING POSITION CHANGE button	The folding position change screen is displayed. →Refer to **"Ⅱ-2-12. Changing the folding position" p.48**.
Ⓓ	FOLDING TIMING CHANGE button	This is the button to change the order of folding-timing operation and to change enable/disable of the folding unit. → Refer to **"Ⅱ-2-11. Changing the folding timing" p.45**.
Ⓔ	PRESSER DOWN button	The presser arm, presser plate presser plunger come down, and the presser down screen is displayed. → Refer to **"Ⅱ-2-14. Lowering the presser" p.52.**
Ⓕ	PATTERN NO./TYPE display	The pattern No. and type of the pattern which is being selected are displayed.
Ⓖ	SEWING SHAPE display	The sewing shape of the currently selected pattern is displayed.
Ⓗ	NUMBER OF STITCHES display	The number of stitches for the currently selected pattern is displayed.
Ⓘ	X ACTUAL SIZE VALUE display	The actual X size value of the sewing shape which is being selected is displayed.
Ⓙ	Y ACTUAL SIZE VALUE display	The actual Y size value of the sewing shape which is being selected is displayed.
Ⓚ	PATTERN NAME display	The name of the currently selected pattern is displayed.
Ⓛ	COUNTER VALUE CHANGE button	The counter value is changed using PLUS button Ⓢ or MINUS button Ⓣ. The counter value is indicated on the button. When the button is pressed, Ⓠ is displayed to allow the counter value to be changed. The current counter value is indicated on edit data display Ⓡ. →Refer to **"Ⅱ-2-16. Using counter" p.54**.
Ⓜ	CLEAR button	The counter value is cleared. * This button is displayed only when COUNTER VALUE CHANGE button Ⓛ is being selected.
Ⓝ	SHAPE CHECK button	The shape of the pattern which is being selected is checked using PLUS button Ⓢ or MINUS button Ⓣ. The current number of stitches is indicated on edit data display Ⓡ. During the pattern shape checking, the SEWING SHAPE display Ⓖ is shown with the current point ✪ (pink circle). To finish the pattern shape checking, press the SHAPE CHECK button again.
Ⓞ	RETURN TO ORIGIN button	This button is used to return the presser plate to the start point of sewing at the time of the temporary stop or pattern shape checking.

	Button and display	Description
❾	NEEDLE THREAD TENSION SETTING button	The current needle thread tension reference value is indicated on the button. When the button is pressed, the reference value of the thread tension can be set. During the setting procedure, the thread tension reference value is indicated on edit data display ❽. The thread tension value is increased/decreased in increments of 1 using PLUS button ❿ or MINUS button ⓫. The thread tension can be changed even during sewing.
⓬	SPEED CHANGE button	The speed of stitch of the sewing machine is indicated on the button. When the button is pressed, the speed of stitch can be changed. During the setting procedure, the current speed of the sewing machine is indicated on edit data display ❽. The max. speed limitation is increased/decreased in increments of 100 sti/min using PLUS button ❿ or MINUS button ⓫.
❽	EDIT DATA display	The data which is being edited on the currently selected edit item is displayed. * When no edit item is selected, this display is not given.
❿	PLUS button	The value for the selected item is increased in increments of the reference unit or the needle is moved forward by one stitch.
⓫	MINUS button	The value for the selected item is decreased in increments of the reference unit or the needle is moved backward by one stitch.
Ⓐ	SEWING DATA TYPE display	The type of data read from a medium is displayed. VDT : Vector form data * This display is given when the media pattern is selected.
A	PATTERN LIST button	Pattern No. and type which are currently selected are indicated on the button. When the button is pressed, the selected pattern list screen is displayed for the pattern selection.

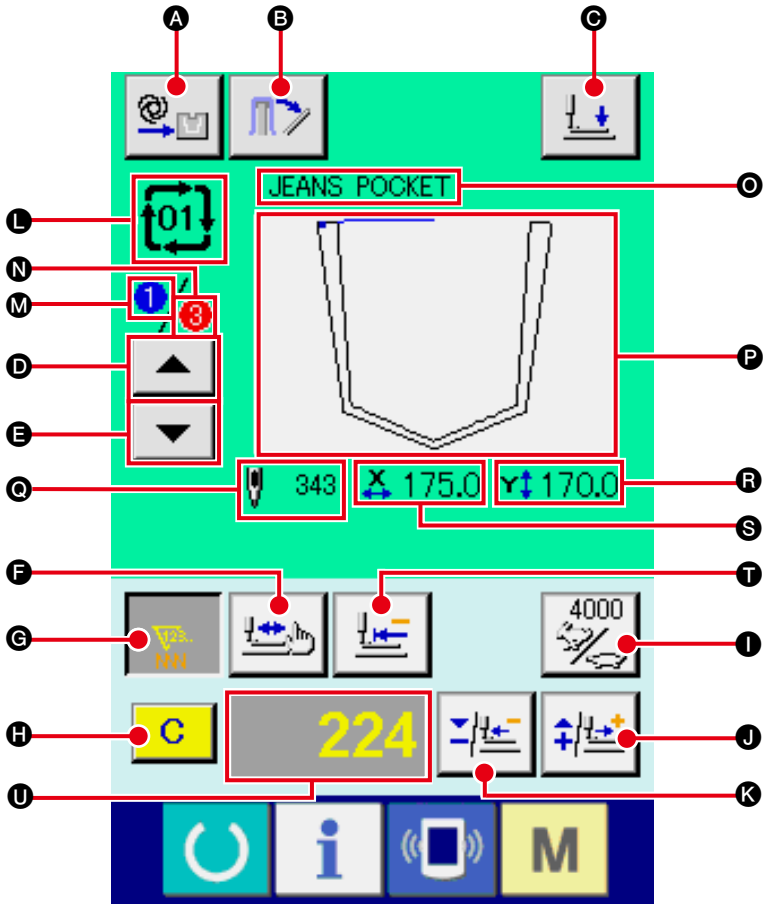
(3) Data input screen (combination sewing)



	Button and display	Description
Ⓐ	PRESSER DOWN button	The presser plunger comes down, and the presser down screen is displayed. → Refer to "Ⅱ-2-14. Lowering the presser" p.52.
Ⓑ	SEWING ORDER RETURN button	The pattern No. to be sewn first can be returned to the previous sewing order. The pattern information shown at the upper part of the screen is updated.
Ⓒ	SEWING ORDER ADVANCE button	The pattern No. to be sewn first can be advanced to the next sewing order. The pattern information shown at the upper part of the screen is updated.
Ⓓ	PATTERN No. SETTING button	Pattern No. is set. Registered pattern No. is retrieved using PLUS button Ⓕ and MINUS button Ⓖ.
Ⓔ	PATTERN LIST button	Pattern No. and type which are currently selected are indicated on the button. When the button is pressed, the selected pattern list screen is displayed for the pattern selection.
Ⓕ	PLUS button	The value for the selected item is increased in increments of the reference unit.
Ⓖ	MINUS button	The value for the selected item is decreased in increments of the reference unit.
Ⓗ	SEWING ORDER display	The sewing order of the currently selected pattern data is displayed.
Ⓘ	TOTAL NUMBER OF REGISTERS display	The total number of patterns registered to the cycle pattern which is currently being selected is displayed.

	Button and display	Description
❿	PATTERN NAME display	The name of the currently selected pattern is displayed.
ⓚ	SEWING SHAPE display	The sewing shape of the currently selected pattern is displayed.
❶	NUMBER OF STITCHES display	The number of stitches for the currently selected pattern is displayed.
Ⓜ	X ACTUAL SIZE VALUE display	The actual X size value of the currently selected pattern is displayed.
Ⓝ	Y ACTUAL SIZE VALUE display	The actual Y size value of the currently selected pattern is displayed.
ⓞ	EDIT DATA display	The data which is being edited on the currently selected edit item is displayed. * When no edit item is selected, this display is not given.

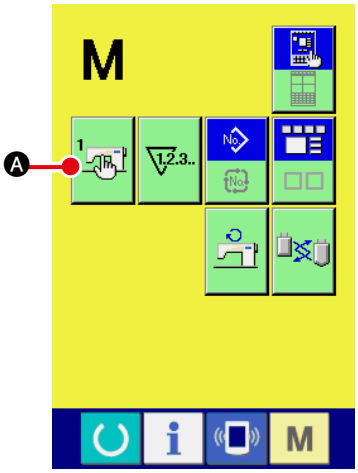
(4) Sewing screen (combination sewing)



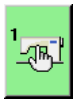
	Button and display	Description
Ⓐ	MANUAL/AUTOMATIC/ STEP setting display	Every time this button is pressed, the mode is changed over in the order of "→ →STEP". → Refer to **"Ⅱ-2-10. Setting the MANUAL/AUTOMATIC/STEP" p.44**.
Ⓑ	MATERIAL RELEASE button	The material presser of the stacker opens to allow the sewing product in the stacker to be taken out. →Refer to **"Ⅱ-2-15. Stacker operation (taking out the material)" p.53**.
Ⓒ	PRESSER DOWN button	The presser arm, presser plate presser plunger come down, and the presser down screen is displayed. → Refer to **"Ⅱ-2-14. Lowering the presser" p.52.**
Ⓓ	SEWING ORDER RETURN button	The pattern to be sewn can be returned to the previous one.
Ⓔ	SEWING ORDER ADVANCE button	The pattern to be sewn can be advanced to the next one.
Ⓕ	SHAPE CHECK button	The shape of the pattern which is being selected is checked using PLUS button Ⓙ or MINUS button Ⓚ. The current number of stitches is indicated on edit data display Ⓤ. During the pattern shape checking, the SEWING SHAPE display Ⓟ is shown with the current point ✿ (pink circle). To finish the pattern shape checking, press the SHAPE CHECK button again.

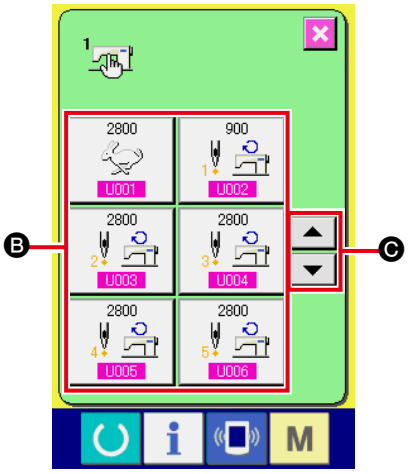
	Button and display	Description
Ⓖ	COUNTER VALUE CHANGE button	The counter value is changed using PLUS button Ⓙ or MINUS button Ⓚ. The counter value is indicated on the button. When the button is pressed, Ⓗ is displayed to allow the counter value to be changed. The current counter value is indicated on edit data display Ⓤ. →Refer to "Ⅱ-2-16. Using counter" p.54.
Ⓗ	CLEAR button	The counter value is cleared. * This button is displayed only when COUNTER VALUE CHANGE button Ⓖ is being selected.
Ⓘ	SPEED CHANGE button	The speed of stitch of the sewing machine is changed. The speed of stitch can be changed even during sewing. When this button is pressed, the current speed of stitch of the sewing machine is indicated on edit data display Ⓤ. The speed of stitch is increased/decreased in increments of 100 sti/min using PLUS button Ⓙ and MINUS button Ⓚ.
Ⓙ	PLUS button	The value for the selected item is increased in increments of the reference unit or the needle is moved forward by one stitch.
Ⓚ	MINUS button	The value for the selected item is decreased in increments of the reference unit or the needle is moved backward by one stitch.
Ⓛ	PATTERN NO./TYPE display	The pattern No. and type of the pattern which is being selected are displayed.
Ⓜ	SEWING ORDER display	The sewing order of currently selected pattern data is displayed.
Ⓝ	TOTAL NUMBER OF REGISTERS display	The total number of patterns registered to the cycle pattern which is currently being selected is displayed.
Ⓞ	COMBINATION DATA NAME display	The name input in the combination data which is being selected is displayed.
Ⓟ	SEWING SHAPE display	The sewing shape of the currently selected pattern is displayed.
Ⓠ	NUMBER OF STITCHES display	The number of stitches for the currently selected pattern is displayed.
Ⓡ	X ACTUAL SIZE VALUE display	The actual X size value of the currently selected pattern is displayed.
Ⓢ	Y ACTUAL SIZE VALUE display	The actual Y size value of the currently selected pattern is displayed.
Ⓣ	RETURN TO ORIGIN button	This button is used to return the presser plate to the start point of sewing at the time of the temporary stop or pattern shape checking.
Ⓤ	EDIT DATA display	The data which is being edited on the currently selected edit item is displayed. * When no edit item is selected, this display is not given.

2-29. Changing memory switch data



① **Display the memory switch data list screen.**

When MODE key M is pressed, memory switch button  Ⓐ is displayed on the screen. When this button is pressed, the memory switch data list screen is displayed.

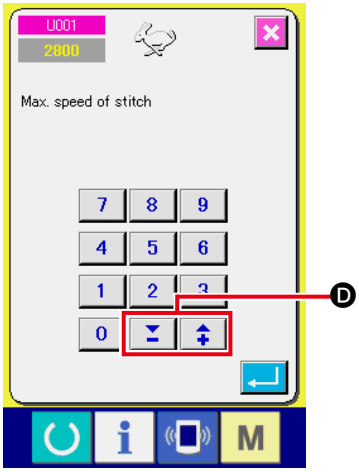


② **Select the memory switch button you desire to change.**

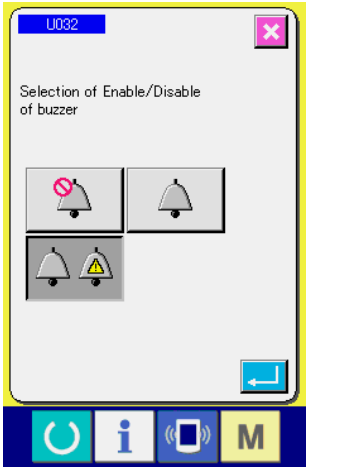
Press UP/DOWN SCROOL button ▲ ▼ Ⓒ and select the data item button Ⓑ you desire to change.

③ **Change the memory switch data.**

There are data items to change numerals and those to select pictographs in the memory switch data.



No. in pink color such as U001 is put on the data items to change numerals and the set value can be changed with   Ⓓ buttons displayed in the change screen.



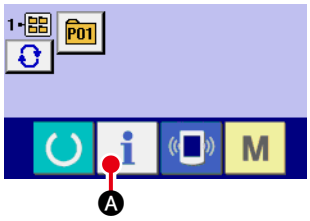
No. in blue color such as U032 is put on the data items to select pictographs and the pictographs displayed in the change screen can be selected.

→ For the details of memory switch data, refer to **"Ⅱ-3. MEMORY SWITCH DATA LIST" p.96**.

2-30. Using information

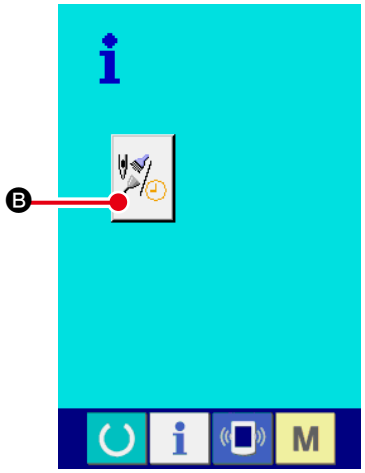
Oil replacement time, needle replacement time, cleaning time, etc. can be specified and the warning notice can be performed after the lapse of the specified time.

(1) Observing the maintenance and inspection information



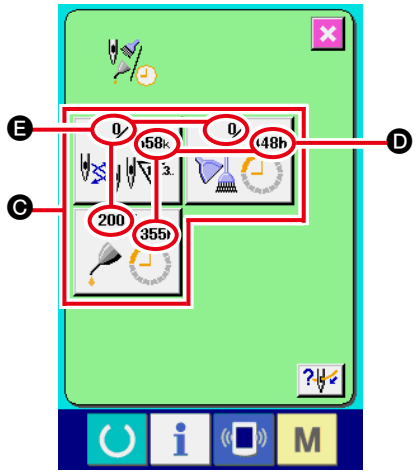
① **Display the information screen.**

When information key  Ⓐ of the switch seat section is pressed in the data input screen, the information screen is displayed.



② **Display the maintenance and inspection information screen.**

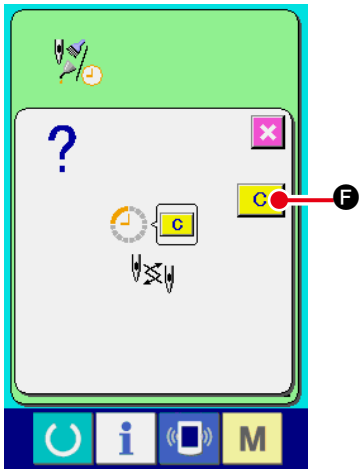
Press maintenance and inspection information screen display button  Ⓑ in the information screen.



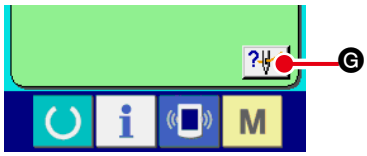
Information on the following three items is displayed in the maintenance and inspection information screen.

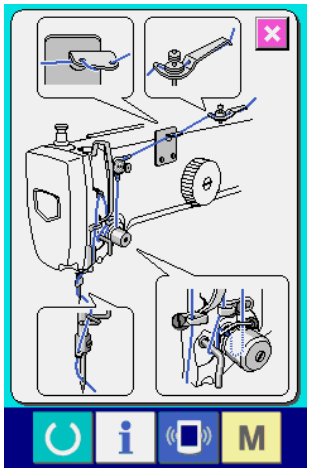
- Needle replacement (1,000 stitches) : 
- Cleaning time (hour) : 
- Oil replacement time (hour) : 

The interval to inform of the inspection for each item in button Ⓒ is displayed at Ⓓ, and remaining time up to the replacement is displayed at Ⓔ. In addition, remaining time up to the replacement can be cleared.



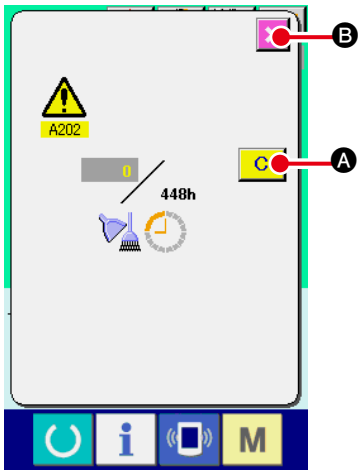
③ **Perform clearing remaining time up to the replacement.**
When button Ⓒ of the item you desire to clear is pressed, the time of replacement clear screen is displayed. When CLEAR button C Ⓕ is pressed, the remaining time up to the replacement is cleared.





④ **Display the threading diagram.**
When threading button Ⓖ displayed in the maintenance and inspection screen is pressed, the needle thread threading diagram is displayed.
Observe it when performing threading.

(2) Releasing procedure of the warning



When the designated inspection time is reached, the warning screen is displayed.
In case of clearing the inspection time, press CLEAR button C Ⓐ. The inspection time is cleared and the pop-up is closed. In case of not clearing the inspection time, press CANCEL button Ⓑ and close the pop-up. Every time one sewing is completed, the warning screen is displayed until the inspection time is cleared.
Warning Nos. of the respective items are as follows.

- Needle replacement : A201
- Cleaning time : A202
- Oil replacement time : A203

2-31. Using communication function

Communication function can download the sewing data created with other sewing machine, creation of sewing data and sewing data created by editing device PM-1 to the sewing machine. In addition, the function can upload the aforementioned data to the media or personal computer. CompactFlash (TM) and USB are available as communication media.

* However, SU-1 (data server utility) is necessary to perform download/upload from the personal computer.

(1) Handling possible data

Sewing data that can be handled are as given in the table below:

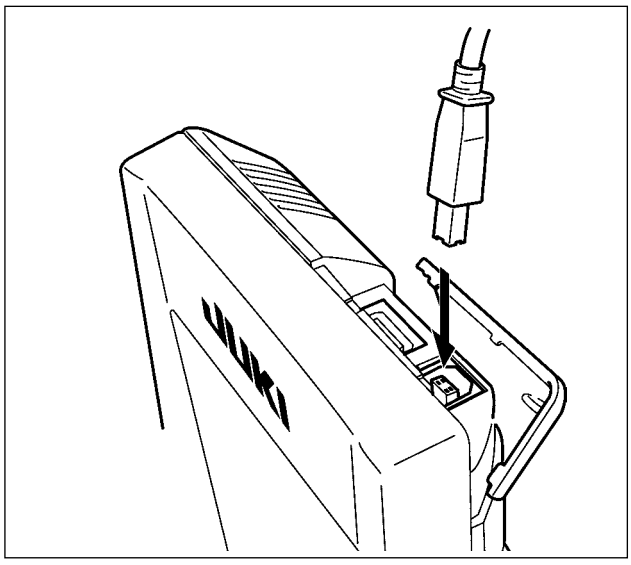
Data name		Extension	Description of data
Vector format data		VD00XXX.VDT	It is the data of needle entry point created with PM-1, and the data format that can be operated in common between JUKI sewing machines.

XXX : file No.

(2) To conduct communication by means of the CompactFlash (TM)

Refer to "Ⅱ-1. PREFACE" p.25 for how to handle the CompactFlash (TM).

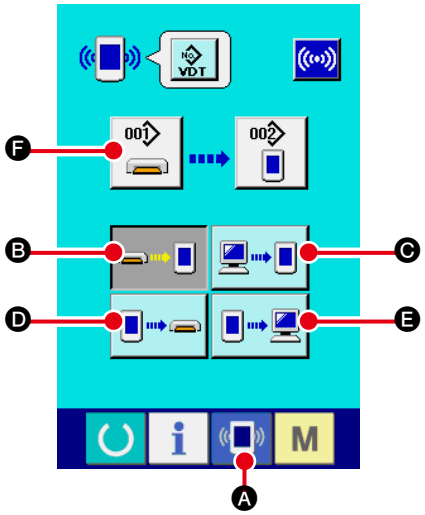
(3) Performing communication by using USB



Data can be sent/received to/from a personal computer or the like, by means of a USB cable.

If the contact part becomes dirty, failure of contact will be caused. Do not touch by hand, and control so that dust, oil or other foreign material does not adhere to it. In addition, the inside element is damaged by static electricity or the like. So, be very careful when handling.

(4) Take-in of the data



① **Display the communication screen.**

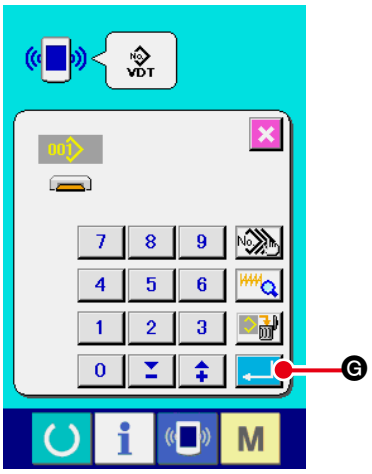
When communication switch  Ⓐ of switch seat section is pressed in the data input screen, the communication screen is displayed.

② **Select the communication procedure.**

There are four communication procedures as described below.

Ⓑ Writing data from media to panel
Ⓒ Writing data from personal computer (server) to panel
Ⓓ Writing data from panel to media
Ⓔ Writing data from panel to personal computer (server)

Select the button of communication procedure you desire.

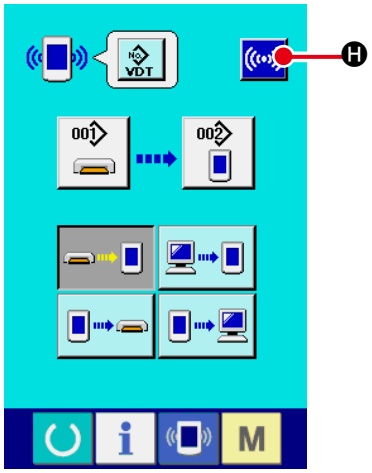


③ **Select the data No.**

When  Ⓕ is pressed, the writing file selection screen is displayed.

Input the file No. of the data you desire to write. For the file No., input the numerals of the part xxx of VD00xxx .vdt of the file name.

Designation of the pattern No. of writing destination can be performed in the same way. When the writing destination is the panel, pattern Nos. which have not been registered are displayed.

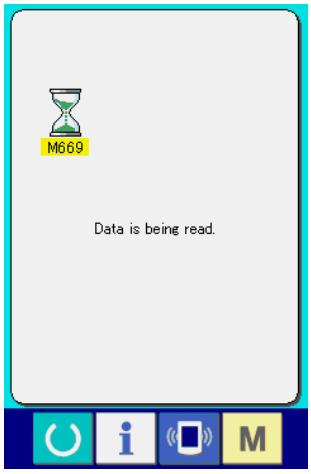


④ **Determine the data No.**

When ENTER button  Ⓖ is pressed, the data No. selection screen is closed and the selection of the data No. has been completed.

⑤ **Start communication.**

When COMMUNICATION START button  Ⓗ is pressed, the data communication starts. The during communication screen is displayed during communication and the screen returns to the communication screen after the end of communication.

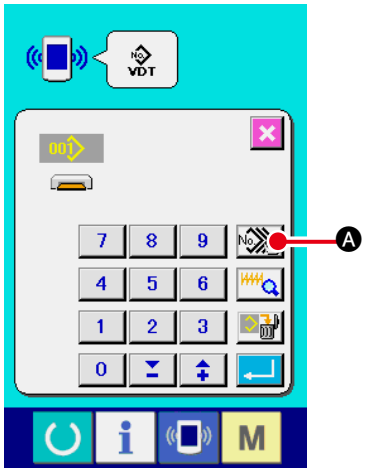


Caution **Do not open the cover during reading the data. Data may not be read in.**

(5) Taking in plural data together

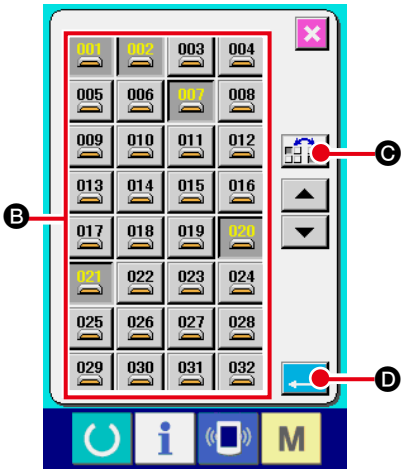
For the vector data, it is possible to select two or more pieces of data to be written and to write them together. Pattern No. of writing destination will become the same No. of the selected data No.

It is not possible for the No. after No. 201 of media to select plural No.



① **Display the writing file selection screen.**

When PLURAL SELECTION button Ⓐ is pressed, the data No. plural selection screen is displayed.

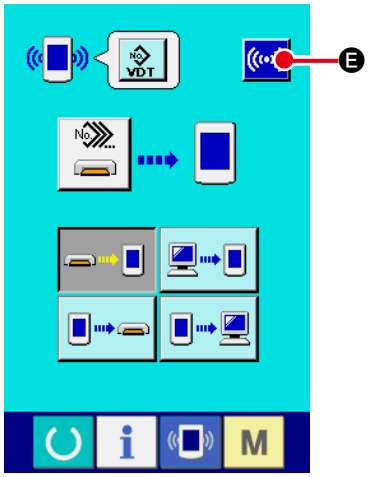


② **Perform the data No. selection.**

Since the list of existing data file numbers is displayed, press FILE NO. button Ⓑ you desire to write. It is possible to invert the selected state of the button with INVERSION button Ⓒ.

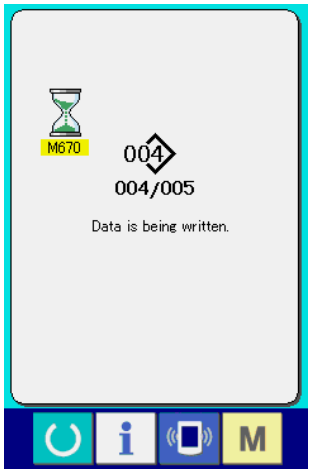
③ **Determine the data No.**

When ENTER button Ⓓ is pressed, the data No. plural selection screen is closed and the data selection ends.

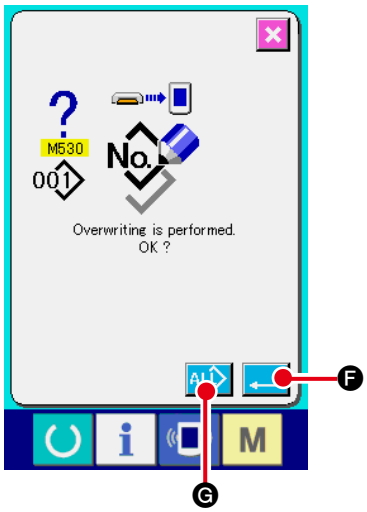


④ **Start the communication.**

When COMMUNICATION START button Ⓔ is pressed, the data communication starts.



Data No. during communication, total number of writing data and number of data that have ended the data communication are displayed in the during communication screen.

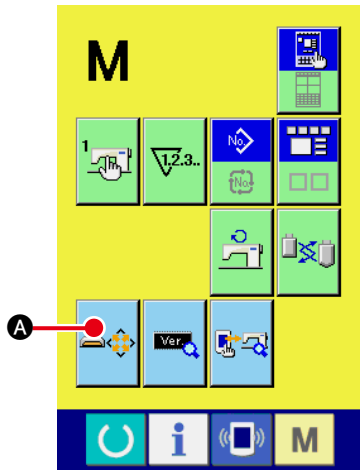


* When performing writing to the pattern No. which already exists, the overwriting confirmation screen is displayed before writing. When performing overwriting, press ENTER button  Ⓕ.

When performing overwriting all without displaying the overwriting confirmation screen, press OVERWRITING button  Ⓖ in all cases.

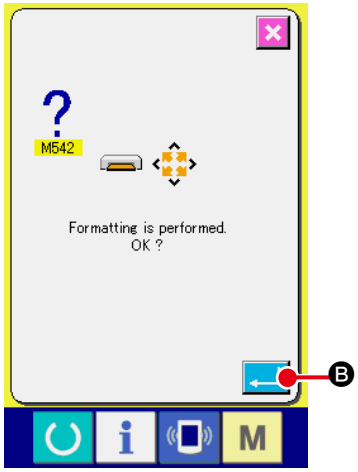
2-32. Performing formatting of the media

To re-format a medium, the IP-420 has to be used. The IP-420 is not able to read any medium which is formatted on a personal computer.



① **Display the media format screen.**

When M switch is held pressed for three seconds, MEDIA FORMAT button Ⓐ is displayed on the screen. When this button is pressed, the media format screen is displayed.



② **Start formatting of the media.**

Set the media you desire to format to the media slot, close the cover, press ENTER button Ⓑ and formatting starts.

Save necessary data in the media to the other media before formatting. When formatting is performed, the inside data are deleted.

When two or more media are connected to the sewing machine, the medium to be formatted is determined by the predetermined priority order.

High ← Low

CF(TM) slot ← USB device 1 ← USB device 2 ← ....

When a CompactFlash (TM) is inserted in the CF(TM) slot, the CompactFlash (TM) will be formatted according to the priority order as shown above.

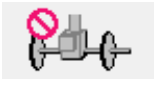
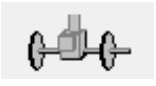
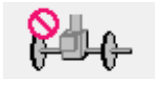
Refer to the USB specifications for the priority order of access.

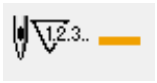
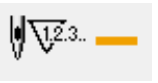
3. MEMORY SWITCH DATA LIST

Memory switch data are the motion data that the sewing machine has in common and the data that operate on all sewing patterns in common.

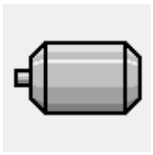
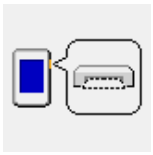
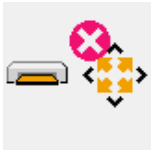
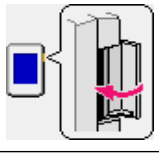
Data list

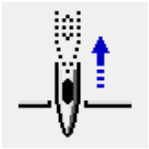
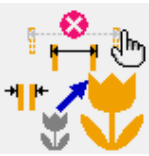
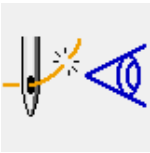
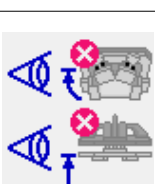
No.	Item	Setting range	Edit unit	Initial value
U001	**Maximum sewing speed** 	500 to 4000	100sti/min	4000
U002	**Sewing speed of 1st stitch** 	200 to 900	100sti/min	400
U003	**Sewing speed of 2nd stitch** 	500 to 4000	100sti/min	800
U004	**Sewing speed of 3rd stitch** 	500 to 4000	100sti/min	3000
U005	**Sewing speed of 4th stitch** 	500 to 4000	100sti/min	4000
U006	**Sewing speed of 5th stitch** 	500 to 4000	100sti/min	4000
U007	**Thread tension of 1st stitch** 	0 to 200	1	200
U008	**Thread tension setting at the time of thread trimming** 	0 to 200	1	0
U009	**Thread tension changeover timing at the time of thread trimming** 	- 6 to 4	1	0
U032	**Buzzer sound can be prohibited.**  Without buzzer sound  Panel operating sound  Panel operating sound + error	---	---	
U046	**Thread trimming can be prohibited.**  Normal  Thread trimming prohibited	---	---	
U068	**Thread tension output time when setting thread tension can be set.** 	0 to 20	1	20
U071	**Thread breakage detection selection**  Thread breakage detection invalid  Thread breakage detection valid	---	---	
U072	**Number of invalid stitches at the start of sewing of thread breakage detection** 	0 to 15 stitches	1 stitch	8 stitch

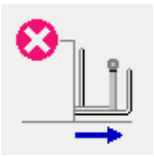
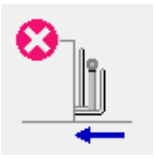
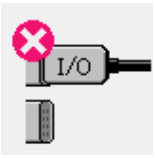
No.	Item	Setting range	Edit unit	Initial value
U073	**Number of invalid stitches during sewing of thread breakage detection** 	0 to 15 stitches	1 stitch	3 stitch
U081	**Presser control and pedal open/close** Presser operation is selected by operating the pedal. 	0 to 99	1	0
U084	**Pedal SW1 with/without latch**  Without  With	---	---	
U085	**Pedal SW2 with/without latch**  Without  With	---	---	
U086	**Pedal SW3 with/without latch**  Without  With	---	---	
U087	**Pedal SW4 with/without latch**  Without  With	---	---	
U097	**Temporary stop : thread trimming operation**  Automatic thread trimming  Manual (Thread trimming by turning Stop SW ON again)	---	---	
U108	**With/without air pressure detection**  Without  With	---	---	
U129	**With/without needle cooler control**  Without  With	---	---	
U376	**Stacker usage selection**  Stop  Operation	---	---	
U378	**Roller stacker usage selection**  Stop  Operation	---	---	
U379	**Label attaching usage selection**  Stop  Operation	---	---	

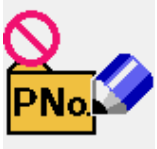
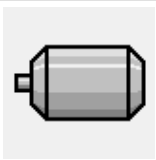
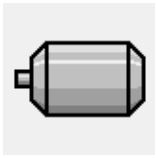
No.	Item	Setting range	Edit unit	Initial value
U454	**Corner section sewing speed** Though the sewing speed is automatically reduced at the corner section of the material, this switch is used for further restricting the sewing speed. 	1 to 10	1	7
U456	**Selection of carrying speed from the folding position to the sewing starting position**   High speed Low speed	---	---	
U477	**AW operation mode**   Automatic Manual	---	---	
U478	**AW thread type/count selection**    Spun thread 20 Spun thread 30 Spun thread 40    Spun thread 50 Cotton thread 20 Cotton thread 30	---	---	
U479	**AW bobbin thread winding length selection** 	2 to 35	1m	15
U480	**AW allowance length setting** 	1.0 to 3.5	0.1m	3.5
U481	**AW operation mode**   Down Up Counter selection for AW operation manual mode	---	---	
U482	**Setting of the number of stitches for AW bobbin change** Number of stitches to be sewn until the bobbin change is carried out under the AW operation manual mode Bobbin is changed after the completion of sewing during which the set number of stitches has been reached. **(Caution) The unit to be used when setting the number of stitches is the "numeric number x 10". For example, in the case "160" is displayed, the actual number of stitches is 1,600 stitches.** 	0 to 9999	1	0
U500	**Language selection** 日本語 Japanese English English 中文繁體字 Chinese (traditional) 中文简体字 Chinese (simplified) Español Spanish Italiano Italian Français French Deutsch German Português Portuguese Türkçe Turkish Tiếng Việt Vietnamese 한국어 Korean Indonesia Indonesian Русский Russian	---	---	Not set

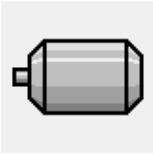
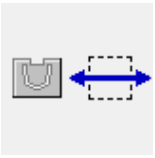
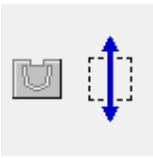
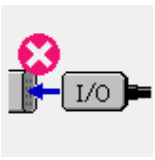
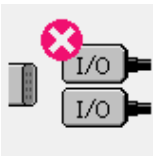
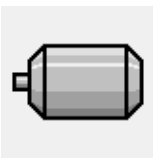
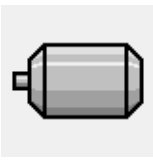
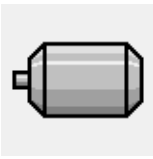
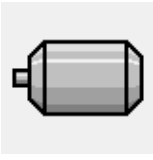
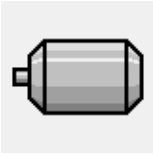
4. ERROR CODE LIST

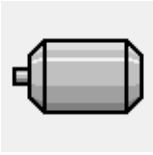
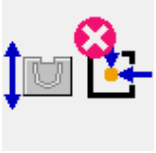
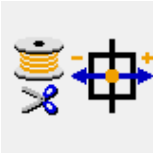
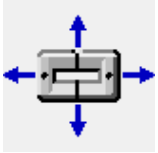
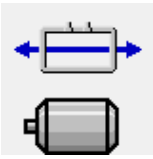
Error code	Display	Description of error	Display message	How to recover	Place of recovery
E007		**Machine lock** Main shaft of the sewing machine fails to rotate due to some trouble.	Machine is locked.	Turn OFF the power	
E010		**Pattern No. error** Pattern No. which is backed up is not registered to data ROM, or setting of reading inoperative is performed.	Specified pattern does not exist.	Possible to re-enter after reset.	Previous screen
E011		**External media not inserted** External media is not inserted.	Media is not inserted.	Possible to re-enter after reset.	Previous screen
E012		**Read error** Data read from external media cannot be performed.	Data cannot be read.	Possible to re-start after reset.	Previous screen
E013		**Write error** Data write from external media cannot be performed.	Data cannot be written.	Possible to re-start after reset.	Previous screen
E015		**Format error** Format cannot be performed.	Formatting is impossible.	Possible to re-start after reset.	Previous screen
E016		**External media capacity over** Capacity of external media is short.	Capacity is insufficient. (media)	Possible to re-start after reset.	Previous screen
E017		**Machine memory capacity over** Machine memory capacity is insufficient.	Capacity is insufficient. (Machine)	Possible to re-start after reset.	Previous screen
E019		**File size over** File is too large.	Pattern data is too large. (Approx. 50000 stitches)	Possible to re-start after reset.	Previous screen
E024		**Pattern data size over** Memory size is over.	Memory capacity has run out.	Possible to re-start after reset.	Data input screen
E029		**Media slot release error** Lid of media slot is open.	Cover of media slot is open.	Possible to re-start after reset.	Previous screen

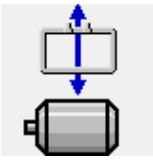
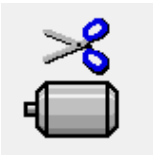
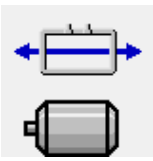
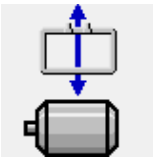
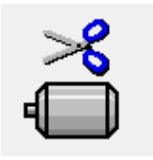
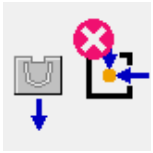
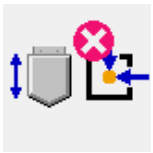
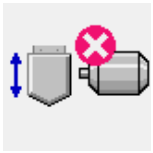
Error code	Display	Description of error	Display message	How to recover	Place of recovery
E030		**Needle bar position missing error** Needle bar is not in the predetermined position.	Needle is not in a proper position.	Turn hand pulley to bring needle bar to its predetermined position.	Data input screen
E031		**Air pressure drop** Air pressure is dropped.	Low air pressure.	Possible to re-start after reset.	Data input screen
E032		**File interchanging error** File cannot be read.	File cannot be read.	Possible to re-start after reset.	Data input screen
E040		**Sewing area over**	Move limit is exceeded.	Possible to re-start after reset.	Sewing screen
E043		**Enlarging error** Sewing pitch exceeds Max. pitch.	Max. Pitch is exceeded.	Possible to re-start after reset.	Data input screen
E045		**Pattern data error**	Pattern data no good.	Possible to re-start after reset.	Data input screen
E050		**Stop switch** When stop switch is pressed during machine running.	Temporary stop switch is pressed.	Possible to re-start after reset.	Step screen
E052		**Thread breakage detection error** When thread breakage is detected.	Thread breakage is detected.	Possible to re-start after reset.	Step screen
E099		**Stacking full** This error occurs when the allowable number of pieces of products to be stacked on the stacker is exceeded.	The possible number of the finished materials to be stacked is exceeded	Possible to re-start after reset.	Sewing screen
E204		**USB connection error** With the number of times of sewing has reached 10 or more, with a USB device connected to the sewing machine	Never connect USB storage device to the machine during sewing.	Possible to re-start after reset.	Sewing screen
E370		**Initial position error for the folding unit and the folding arm** Neither the folding unit nor the folding arm is positioned at their initial positions.	Folding unit/folding arm initial position error	Possible to re-start after reset.	Data input screen

Error code	Display	Description of error	Display message	How to recover	Place of recovery
E371		**Folding unit initial position error** The folding unit is not positioned at its initial position.	The folding unit initial position error	Possible to re-start after reset.	Data input screen
E372		**Folding arm initial position error** The folding arm is not at its initial position.	The folding arm initial position error	Possible to re-start after reset.	Data input screen
E373		**Stacker position error** The stacker is not in the opened state.	Drawing out incompleteness end of stacker	Possible to re-start after reset.	Data input screen
E374		**Stacker position error** The stacker is not in the closed state.	Storage incompleteness end of stacker	Possible to re-start after reset.	Data input screen
E390		**I/O connector connection position error** The I/O connector is connected to a wrong position.	I/O connector connecting position is wrong	Data input screen is displayed after resetting	
E392		**Presser plate (large) upper sensor error**	Upper sensor fails to detect the presser arm	Possible to re-start after reset.	Data input screen
E393		**Presser plate (large) lower sensor error**	Lower sensor fails to detect the presser arm	Possible to re-start after reset.	Data input screen
E394		**Folding arm lifting sensor detection error**	The folding arm sensor (upper) of the folding unit is not detected	Possible to re-start after reset.	Data input screen
E395		**Folding arm lowering sensor detection error**	The folding arm sensor (lower) of the folding unit is not detected	Possible to re-start after reset.	Data input screen
E396		**Folding unit lifting sensor detection error**	The sensor (upper) of the folding unit is not detected	Possible to re-start after reset.	Data input screen
E397		**Folding unit lowering sensor detection error**	The sensor (lower) of the folding unit is not detected	Possible to re-start after reset.	Data input screen

Error code	Display	Description of error	Display message	How to recover	Place of recovery
E398		**Stacker cloth brush completion sensor detection error**	The stacker cloth brush completion sensor is not detected	Possible to re-start after reset.	Data input screen
E399		**Stacker cloth brush initial position sensor error**	The stacker cloth brush initial sensor is not detected	Possible to re-start after reset.	Data input screen
E401		**Copy disapproved** When trying to perform overwriting copy on the pattern No. which has been already registered	Cannot copy.	Possible to re-enter after reset.	Previous screen
E402		**Erasing disapproved** When trying to delete the pattern used in the cycle sewing	Data cannot be deleted since it is used for cycle data.	Possible to re-enter after reset.	Previous screen
E403		**New creation disapproved** When the registered pattern is selected to the new creation pattern No.	This No. is already used.	Possible to re-enter after reset.	Previous screen
E404		**Data of designated No. does not exist.** When data of designated No. does not exist in media or server	This No. cannot be found.	Possible to re-enter after reset.	Previous screen
E435	- - -	**Erasing disapproved** When trying to erase pattern registered to direct pattern.	Set value exceeds the range.	Possible to re-enter after reset.	Previous screen
E703		**Panel is connected to the sewing machine which is not supposed. (Machine type error)** When the machine type code of system is not proper in the initial communication.	Model of sewing machine is different from that of panel.	Possible to rewrite program after pressing down communication switch.	Communi-cation screen
E704		**Inconsistency of system version** System software version is inconsistent in the initial communication.	Version of program incompatible.	Possible to rewrite program after pressing down communication switch.	Communi-cation screen
E730		**Main shaft motor encoder defectiveness** When encoder of the sewing machine motor is abnormal.	Sewing machine motor is defective. (Encoder A and B phases)	Turn OFF the power	
E731		**Main motor hole sensor is defective or position sensor is defective.** Hole sensor or position sensor of the sewing machine motor is defective.	Sewing machine motor is defective. (Encoder U V and W phases)	Turn OFF the power	

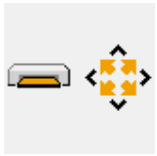
Error code	Display	Description of error	Display message	How to recover	Place of recovery
E733		**Reverse rotation of main shaft motor** When sewing machine motor rotates in reverse direction.	Sewing machine motor runs in the reverse direction.	Turn OFF the power	
E780		**Out of X-axis operation range** The operation range in X axis is exceeded.	Out of operating range in X axis	Turn OFF the power	
E781		**Out of Y-axis operation range** The operation range in Y axis is exceeded.	Out of operating range in Y axis	Turn OFF the power	
E782		**PDET signal fault** PDET signal fault is detected.	PDET signal abnormality is detected	Turn OFF the power	
E797		**No I/O connection** I/O connection is not confirmed.	I/O is not yet connected	Turn OFF the power	
E798		**I/O address duplication** I/O address duplication is detected.	I/O address overlapping	Turn OFF the power	
E802		**Power electrical discontinuity detection**	Power instantaneously lost.	Turn OFF the power	
E811		**Overvoltage** When input power is more than the specified value.	Input voltage is too high. (Check input voltage.)	Turn OFF the power	
E813		**Low voltage** When input power is less than the specified value.	Input voltage is too low. (Check input voltage.)	Turn OFF the power	
E901		**Main shaft motor IPM abnormality** When IPM of servo control p.c.b. is abnormal.	SDC P.C.B. is defective. (IPM)	Turn OFF the power	
E903		**Stepping motor power abnormality** When stepping motor power of SERVO CONTROL p. c. b. fluctuates more than ± 15%.	Power of SDC P.C.B. is defective. (Stepping motor power 85 V)	Turn OFF the power	

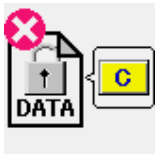
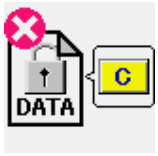
Error code	Display	Description of error	Display message	How to recover	Place of recovery
E904		**Solenoid power abnormality** When solenoid power of SERVO CONTROL p. c. b. fluctuates more than ± 15%.	Power of SDC P.C.B. is defective. (Solenoid power 33 V)	Turn OFF the power	
E905		**Heat sink temperature for SERVO CONTROL p. c. b. abnormality** Turn ON the power again after taking overheat time of SERVO CONTROL p. c. b.	Temperature of SDC P.C.B. is too high.	Turn OFF the power	
E907		**X feed motor origin retrieval error** When origin sensor signal is not inputted at the time of origin retrieval motion.	Origin of X motor cannot be found. (X origin sensor)	Turn OFF the power	
E908		**Y feed motor origin retrieval error** When origin sensor signal is not inputted at the time of origin retrieval motion.	Origin of Y motor cannot be found. (Y origin sensor)	Turn OFF the power	
E911		**Bobbin thread trimming motor origin retrieval error** In the case the origin sensor signal is not input at the time of origin retrieving operation	Bobbin thread trimming motor origin cannot be found	Turn OFF the power	
E914		**Feed defective error** Timing lag between feed and main shaft occurs.	X/Y feed trouble is detected.	Turn OFF the power	
E915		**Communication abnormality between operation panel and MAIN CPU** When abnormality occurs in data communication.	Communication is impossible. (Panel - MAIN P.C.B.)	Turn OFF the power	
E916		**Communication abnormality between MAIN CPU and main shaft CPU** When abnormality occurs in data communication.	Communication is impossible. (MAIN P.C.B. - SDC P.C.B.)	Turn OFF the power	
E917		**Communication failure between operation panel and personal computer** When abnormality occurs in data communication.	Communication is impossible. (Panel - PC)	Possible to re-start after reset.	
E918		**MAIN p. c. b. overheat** Overheat of MAIN p. c. b. Turn ON the power again after taking time.	Main P.C.B. temperature is too high.	Turn OFF the power	
E926		**X motor position slip error**	X-feed motor position is off.	Turn OFF the power	

Error code	Display	Description of error	Display message	How to recover	Place of recovery
E927		**Y motor position slip error**	Y-feed motor position is off.	Turn OFF the power	
E928		**Thread trimming motor position slip error**	Thread trimming motor position is off.	Turn OFF the power	
E931		**X motor overload error**	X-feed motor overload is excessive.	Turn OFF the power	
E932		**Y motor overload error**	Y-feed motor overload is excessive.	Turn OFF the power	
E933		**Thread trimming motor overload error**	Thread trimming motor overload is excessive.	Turn OFF the power	
E936		**X/Y motor out of range error**	Feed motor position has exceeded the sewing area.	Turn OFF the power	
E943		**MAIN CONTROL p.c.b trouble** When data writing to MAIN CONTROL p.c.b. cannot be performed	MAIN P.C.B. is defective.	Turn OFF the power	
E991		**Presser plate initial operation fault** In the case the needle bar rests on the presser plate cylinder movement path when the origin retrieval is carried out.	Presser is located at a position where the origin retrieval is disabled Move the presser plate toward you	Possible to re-start after reset.	Data input screen
E992		**Pattern plate origin retrieval error** The pattern plate motor origin sensor fails to detect the origin.	The pattern board sensor is not detected	Turn OFF the power	
E994		**Pattern plate motor step-out error** Step-out of the pattern plate motor is detected.	Step-out of the pattern plate longitudinal motor is detected	Possible to re-start after reset.	Data input screen

5. MESSAGE LIST

Message No.	Display	Display message	Description
M520		Erasing is performed. OK ?	**Erase confirmation of Users' pattern** Erase is performed. OK ?
M521		Erasing is performed. OK ?	**Erase confirmation of pattern button** Erase is performed. OK ?
M522		Erasing is performed. OK ?	**Erase confirmation cycle pattern** Erase is performed. OK ?
M523		Pattern data is not stored. Erasing is OK?	**Erase confirmation of backup data** Pattern data is not stored in memory. Erase is OK ?
M528		Overwriting is performed. OK ?	**Overwriting confirmation of users' pattern** Overwriting is performed. OK ?
M529		Overwriting is performed. OK ?	**Overwriting confirmation of media** Overwriting is performed. OK ?
M530		Overwriting is performed. OK ?	**Overwriting confirmation of vector data of panel** Overwriting is performed. OK ?
M531		Overwriting is performed. OK ?	**Overwriting confirmation of vector data of media** Overwriting is performed. OK ?
M534		Overwriting is performed. OK ?	**Overwriting confirmation of adjustment data of media and all machine data** Overwriting is performed. OK ?

Message No.	Display	Display message	Description
M535		Overwriting is performed. OK ?	**Overwriting confirmation of adjustment data on personal computer and all machine data** Overwriting is performed. OK ?
M537		Deleting is performed. OK ?	**Deletion confirmation of thread tension command** Deleting is performed. OK ?
M542		Formatting is performed. OK ?	**Format confirmation** Formatting is performed. OK ?
M544		Data does not exist.	**Data corresponding to panel does not exist.** Data does not exist.
M545		Data does not exist.	**Data corresponding to media does not exist.** Data does not exist.
M546		Data does not exist.	**Data corresponding to personal computer does not exist.** Data does not exist.
M547		Overwriting cannot be performed since data exists.	**Overwriting prohibition on pattern data** Overwriting cannot be performed since data exists.
M548		Overwriting cannot be performed since data exists.	**Overwriting prohibition on media data** Overwriting cannot be performed since data exists.
M549		Overwriting cannot be performed since data exists.	**Overwriting prohibition on data on personal computer** Overwriting cannot be performed since data exists.
M550		There is back-up data of body input.	**Backup data information on main body input** There is back-up data of body input.

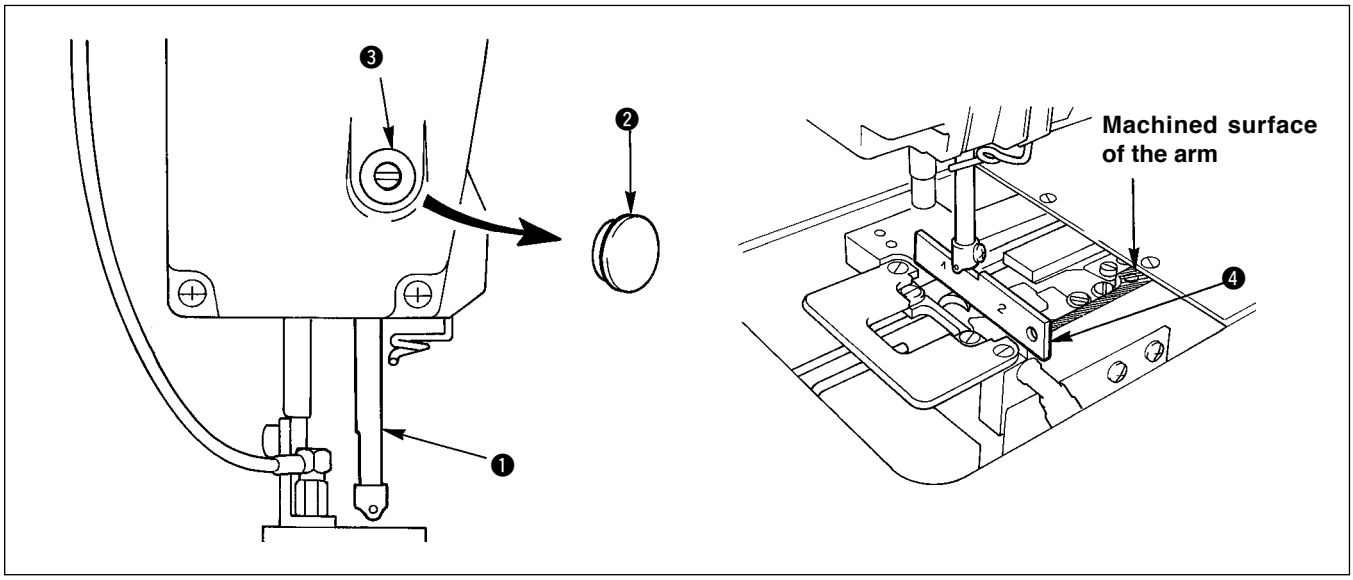
Message No.	Display	Display message	Description
M554		Key-lock customization data have been initialized.	**Customized data initialization notice** Customized key-lock data has been initialized.
M555		Key-lock customization data are broken. Initializing is OK?	**Customized data breakage** Customized key-lock data has broken. Initialization is performed. OK?
M556		Key-lock customization data are to be initialized. OK?	**Initialization confirmation of customized data** Customized key-lock data is initialized. OK?
M653		Formatting is performed.	**During formatting** Formatting is performed.
M669		Data is being read.	**During data reading** Data is being read.
M670		Data is being written.	**During data writing** Data is being written.
M671		Data is being converted.	**During data converting** Data is being converted.

Ⅲ. MAINTENANCE OF SAWING MACHINE

1. MAINTENANCE

1-1. Adjusting the height of the needle bar

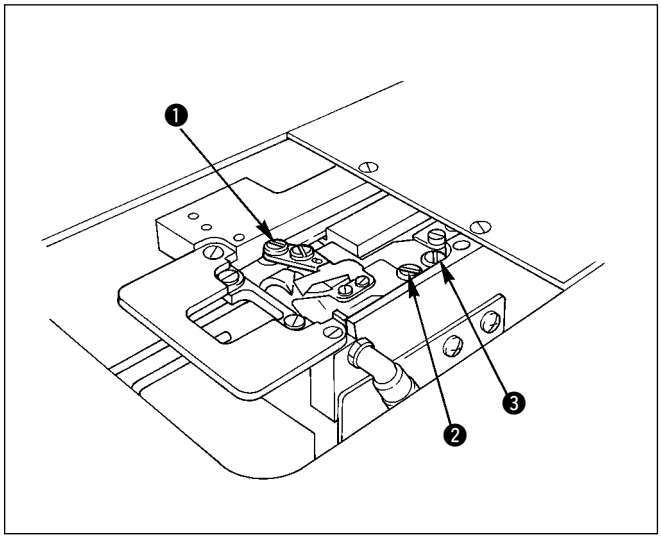
WARNING :
Turn OFF the power before starting the work so as to prevent accidents caused by abrupt start of the sewing machine.

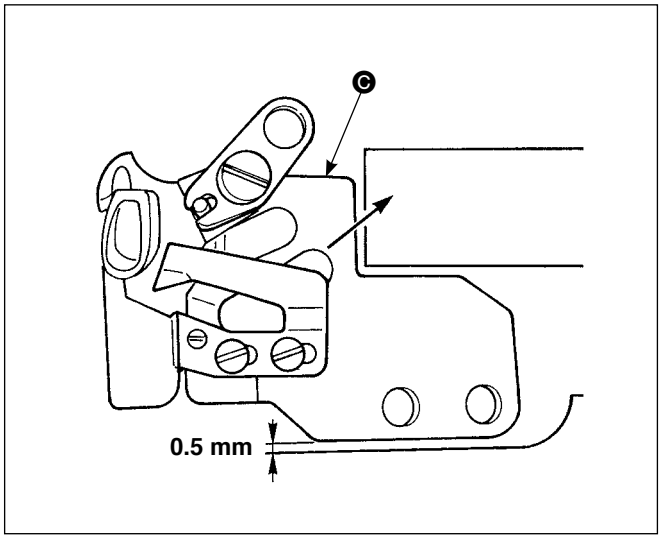


Move needle bar ❶ to the lowest position of its stroke. Align the lower end the needle bar with the top surface of hook timing gauge ❹ on “1” side. Then, remove cap ❷ and loosen needle bar connecting stud screw ❸. Now, conduct adjustment works.

1-2. Needle and hook adjustment

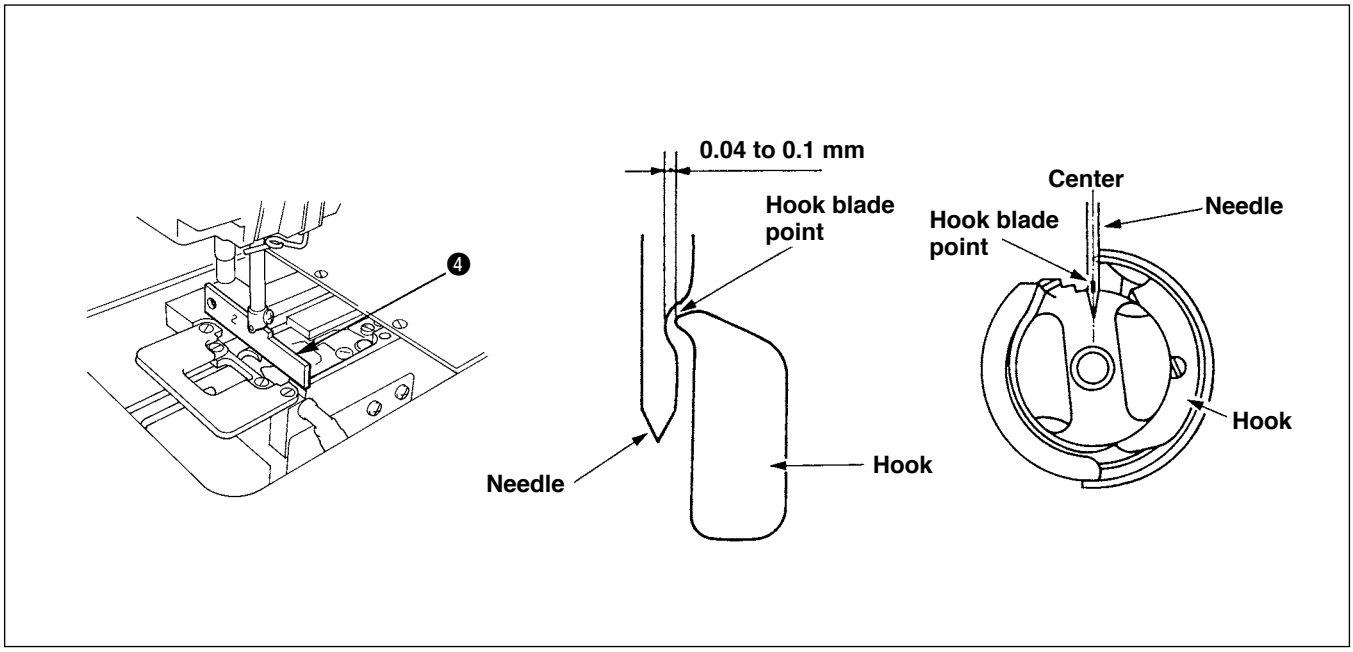
WARNING :
Turn OFF the power before starting the work so as to prevent accidents caused by abrupt start of the sewing machine.





1) Remove the throat plate (front side) from the bed surface.

2) Remove the screws in the order ❶ ❷ ❸, then remove trimmer mounting base Ⓒ from the bed surface.

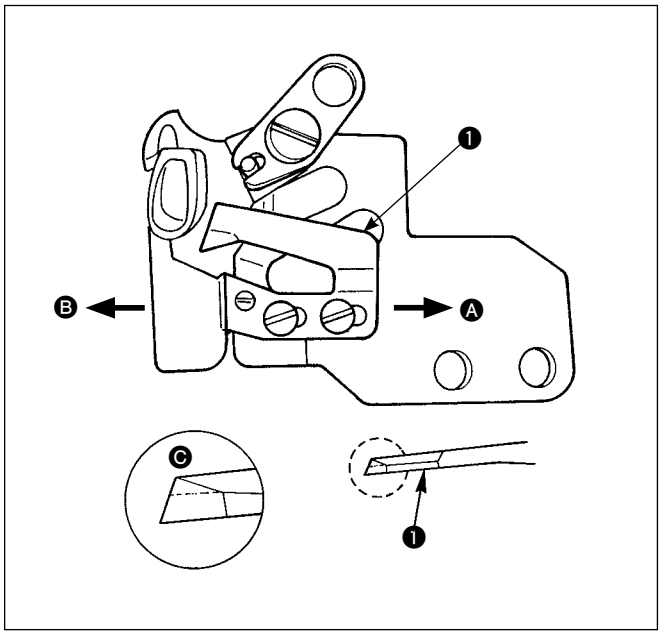


3) Adjust so that the lower end of the needle bar is aligned with the top surface of hook timing gauge ❹ on 2 side, a clearance of 0.04 to 0.1 mm is provided between the needle and the blade point of the inner hook and the blade point of the hook meets the center of the needle. Then, tighten three screws that are used to secure the hook.

4) Attach knife mounting base Ⓒ to the bed surface.
At this time, pressing the knife mounting base in the direction of the arrow to provide a 0.5 mm clearance between the base and the bed surface. Then, tighten screws ❷ and ❸. Finally, tighten screw ❶.

1-3. Counter knife

WARNING :
Turn OFF the power before starting the work so as to prevent accidents caused by abrupt start of the sewing machine.



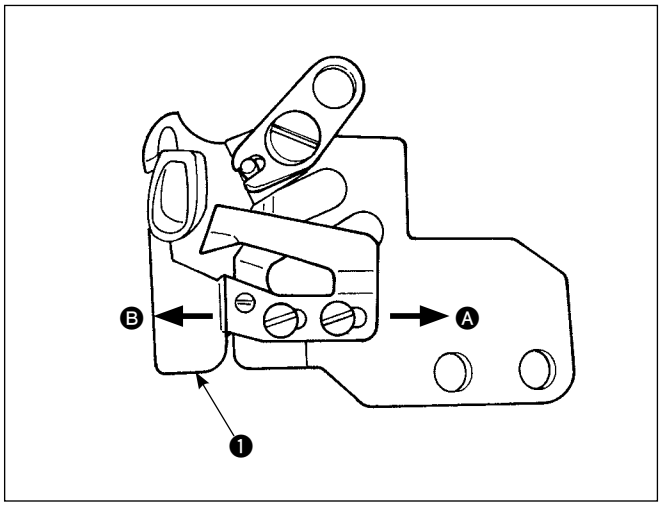
1) If the knife sharpness has deteriorated, re-sharpen counter knife ❶ soon as illustrated in Fig. Ⓒ. Then re-attach it in position.

2) If the mounting position of the counter knife is moved in the right (direction Ⓐ) from the standard mounting position, length of the thread remaining after thread trimming will be longer than the standard length by the distance between the standard position.

3) If the mounting position of the knife is moved in the left (direction Ⓑ), length of the thread remaining after thread trimming will be shorter than the standard length accordingly.

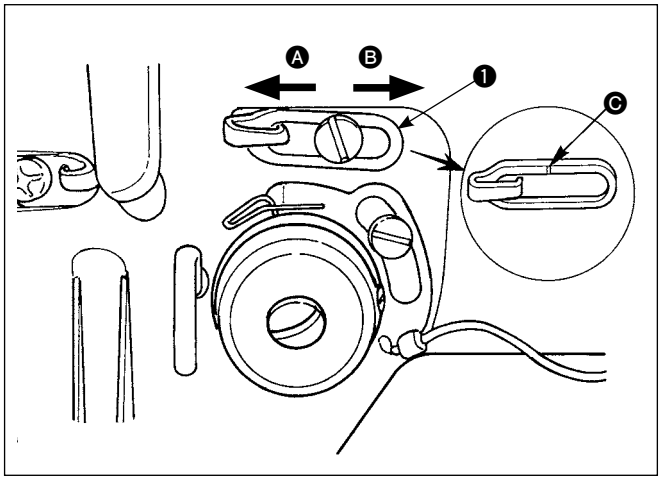
1-4. Positioning the counter knife and the knife thread guide

WARNING :
Turn OFF the power before starting the work so as to prevent accidents caused by abrupt start of the sewing machine.



1) Knife thread guide ❶ should be attached so that the needle enters about the center of the window section.
2) If the counter knife position is changed from the standard position in direction Ⓐ: The length of remaining thread after thread trimming will be lengthened by the shifting amount of the counter knife as compared with the thread length when the counter knife is in the standard position.
   If the counter knife position is changed from the standard position in direction Ⓑ: The length of remaining thread after thread trimming will be shortened by the shifting amount of the counter knife as compared with the thread length when the counter knife is in the standard position.

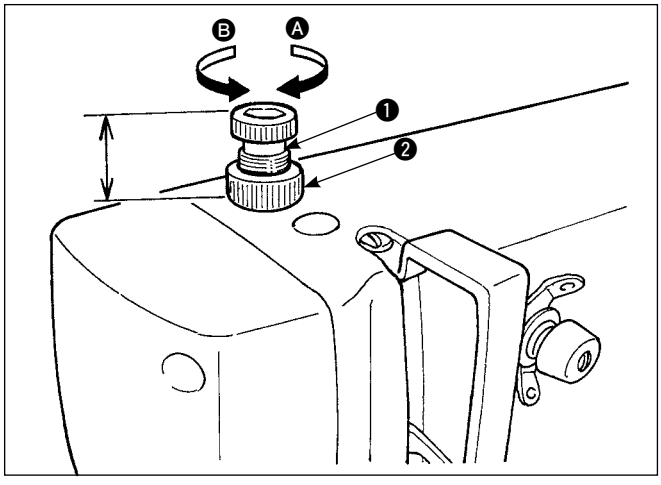
1-5. Thread take-up amount adjustment



1) When sewing heavy-weight material, move thread guide ❶ to the left (arrow Ⓐ) to increase the thread take-up amount.
2) When sewing light-weight material, move thread guide ❶ to the right (arrow Ⓑ) to reduce the thread take-up amount.
3) The standard position of thread guide ❶ is where marker line Ⓒ is aligned with the center of the screw.

If thread guide ❶ is moved to where marker line Ⓒ is far from the center of screw, it can cause the thread to break.

1-6. Holder pressure adjustment



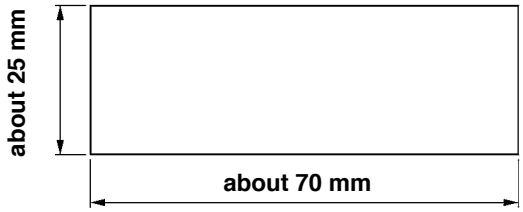
1) First loosen nut ❷. To increase the holder pressure, turn holder adjustment screw ❶ clockwise (arrow Ⓐ).
2) To decrease the presser pressure, turn counterclockwise (arrow Ⓑ)
3) After adjustment, tighten nut ❷.

After holder pressure adjustment, do not change the height of holder adjustment screw ❶.

1-7. Hook oil amount (track of oil) adjustment

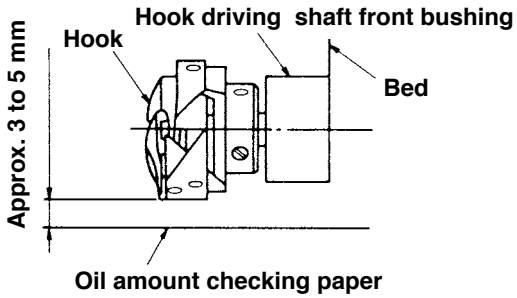
WARNING :
Be extremely careful about the operation of the machine since the amount of oil has to be checked by turning the hook at ahigh speed.

① **Oil amount (track of oil) test paper**

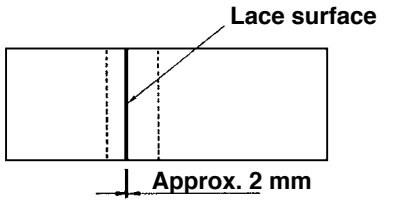


* **It is not necessary to be fussy about the paper quality.**

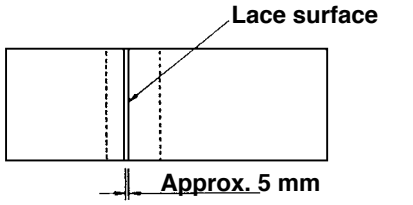
② **Oil amount (track of oil) checking position**



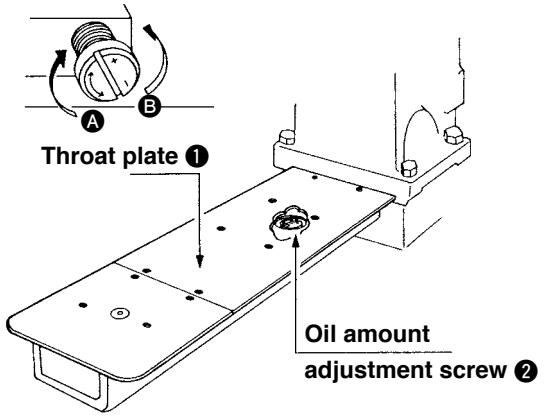
* **Fit the oil amount checking paper to the underside of the hook.**



Proper amount (small amount)



Proper amount (large amount)



1) Check that the oil amount in the hook is proper against the oil gauge.
2) Set the sewing machine at 4,000 sti/min referring to **" I -3-15. Break-in operation" p.12**, and make the sewing machine run idle for about three minutes.
3) Place an oil amount checking paper in the specified position while the sewing machine is in operation.
4) Check the oil amount (trace of oil) in five seconds. (Confirm the time with your watch.)

(1) Sample of the correct oil amount (trace of oil)

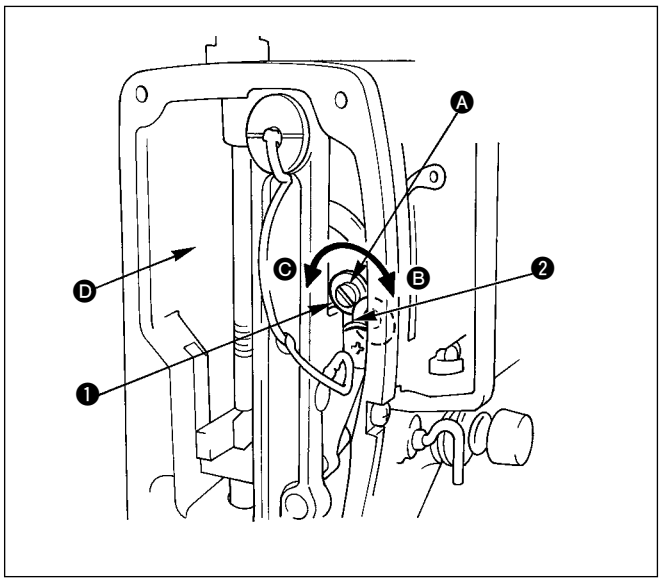
1) The oil amount in the sample shown in the figure on the left should be finely adjusted to increase/decrease it properly. When finely adjusting the oil amount, be careful not to excessively increase or decrease it.
   When the oil amount is too small = The hook may be seized. (The hook may become hot.)
   When the oil amount is too large = The sewing material would be stained with oil.
2) The oil amount is checked on the condition that the amount of oil on the three sheets of the oil amount checking paper must be uniform.

(2) Adjusting the oil amount (trace of oil) in the hook

1) Remove throat plate ❶. Turn oil amount adjustment screw ❷ in the "+" direction (direction Ⓐ) to increase the oil amount (tract of oil). Turn the screw in the "–" direction (direction Ⓑ) to decrease it.
2) After the oil amount is adjusted using oil amount adjustment screw ❷, run the sewing machine idle for approximately 30 seconds and confirm the oil amount (tract of oil).

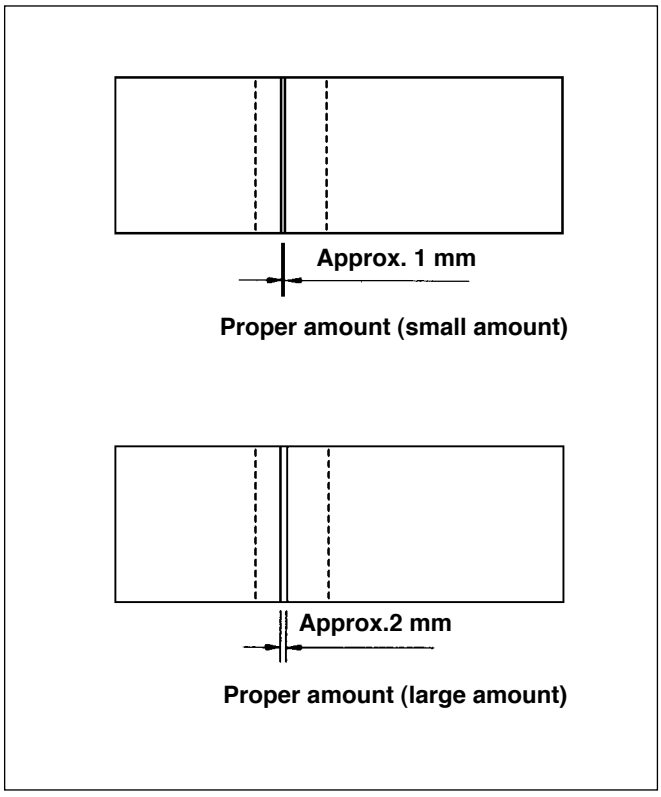
1-8. Adjusting the oil amount in the face plate

WARNING :
Turn OFF the power before starting the work so as to prevent accidents caused by abrupt start of the sewing machine.



1) The amount of oil to be fed to the thread take-up lever and needle bar crank section ❷ by turning oil amount adjusting pin ❶.
2) The oil amount is minimized by turning the adjusting pin in direction Ⓐ until marker dot Ⓑ engraved on the pin moves from the position in the figure reaches near needle bar crank ❷.
3) The oil amount is maximized by turning the adjusting pin in direction Ⓒ from the position in the figure to the position opposite to the needle bar crank.

After the oil amount is adjusted using oil amount adjust pin ❶. run the sewing machine idle for apporoximately 30 seconds and confirm the oil amount (trace of oil).



(1) Sample of the correct oil amount (trace of oil)

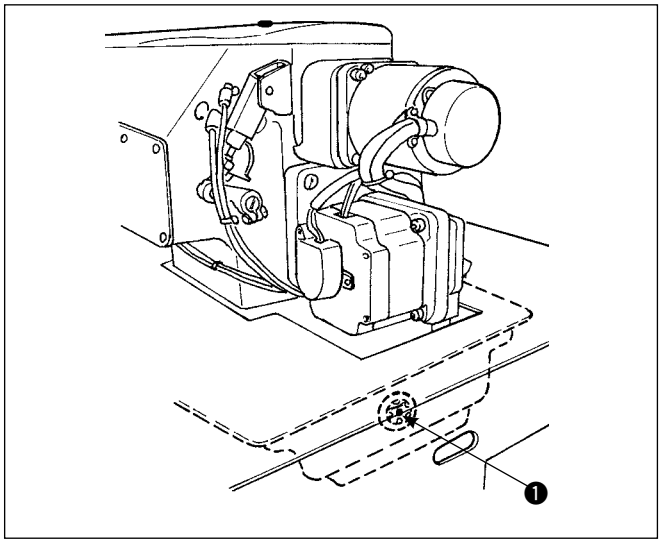
1) Place a sheet of oil amount (trace of oil) checking paper in position Ⓓ in the figure on the upper right, and check the amount of oil.

At this time, be sure not to allow the oil amount checking paper to come in contact with the moving parts.

2) Check the amount of oil (trace of oil) three time in repetition to be sure that the amount oil does not change.
3) Check the amount of oil (trace of oil) for 10 seconds.
(Check the time with your watch.)

1-9. Replacing the oil in the machine head

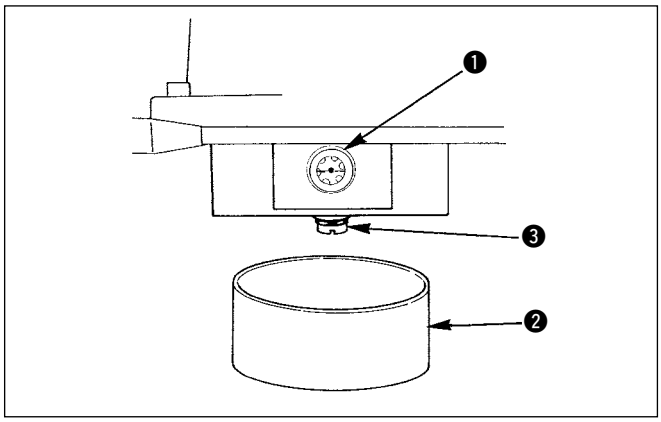
WARNING :
Turn OFF the power before starting the work so as to prevent accidents caused by abrupt start of the sewing machine.



(Caution)

Be sure to apply JUKI New Defrix Oil No. 1.
Visually check the oil through oil gauge window ❶ on the machine head. If the oil is contaminated, replace it with new oil.
Replace the oil at the interval of a half year although it depends on the frequency of the use.

WARNING :
Negligence of replacing the oil causes the seizure of the machine head.

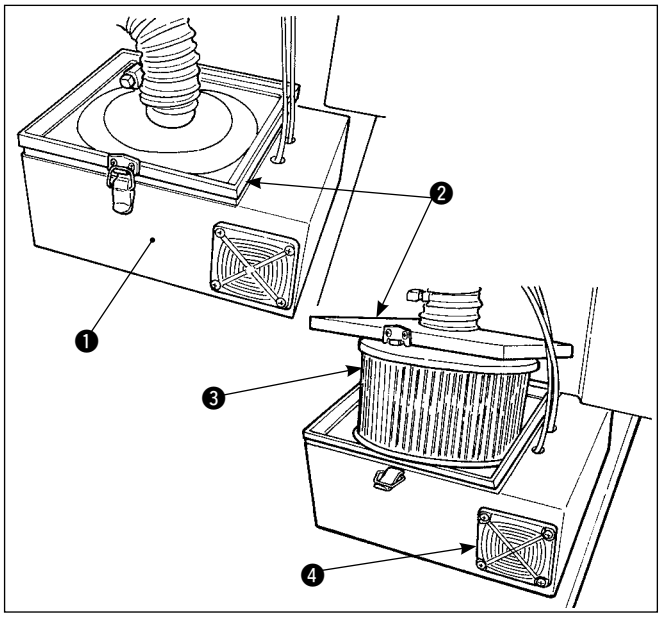


Oil changing procedure

1) Prepare oil receiver ❷ and remove screw ❸ from the lower section of the oil pan, then oil flows out from the oil pan.
2) After the oil pan is drained, tighten screw ❸ and pour oil from the oil hole until the oil surface reaches the center of oil gauge ❶.

1-10. Cleaning the vacuum filter

WARNING :
Turn OFF the power before starting the work so as to prevent accidents caused by abrupt start of the sewing machine.

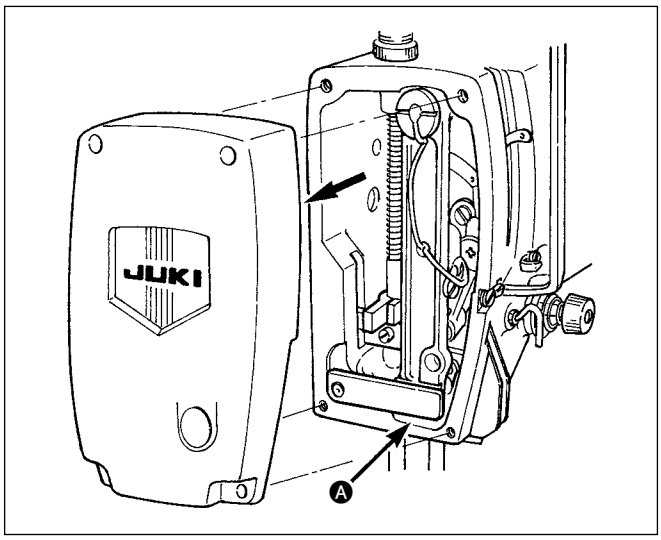


1) Detach top cover ❷ from filter box ❶ and take filter ❸ from inside the filter box.
2) Blow off dust or any other foreign matters that have gathered in the filter using an air gun supplied with the machine.
   (Clean the vacuum filter periodically once a week.)
3) Blow off any dust that has gathered in filter ❹.
   (Clean the filter periodically once a week.)

WARNING :
Negligence of cleaning causes the seizure of the motor.

1-11. Removing dust from the face part of the machine head

WARNING :
Turn OFF the power before starting the work so as to prevent accidents caused by abrupt start of the sewing machine



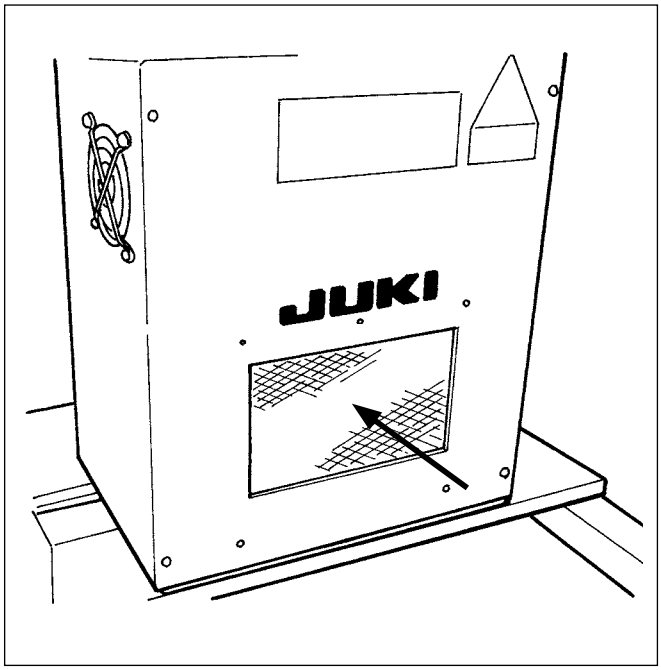
Remove the face cover and remove dust collected around the section Ⓐ, clearance in the moving part of the needle bar frame.
(Remove dust once every three months.)

The necessary needle rocking amount at the bar-tacking section cannot be obtained due to the malfunction of the needle bar frame unless dust is removed. In addition, this relates to the slip of the needle bar rocking crank.

1-12. Cleaning the filter in the electrical box

WARNING :
To avoid possible accidents caused by electric shock, check to be sure to turn OFF the power switch and the power switch for maintenance, and to draw out the power plug from the plug socket before starting the work.

Be sure to clean the fan filter in the electrical box once a week or more.



Clean up the filter installed on the front face of the electrical box with a vacuum or an air gun.

WARNING :
Negligence of cleaning may give the trouble and damage to the electrical components.

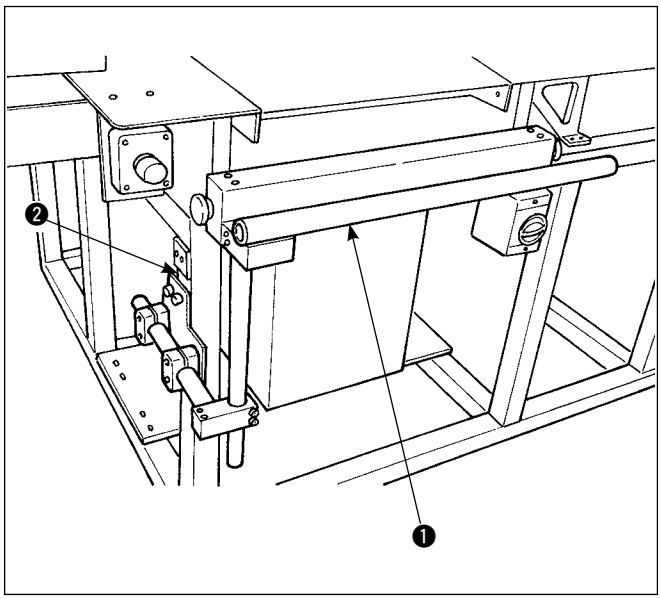
2. TROUBLE SHOOTING

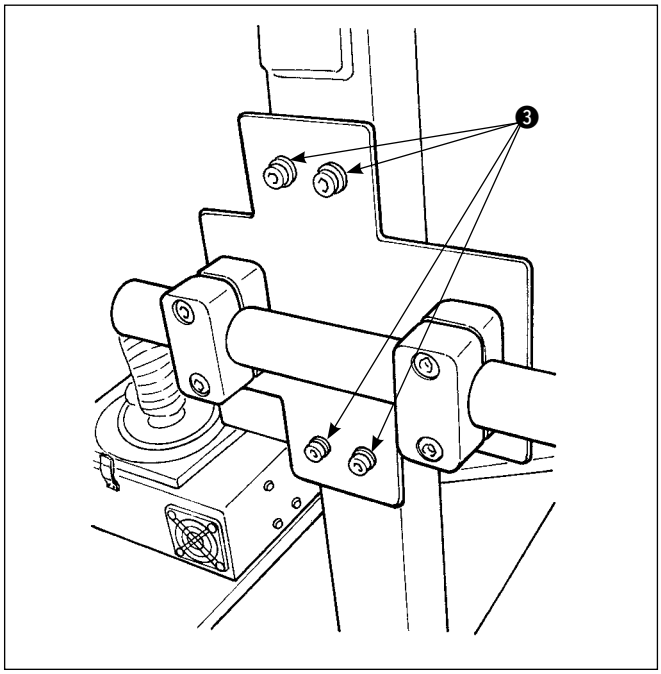
Phenomenon	Cause	Corrective measure
1. Thread breakage	① The thread path, tip of needle, blade point of hook, or bobbin case positioning finger has scratches. ② The needle thread tension is too high. ③ The needle comes in contact with the blade point of hook. ④ Lubricating oil in the hook is too small. ⑤ The needle thread tension is too low. ⑥ The thread take-up spring pressdre is too high, and stroke of the thread take-up lever is too small. ⑦ The timing between needle and hook is too early or too late. ⑧ Idling amount of the bobbin is too large.	○ Re-sharpen the blade point of hook with a fine emery paper to remove scratches. Buff the bobbin case positioning finger. ○ Adjust the needle thread tension. ○ Refer to **"Ⅲ-1-2. Needle and hook adjustment" p.109**. ○ Adjust the oil amount properly. Refer to **"Ⅲ-1-7. Hook oil amount (track of oil) adjustment" p.112** and **"Ⅲ-1-8. Adjusting the oil amount in the face plate" p.113**. ○ Adjust the needle thread tension properly. ○ Decrease the pressure of the thread take-up spring, and increase the stroke of thread take-up lever. ○ Refer to **"Ⅲ-1-2. Needle and hook adjustment" p.109**. ○ Increase the spring pressure.
2. Stitch skipping	① The clearance between the needle and the hook point is too large. ② The timing between the needie and the hook is too early or too late. ③ The holder pressure is too low. ④ The clearance between the top edge of the needle eyelet and the hook point is not correct. ⑤ The needle thread guide is not properly threaded. ⇨ Refer to **" Ⅰ -4-2. Threading the needle thread" p.14**.	○ Refer to **"Ⅲ-1-2. Needle and hook adjustment" p.109**. ○ Refer to **"Ⅲ-1-2. Needle and hook adjustment" p.109**. ○ Tighten the holder spring regulator. ○ Refer to **"Ⅲ-1-2. Needle and hook adjustment" p.109**.
3. Loose stitches	① The thread has not been passed through the forked section of the bobbin case tension spring. ② The thread path has been poorly finished. ③ The bobbin does not rotate smoothly. ④ The bobbin thread tension is too low. ⑤ The bobbin thread tension is too high. ⑥ The presser sponge is located too close to the needle entry. As a result, the thread comes in contact with the sponge. ⇨ Cut the section of sponge which comes in contact with the thread.	○ Properly thread the bobbin case. ○ Grind the thread path with a fine emery paper, or buff it up. ○ Replace the bobbin or the hook. ○ Adjust the bobbin thread tension properly. ○ Decrease the bobbin thread tension.

Phenomenon	Cause	Corrective measure
4. The tread slips off the needle upon being trimmed.	① The returning force of the thread take-up spring is too high. ② The tension of the tension controller No. 1 is too high. ③ The counter knife is improperly positioned.	○ Refer to **"Ⅰ-4-7. Thread take-up spring" p.20**. ○ Refer to **"Ⅲ-1-4. Positioning the counter knife and the knife thread guide" p.111**.
5. The needle thread cannot be trimmed. (The bobbin thread can be trimmed.)	① The last stitch has been skipped. (The clearance between the needle and the hook is too large.)	○ Refer to **"Ⅲ-1-2. Needle and hook adjustment" p.109**.
6. Bobbin thread cannot be trimmed. (Needle thread can be trimmed.)	① The moving knife fails to catch the bobbin thread at the last stitch. (The stitching pitch of the last stitch is excessively large, and the bobbin thread is not present on the moving knife locus.)	○ Decrease the stitching pitch of the last stitch. (To approximately 2 mm)
7. Neither the needle thread nor the bobbin thread can be trimmed.	① The thread trimming timing is wrong. ② The knife has been damaged. ③ The knife pressure is inadequate. ④ The moving amount of the moving knife is too short. ⑤ Pattern input failure	○ Replace the knife. ○ Increase the knife pressure. ○ It is necessary to check the thread trimming motor operation. ○ Input the pattern prior to thread trimming using the forward stitch.
8. Thread cannot be trimmed sharply	① Thread trimming timing is wrong. ② The knife pressure is too low. ③ The knife blade is blunt.	○ Refer to **"Ⅲ-1-4. Positioning the counter knife and the knife thread guide" p.111**. ○ Increase the knife pressure. ○ Replace the knife.
9. The machine cannot be powered on.	① Emergency switch is in the ON state.	○ Refer to **"Ⅰ-5. Emergency stop switch" p.24**.

3. OPTIONAL

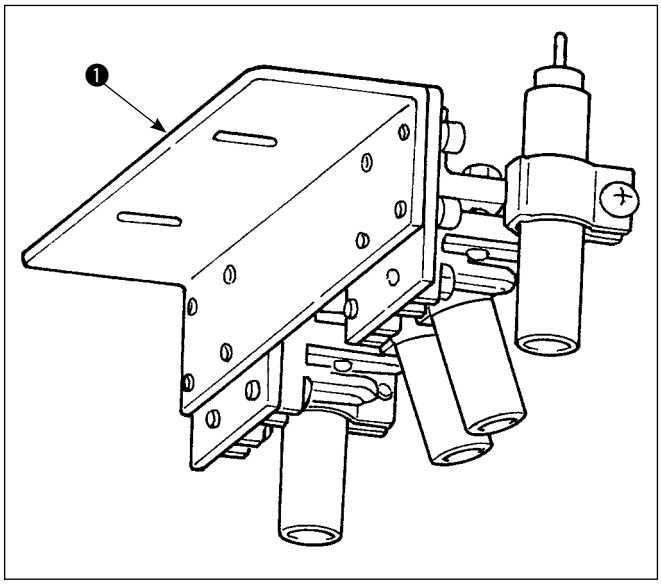
3-1. Garment body rack



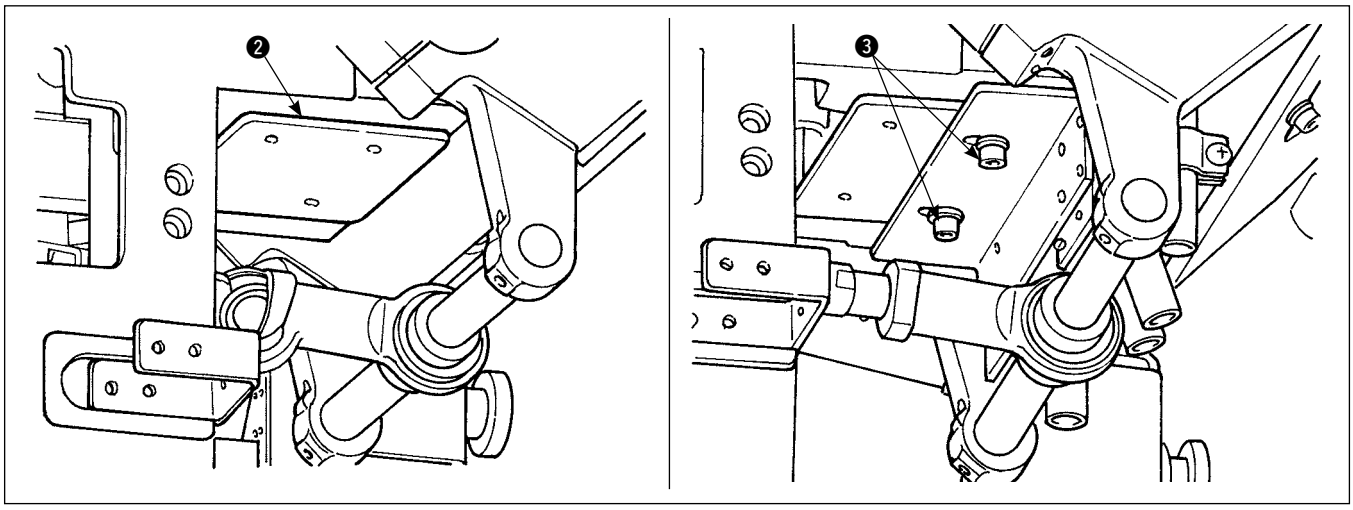


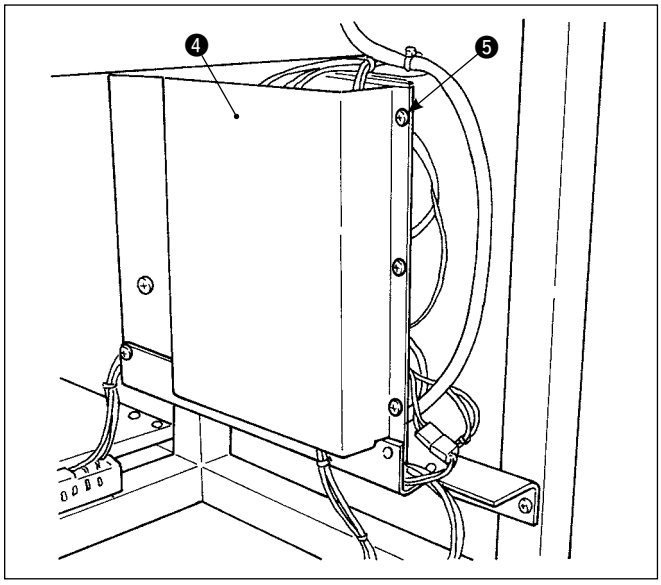
Secure garment body rack ❶ to chassis ❷ with four setscrews ❸.

3-2. Marking light

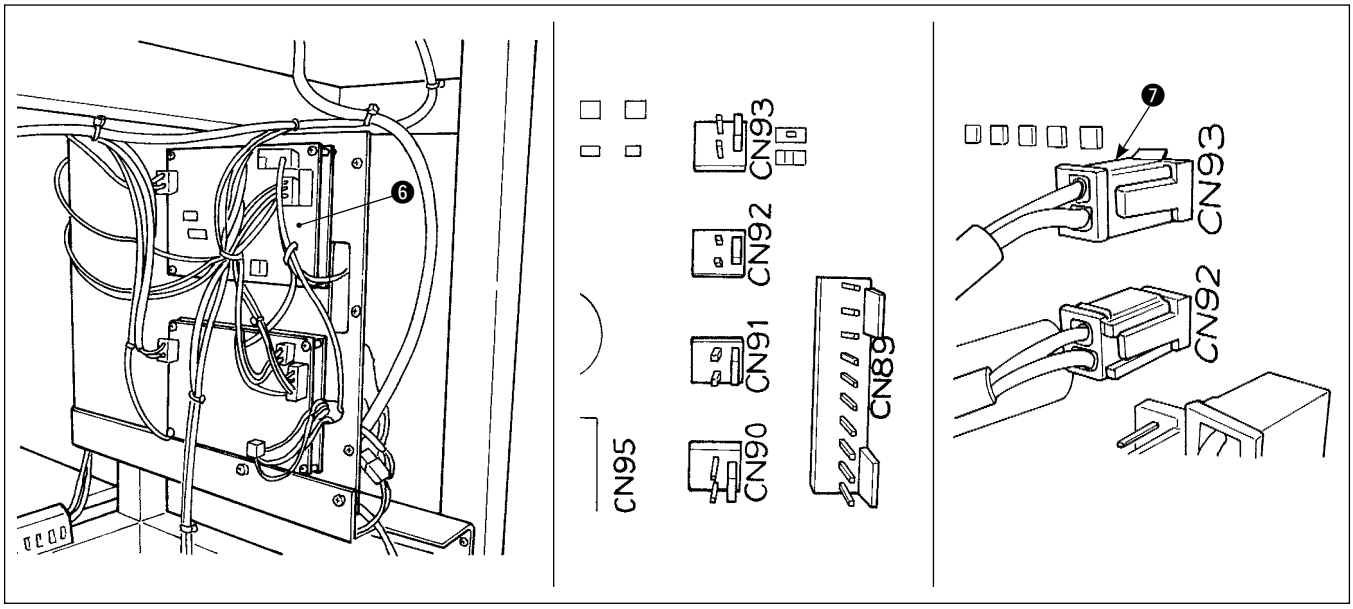


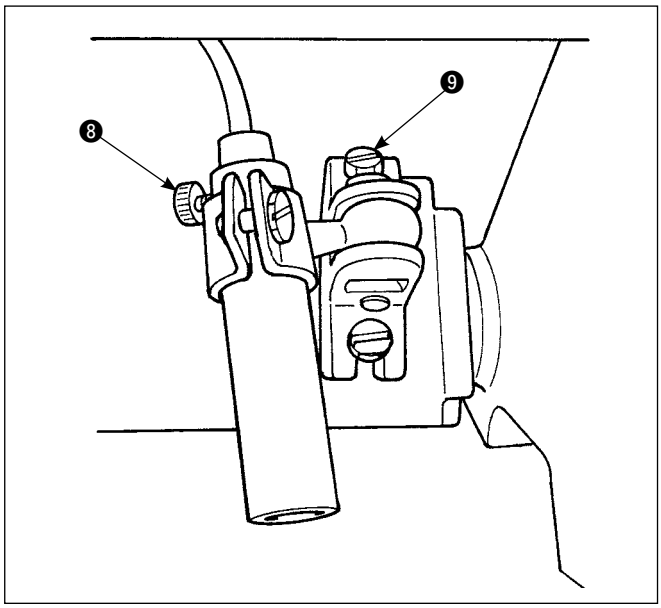
1) Install marking light asm. ❶ on folding unit base B ❷ with setscrews ❸.





2) Remove setscrew from IO PWB cover ❹. Insert connectors ❼ into CN90 to CN93 of IO PWB ❻.





3) Loosen marking focusing setscrew ❽ Adjust the direction of the marking (in the direction of rotation) to align the focus (in terms of vertical direction) and tighten the setscrew.
Loosen marking focusing setscrew ❾ and change the position of the marking. If you excessively loosen the setscrew, the marking light may move during operation. Be sure to tighten setscrew ❾ to such an extent that you can change the marking position by hand.