

User's manual

GARUDAN[®]

GPS-1306 series



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MACHINE SAFETY REGULATIONS




Safety instruction on this manual are defined as Danger, Warning and Notice.

If you do not keep the instructions, physical injury on the human body and machine damage might be occurred.

Danger : This indication should be observed definitely. If not, danger could be happen during the installation, conveyance and maintenance of machines.

Warning : When you keep this indication, injury from the machine can be prevented.

Notice : When you keep this indication, error on the machine can be prevented.

<p>1-1) Machine Transportation</p> 	<p>Those in charge of transporting the machine should know the safety regulations very well. The following indications should be followed when the machine is being transported.</p> <ul style="list-style-type: none"> Ⓐ More than 2 people must transport the machine. Ⓑ To prevent accidents from occurring during transportation, wipe off the oil on the machine well.
<p>1-2) Machine Installation</p> 	<p>The machine may not work well or breakdown if installed in certain places, Install the machine where the following qualifications agree.</p> <ul style="list-style-type: none"> Ⓐ Remove the package and wrappings starting from the top. Take special notice on the nails on the wooden boxes. Ⓑ Dust and moisture stains and rusts the machine. Install an airconditioner and clean the machine regularly. Ⓒ Keep the machine out of the sun. Ⓓ Leave sufficient space of more than 50cm behind, and on the right and left side of the machine for repairing. Ⓔ Do not operate in explosive atmospheres. To avoid explosion, do not operate this machine in an explosive atmosphere including a place where quantities of aerosol spray product are being used or where oxygen is being administered unless it has been specifically certified for such operation. Ⓕ The machines were not provided with a local lighting due to the feature of machine. Therefore the illumination of the working area must be fulfilled by end user. <p>[Reference] Details for machine installation are described in Machine Installation.</p>
<p>1-3) Machine Repair</p> 	<p>When the machine needs to be repaired, only the assigned troubleshooting engineer educated at the company should take charge.</p> <ul style="list-style-type: none"> Ⓐ Before cleaning or repairing the machine, Turn off the main power and wait 4 minutes till the machine is completely out of power. Ⓑ Not any of the machine specifications or parts should be changed without consulting the company. Such changes may make the operation dangerous. Ⓒ Spare parts produced by the company should only be used for replacements. Ⓓ Put all the safety covers back on after the machine has been repaired.

1-4) Machine Operation



SPS/B-1306 Series are made for industrial use to perform pattern sewing for fabrics or its similar materials. Please observe the following principles.

- Ⓐ Read the manual to understand on the operation of machine perfectly.
- Ⓑ Wear suitable clothes and cap for safe operation.
- Ⓒ During operation, don't make you body close to operating part of machine such as needle, hook, take-up lever or pulley.
- Ⓓ Do not remove a safety plate and covers during operation
- Ⓔ Be sure the grounding lines in connected.
- Ⓕ Before opening electricity box such as control box, cut off the supply of electricity and confirm if the switch is "off".
- Ⓖ When inserting thread into a needle or before inspecting after sewing, be sure the machine is stopped.
- Ⓗ Do not turn on the power during pedaling.
- Ⓘ Do not use several motor per a electric outlet.
- Ⓚ Install the machine apart from noise occurrence area such as high frequency welding machines as far as possible.
- Ⓛ Be careful-When the upper feed plate comes down to press. Otherwise, the finger or hand might be hurt at smacking.

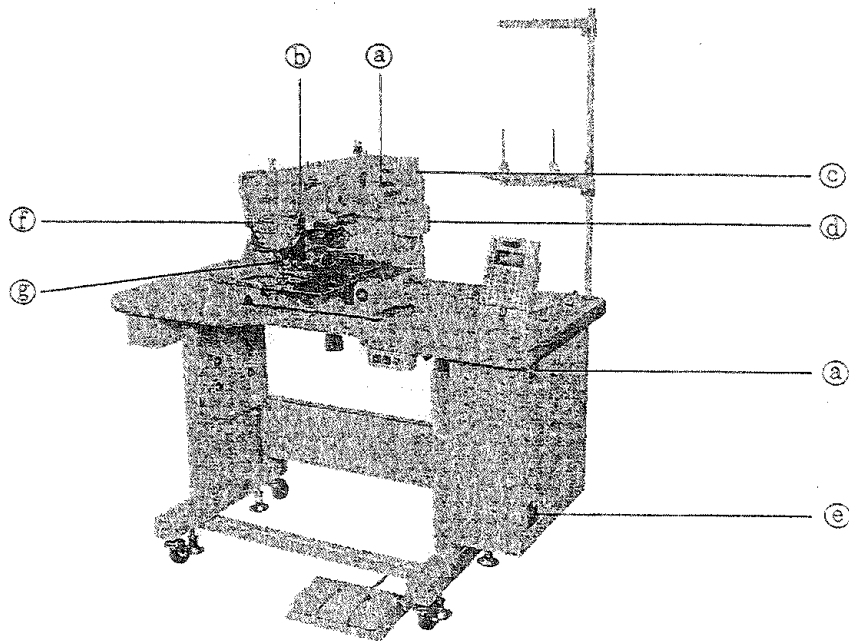
[Warning]

Belt will crush or amputate finger or hand, keep cover in place before operating, turn off power before inspecting or adjusting.

1-5) Devices for Safety



- Ⓐ Safety label : It describes cautions during operating the machine.
- Ⓑ Thread take-up lever : It prevents from any contact between body and take-up lever.
- Ⓒ Servo motor cover : It prevents from insertion of hands, feet or clothes by motor and Y-drive shaft.
- Ⓓ Step motor cover : It prevents from accidents during rotation of step motors.
- Ⓔ Label for specification of power : It describes cautions for safety to protect against electric shock during rotating the motors.
- Ⓕ Safety plate : It protects eyes against needle breaks.
- Ⓖ Finger guard : It prevent from contacts between a finger and needle.



1-6) Caution Mark Position

Caution mark is attached on the machine for safety. When you operate the machine, observe the directions on the mark.

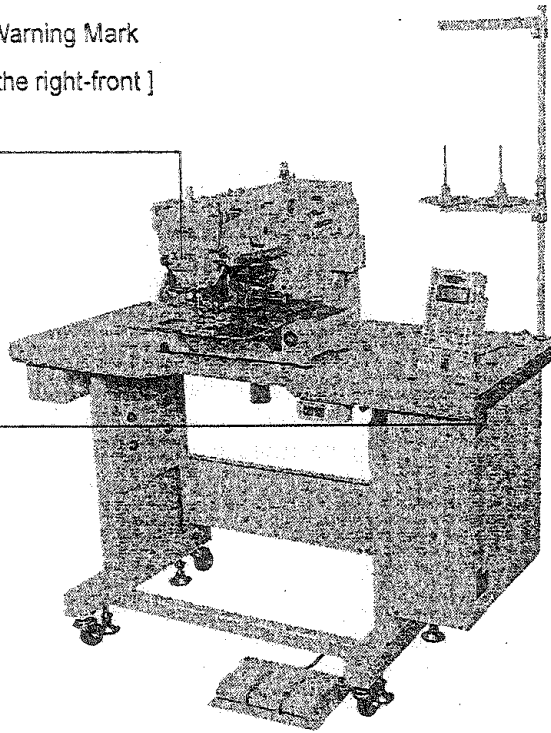
CAUTION
경고

Do not operate without finger guard and safety devices. Before threading, changing bobbin and needle, cleaning etc. switch off main switch.
손가락 보호대와 안전장치 없이 작동하지 마십시오.
실, 보빈, 바늘교체시나 청소전에는 반드시 주전원의 스위치를 꺼 주십시오.

CAUTION
경고

Hazardous voltage will cause injury. Be sure to wait at least 360 seconds before opening this cover after turn off main switch and unplug a power cord.
고압 전류에 의해 감전될 수 있으므로 커버를 열 때는 전원을 내리고 전원 플러그를 뽑고 나서 360초간 기다린 후 여십시오.

Position of Warning Mark
[View from the right-front]



1-7) Contents of Marks

Caution



1)

CAUTION
경고

Do not operate without finger guard and safety devices. Before threading, changing bobbin and needle, cleaning etc. switch off main switch.
손가락 보호대와 안전장치 없이 작동하지 마십시오.
실, 보빈, 바늘교체시나 청소전에는 반드시 주전원의 스위치를 꺼 주십시오.

2)

CAUTION
경고

Hazardous voltage will cause injury. Be sure to wait at least 360 seconds before opening this cover after turn off main switch and unplug a power cord.
고압 전류에 의해 감전될 수 있으므로 커버를 열 때는 전원을 내리고 전원 플러그를 뽑고 나서 360초간 기다린 후 여십시오.

2

SPECIFICATIONS OF THE MACHINE

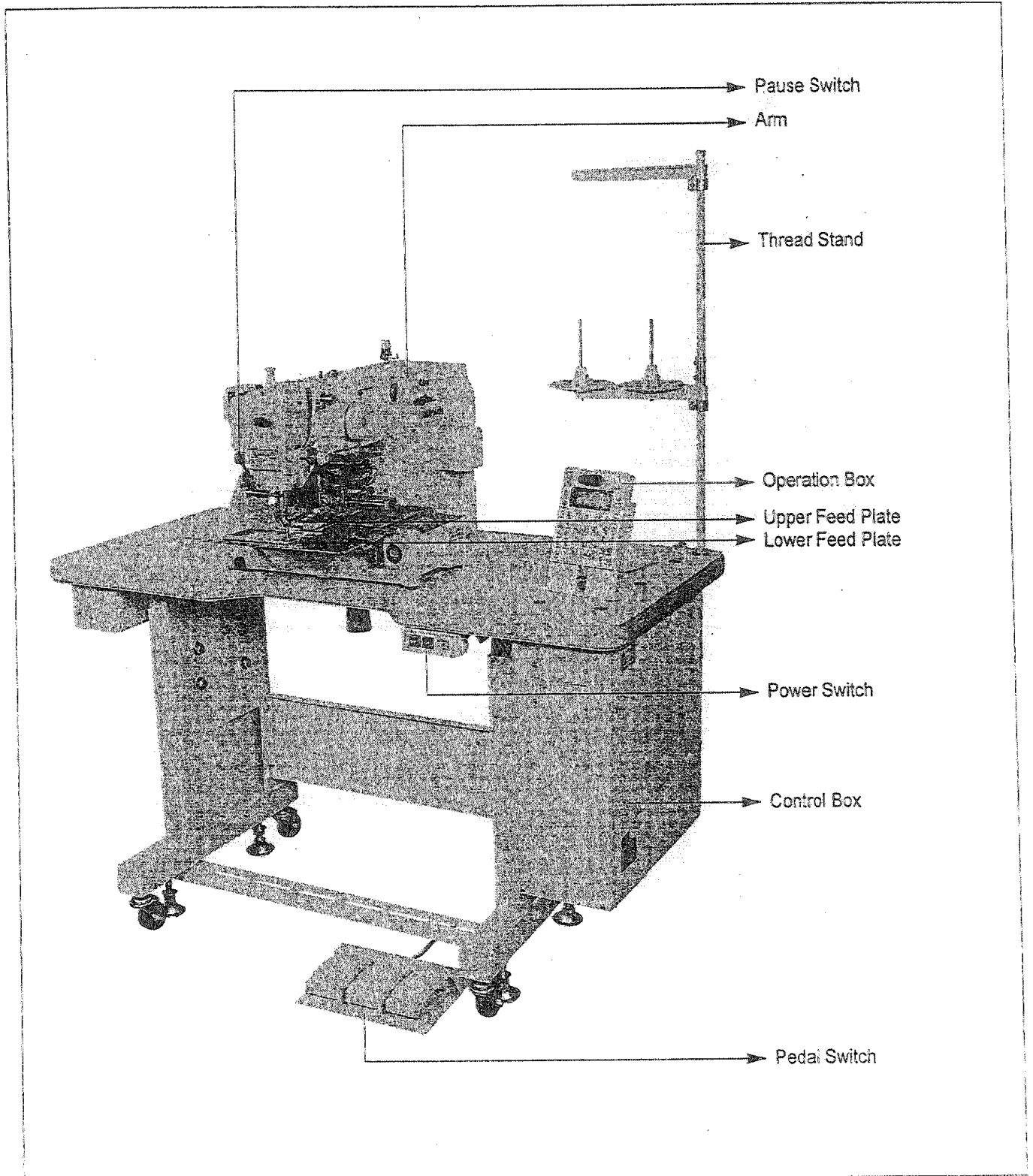
Sewing Area	X:130mm × Y:60mm
Sewing Speed	Max. 2,500 spm(Stitch Length : 3mm or shorter)
Stitch Length	0.1~12.7
Needle	DP × 17, DP × 5
Needle Bar Stroke	41.2mm
Hook	Semi-Rotary Large Shuttle Hook
Bobbin Case	Bobbin Case for Semi-Rotary Large Shuttle Hook
Bobbin	Bobbin for Large Shuttle Hook
Presser Foot Stroke	Standard 4mm [0.5~10mm]
Lifting Amount of Presser Foot	Max. 20mm
Lifting Amount of Feeding Frame	22mm [Max. 25mm]
Feeding System	Feeding by Pulse Motor
Emergency Stop Function	Available During Sewing Operation
Pattern Select Function	Pattern No. Can be Selected from No.1 to No.999
Memory	3.5" Floppy Diskette (2HD)
Memory Backup	The Working Point is Stored in the Memory when the machine stops Abnormally
2nd Origin Function	Another Origin Point Can be Set by Using Jog Key
Maximum Speed Limit	The Maximum Speed can be Limited from 200 to 2,500 spm
Number of Patterns	Max. 691 Patterns / Disk
Safety Device	Emergency Stop Function, Maximum Speed Limit Function
Main Motor	Direct Drive AC Servo Motor
Power Consumption	600VA
Recommended Temperature	5°C~40°C (41°F~104°F)
Recommended Humidity	20%~80%
Power	1 φ : 100~240V, 3 φ : 200~440V, 50/60Hz
Airborne Noise Humidity	L=80.7LAeq

※ Remark : The Airborne Noise Level given above was measured in accordance with the prEN/ISO10821 with the respective machine operating at maximum speed without any material being positioned.

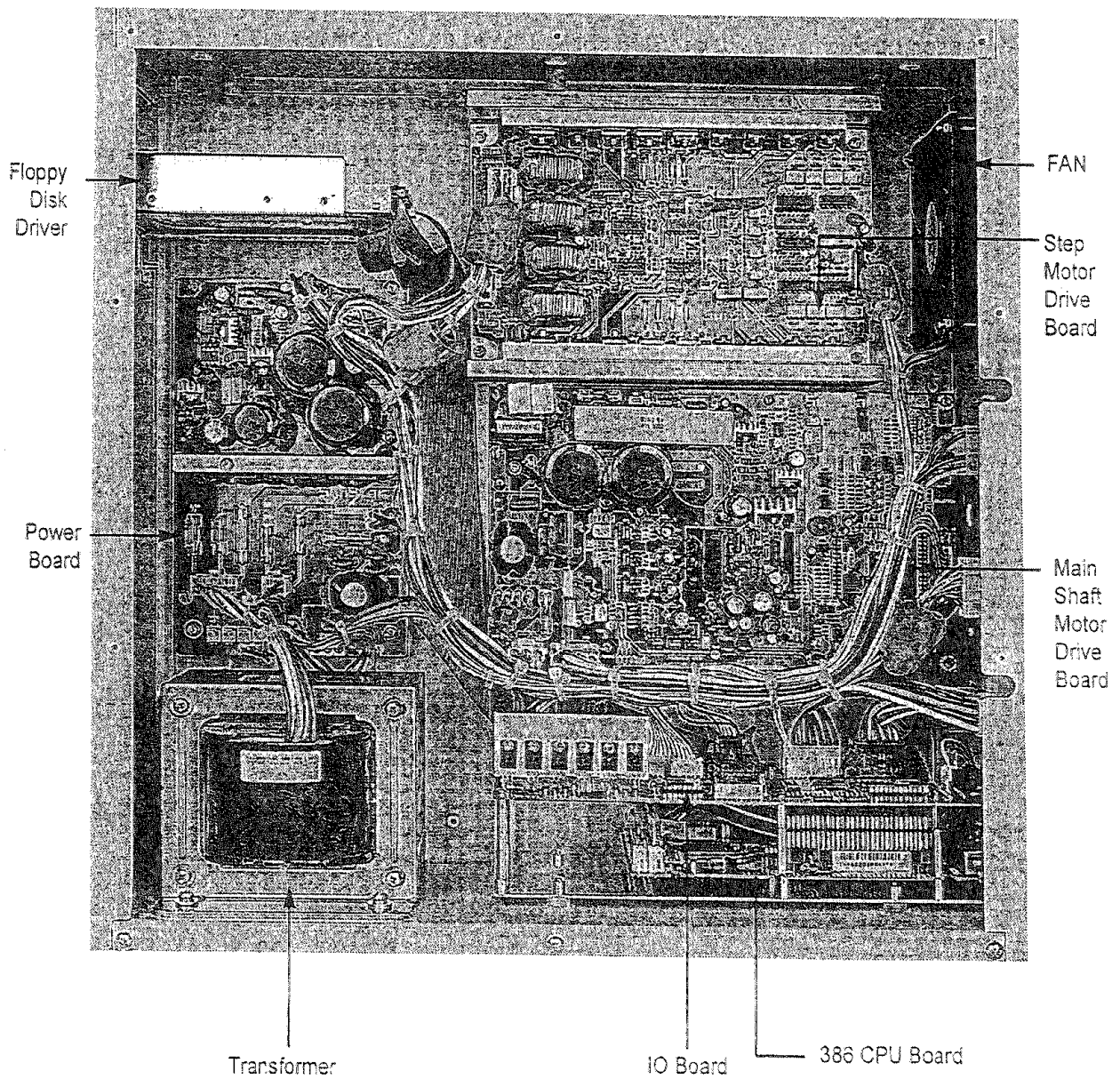
3

STRUCTURE OF THE MACHINE

1) Names of Each Parts of the Machine



2) Inside Structure of Control Box



4

INSTALLATION OF THE MACHINE

1) Environment for Machine Installation

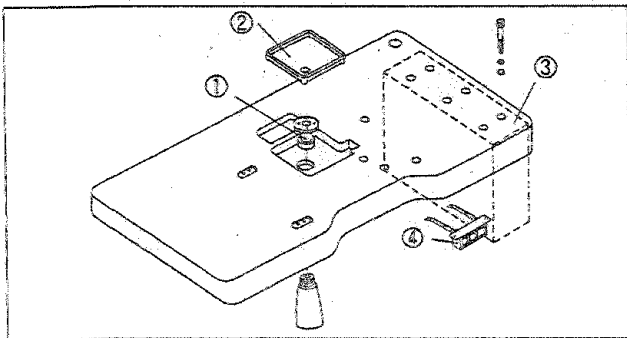
- A. Do not use the machine where the voltage is over regular voltage $\pm 10\%$ to prevent accidents.
- B. Check the indicated pressure of the devices that use atmospheric pressure such as the air cylinder to prevent any accidents from occurring.
- C. For safe operation of the machine, use the machine under the following conditions.
 - ⇒ Surrounding Temperature During Operation : $5^{\circ}\text{C} \sim 40^{\circ}\text{C}$ ($41^{\circ}\text{F} \sim 104^{\circ}\text{F}$)
 - ⇒ Surrounding Temperature During Maintenance : $-10^{\circ}\text{C} \sim 60^{\circ}\text{C}$ ($14^{\circ}\text{F} \sim 140^{\circ}\text{F}$)
- D. Humidity : Between 20~80%(Relative humidity)

2) Electric Installment Conditions

- A. Power Voltage
 - The power voltage must be between regular voltage $\pm 10\%$.
 - The frequency of the power should be regular frequency ($50/60\text{HZ}$) $\pm 1\%$.
- B. Electromagnetic Wave Noise
 - Use separate power with strong magnetics or high frequency products, and do not leave the machine near them.
- C. Use low voltage when supplements or accessories are being adhered.
- D. Be careful not to have water or coffee be spilled into the Controller and Motor.
- E. Do not drop the Controller or Motor.

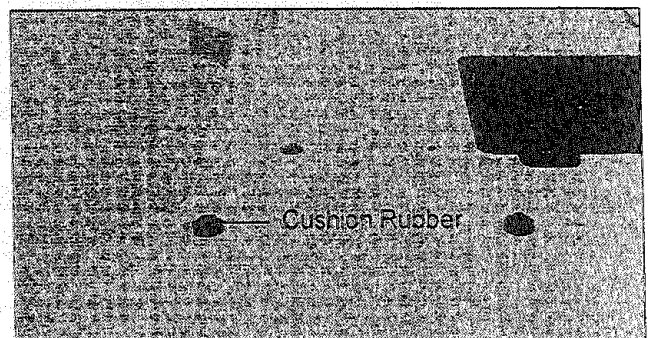
3) How to Install the Table Safety

- A. Fix the oil tub holder ①, oil holder ②, control box ③ and main switch ④ on the table.



[Fig. 1]

- B. Stick the bed cushion rubber onto the table.

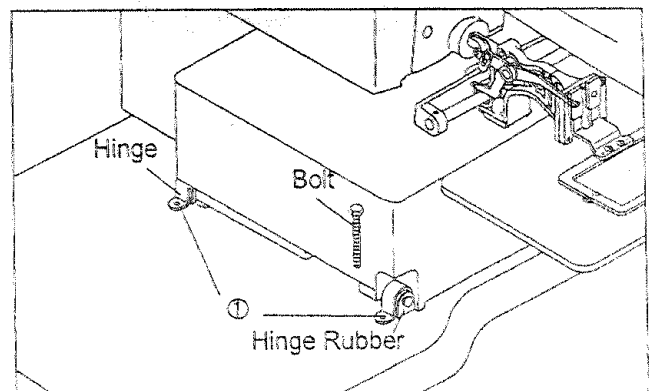


[Fig. 2]

- C. Add the hinge metal and hinge rubber to the bed.
Then insert the fixing bolt into the hinge metal hole of point ① and fix the table as shown in the picture.

[Danger]

The machine should be carried by more 2 persons for safety.

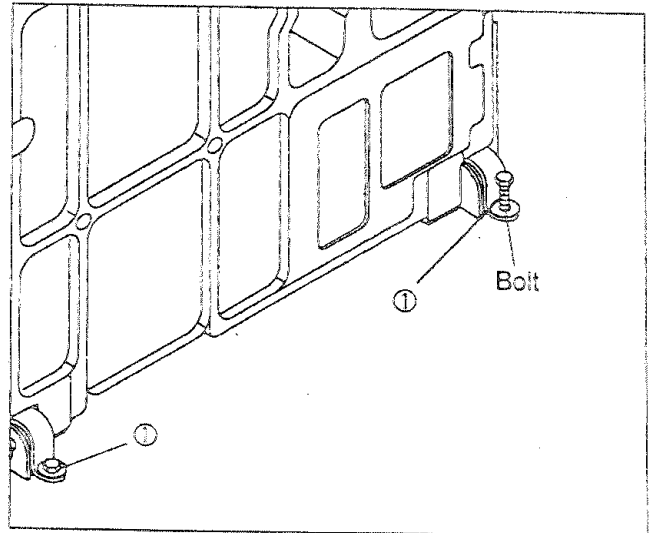


[Fig. 3]

D. Stand the machine as shown in the picture, and then fix the machine on the table after inserting the fixing bolts into the hinge metal holes of point ①.

[Danger]

Since the machine is not perfectly installed on the table, extreme care is needed when you make the machine stand up not to have any accident occurred.

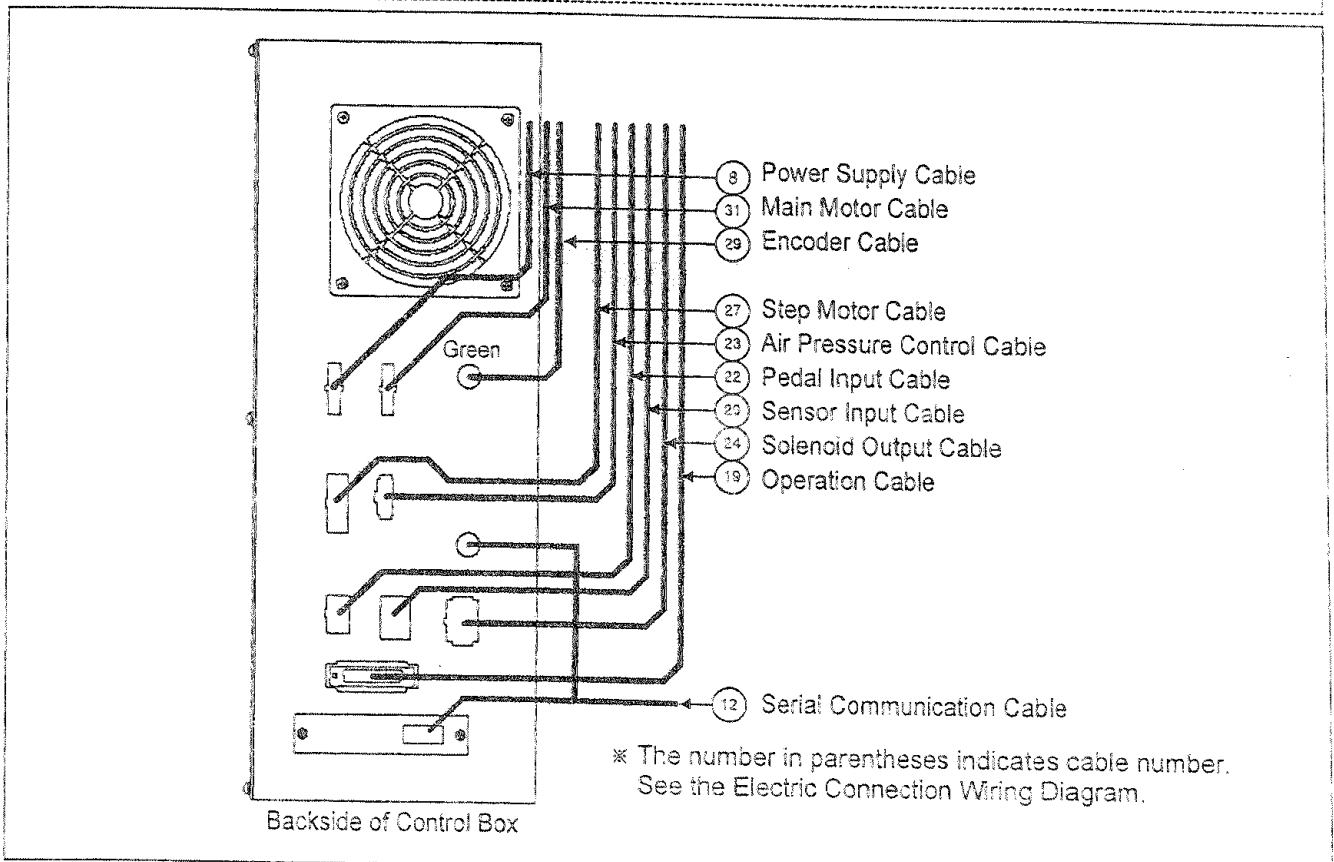


[Fig. 4]

E. Method of Cable Connection

[Caution]

- ① Please turn off the power when you insert or pull out the cable connector.
- ② Please make sure that cable should not contact to machine parts.

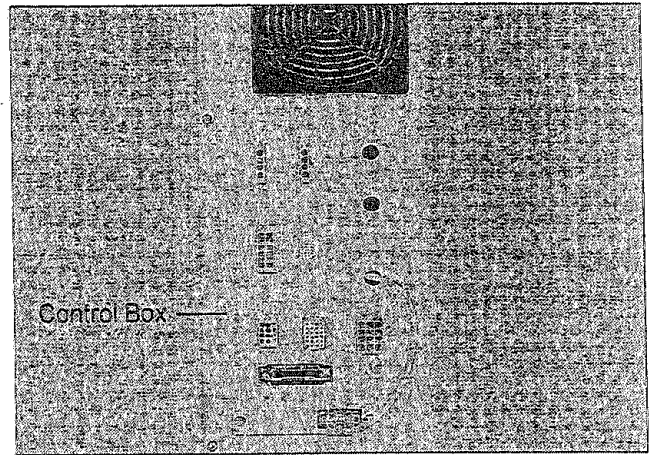


[Fig. 5]

F. Connect the connectors of the electric cords from the machine to the control box.

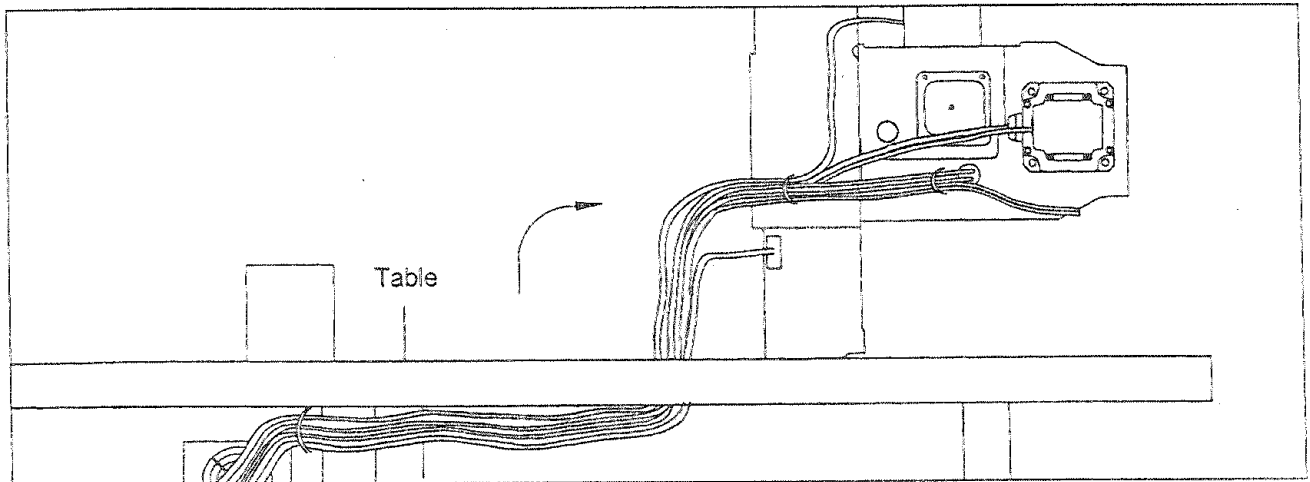
[Caution]

- ① Hold the connector part to plug in and pull out the cords.
- ② Have the power turned off before the cords are plugged in or pulled out.
- ③ Make sure the plug cable does not get too close to the "V"-Belt or other machine supplements.



[Fig. 6]

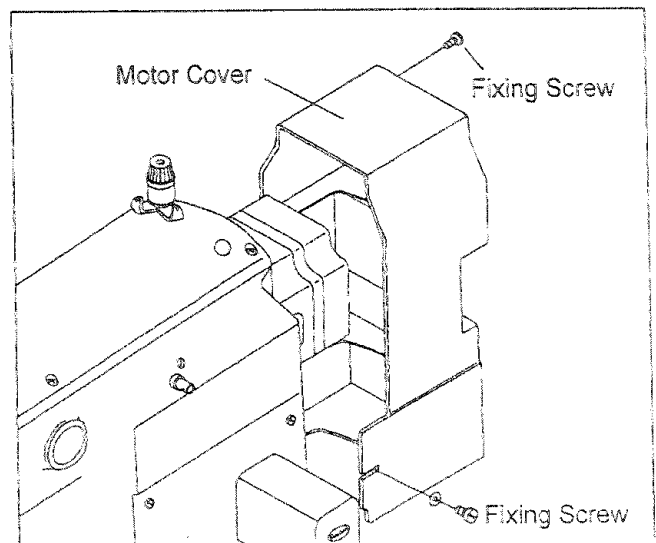
G. After the cable connections between the machine and the control box is finished, fix the cable wiring under the table as shown in the picture.
(Adjust the length of the wire considering the situation of standing the machine.)



[Fig. 7]

4) The Assembly of Peripheral Parts

A. Use the fixing screws to install the motor cover onto the back of the machine.

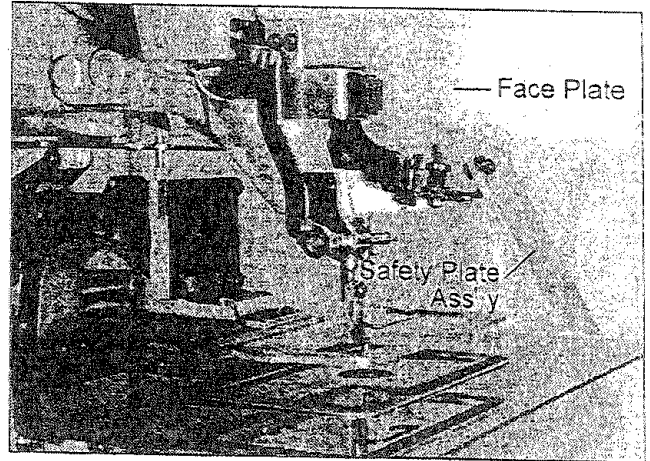


[Fig. 8]

B. Install the safety plate on the side of the face plate.

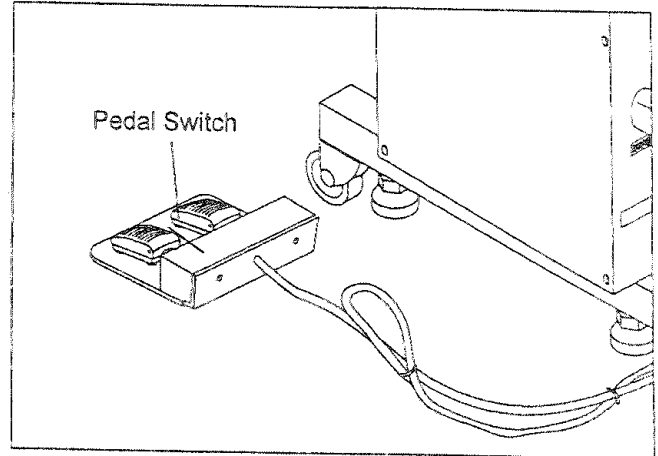
[Caution]

1. For safety, have the plate on during operation.
2. Be careful when you start operation. Otherwise, fingers or hand might be hurt at the upper feed plate accidentally.



[Fig. 9]

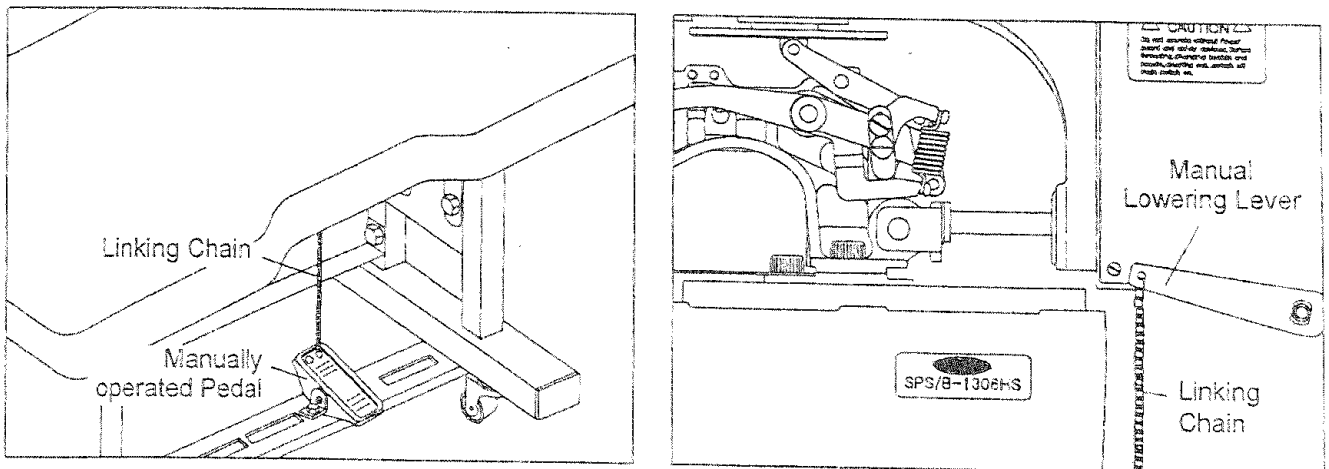
C. Connect a plug of pedal switch with control box.



[Fig. 10]

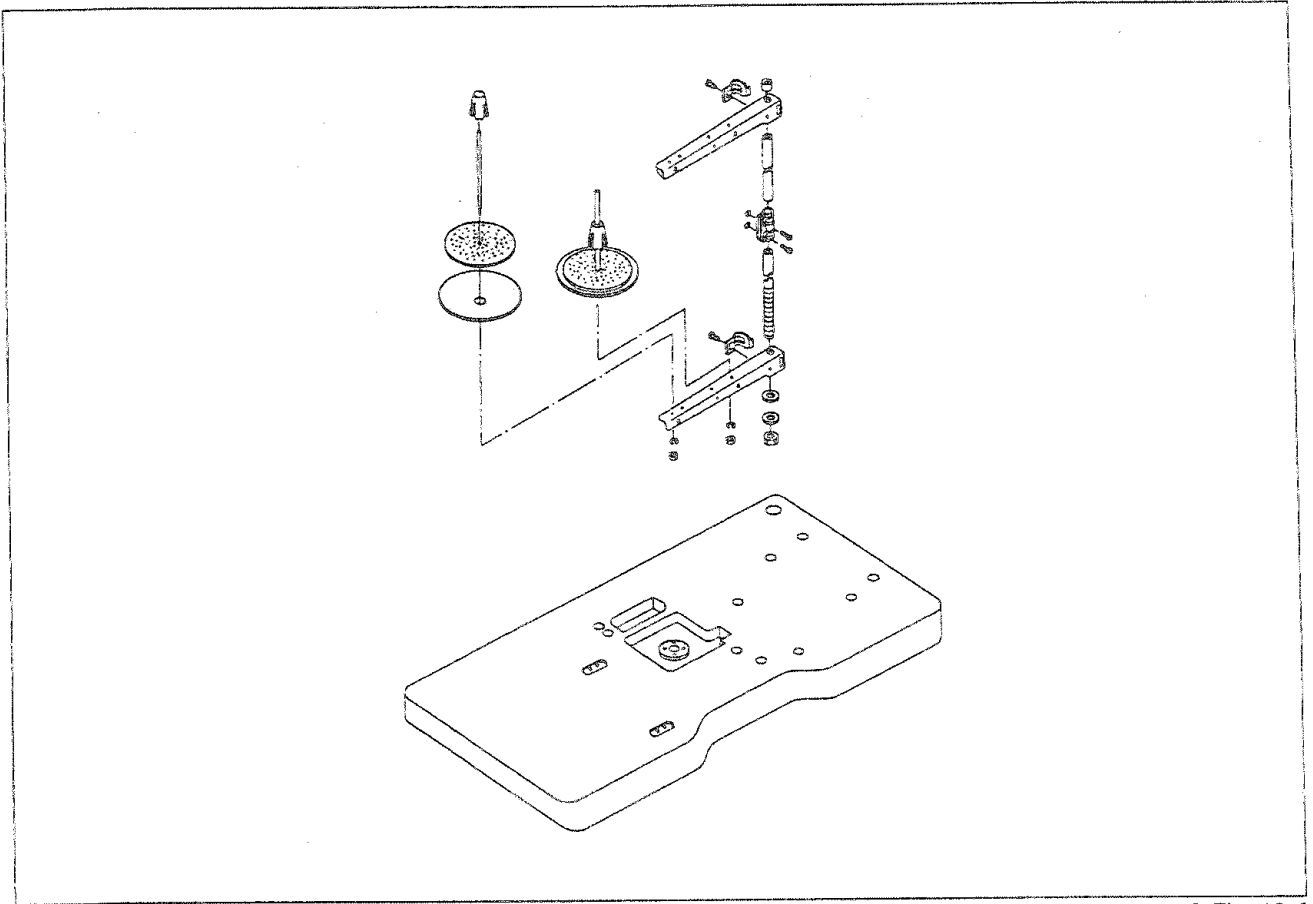
D. Connect the chain between the manually operated pedal and the manual lowering lever.

If the distance between a manual pedal and linking chain is not fitted, unfasten the bolts and nuts of manual pedal and adjust the manual pedal for proper distance.



[Fig. 11]

E. Install the Thread stand onto the table.



[Fig. 12]

5

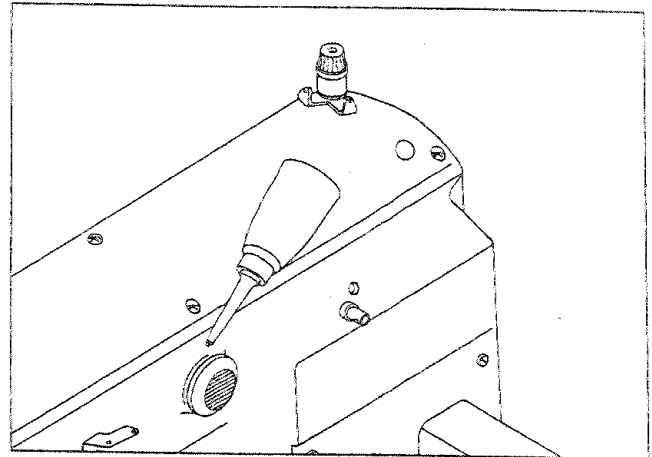
PREPARATIONS BEFORE OPERATING THE MACHINE

1) How to Supply Oil

- A. Check the amount of oil left in the oil tank which is installed on the arm and supply oil sufficiently.

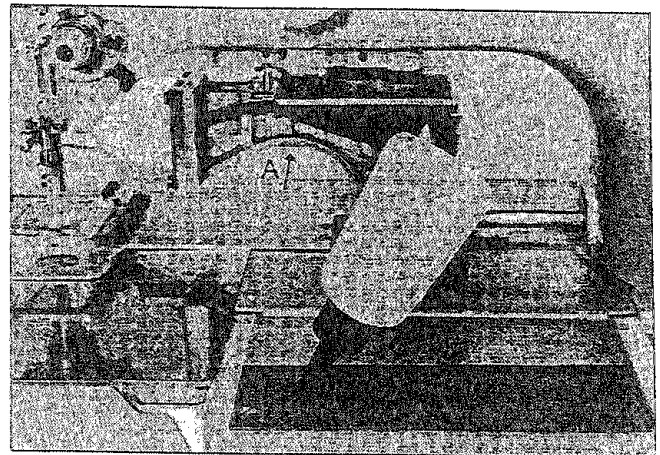
[Caution]

Be sure to supply oil when operating the machine for the first time or when the machine has not been used for a long time.



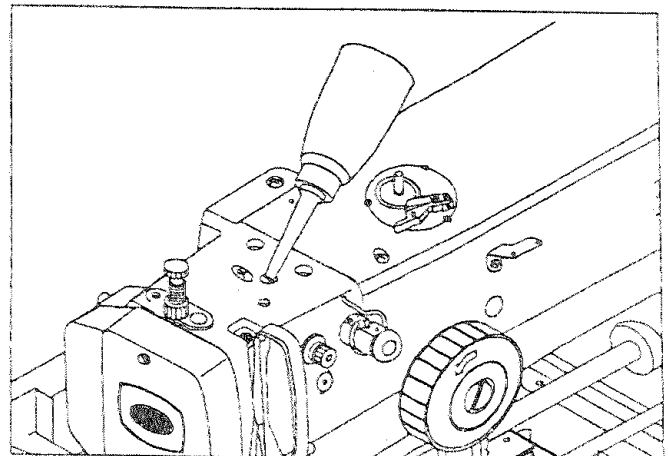
[Fig. 13]

- B. As shown in the picture, move the feed bracket in the direction of "A" and supply oil into the bed oil window through the hole on the bed cover.



[Fig. 14]

- C. Supply oil into the hole in the upper part of the arm.

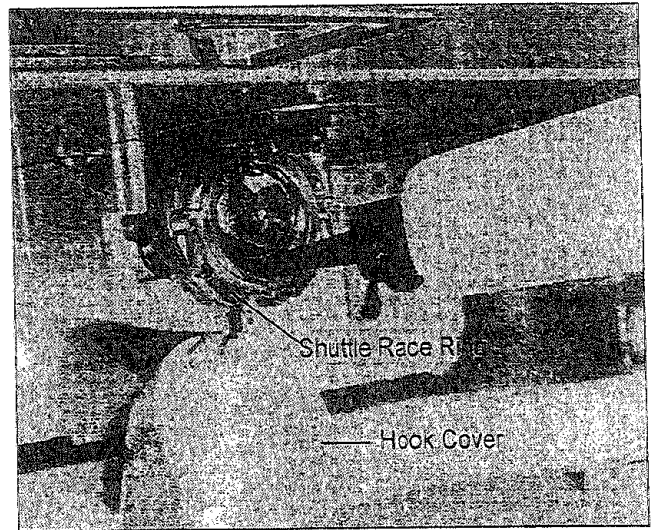


[Fig. 15]

D. Open the hook cover and supply oil till the shuttle race ring is surrounded by oil. Put the hook cover back on after finishing.

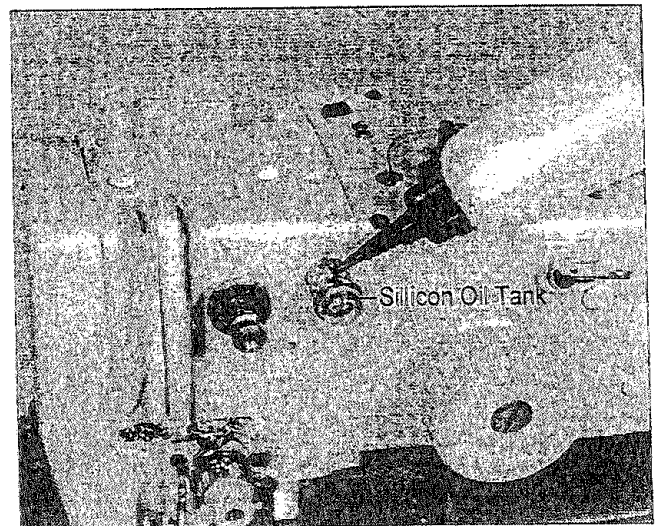
[Caution]

For safety, keep the hook cover covered during operating.



[Fig. 16]

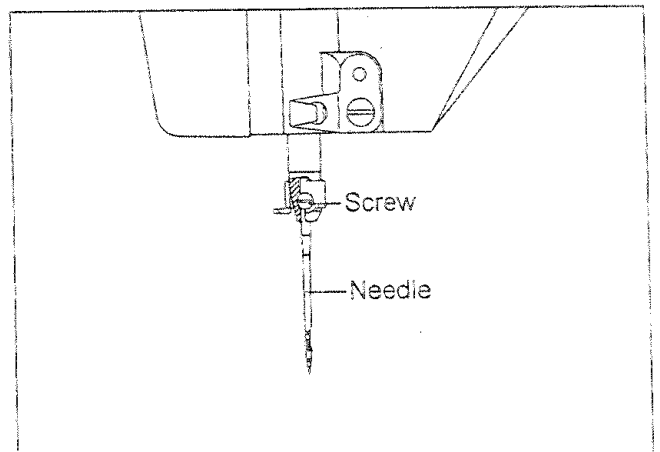
E. Supply silicon oil into the silicon oil tank which is installed on the right side of the arm.



[Fig. 17]

2) How to Install the Needle Bar

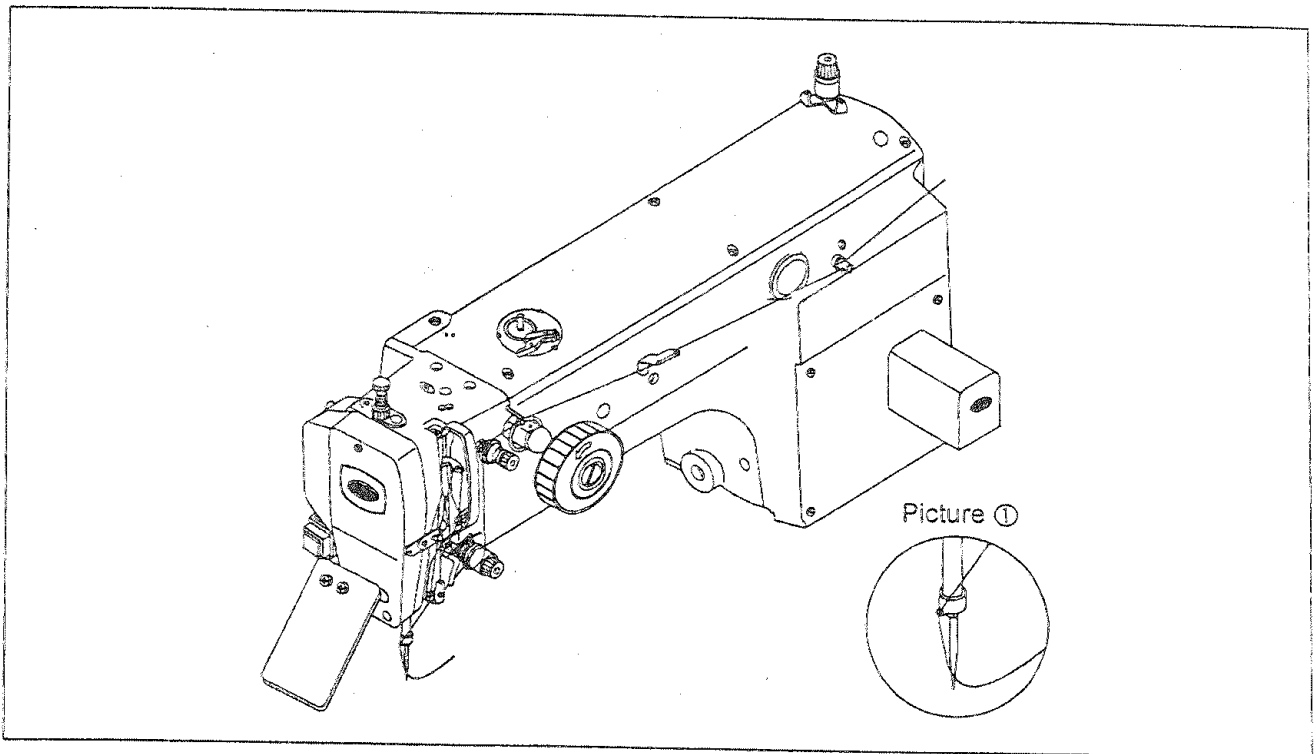
Unfasten the needle fixing screw on the needle bar. Then, with the needle groove facing forward, push the needle until the upper end touches the needle hole of the needle bar. Fix the needle in with the needle fixing screw.



[Fig. 18]

3) How to Thread the Upper Thread

- A. Hook the upper thread as shown in the following picture after setting the thread take-up lever at the highest position. As with the needle bar thread guide, hook the thread as shown in picture for heavy materials. (SPS/B-1306-HS)



[Fig. 19]

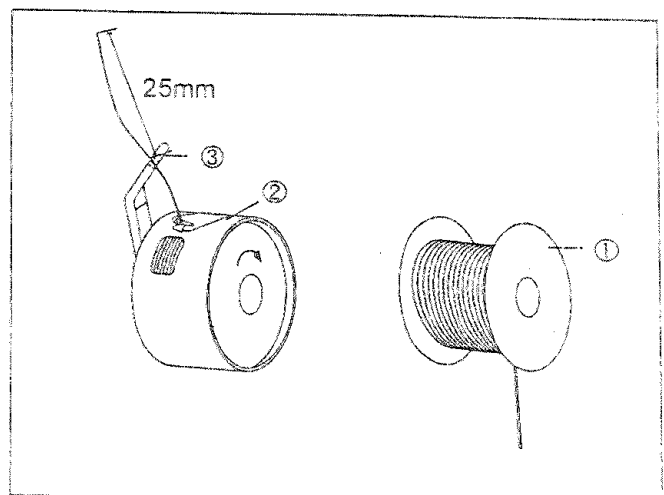
4) Threading the Lower Thread

- A. Insert bobbin ① into bobbin case ② as shown in the picture.

[Caution]

insert the bobbin to turn clockwise when seen from behind the bobbin case

- B. After setting the lower thread through the crack of the bobbin case, insert the thread through thread hole ③.
- C. Adjust the lower thread to hang 25mm out of thread hole ③.



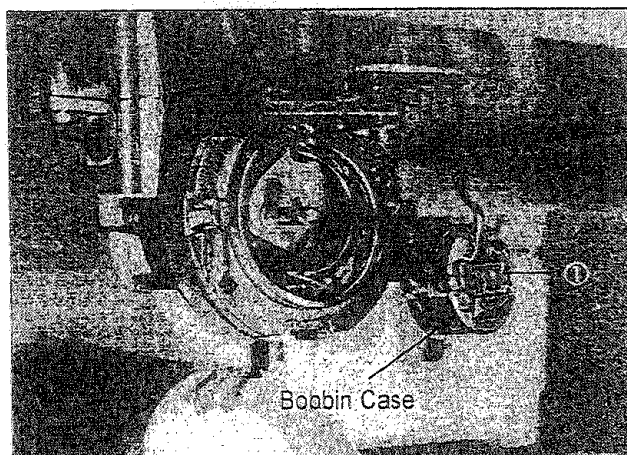
[Fig. 20]

5) How to Take the Bobbin Case On and Off

Hold knob ① of the bobbin case and push into the shuttle until a click sound is heard.

[Caution]

If you start operating the machine when a bobbin case is not perfectly installed, thread can be tangled of the bobbin case would be protruded.

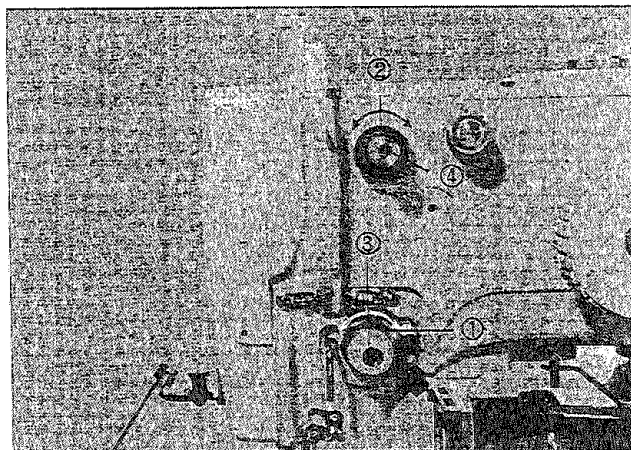


[Fig. 21]

6) How to Adjust the Tension of the Upper Thread and the Lower thread

A. Adjusting the Tension of the Upper Thread

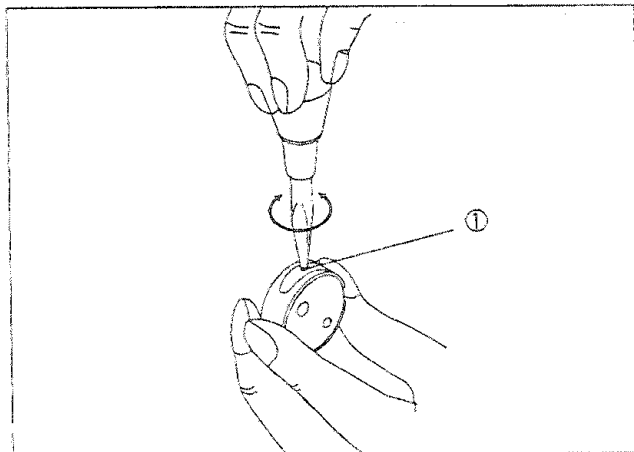
When the tension adjusting nuts ③ and ④, of thread tension adjusting unit ① and sub-tension adjusting unit ②, are turned clockwise the upper thread is tightened. And loosens when turned the other way around.



[Fig. 22]

B. Adjusting the Tension of the Lower Thread

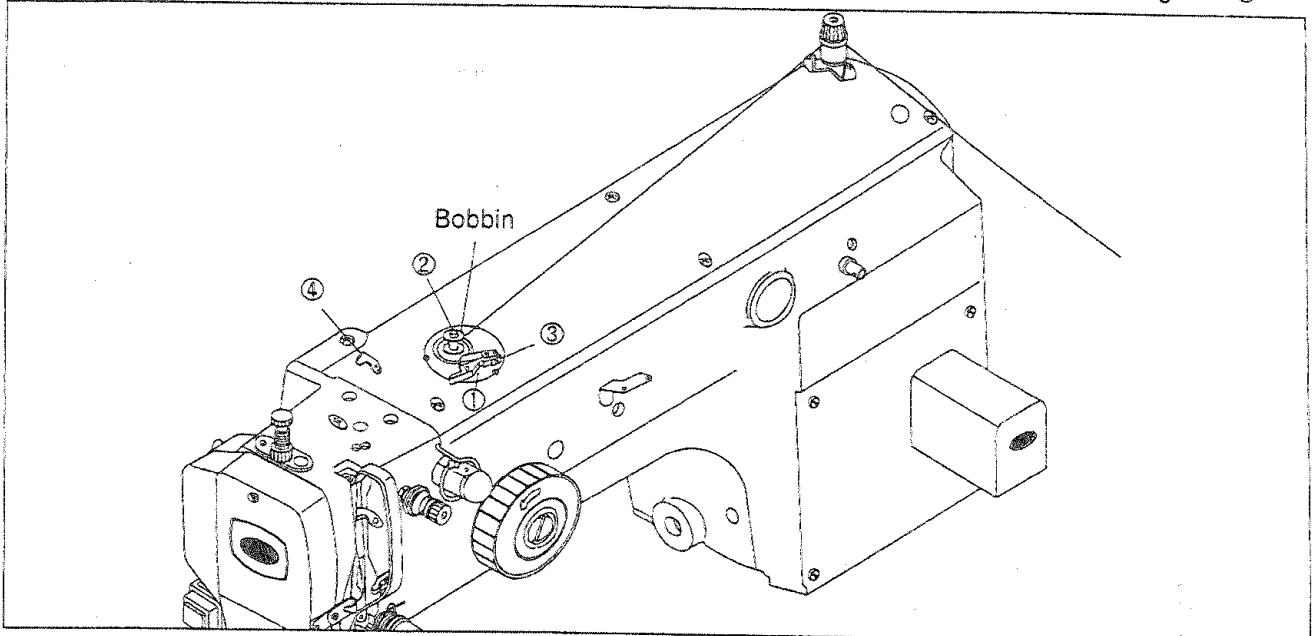
The lower thread becomes tight when tension adjusting screw ① is turned clockwise, as shown in the picture. When the screw is turned the other way the lower thread is loosened.



[Fig. 23]

7) How to Wind the Lower Thread

- Insert the bobbin into thread winding drive shaft ② on thread winding base ① which is installed on the upper top.
- Operate the machine after sticking the thread winding lever ③ to the bobbin.
- When the thread winding lever is separated from the bobbin, cut the bobbin thread with thread winding mes ④.



[Fig. 24]

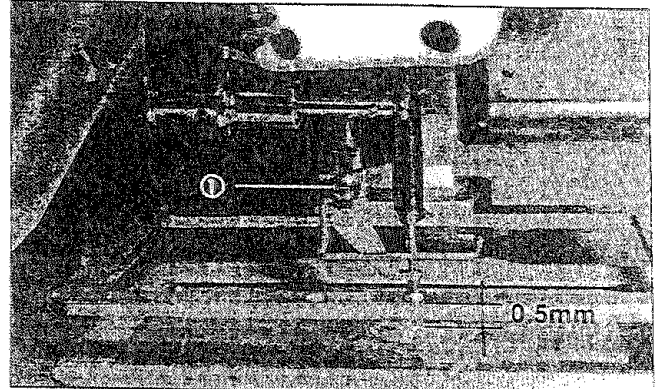
8) Adjusting the Height of the Presser Foot

- Unfasten presser foot screw ① with the needle bar at the lowest position.
- Adjust the height so that the presser foot bottom comes 0.5mm (the thickness of the thread used) above the sewing material. Then, tighten the screw.

[Caution]

After adjusting the height of presser foot, confirm the position of wiper.

- Too excessive gap can cause jumping.
- Insufficient gap can cause a failure in thread adjustment.



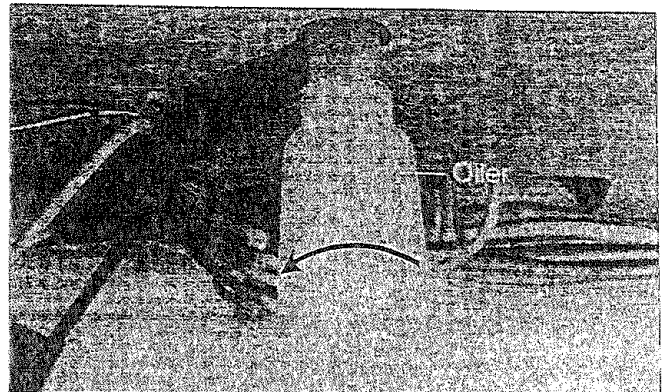
[Fig. 25]

9) Disposing the Waste Oil

When the oil receiving oiler at the bottom of the table is full, take it off to empty.

[Caution]

Spread out some fabrics or papers on the floor when you attach or remove the oil receiving container.



[Fig. 26]

10) Model of Transformer by Voltage and Setup of Voltage

- A. Then inner structure is as below when the cover of electronically-controlled pattern sewing machine is removed.
 B. Confirm if the position of input voltage change connector on power board (Refer Fig. 27) and used transformer are properly selected according input voltage like Table 1

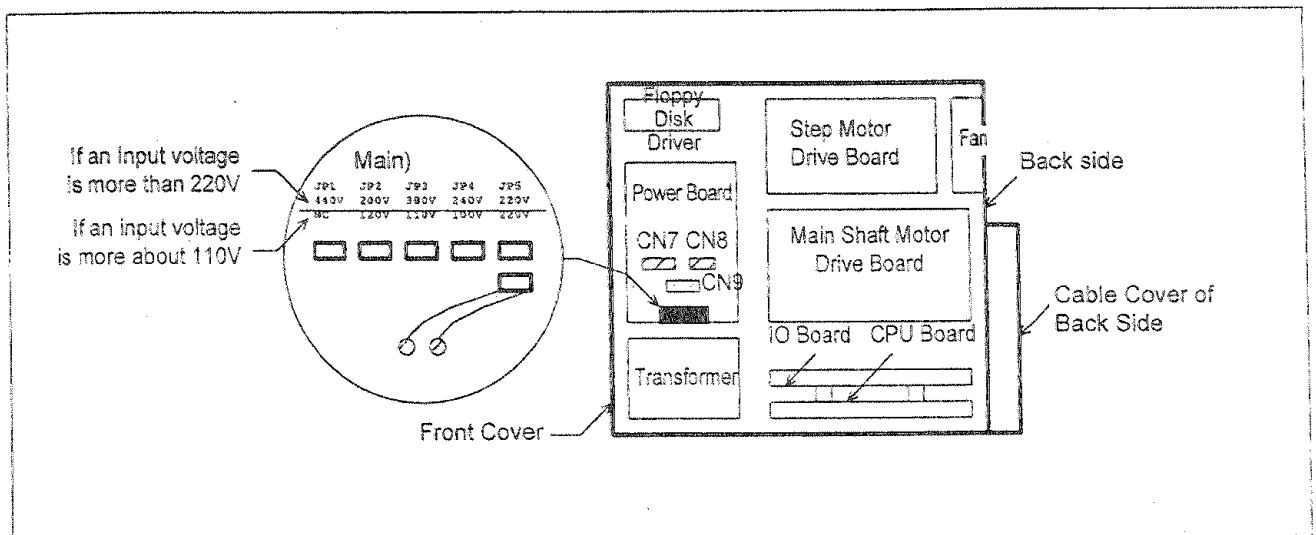
Model	Input Voltage	Position of Input Voltage Change Connector	Model of Used Transformer	Reference
SPS/B-1306-□□-□□ SPS/B-1811-□□-□□	95V~105V	JP4	SPS/B-1306-110□ SPS/B-1811-110□	Control box is used only for 1306 and 1811 differently. You don't need differentiate it by electronic/pneumatic or basic/perfect or general use/thick materials according to the model of machine.
	106V~115V	JP3		
	116V~125V	JP2		
	200V~230V	JP5	SPS/B-1306-220□ SPS/B-1811-220□	
	231V~245V	JP4		
	345V~415V	JP3		
	416V~480V	JP1		

Table. 1 Model of used transformer and connector position according to input voltage

Ex.) When model of machine is SPS/B-1306-□□-□□, and voltage is 220V; it is normal that the model of used transformer is "SPS-1306-220□", and connector should be placed on "JP5".

※ The model of transformer is attached to the upper transformer.

- C. Confirm if the power switch is for 3 phase or single phase.
 D. If the setting of 2 and 3 is not proper, the machine can be damaged. In case, take below measures.
- Separate the connector linked to transformer from CN7, CN8, CN9 on power board.
 - Fix the connector on any proper site on Table 1.
 - Link the connector linked to transformer to the power board.

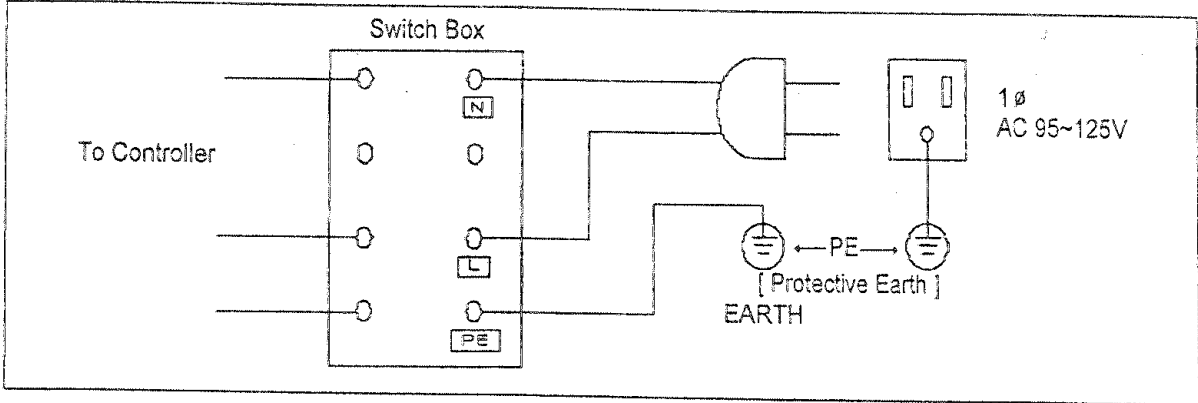


[Fig. 27 Setup of Input Voltage Change Connector]

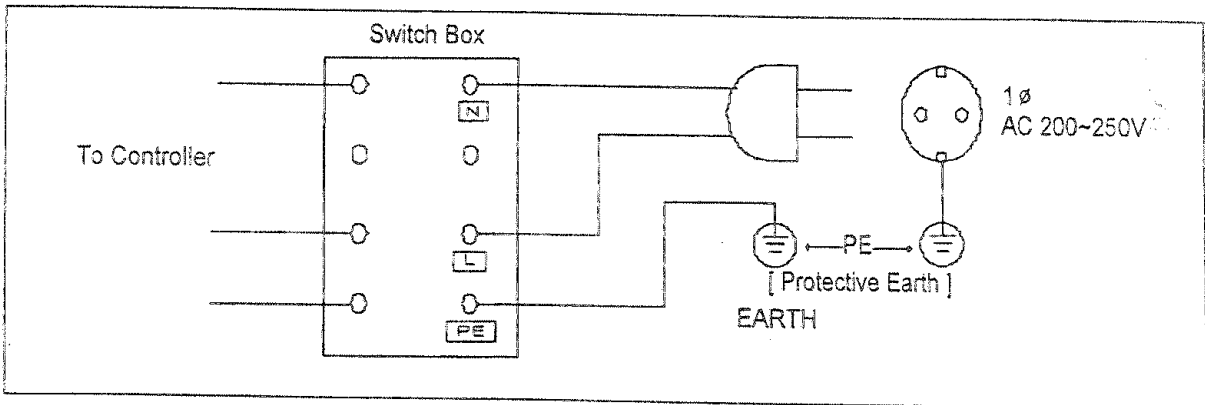
WIRING AND GROUNDING

1) Specification of the Power Plug

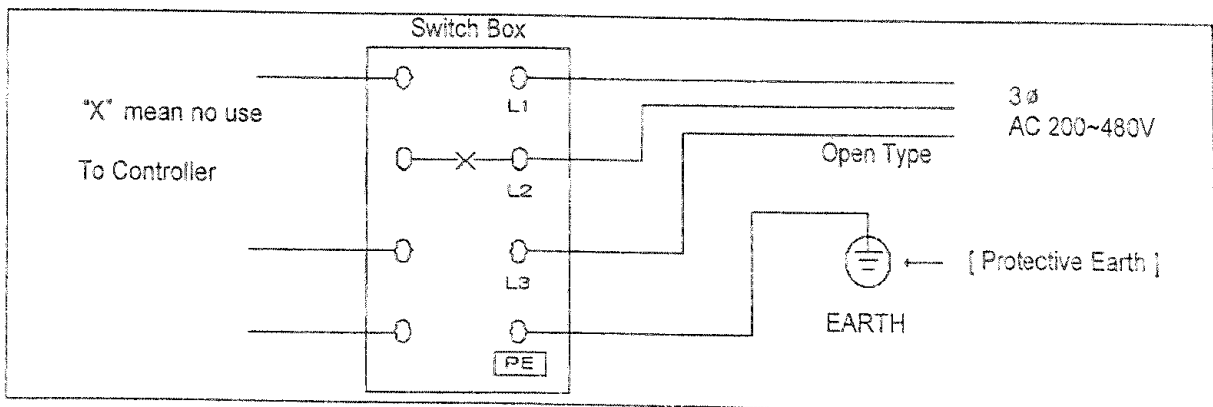
① Single Phase AC 95V~125V



② Single Phase AC 200V~245V



③ Single Phase AC 200V~480V



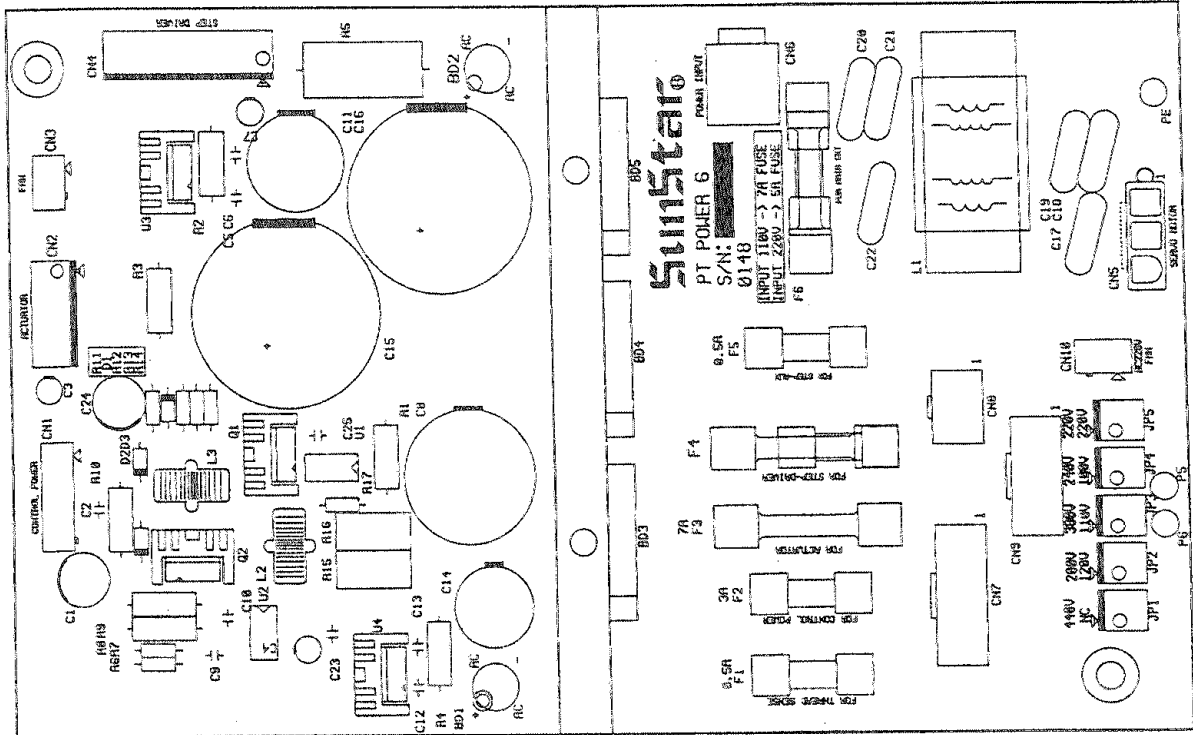
※ Be sure to connect Protective Earthing.

Make sure to use the circuit bracket on the input line if you use 3-Phase.

2) Specification of Electric Current in Wiring of Power Plug

Be sure to use wiring materials which can stand electric current of higher than 15A.

EACH FUSE CAPACITY (PATTERN 1306 SERIES)



NO	DEVICE NO.	FUSE CAPACITY		FUNCTION	ETC.	
		VOLTAGE	CURRENT			
1	F1	AC250V	0.5A	FOR THREAD SENSE		
2	F2	AC250V	3A	FOR CONTROL POWER		
3	F3	AC250V	7A	FOR ACTUATOR		
4	F4	AC250V	5A	FOR STEP DRIVER		
5	F5	AC250V	0.5A	FOR STEP - AUX		
6	F6	AC250V	INPUT 110V	7A	FOR MAIN POWER	
			INPUT 220V	5A		

When you change the Fuse you should TURN OFF THE POWER.

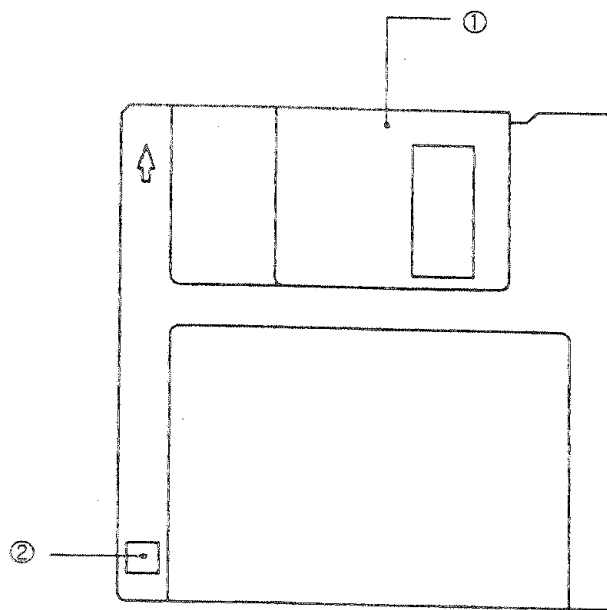
11) Caution when Using the Floppy Disks

Observe the following principles thoroughly when you treat floppy disks.

[Caution]

Use the identified floppy disks after formatting when you get them in market.

- ① Do not put floppy disks near magnetic-related materials such as television.
- ② Keep away from overheat, humidity or direct ray of light.
- ③ Do not put any heavy materials on a floppy disk.
- ④ During formatting or inputting and outputting, do not take out the floppy disk from a disk drive.
- ⑤ Do not open a cover of floppy disk.
- ⑥ If a write protected tab is opened, you can't input data in a disk
- ⑦ If yo repeat read and write in a disk many times, error can be occurred in a disk.
- ⑧ It is safe to keep important design data in two disks.



① Shutter

② Write Protect tab

6

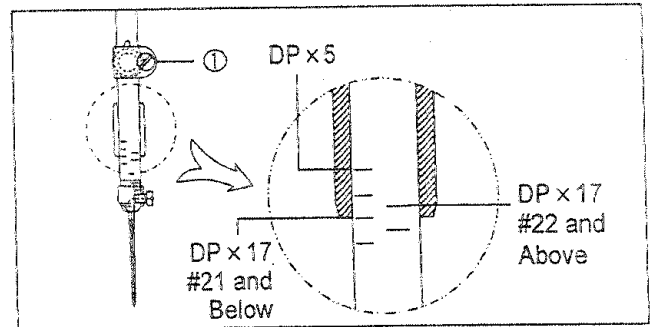
HOW TO REPAIR THE MACHINE

Caution

The machine is set to be the best condition at the factory. Do not make any discrete adjustments on the machine and replace genuine parts approved by the company only.

1) Adjusting the Height of the Needle Bar

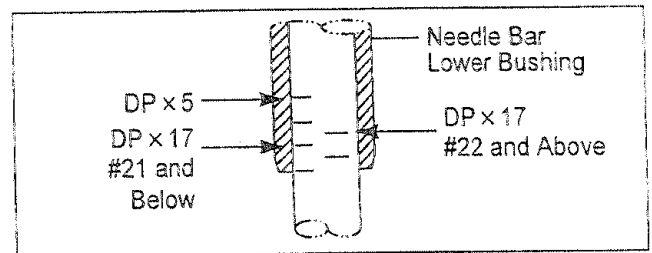
When the needle bar is at its lowest position, unfasten the needle bar holder screw ①. Adjust the desired height by making the specified upper carving line fit in with the needle bar bushing. Then, tighten the needle bar holder screw back on firmly.



[Fig. 28]

2) Adjusting the Needle and the Shuttle

A. Have the lower carving line for the needle that is applied when the needle bar goes up fit in with the lower side of the needle bar bushing as shown in the picture.

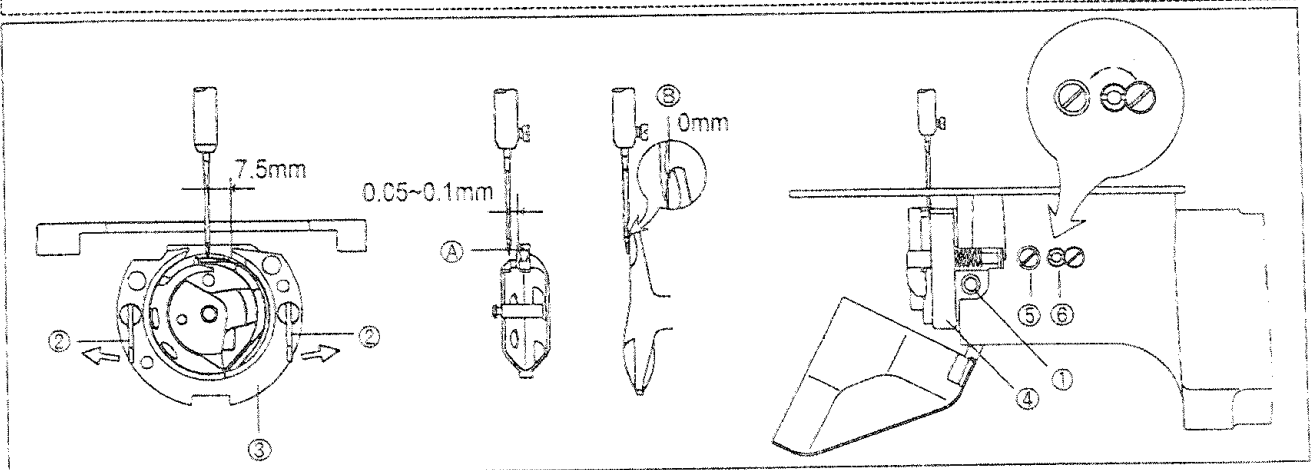


[Fig. 29]

- B. After unfastening the shuttle drive screw ①, open the inner hook pressure bar ② left to right and remove the shuttle Race ring ③ from the (large) shuttle ④.
- C. Make the shuttle hook point ④ accord with the center of the needle. And make the needle and the front face of the shuttle drive ⑤ connect each other to prevent the needle from curving. Then, tighten the drive screw ① firmly.
- D. After unfastening the (large) shuttle screw ⑤, turn the large hook adjustment shaft ⑥ to the left to right and adjust the (large) shuttle ④ so that the needle and the shuttle hook point ④ is 0.05~0.1mm apart from each other.
- E. After adjusting the (large) shuttle ④ in place, adjust the rotary direction of the (large) shuttle ④ so the needle and the (large) shuttle ④ is 7.5mm apart from each other. Then, tighten the (large) shuttle screw ①.

[Caution]

For safety, make sure all the screws are tightened firmly after adjusting the (large) shuttle.



[Fig. 30]

3) Adjusting the Lower Shaft Gear and the Rocking Shaft Gear

- A. Unfasten screws ① and ②.
- B. While having the upper shaft turning, move the rocking shaft gear in the direction of the arrow to the position where it will move easily without load.

[Caution]

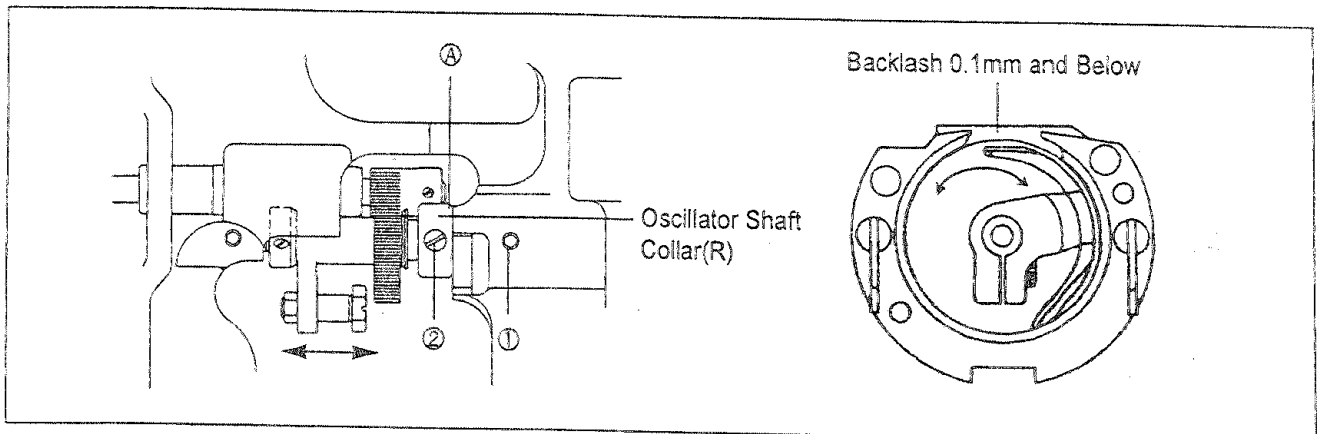
The machine may not operate when the rocking shaft gear is not in the right position.

- C. Have the oscillator shaft collar(right) stick to the bed surface ④, and then tighten the collar screw.
- D. Turn the oscillator shaft collar(right), still sticking to the bed surface ④, in the direction of the arrow and make adjustments so the end of the shuttle drive will rotate smoothly with the backlash of under 0.1mm.

[Caution]

If there is too much backlash the machine may make more noise than usual during operation. And if there is not enough backlash, the machine may not operate.

- E. Tighten screw ① back on firmly.



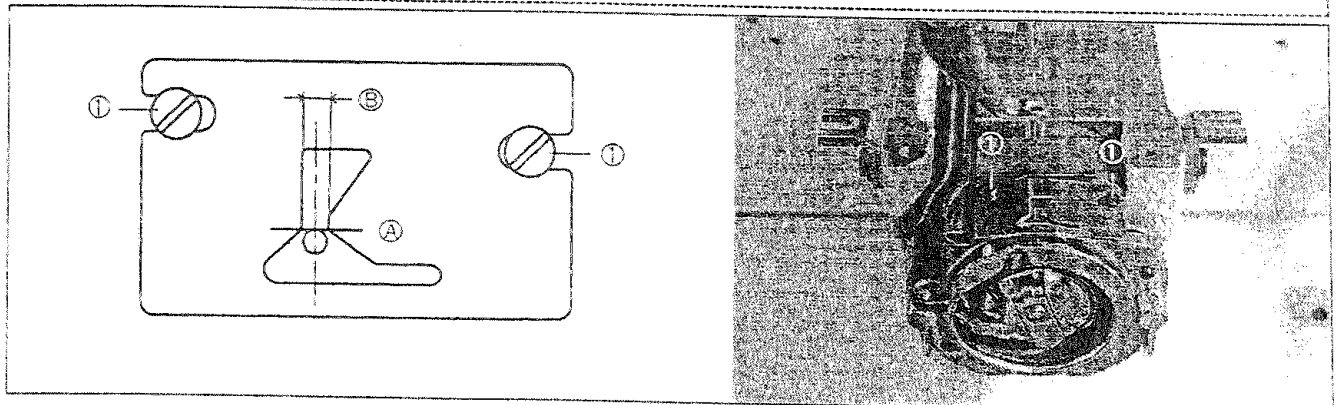
[Fig. 31]

4) Adjusting the Spring on the Upper Side of the Shuttle

After removing the lower feed plate and the needle plate from the machine, unfasten the screw of the spring on the upper side. Then, adjust the spring on the upper side of the shuttle so that the backside of the needle and comes to point ④ in the vertical direction, and the center of the needle will come to the middle of interval ③ horizontally. After the adjustment is done, tighten the screw back on firmly.

[Caution]

The thread may be disconnected or the thread strand may be unfastened if there are scratches or if the surface is rough around the spring groove on the upper side of the shuttle. Always check the surface of the spring before operating the machine.



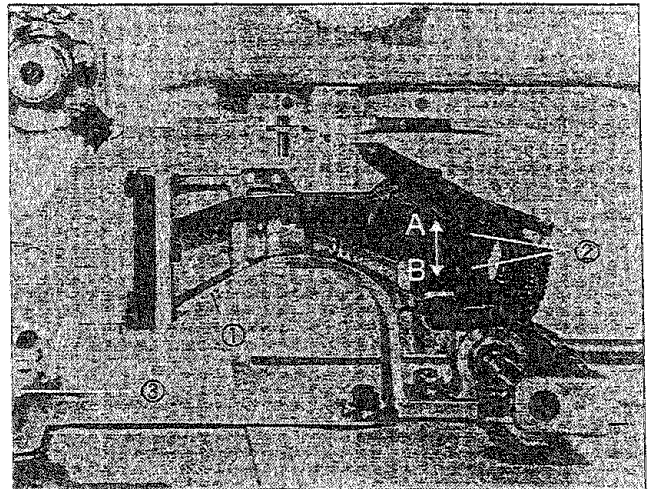
[Fig. 32]

5) Adjusting the Height of the Feed Plate

After unfastening the lifting lever control plate screws ② on each side of the feed bracket ①, raise the control plate in direction A to lower the upper feed plate ③ and lower the control plate in direction B to heighten. Tighten the lifting lever control plate screws back on firmly after adjusting the height of the upper feed plate.

[Caution]

Tighten all the screws back on completely after adjusting the feed plate height.



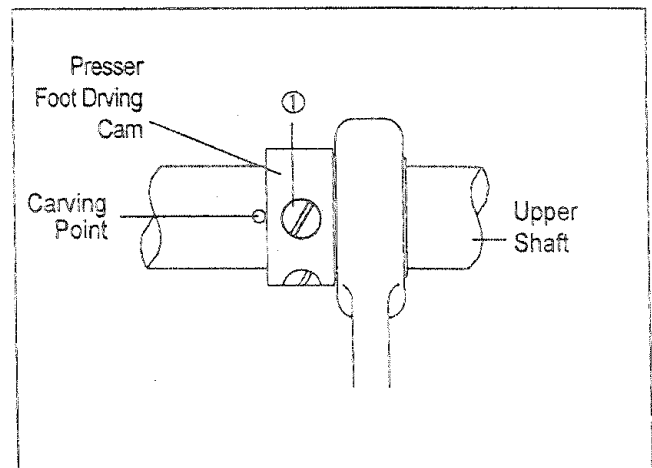
[Fig. 33]

6) Adjusting the Presser Foot Devices

A. Have the end of the presser foot drive cam accord with the carving point center of the upper shaft, and the line of the cam accord with the carving point. Tighten screw ①.

[Caution]

If the presser foot drive cam is not in the right position, the presser foot may not move vertically in time and run into the needle bar.



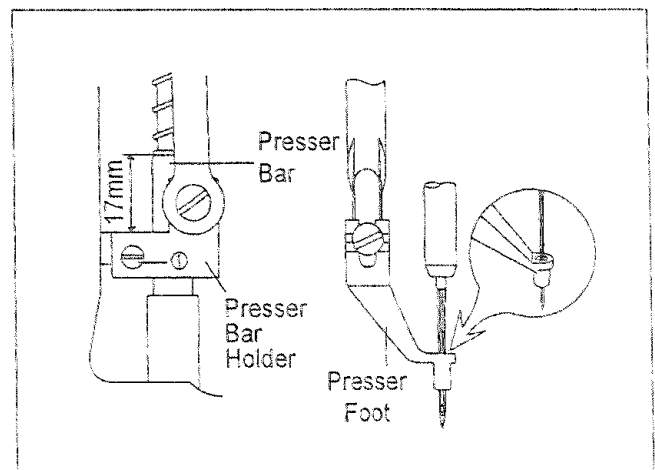
[Fig. 34]

B. Height Adjustment of Presser Bar

Adjust the presser bar that end of presser bar should come out about 17mm from presser bar handle and check if the needle passes through center of presser bar. If checking ends, fasten joint screw ①.

[Caution]

Fasten joint screw ① of presser bar with the pressure about 40-45kgf/cm². If connection pressure is excessive, it becomes cause of deformation of presser bar and cause trouble to machine operation.



[Fig. 35]

C. Adjustment of Presser Foot Adjusting Arm

- Unscrew location link stopper screw to make space between location link stopper ④ and fixing stud screw of presser foot motion link ③.
- After unscrewing fork link joint screw ① and placing stud screw of presser foot link to the right side of presser foot adjusting arm, fasten stud screw ② of presser foot link tightly.
- Place the needle bar to the lowest point by turning the hand pulley.
- Raise the presser bar so that the distance between presser bar handle and presser bar bush is to be 4mm and fasten the joint screw ① of fork link tightly.

[Caution]

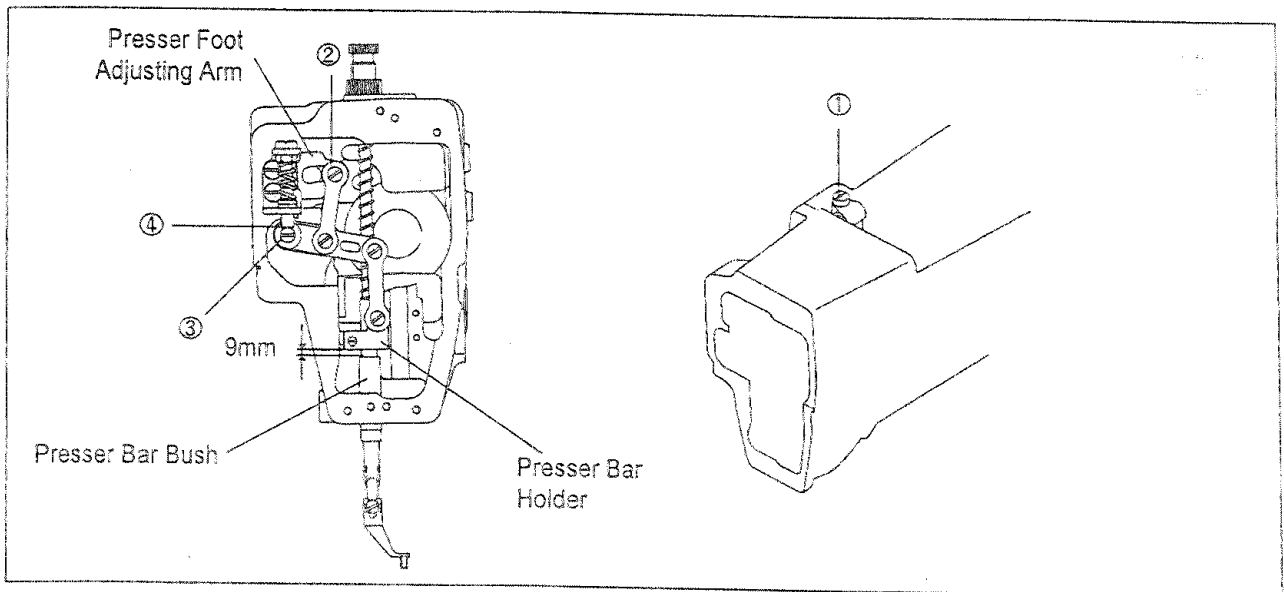
If there is space between presser bar handle and presser bar bush, interference and noise is occurring during machine operation. Screws are not fastened tightly after adjustment; it can cause breakage during operation.

- Adjust so that location link stopper ④ and fixing stud screw of presser foot motion link ③ get close by turning stopper screw of location link.

[Caution]

If fixing stud screw ③ of presser foot motion link and end of the location link stopper ④ did not get perfectly close, trembling phenomenon occurs during operation and noise can increase.

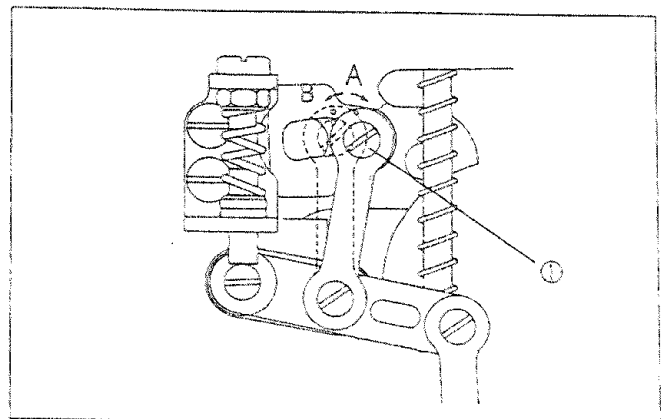
- After fastening fork link joint screw ① tightly, check if there is play to vertical direction in presser foot adjusting arm. Checking fastening status of screws, adjust presser foot stroke.



[Fig. 36]

D. Adjustment of Presser Foot Stroke(Adjustment of Presser Foot UP/DOWN Motion)

After unfastening stud screw ① of presser foot adjusting arm, placing it to A direction, presser foot stroke increases. Placing to direction B, stroke decreases. (It is set to 4mm at the moment of factory shipping).



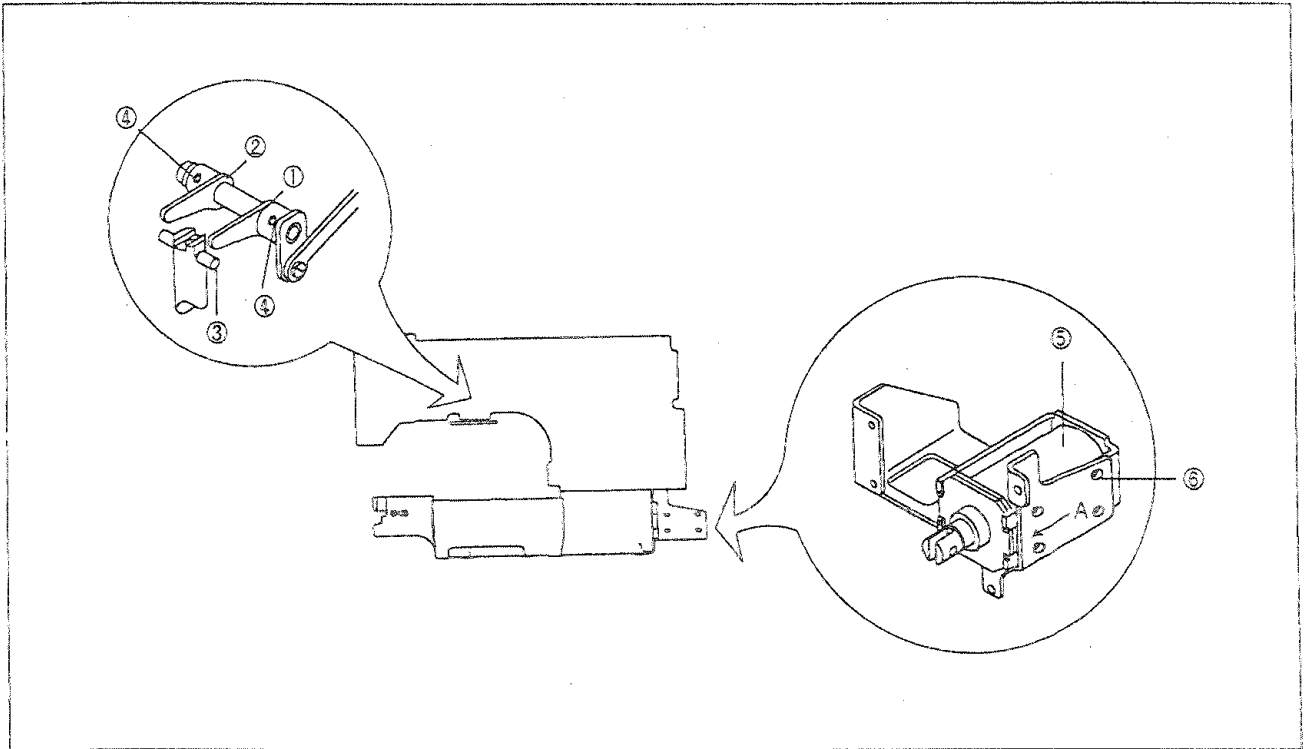
[Fig. 37]

7) Adjusting the Parts for the Presser Plate

Place the left ① and right ② presser plate arms closer to each other so both arms will press the presser plate shaft pin ③ equally and tighten screw ④. If thin material is to be sewed or if the presser is too weak, adjust the presser foot solenoid ⑤ in direction A and tighten screw ⑥.

[Caution]

The screws may be damaged when the left and right presser plate arms are not set in the same angle. If the presser plate solenoid is adjusted too much in direction A the presser plate may go up, and the presser may become weak or the presser plate may be returned if adjusted too much in the opposite direction.



[Fig. 38]

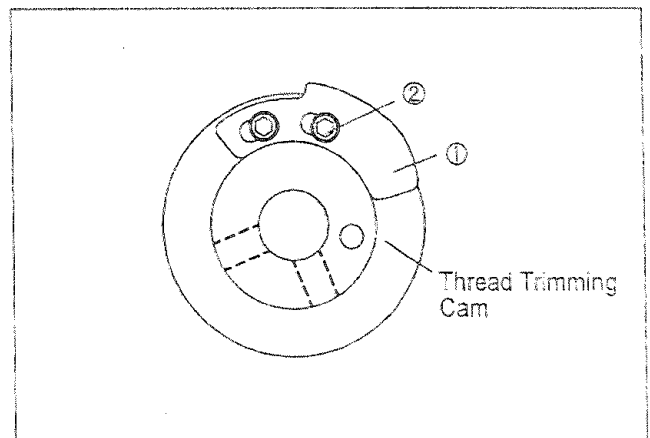
8) Adjusting the Parts for Thread Release

A. How to Set the Thread Release Notch

Place the notch so that the right side of the slot of the thread release notch ① touches circumference of the notch screw ②, and then fix with a screw.

[Caution]

The remaining amount of thread may not be enough or not be regular and the thread may be unfastened from the needle if the notch is not set in the right position.



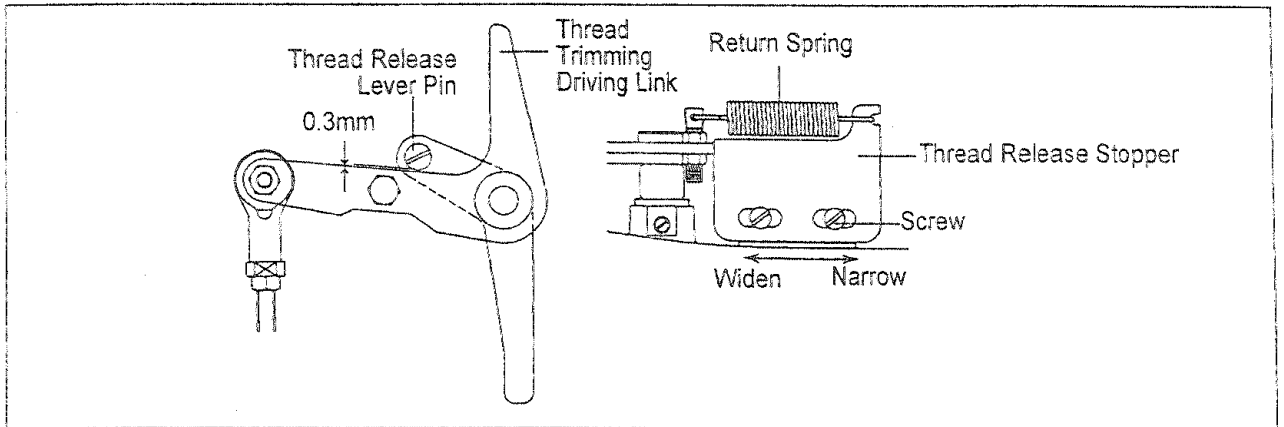
[Fig. 39]

B. How to Set the Thread Release Stopper

- ㊸ Remove the thread release return spring.
- ㊹ After unfastening the thread release stopper screw, adjust the trimming drive link and the thread release lever pin 0.3mm apart from each other. Then, attach the arm to the thread release stopper completely. When the thread release stopper is pushed to the right, the space between the trimming drive link and the thread release lever pin is reduced. And it is enlarged when the stopper is pushed to the left.
- ㊺ Hang on the thread release return spring.

[Caution]

Use a tool when removing or attaching the thread delay spring to prevent accidents.



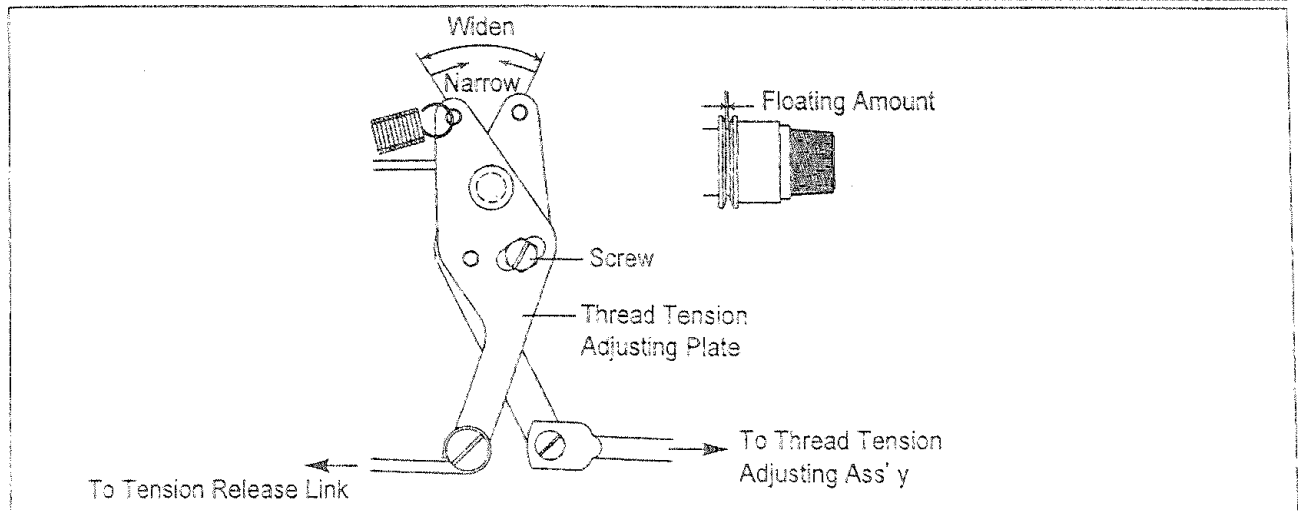
[Fig. 40]

C. How to adjust the opening capacity of the thread guide disk

- ㊻ Unfasten the thread release adjusting plate screw.
- ㊼ Open the thread guide disk by operating the trimming devices.
- ㊽ Adjust the opening capacity to 0.6~0.8mm for normal material and 0.8~1mm for heavy material. To increase the opening capacity, widen the angle between the thread release plate and narrow the angle to reduce the opening capacity.
- ㊾ Tighten the screw after the adjustment.

[Caution]

If the disk is not opened appropriately, the amount of remaining thread may be not enough or not regular, and the disk may not be closed completely.



[Fig. 41]

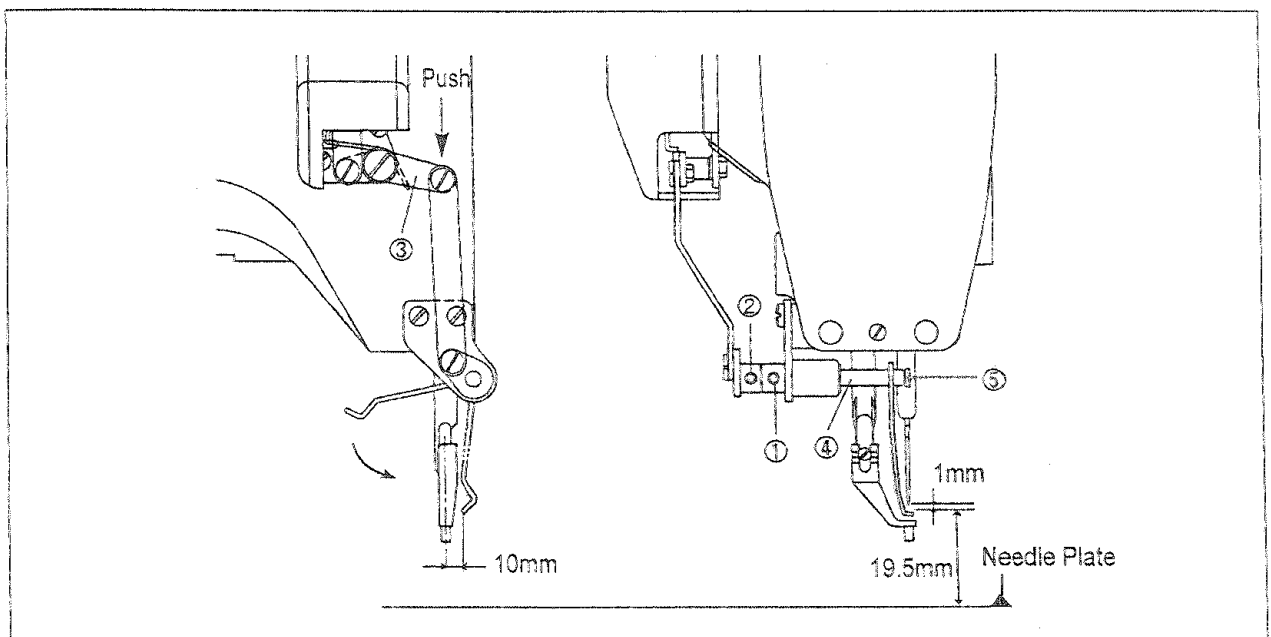
9) Adjusting Parts for the Wiper

A. Adjusting the Wiper Position

- Ⓐ Unfasten the wiper rotary shaft collar screw ① and the wiper crank screw ② when the needle tip is 19.5mm above the needle plate
- Ⓑ Press the wiper rocking link ③, then adjust the wiper shaft ④ so the wiper and the needle is about 10mm apart from each other.
- Ⓒ Tighten the wiper rotary shaft collar screw ① and the wiper crank screw ②.
- Ⓓ Unfasten the wiper screw ⑤ and adjust the wiper so that the end of the wiper is about 1mm apart from the needle end. Then, tighten the screw back on firmly.

[Caution]

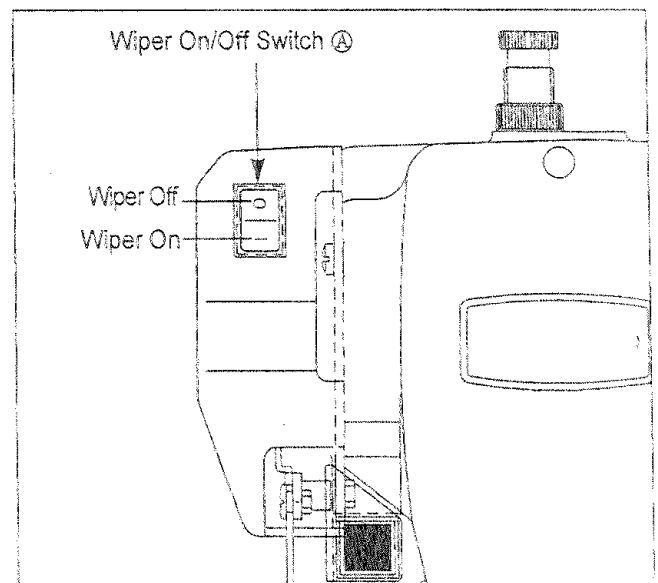
If the wiper is not placed in the right position, the wiper may collide with the presser foot or needle during the operation, and the wiper may not move properly.



[Fig. 42]

B. Wiper On/Off Switch

If you want to use the wiper, press the Wiper On/Off Switch ④ —, if you don't, press the Wiper Operating Switch ④ ○.



[Fig. 43]

10) Adjusting the X-Y Parts

A. Adjusting the tension of the X-timing Belt

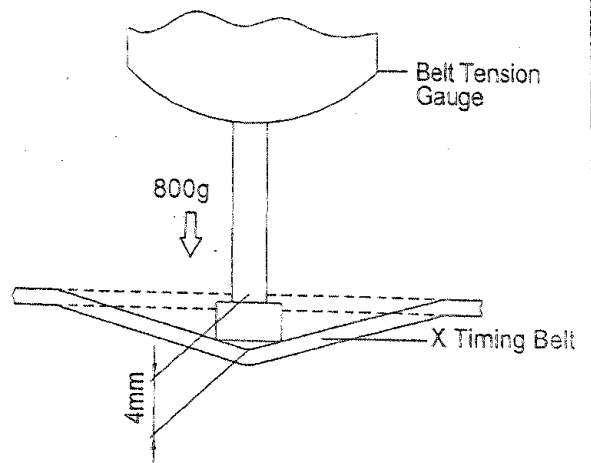
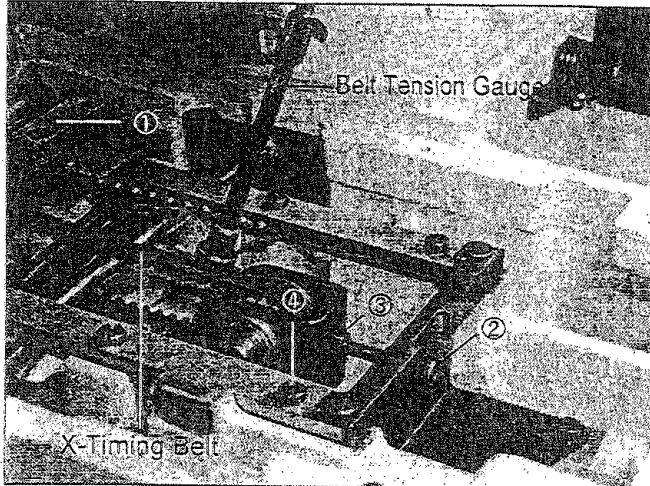
③ Move the race table ① to the left.

⑤ Use the tension gauge to adjust the X-tension adjustment bolt ② so that 800g of load is applied 4mm longer on the timing belt. Tighten the nut ③ after the tension is adjusted.

[Caution]

If the timing belt is too tense, the belt may be damaged, and if the belt is too relax, the transfer in direction X may become difficult.

④ Tighten the X-bracket screw ④.



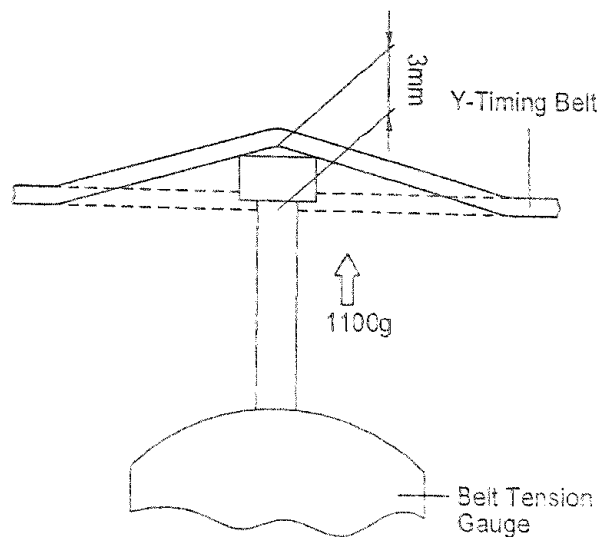
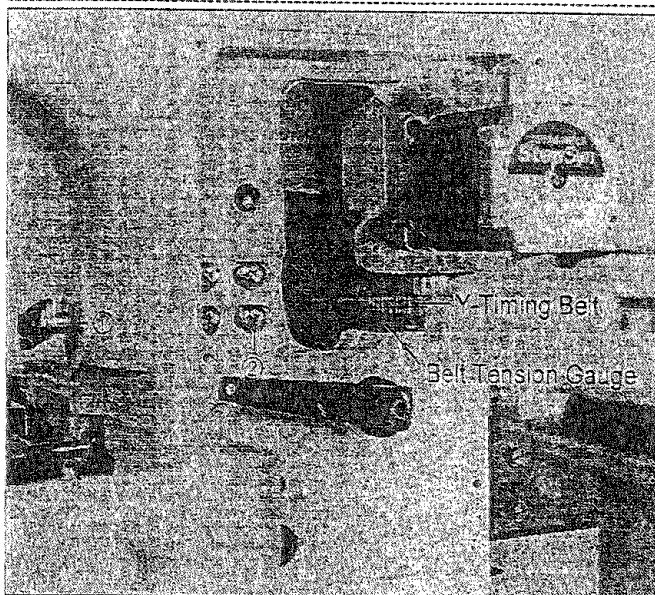
[Fig. 44]

B. Adjusting the tension of the Y-timing Belt

Use the tension gauge to adjust the Y-tension adjustment bolt ① so that 1100g of load is applied 3mm away from the center of the timing belt. Then, tighten the Y-bracket screw ②.

[Caution]

If the timing belt is too tense, the belt may be damaged, and if it is too relax, the transfer in direction Y may become difficult.



[Fig. 45]

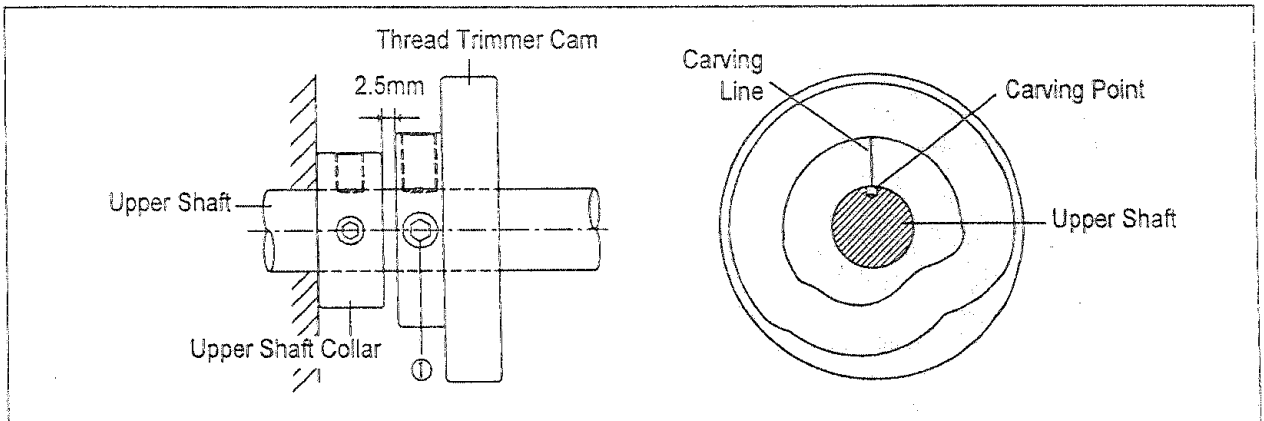
11) Adjusting the Trimming Parts

A. Setting the position of the trimming Cam

Set the upper shaft collar and the trimming cam 2.5mm apart from each other and place the trimming cam where the trimming cam carving line accords with the upper shaft carving point. Then, tighten screw ①.

[Caution]

If the trimming cam is not placed in the right position, the trimming operation may not be made correctly or the machine may be lock.



[Fig. 46]

B. How to adjust the link stopper

- ④ With the needle bar in its lowest position, check if there is enough clearance between the trimming cam roller and both ends of the trimming cam when the trimming drive link is pushed in the direction of the arrow(←) within the trimming cam moving part.

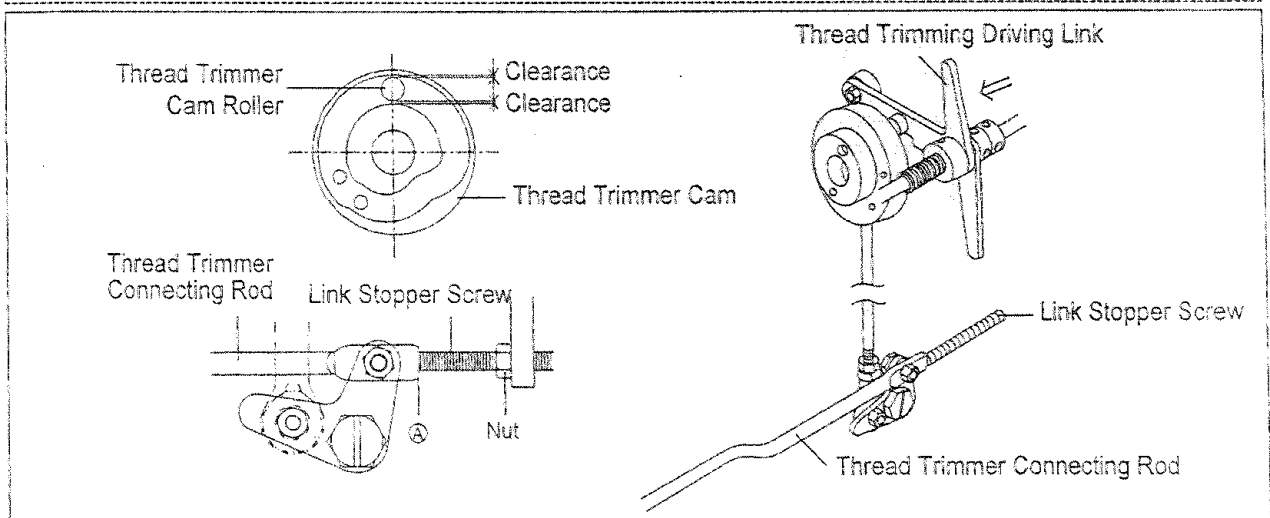
[Caution]

If there is not enough clearance between the trimming cam roller and both ends of the trimming cam, trimming may not be operated correctly or the machine may be lock when beginning to sew or trimming.

- ⑤ Make the end of the link stopper screw touch part ④ of the trimming link stick when the trimming cam roller is inserted into the trimming cam moving part. Then, tighten the nut.

[Caution]

If the position is not set appropriately, the return to the previous point after trimming may be delayed and the first stitch may not be tight enough.



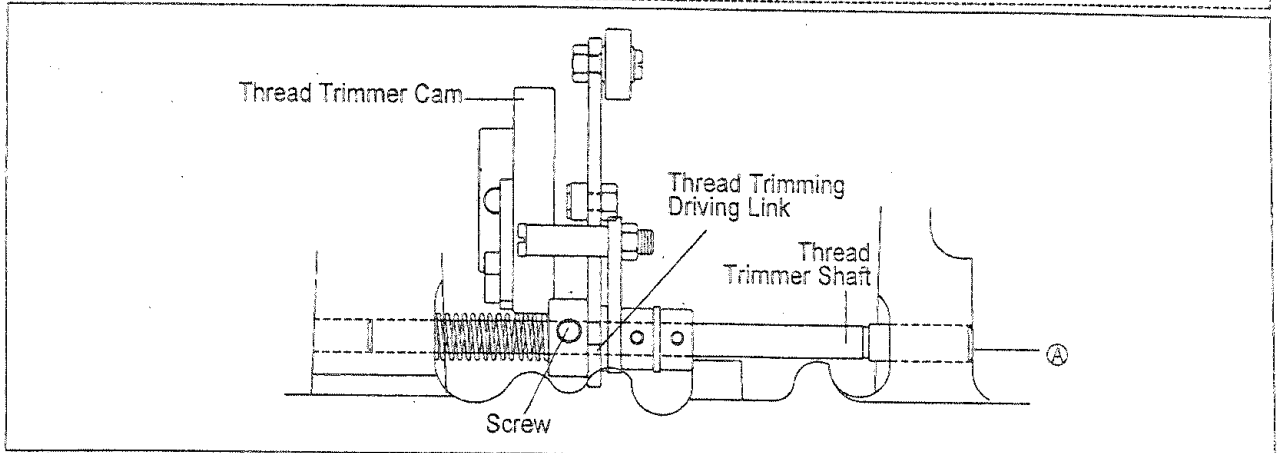
[Fig. 47]

C. Setting the trimming shaft in place

- Ⓐ Unfasten the trimming drive link screw and the trimming shaft collar screw.
- Ⓑ Make the trimming shaft tip accord with part Ⓐ of the arm.
- Ⓒ Tighten the screws.

[Caution]

If the position is not adjusted appropriately, trimming may not be operated correctly or the machine may be lock.



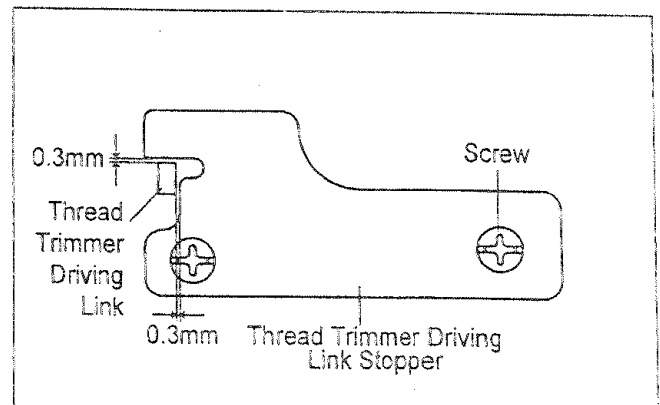
[Fig. 48]

D. Setting the Link Stopper in Place

- Ⓐ Unfasten the trimming drive link stopper screw while trimming is not operated and have the trimming drive link and the trimming drive link stopper notch 0.3mm apart from each other.
- Ⓑ Tighten the screw.

[Caution]

If the link stopper is not set in the right position, trimming may not be operated correctly and the machine may be struck.



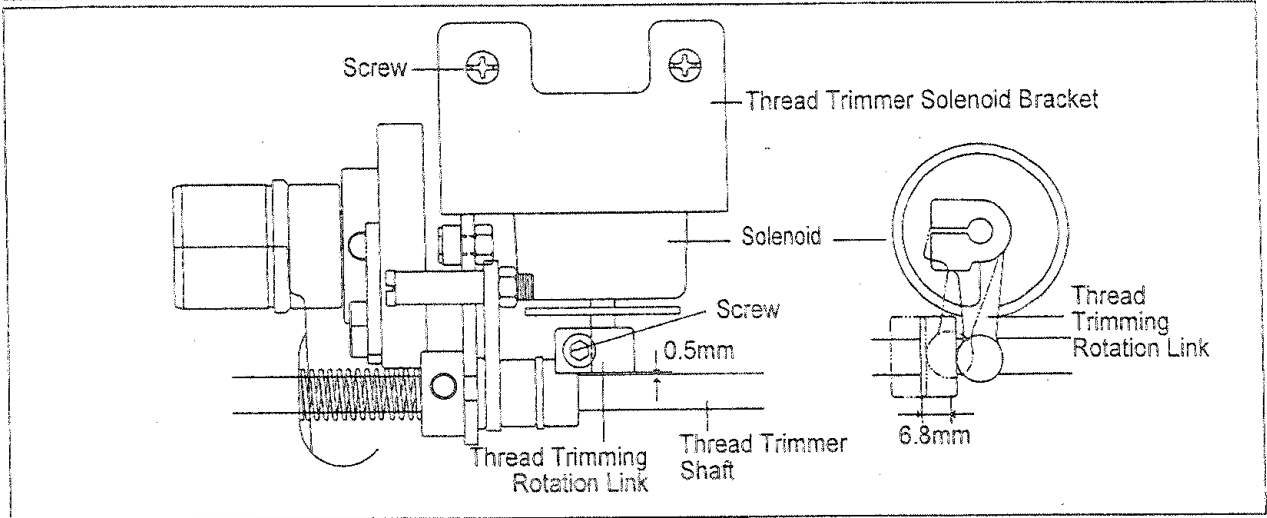
[Fig. 49]

E. Setting the Thread Trimming Solenoid in Place

- Ⓐ After unfastening the thread trimming solenoid bracket screw, have the trimming shaft and the thread trimming solenoid rotary link 0.5mm apart from each other and tighten the screw back on.
- Ⓑ Unfasten the thread trimming solenoid rotary link screw and drive the thread trimming solenoid rotary link manually to move the trimming shaft collar 6.8mm in the direction of the arrow. Then, tighten the screw back on.
- Ⓒ Check if the trimming shaft collar returns to its place when the thread trimming solenoid rotary link returns.

[Caution]

if the position is not set right, the trimming return or the thread delay may be delayed to bring poor sewing quality.



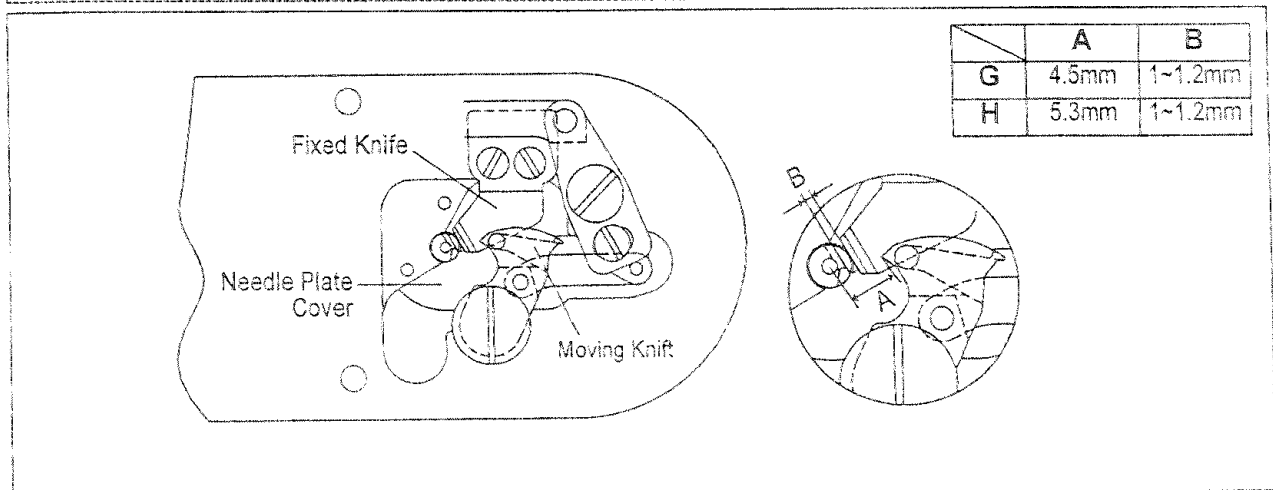
[Fig. 50]

F. Adjusting the Moving Knife and the Fixed Knife

- Ⓐ When the needle bar stops at the upper position, use the trimming lever adjustment screw to adjust space A between the thread separation point of the moving knife and the needle plate hole as indicated in the table.
- Ⓑ Use the fixed knife screw to adjust space B between the fixed knife and the needle plate cover as indicated in the table.
- Ⓒ after the adjustment, check the position of the knife by manual trimming operation.

[Caution]

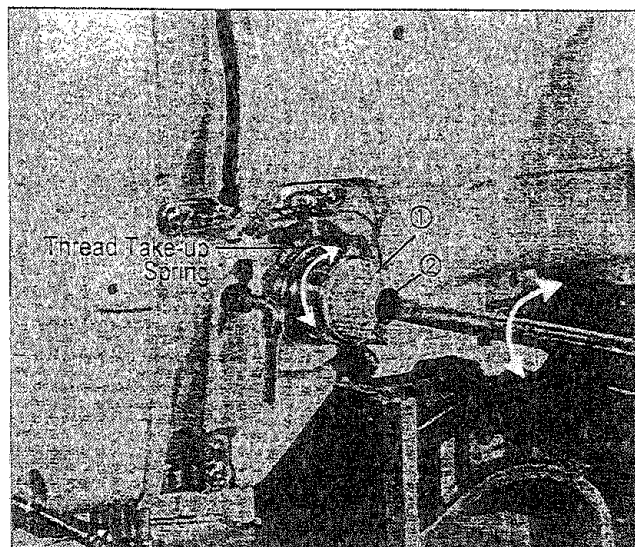
Trimming may not be operated or there may not be enough remaining thread if the knife is set inappropriately.



[Fig. 51]

12) Adjusting the Main Thread Control Device

- A. When the tension control nut ① of the thread control device is turned clockwise, the upper thread is tightened and becomes loose as the nut is turned counterclockwise. Adjust the tension according to the sewing conditions such as material, thread, number of stitches etc.
- B. To tighten the take-up lever spring, use a driver to turn the groove ② on the edge face of the thread tension control device shaft clockwise. And to make the spring relax, turn it counterclockwise.



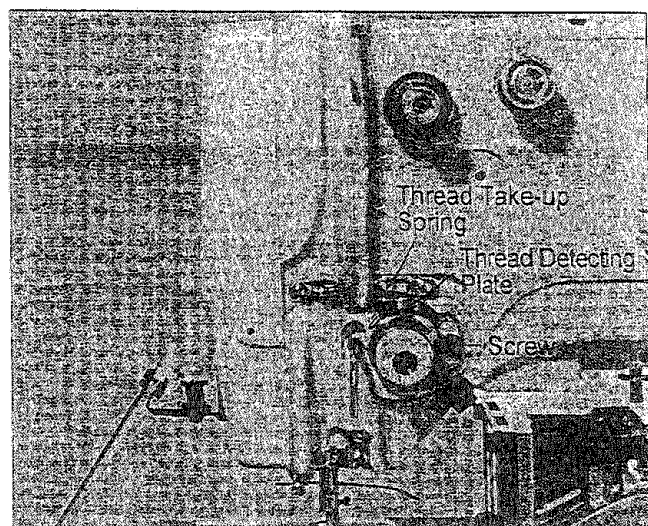
[Fig. 52]

13) Adjusting the Upper Thread Detecting Device

- A. Unfasten the thread detecting plate screw with the thread off the take-up spring and make the take-up lever spring touch the detecting plate. Then, tighten the screw.
- B. Be sure to adjust the detecting plate so the take-up lever spring and the detecting plate will connect with each other even when the take-up lever spring stroke changes.

[Caution]

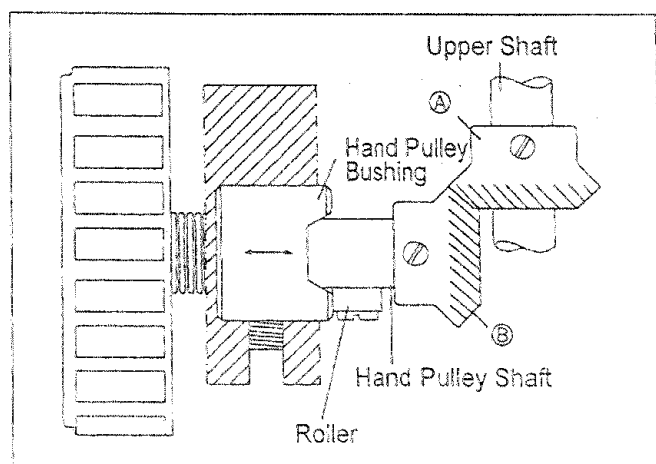
Be careful not to touch with any other metals except take-up lever spring. If it does, detection may be failed.



[Fig. 53]

14) Adjusting the Hand Pulley Device

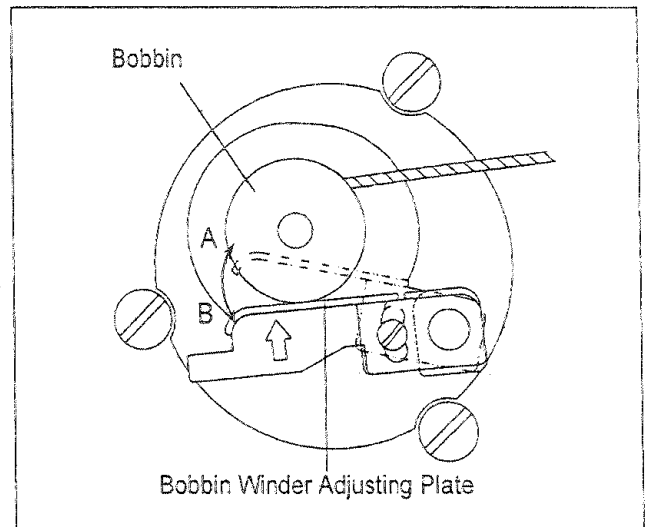
- A. Tighten the screw after putting the hand pulley gear ② and the hand pulley shaft tip in accord.
- B. Adjust the clearance of hand pulley gears ① and ② and tighten the screws.
- C. Move the bushing in the direction of the arrow to reduce the backlash between gears ① and ② when the roller is on the end of the pulley bushing.



[Fig. 54]

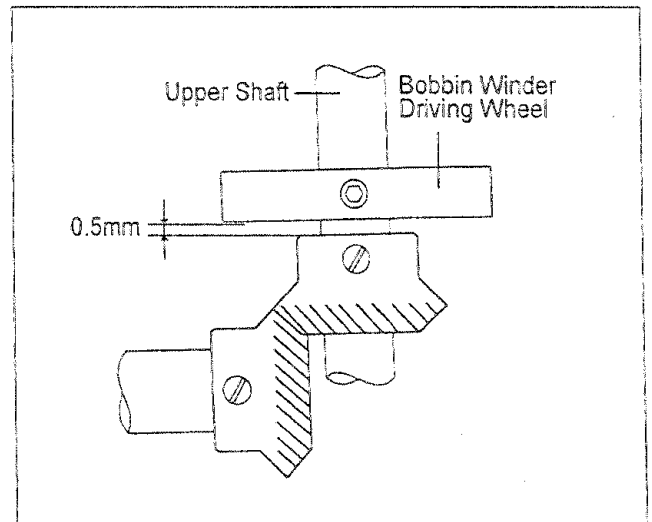
15) Adjusting the Winding Device

- A. To adjust the winding capacity of the bobbin, use the beginning position of the winding control plate, and after unfastening the screw, turn the plate in direction A for large winding capacity and turn in direction B for small winding capacity.



[Fig. 55]

- B. Place the winding drive wheel 0.5mm away from the hand pulley gear and tighten the screw.

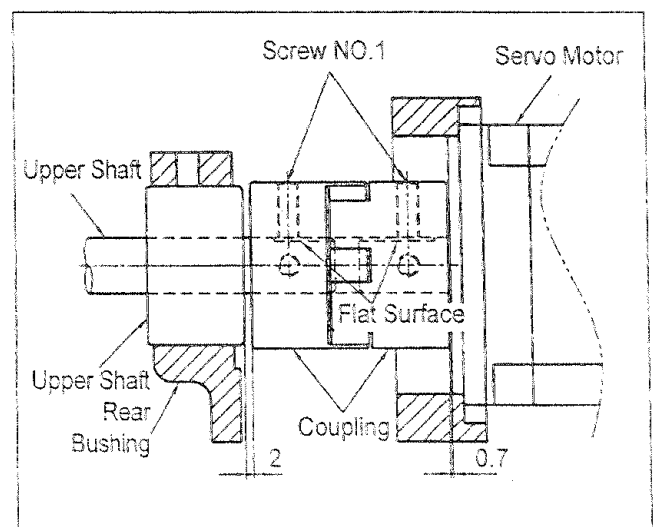


[Fig. 56]

16) Mounting the Direct Motor and Adjusting Method

- A. When you mount the coupling on the servo-motor, fit the screw No.1 of coupling to the flat surface of the servo motor shaft and make the clearance between the coupling and servo motor 0.7mm.
- B. When you mount the coupling on the upper shaft, fit the screw No.1 of coupling to the flat surface of the upper shaft and make the clearance between the coupling and upper shaft bushing(R) 2mm.
- C. After mounting both couplings, check the positions of each screws to the aligned.

※ If the positions of each screws are not aligned, the needle does not stop normal position.

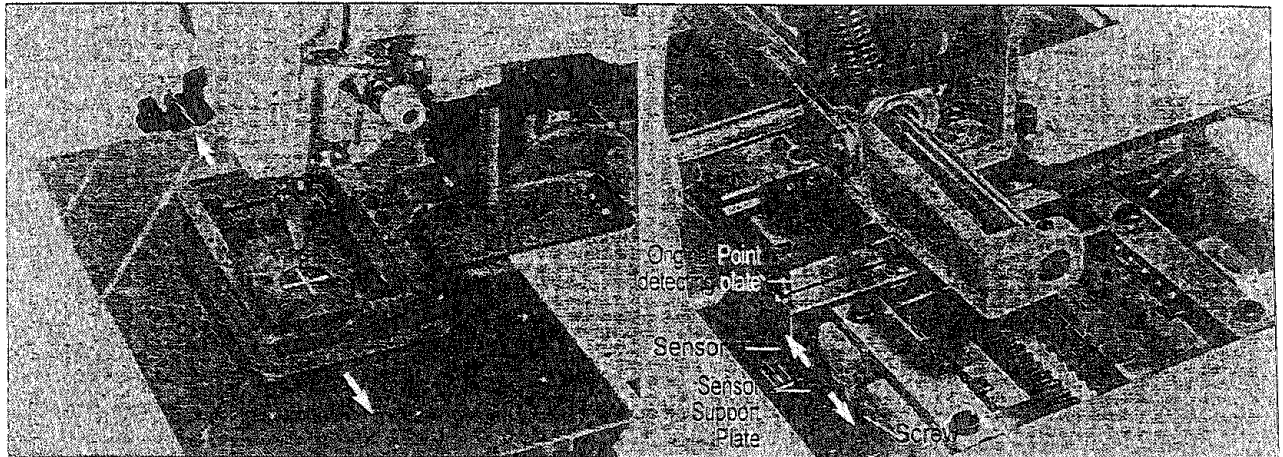


[Fig. 57]

17) How to Set the Original Point of X-Y

A. How to set the original point of the X-axis

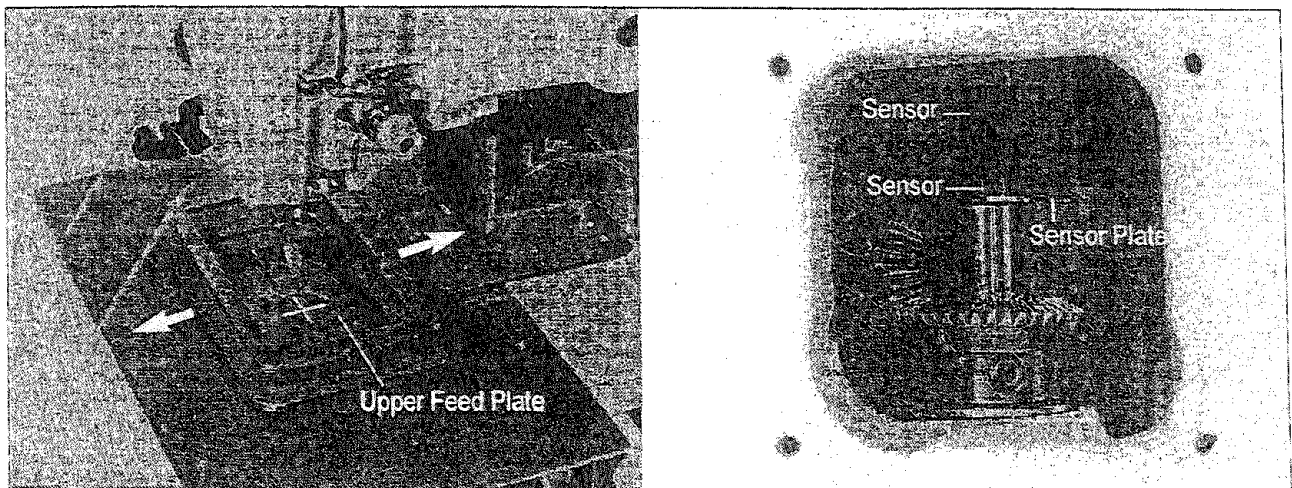
- Ⓐ Remove the lower feed plate, X-fixed cover, and transport cover.
- Ⓑ Place the upper feed plate center in the middle of the X-axis direction.
- Ⓒ Unfasten the two screws of the X-axis original point detecting sensor supporting plate and have the X-axis original point detecting plate on the X-Y transfer system placed in the center of the sensor as shown in the picture. Then, tighten the screw with the + driver.



[Fig. 58]


B. How to Set the Y-axis Original Point

- Ⓐ Remove the Y- stepping motor cover.
- Ⓑ Move the upper feed plate to the middle of the Y-axis direction.
- Ⓒ Unfasten the screw and place the Y-axis original point detecting plate in the center of the original point detecting sensor as shown in the figure. Then, tighten the screw with the L wrench.



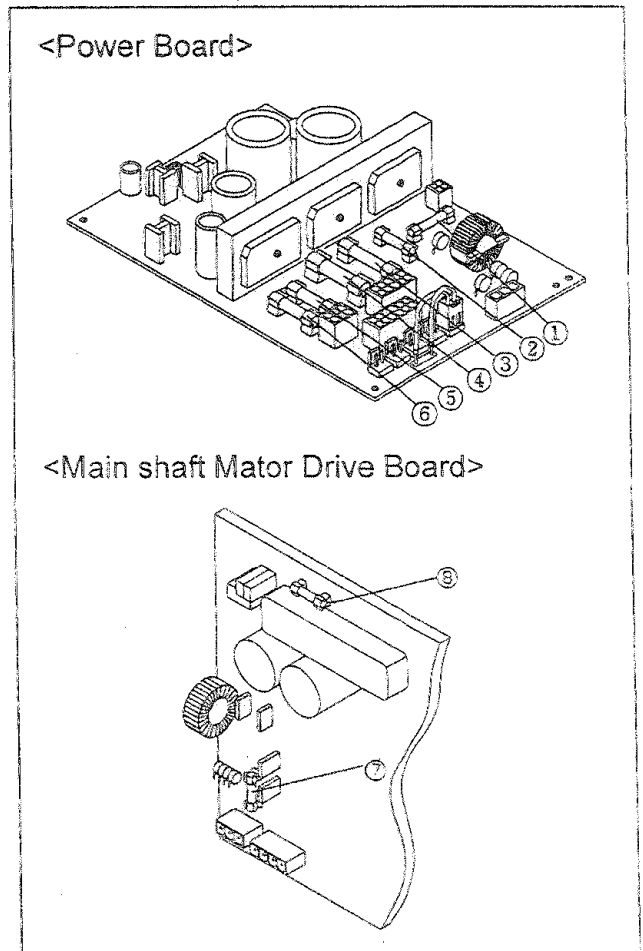
[Fig. 59]

18) Exchanging the Fuse

 Caution	<ul style="list-style-type: none"> ■ To prevent from electric shock, turn off the power and wait 5 minutes, then open the cover ■ Be sure to turn off the power and exchange into the fuse of the designated quantity after opening the cover of control box.
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8 Fuses are used.

No.	Quality	Use
①	0.5A	For the Protection of thread sensor
②	3A	For the Protection of control power
③	7A	For the Protection of actuator
④	5A	For the Protection of step driver
⑤	0.5A	For the Protection of step - aux
⑥	INPUT 110V 7A INPUT 220V 5A	For the Protection of Main power
⑦	6.3A	For the Protection of servo motor
⑧	0.5A	For the protection of servo motor drive



[Fig. 67]

7

CAUSES OF BREAK-DOWN AND TROUBLESHOOTING

No.	Type of Breakdown	Cause	Troubleshooting
1	Error on operation or drive of machine	Loosing of belt tension and damage on belt	Adjust the belt tension or exchange it
		Fuse shortage for main power or circuit	Check the fuse shortage of main shaft drive motor in a controller box or exchange it
		Deviation from Y and Y limit of feed bracket	Move the feed bracket to normal place (inside limit switch)
2	Bad position of stopping position	Slackness of main drive belt	Adjust the belt tension
		Wrong position of upper shaft sensor plate or photo sensor	Adjust the position of upper shaft sensor plate or exchange the photo sensor
3	Needle bent	Damage on needle(Bending of needle, cracks on needle hole or groove, and abrasion or transformation of needle tip)	Exchange the needle
		Wrong installation of needle	Install the needle properly
		Contact of needle with shuttle	Adjust the distance properly between a needle and shuttle
4	Thread is cut	Wrong insertion of thread	Insert the thread properly
		Wrong installation of needle (Height of needle or direction of needle)	Reinstall the needle
		Damage on needle (Bending of needle, cracks on needle hole or groove, and abrasion or transformation of needle tip)	Exchange the needle
		Excessive tension of upper thread and under thread	Adjust the tension
		Excessive tension and stroke of take-up lever spring	Adjust the tension and stroke of take-up lever spring
		Crack on the controlling hole of shuttle surface spring	Exchange the shuttle surface spring
5	Stitch skipping	Use of bending needle	Exchange the needle
		Use of improper sized needle compared with using thread	Exchange the needle
		Wrong installation of needle	Reinstall of needle
		Improper timing for a needle and shuttle	Readjust the timing for a needle and shuttle
		Large interval between a needle groove and shuttle point	Readjust the timing for a needle and shuttle
		Excessive tension of take-up lever spring and stroke	Adjust the tension of take-up lever spring and stroke

No.	Type of Breakdown	Cause	Troubleshooting
6	Ineffective sense of upper thread	Bad connection between take-up lever spring and detecting plate	Clean up the take-up lever spring and detecting plate. Adjust the tension of take-up lever spring and connecting condition of detecting plate
		Bad connection of wire with thread sensor plate	Reconnect the wire with thread sensor plate
7	Poor quality of thread tightening	Weak tension of upper thread	Adjust the tension of upper thread
		Weak tension of under thread	Adjust the tension of under thread
		Improper timing of needle and shuttle	Readjust the timing of needle and shuttle
8	Mistakes of Trimming	Slackness of exchange tension between moving mes and fixed mes	Adjust the tension of fixed mes
		Groove abrasion on blade of moving mes and fixed mes	Exchange the moving and fixed mes
		Wrong position of trimming cam	Readjust the position of trimming cam