
*
* COMPACT DOUBLE CHAIN STITCH SYSTEM *
*
* MULTIPLE NEEDLE QUILTING MACHINE *
*
*
* INSTRUCTION MANUAL . *
*

S T I C K I N G L A B E L S

There are labels sticking down on this machine.
They are warnig / cautioning machine operators to give their
best attentions when they touch the machine.

Folowings are the meanings that the labels are warning /
cautioning.

Machine operator always be sure to know meaning on these warnings
/ cautions and follow whenever they operates the machine.

a:Warning for High Voltage
electric power.



b:Caution to prevent hands
fingers touch danger done.



c:Caution to prevent hands
fingers touch Hot part.



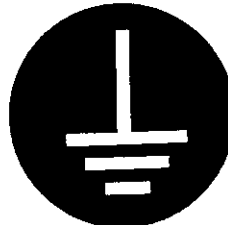
d:Caution for poisonous gas.



e:Causion to operate machine
without gards, covers.



f:Earthing is necessary.

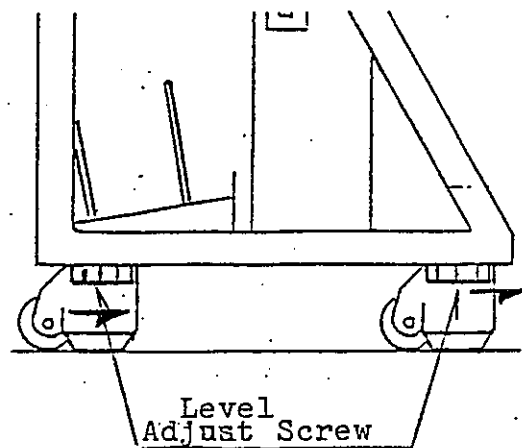
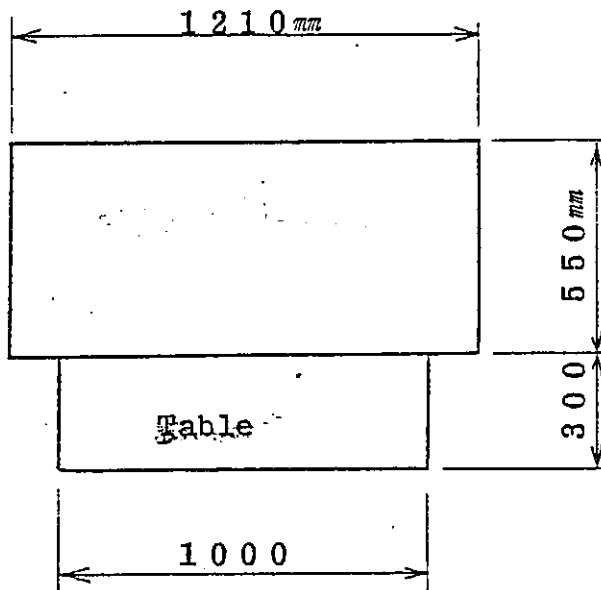


INSTALLATION

It is recommended to use a fork lift for installation and moving of the machine whenever possible.

The position of the fork lift to scoop the machine is about 200mm inside from the legs on both sides with care placed in the balance.

- 1) The installation site of the machine should be of size shown in the sketch below.
- 2) Casters with level adjusters are equipped onto the legs of the machine. Positioning at the installation site and levelling should be done with these casters.
- 3) Turn the level adjusting screws towards the direction of the arrows until the wheels of the casters are lifted off from the floor.



ELECTRIC WIRING

1. Power wiring

Perform wiring work between the machine and the input power. 3 ϕ , 200V-50Hz, 200/220V-60Hz

Power consumption: Abt. 1.1 kVA (Power facility capacity: 2.8 kVA)

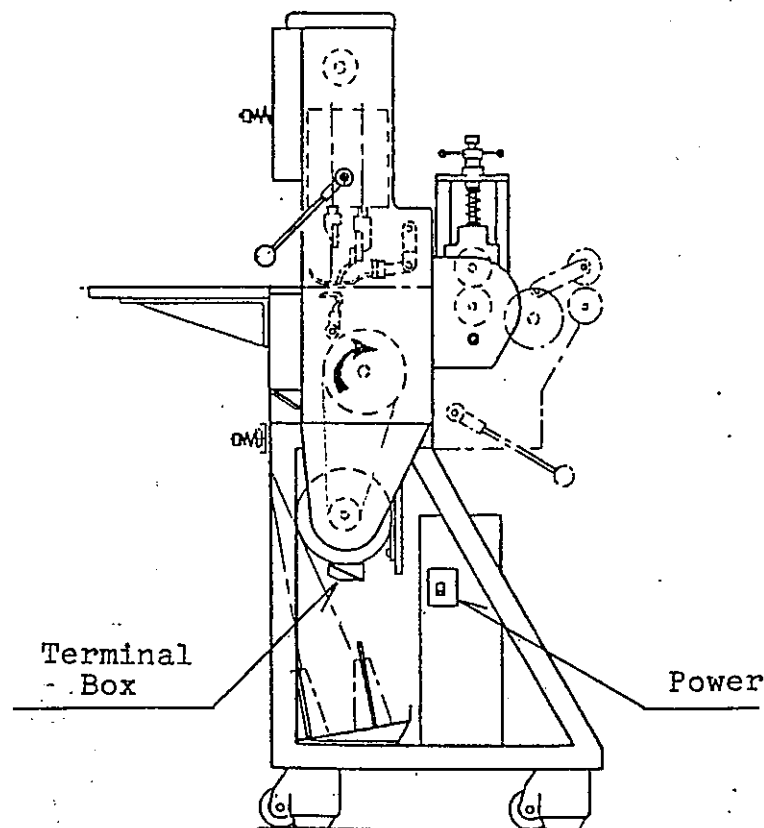
2. Grounding

Always make sure to ground the machine.

3. In the case of non-standard voltage, transform to the above voltage with use of a transformer.

This machine is of inverter control system making adjustment of the turning direction unnecessary.
(The turning direction does not change even when the phases of the power are interchanged.)

The turning direction shall change in accordance with the connection of the motor terminals at time of repair and replacement of the motor, therefore, always make sure to confirm the direction of turn.



LUBRICATION

Always oil the following places with 2 - 3 drops of oil prior to operating the machine.

1. Above and below the needle bar metal.
2. Looper bearings.
3. Thread unraveller rocker bearing.
4. Other bearings and rod ends.

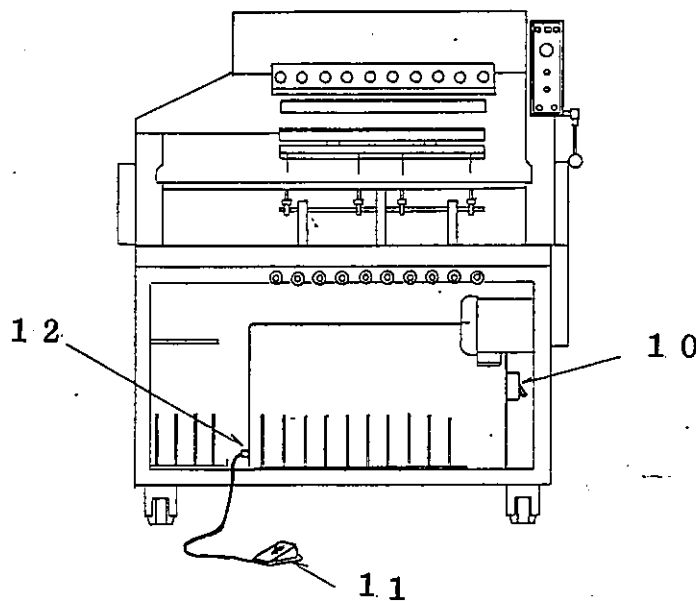
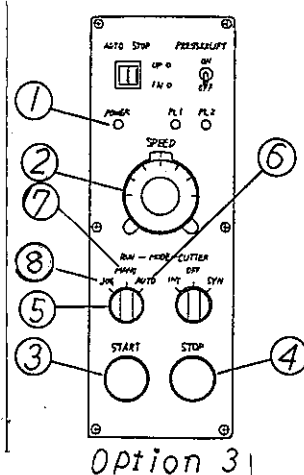
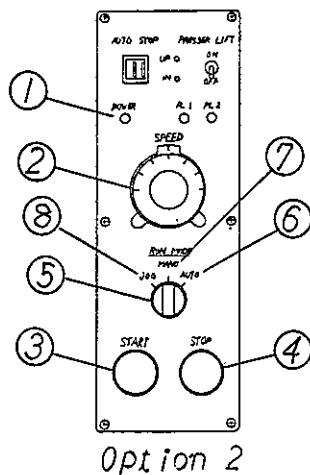
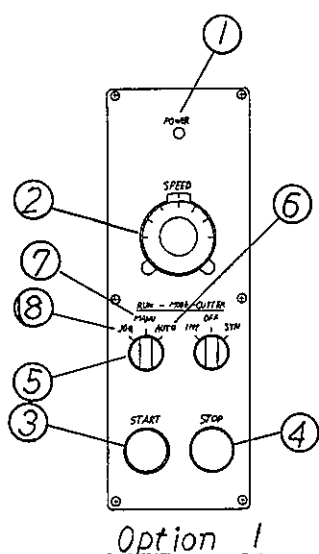
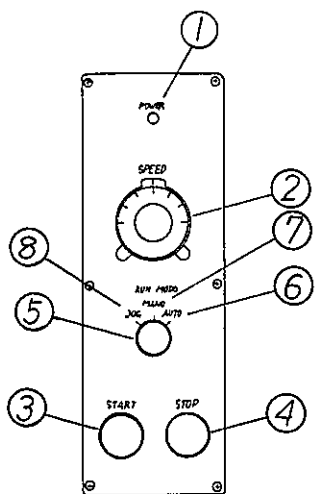
Lubricating places, lubricating oil and frequency

Lubricating places	Maker					Frequency
	Idemitsu	Nisseki	Mobil	Esso	Shell	
Needle bar bearing	Mechanic 56	FBK R056	DTE Oil Medium	Terre-so 46	Turbo 56	2 - 3 drops every hour
Looper bearing						2 - 3 drops every 4 hours
Thread unraveller rocker bearing						2 - 3 drops every 4 hours
Other bearings & rod ends						2 - 3 drops every 10 days
Bearing unit	Coronex No. 2	Multi-knock No. 2	Plex 47	Beacon No. 2	Albania No. 2	Replenish every 6 months
Cam indexing	Texiron	Van torque	ATF		Texiron	Replenish every 200 hrs. Wash and fill fresh oil every 1000 hrs.
Feed roller gear	Sumico Lubricant, Moriton Grease or equivalent					Replenish every 6 months
(Option) Semi-auto lubricator (Needle bar, looper, thread unraveller rocker bearing, each bearing)	Mechanic 56	FBK R056	DTE Oil Medium	Terre-so 46	Turbo 56	Once every hour

LUBRICATION OF CAM INDEXING

Replenish oil every 200 hrs. Wash and fill fresh oil every 1000 hrs. (However, it shall be necessary to shorten the washing and exchange time when of high speed indexing of over 400 cycles/min.)

OPERATION PANEL



1. Power Lights when the power switch (10) on the control box is positioned to "ON".

2. Speed The machine RPM (60 - 600 RPM) can be steplessly changed with means of adjusting the scale of 0 - 100.

3. Start For machine operation (for slitter operation).

4. Stop For machine stopping (for slitter stopping).

5. Operation changeover switch

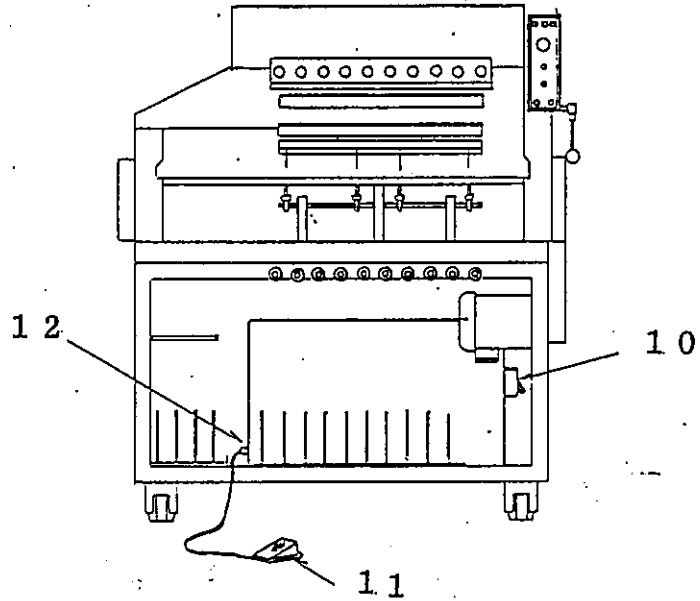
6 a) Automatic ... The machine starts when the start button (4) is pushed and stops at upper position when the stop button (5) is pushed.

7 b) Manual Starts only during time the start button (4) is pushed and stops at the upper position when released.
(Mainly for positioning.)

8 c) Inching Starts only during time the start button (4) is pushed and stops at that position when released.
(Mainly for machine adjusting.)

11 Foot Switch Operation

1. Insert the plug (12) of the foot switch (11) into the socket on the left of the machine control box.
2. The machine will start when stepped on one time. (Take the foot off from the pedal when the machine starts.)
3. Stops when stepped on again.

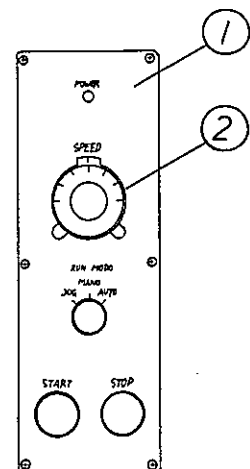


SPEED SETTING

- a. Set the machine speed (60 - 600 RPM) by means of the speed control scale 20 - 100 of the operation panel (1).
- b. After installation, operate with the scale positioned in the range of 40 - 60 (290 - 440 RPM) for about 2 hours.

Comparison of machine RPM and control panel speed controller scale

Scale	Machine RPM
0	60
10	80
20	150
30	220
40	290
50	365
60	440
70	515
80	585
90	600
100	600



PREPARATION OF STITCHING

Decide the pattern

Adjustment is done at time of shipment by fitting 12 pcs each of needles, loopers and thread unravellers at equal spacing (2 inch spacing with standard machine).

When the needles are not at the position of your pattern, adjust the needles, loopers and thread unravellers in the following order.

When there are no spare loopers and set screws, use the loopers and set screws at positions of other than the pattern.

Insert needles to match the stitch pattern.

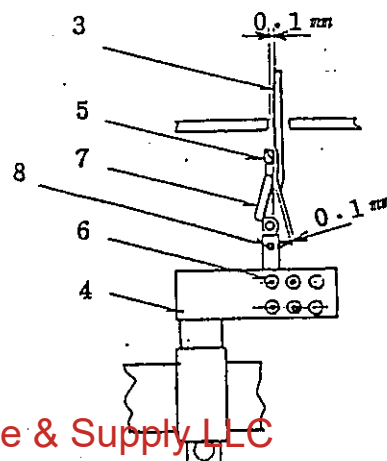
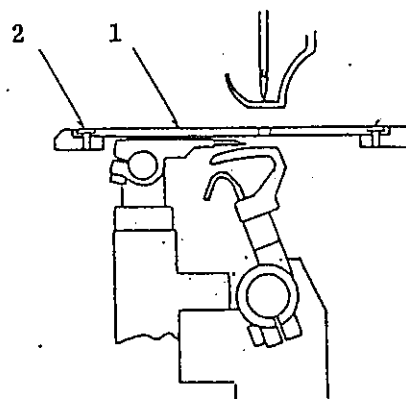
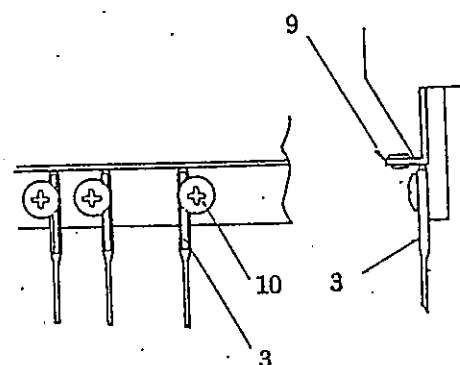
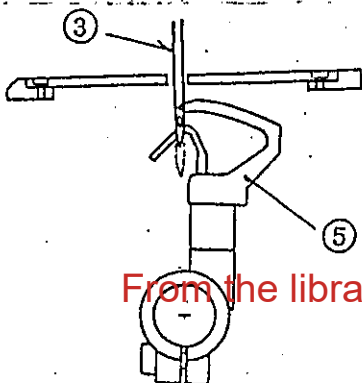
1. Fully insert needles ③ until they strike the needle clamp thread guide.
2. The flat part of the needles ③ should face the front. Tighten the needle clamp screws ⑩.
3. Use the following needles.

Organ DV x 600 #18 or #23

Fitting of Loopers

1. Take off the needle plate ①, lift the presser, unscrew the set screws ② on the front of the needle plate, and then lower the presser again.
2. Insert loopers ⑤ into the looper holders ④ and provisionally tighten the looper clamp screws ⑥.
3. Advance loopers ⑤ from the back position by turning the machine with hands and adjust the clearance between respective parts at the position where the looper tips and needles ③ meet.
 - a) Adjust the clearance between the looper ⑤ tips and needles ③ to 0.1mm followed with tightening of the looper clamp screws ⑥.
 - b) Adjust the clearance between the needle guard ⑦ and needles ③ to 0.1mm followed with tightening of the needle guard clamp screws ⑧.

Do not reverse turn the machine when turning with hands.



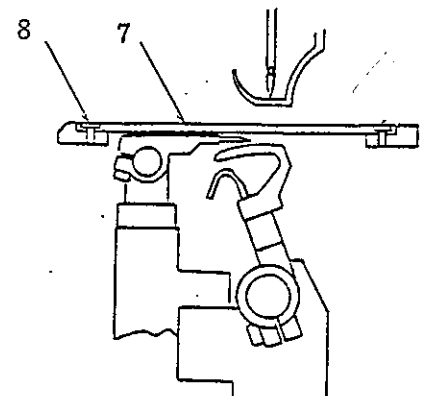
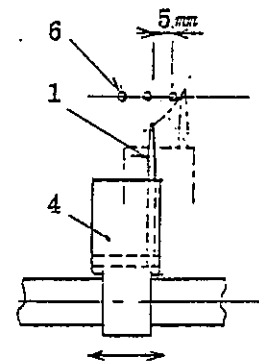
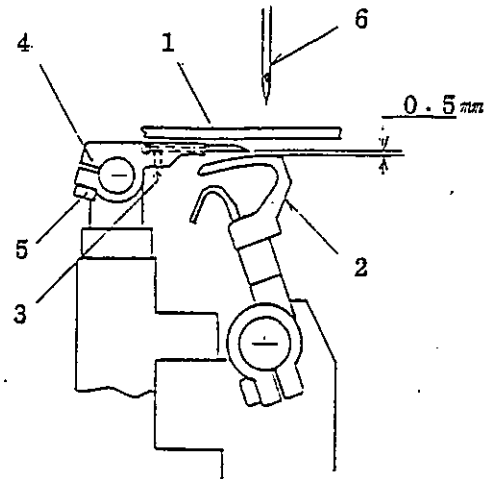
Fitting of Thread Unravellers

Note: Do not reverse turn the machine when turning with hands.

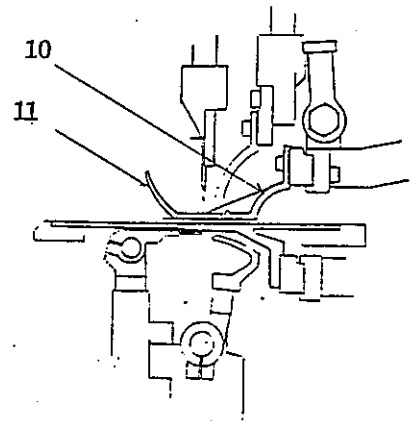
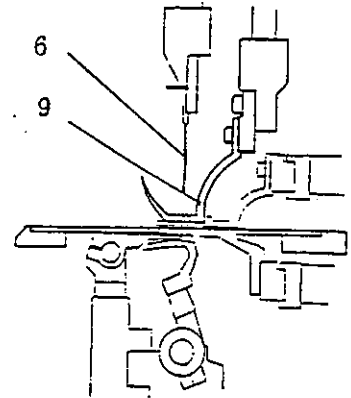
When no spare thread unravellers and clamp screws are available, take out from places other than the pattern.

Turn the machine with hands and stop the machine at the position where the tip of the thread unravellers ① move up to the back face of the loopers.

1. Insert the thread unravellers ① until they strike the back part of the thread unraveller base ④ position the lowered part of the thread unravellers ① tip facing downward (slightly facing the right) and tighten the thread unraveller clamp screws ③.
2. In the case of adjusting by moving the thread unraveller bases ④.
 - a) Loosen the thread unraveller base clamp screws ⑤, move the thread unraveller bases ④ up to the looper back faces of the looper positions and provisionally tighten the thread unraveller base clamp screws ⑤.
 - b) Adjust the gap between the thread unraveller ① tips and looper back faces to 0.5mm.
3. Turn the machine with hands and stop at the position where the thread unravellers ① move to the leftmost position.
 - a) The distance between the thread unravellers ① and needles ⑥ at this position is 5mm. (When this distance is incorrect, the thread unravellers will strike the needles when they move.) Adjust the distance by lightly striking the thread unraveller bases ④ with the handle of a driver.
 - b) Turn the machine with hands again, confirm the clearance of 0.5mm with the looper ② back side and tighten the thread unraveller base clamp screws ⑤.
4. Fit the needle plate ⑦, confirm that the needles drop and tighten the clamp screws ⑧.



5. Turn the machine with hands, stop at the position where the needles (6) rise to the highest position and release the presser (9) at a place where there is no pattern.
6. Raise the presser (9) with the presser lift, release upper feeds A, B, (10) (11) at a place other than where there is a pattern, and mount the upper feed A (10) onto the back of the pattern needle drop part presser.
Note: Feed A (10) cannot be mounted if the presser (9) is fitted first.
7. Fit the presser (9) onto the pattern needle drop part and the upper feed B (11) onto the side of the presser.

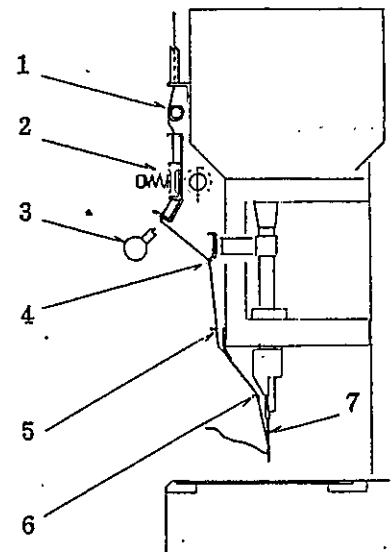


Threading

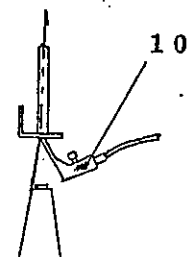
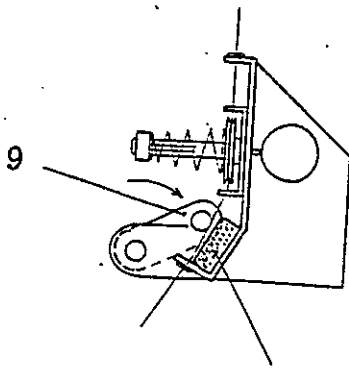
Threading should be done after completion of fitting of needles, loopers and thread unravellers onto pattern positions. The upper thread guides are piped from the leg. Use the air gun (10) for threading.

Upper Thread

1. Wind one wind onto the tension shaft (1).
2. Put through the tension disc (2).
(Raise the tension release handle (3).)
3. Put through the upper thread take-up lever (4).
4. Put through the upper thread guide (5).
(Put through a hole nearby the needle fitting upper position.)
5. Put through the needle clamp thread guide (6). (Put through directly above the needle fitting position or the right hole.)
6. Put through the needle from the right (7).
7. Lower the tension release handle (3).

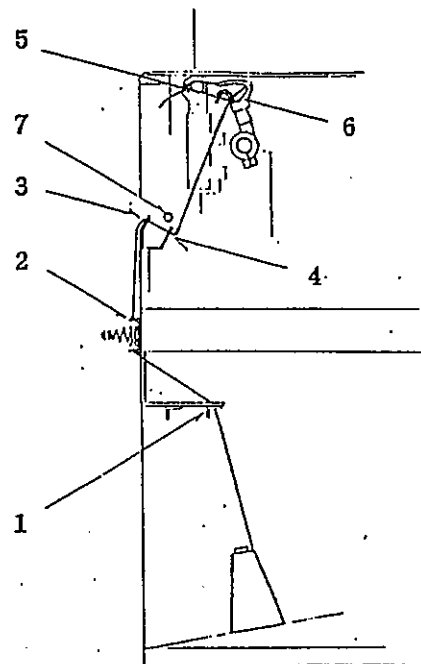


Adjust the tension of the upper thread with the upper thread tension spring. Immerse the lubricator (8) with silicone oil, etc. when stitching vinyl, rubber or leather and trip the thread presser link (9) towards the lubricator (8).



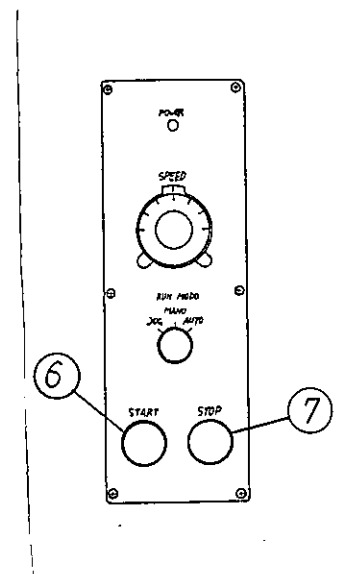
Lower Thread

1. Put through the nearest thread guide from the lower spool holder ①.
2. Put through the tension disc ②.
3. Put through the lower thread take-up lever ③ and put through the back thread guide ④ from underneath the take-up lever shaft ⑦.
4. Put through the looper needle retainer ⑤.
5. Put through the back inside of the looper and through the tip hole.

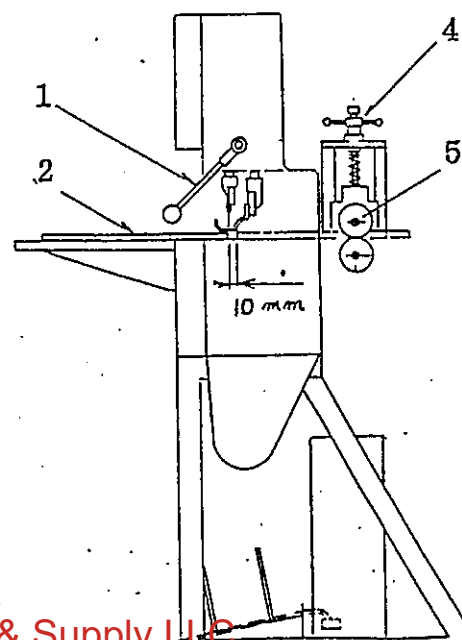


Operation

- a) Single piece stitching procedure
 1. Lift the presser ①, insert the work ② up to the needle position and lower the presser ①.
(The presser is not required to be raised when the work thickness is less than 10mm.)
 2. Lightly hold the workpiece with hands and press the start button ⑥ by which the machine will start.
 3. The machine will stop at the upper position when the stop button ⑦ is pushed at the position where the workpiece ② end advances about 10mm from the needle position.
 4. Raise the presser ① again and repeat Items 1 - 2. Slightly raise the roller ⑤ when the workpiece ② is not favourable fed into the feed roller ⑤ (front pull roller).
(Turn the feed roller adjust screw ④ towards the counter-clockwise direction.)



Note: The distance between the workpiece should be more than 30mm in the case of use of the Stitch Thread Cutter

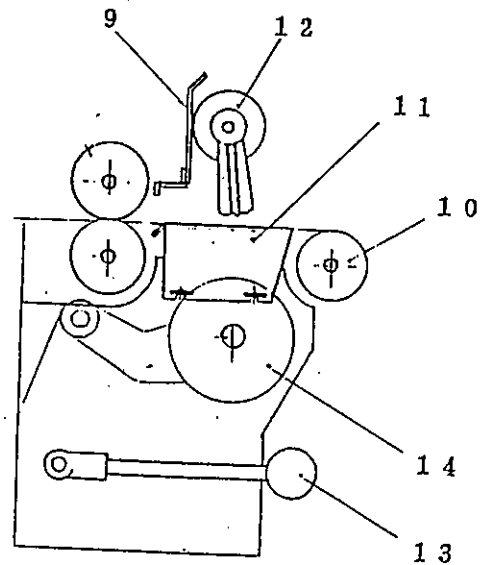


In the case of single piece stitching with slitter mounted machine.

Follow the procedure below.

1. Place the slitter select switch ⑤ into the "OFF" ③ position and lower the slitter handle ⑬.
2. Raise the safety cover ⑨ and the slitter upper roller ⑫.
3. Insert the slide plate ⑪ from between the slitter lower roller ⑩ and the slitter upper roller ⑫. Then tighten the right and left butterfly screws.

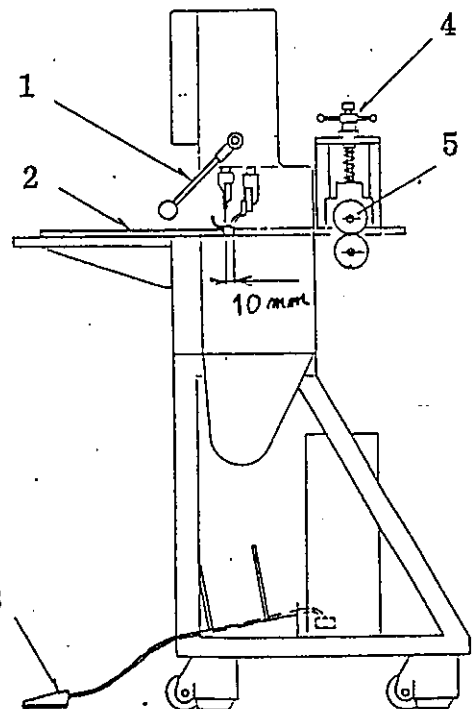
Note: The slitter round blade ⑭ can be left in the removed state.



Single piece stitching by foot switch.

1. Raise the presser ①, insert the workpiece ② up to the needle position and lower the presser ①. (The presser is not required to be raised when the workpiece thickness is less than 10mm.)
2. While lightly holding the workpiece ② with hands, step on the foot switch ③ by which the machine will start.
3. The machine will stop at the upper position when the foot switch ③ is stepped on again at the position where the workpiece ② end has advanced about 10mm from the needle position.
4. Raise the presser ① again and repeat Items 1 - 2. Slightly raise the roller ⑤ when the workpiece ② does not favourably feed into the feed roller ⑤ (front pull roller). (Turn the feed roller adjust screw ④ towards the counter-clockwise direction.)

Note: The distance between the workpiece ③ should be more than 30mm in the case of use of the Stitch Thread Cutter (QH 8072).

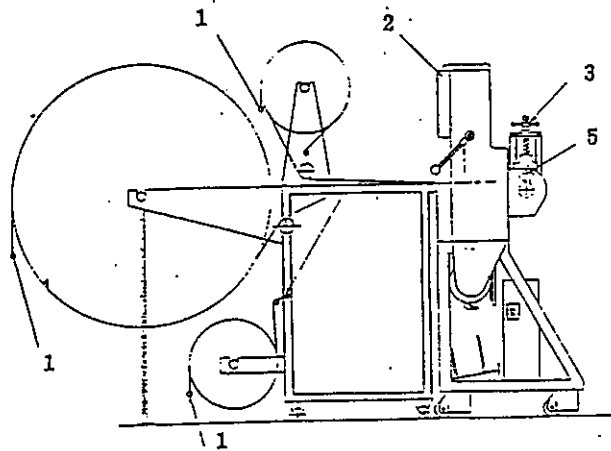


Procedure of long length stitching

A material stand is necessary for long length stitching.

1. The tension ① of each material should be adjusted so that there is no unevenness in the feed.
2. Start, stop and operation should be done with the buttons on the control panel ②. The foot switch should be pulled out from the receptacle.
3. Unevenness in feed shall take place if the feed roller ① is floating or when pressure is insufficient.

The pressure increases when the pressure adjust screw ③ is turned toward the clockwise direction.



Adjustment of Stitch Pitch

The stitch pitch of both the lifting lock feed and the feed roller are adjusted to 5mm at time of shipment.

Both the lifting lock feed and the feed roller should be adjusted when adjusting the stitch pitch.

The feed rate will be uneven when the pitches of the lifting lock feed and the feed roller are unbalanced.

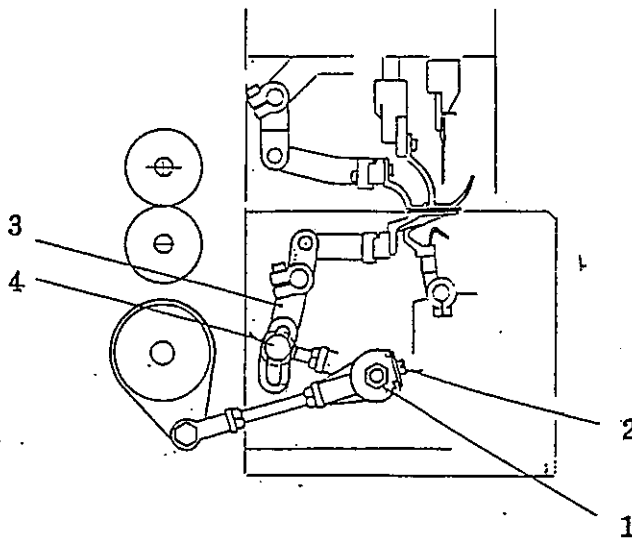
A. Adjustment of feed roller pitch.

1. Loosen the feed rod nut ①.
2. The pitch will decrease when the feed adjust screw ② is turned toward the clockwise direction.
(Changes about 1mm with one turn of the screw.)
3. Measuring of the pitch is done by fitting the presser at a place where the upper feed dog is not fitted and inserting a piece of cardboard (30cm) up to the feed roller followed with turning the machine with hands 2 - 3 times and measuring the needle hole spacing.

B. Adjusting of lifting lock feed pitch.

Adjustment is done to balance the pitch with the feed roller pitch.

1. Loosen the feed adjust nut ④ of the feed adjust lever ③ from the back of the machine.
2. The pitch increases the closer the feed adjust nut ④ is brought toward the shaft.
3. Pitch measuring is done by putting in a piece of cardboard in between the feed dog and turning the machine 2 - 3 times with hands and measuring the needle hole spacing.



CAUSES OF FAULTY TENTION

Always make sure to confirm the cause when troubles such as stitch skipping, thread breakage, needle breakage take place. In particular, needle breakage frequently takes place when the timing and spacing with the loopers are incorrect. In such cases, damage of the loopers can become a major cause of stitch skipping making thorough care necessary.

- * Always put the threads through the thread lubricator when stitching leather, rubber, PVC sheet, etc., otherwise stitch skipping can be caused.
- * Thread treatment
Tetoron thread treated with paraffin is ideal as the thread. Nylon thread treated with oil can also be used.

MAINTENANCE

- * The machine is a precision machine, therefore, all interlocking parts should be thoroughly lubricated.
- * Thread will not slide smoothly when the thread guides are rusted or blocked with dust, therefore, always make sure to keep in good condition.
- * In particular, the ingress of dust and foreign matters into the machine motor should be prevented.
- * Putting the machine directly in contact with environments excessive in temperature fluctuation should be avoided.

a) Stitch skipping

1. When the sequence or order of threading is incorrect.
2. When the thread guide is not set in the proper position.
3. When foreign matter is trapped in the thread guide hole.
4. When the pressure of the tension disc is too tight.
5. When threads are entangled.
6. Fraying and slacking of threads.
7. Faulty timing of needles and loopers.
8. Incorrect spacing between needles and loopers.
9. When the needles do not drop into the centers of the pressure foots.
10. When the needles are bent.
11. Instable pull of upper and lower threads.
12. When the threads are not correctly under the tension disc.
13. When the pressure of the upper and lower threads are too strong or too weak.
14. When the pressure foots are of incorrect tension.
15. When the speed is excessive.

CAUSES OF FAULTY TENSION (Continued)

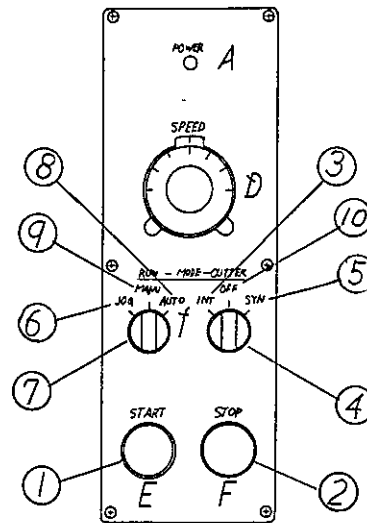
b) Thread breakage

1. When the sequence or order of threading is incorrect.
2. When the thread guide is not set in the proper position.
3. When the pressure of the pressure foot is too tight.
4. Instable pull of upper and lower threads.
5. When threads are entangled.
6. When foreign matter is trapped in the thread guide hole.
7. When the needles are bent.
8. When the looper is damaged.
9. Faulty timing of needles and loopers.
10. When the timing of the needles and feed is incorrect.
11. Incorrect spacing between needles and loopers.
12. When the thread guides are damaged.

c) Needle breakage

1. When the needles do not drop into the centers of the pressure foots.
2. When the needles do not drop into the front centers of the throat plate slot holes.
3. When of incorrect timing with the loopers.
4. When of incorrect timing with the feed.
5. When the needles are bent.
6. When set parts are loose.
7. Incorrect timing of respective transmission parts.
8. When foreign matter is entrapped in the cloth.

- A = Power
- 4 B = Slitter
- 7 C = Operation
- D = Speed Controller
- 1 E = Start Button
- 2 F = Stop Button
- 3 a = Independent [Operation Select
- 10 b = OFF Switch]
- 5 c = Interlock [Slitter Select
- 6 d = Inching Switch]
- 9 e = Manual Select
- 8 f = Automatic Switch]



Slitter Select Switch & Operation Select Switch

- | | |
|--|---|
| <p>Interlock
&
Automatic
⑤ ⑧</p> | <p>Slitter starts when the start button ① is pushed and the machine starts after a short delay. The slitter stops and the machine also stops at upper position when the stop button ② is pushed.</p> |
| <p>Interlock
&
Manual
⑤ ⑨</p> | <p>Slitter only turns during time of when the start button ① is pushed and the machine also starts after a short delay. The slitter stops and the machine also stops at upper position when the start button ① is released.</p> |
| <p>Interlock
&
Inching
⑤ ⑥</p> | <p>Slitter starts when the start button ① is pushed and the machine also starts after a short delay. Only the machine stops when the start button ① is released. The slitter will also stop when the stop button ② is pushed.</p> |
| <p>Independent
③</p> | <p>Only the slitter turns without relation to the operation select switch when the start button ① is pushed and stops when the stop button ② is pushed.</p> |

Slitter Operation Procedure

- A) Follow the procedure below in the case of using the slitter for long length stitching.

Procedure

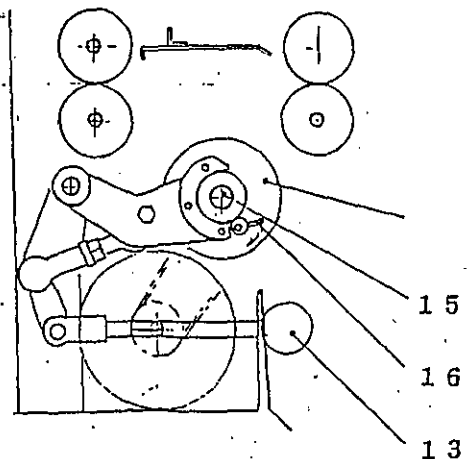
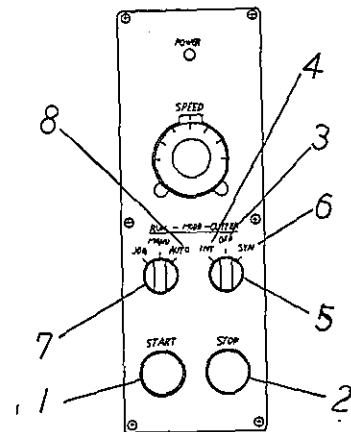
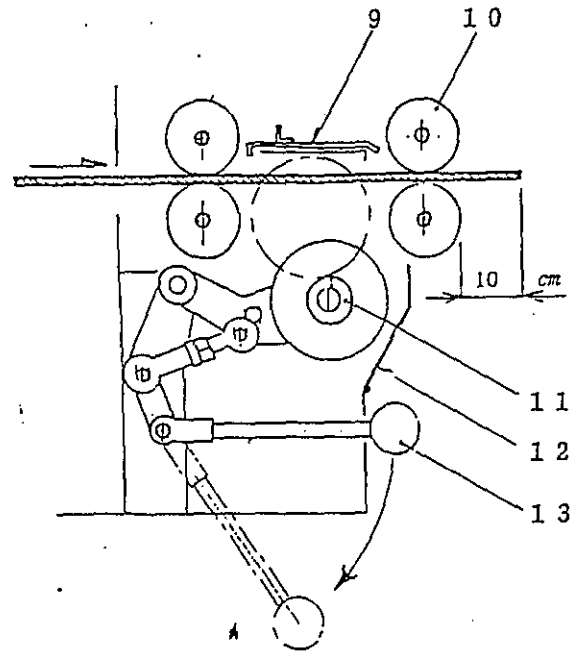
1. Stitch the material beforehand and have it sticking out about 10cm from the slitter roller (10).
2. Loosen the round blade mounting base (11) clamp screw, match the cut position and tighten the clamp screw.
3. Fit the safety cover (9) and the slitter cover (12).
4. Place the slitter select switch (5) in the independent (4) position and push the start button (1), (Slitter starts.)
5. The round blade rises when the slitter handle (13) is slowly lowered and the round blade protrudes from the material surface.
6. Push the stop button (2) after confirming the cut position. (Slitter stops.)
7. Place the slitter select switch (5) in the interlock (6) position. (The operation select switch (7) should be in automatic (8) position.)
8. Proceed into full scale operation. The slitter will start when the start button (1) is pushed and the machine will also start after a short delay.

Note: The slitter select switch (5) should always be placed in the "OFF" (3) position and the round blade should be in the lowered state when the slitter is not used.

Removal

Note: The slitter select switch (5) should always be placed in the "OFF" (3) position prior to removal.

1. Lower the slitter handle (13).
2. Take the V-belt off from the motor pulley.
3. Loosen the butterfly screws of the eccentric collars (16) of the left and right bearings and lower the eccentric collar handle (16).
4. Pull out towards the front while holding the slitter shaft (15) with hands.



Mounting

1. Fit onto the bearing base while holding the slitter shaft (15) with both hands.
2. Put the V-belt onto the motor pulley.
3. Raise the left and right eccentric collar handles (16) and tighten the butterfly screws.

Basic Adjustment of Respective Parts

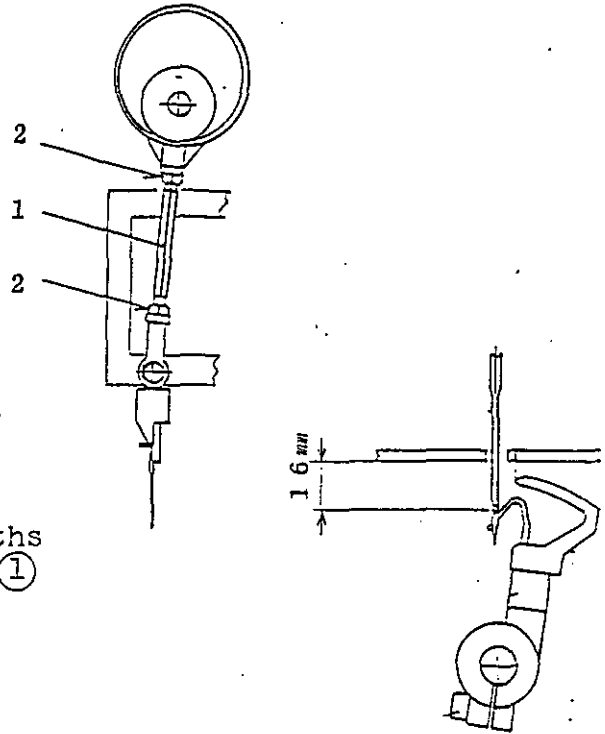
Adjustment of needle bar height

The distance between the needle underside and the center of the needle hole with the needle bar in the lowermost position is 16mm.

Adjustment

Adjust by loosening the rod nuts (2) of the left and right crank rods (1).

Note: Care should be placed since seizing of the needle bar, needle breakage, stitch skipping, etc. can be caused when the lengths of the left and right crank rods (1) are not the same.



Adjustment of looper

1. The distance between the looper (1) tip and needle (2) center with the looper in the backmost position is 4mm.

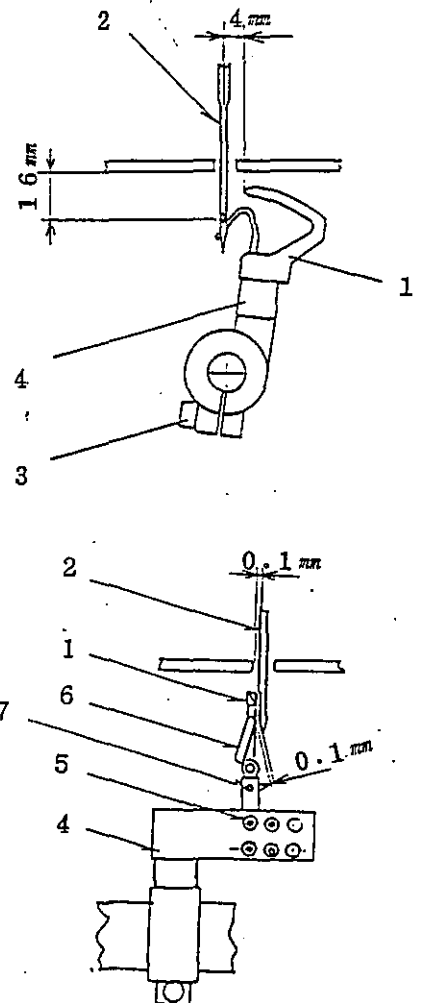
Adjustment: Loosen the looper base clamp screw (3) and adjust the looper base (4) into the correct position followed with tightening of the clamp screw (3).

2. The distance of the looper (1) tip to the center of the needle in the advanced position is 0.1mm.

Adjustment: Loosen the looper clamp screw (5) and adjust the looper (1) into the correct position followed with tightening of the clamp screw (5).

3. The distance between the needle (2) and the needle guard (6) with the looper (1) tip in an advanced position up to the center of the needle (2) is 0.1mm.

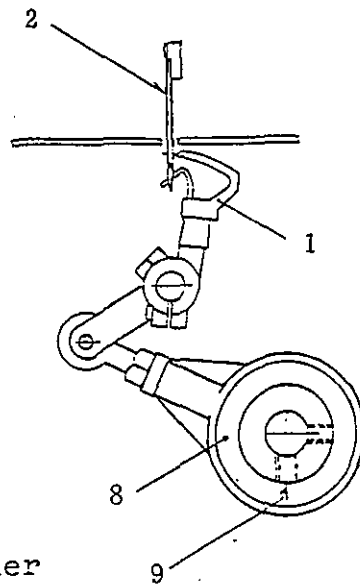
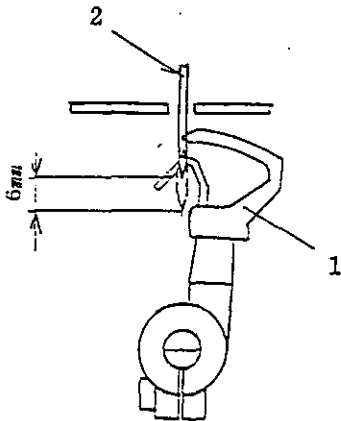
Adjustment: Loosen the needle guard clamp screw (8) and adjust the needle guard (6) into the correct position followed with tightening of the clamp screw (7).



Timing

The looper (1) tip advances to the center of the needle (2) with the needle raised 6mm from the lowermost point.

Adjustment: Loosen the looper eccentric clamp screw (9) and adjust to the correct position followed with tightening of the clamp screw. The timing advances when the looper eccentric (8) is turned toward the machine turning direction.



Adjustment of thread unraveller

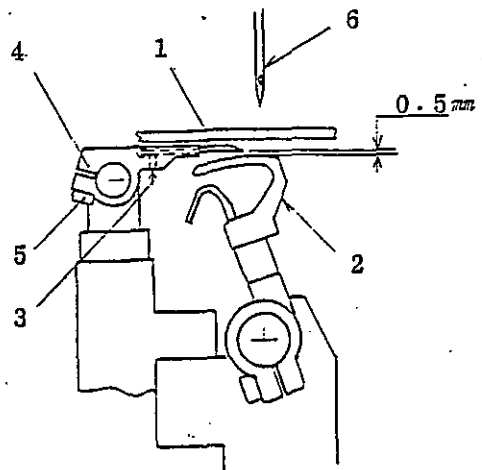
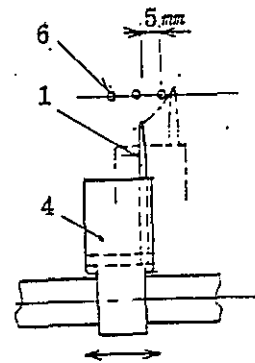
1. The distance between the thread unraveller (1) and the needle with the thread unraveller (1) moved to the leftmost direction is 5mm.

Adjustment: Loosen the thread unraveller base clamp screw (5) and adjust to the correct position followed with tightening of the clamp screws (5).

2. Turn the machine with hands and confirm that the tip of the thread unraveller does not strike the needle. If striking, move the distance between the thread unraveller (1) and the needle (6) of Item 1 to the position where they do not strike each other.

3. The distance between the thread unraveller (1) and the looper (2) top side with the thread unraveller (1) advanced to the looper (2) top side is 0.5mm.

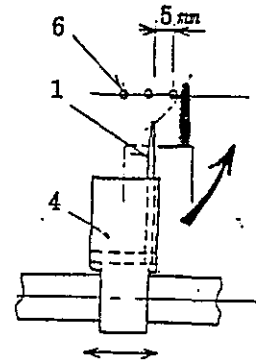
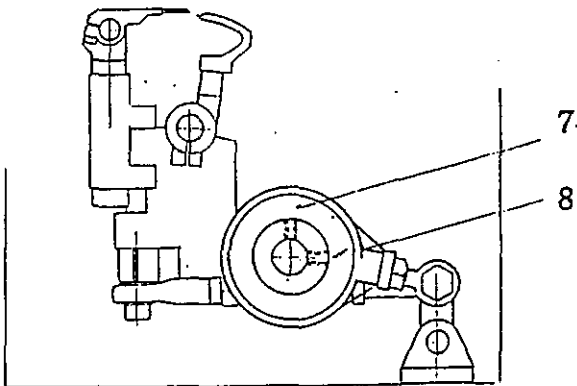
Adjustment: Loosen the thread unraveller base clamp screw (5) and adjust the thread unraveller base (4) to the correct position followed with tightening of the clamp screw (5).



Timing

The thread unraveller ① moves to the rightmost direction with the needle ⑥ tip lowered to the underside of the needle plate.

Adjustment: Loosen the clamp screw ⑧ of the thread unraveller eccentric ⑦ and adjust to the correct position. The timing shall advance when the eccentric ⑦ is turned toward the machine turning direction.



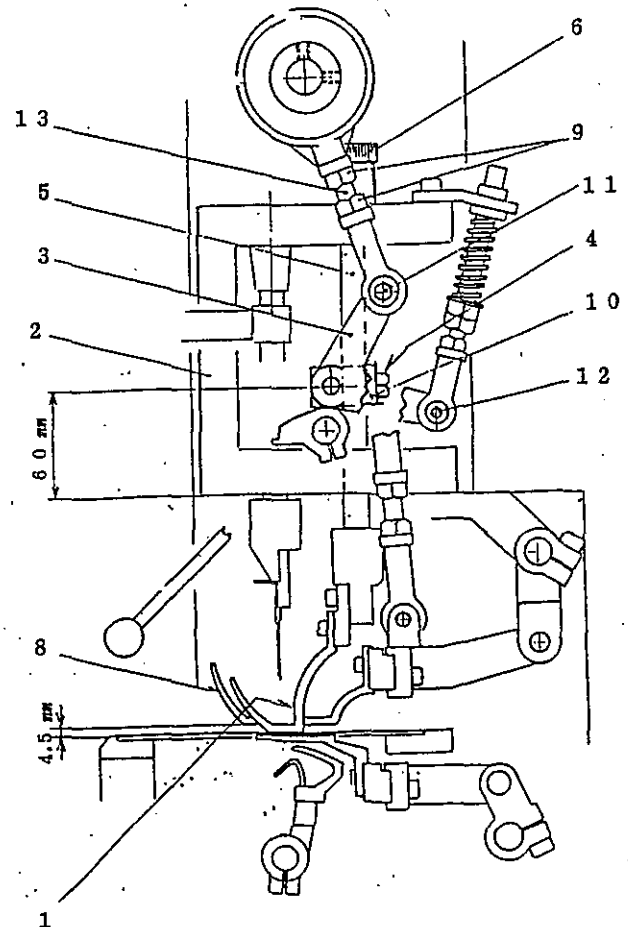
Presser height and upper feed height adjustment

1. Loosen the presser bar drum screw ⑥ and weaken the presser spring.
2. Take off the lifting lock feed rod screw ⑪ and the auxiliary presser spring rod screw ⑫.
3. Turn the machine with hands and stop at the position where the presser ① drops to the needle plate face. The distance between the underside of the needle bar frame ② and the bell crank ③ center screw should be adjusted to 60mm.

Adjustment: Loosen the presser bar guide bracket screws ④ at 2 places on the left and right, and adjust the presser bar guide bracket ⑩ to the correct position followed with tightening of the screws ④.

4. Turn the machine with hands again and confirm that the presser ① and the lift rate of the feed 8 are the same. (Both the presser ① and feed are about 4.5mm from the needle plate face.)

(Loosen adjust nuts ⑨ and adjust the rod 13 length when the lift rate is different.)



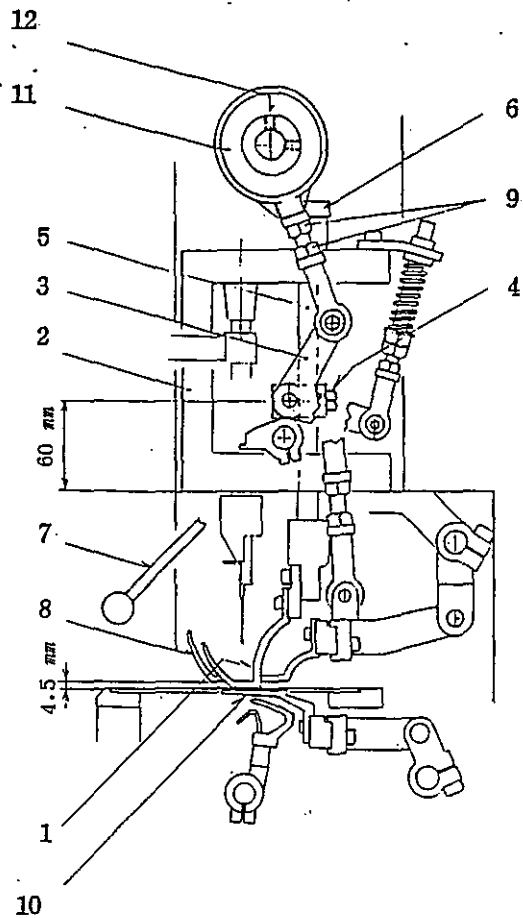
Upper Feed Adjustment

The upper feed (10) functions synchronously with the lower feed (8). Accordingly, the forward-backward feed timing should be the same as the lower forward-backward feed.

Feed up-down timing

The upper feed (8) should also drop to the needle plate face with the lower feed gear (10) in position raised to the needle plate face.

Adjustment: Loosen the set screws (12) of the upper-lower eccentrics (11) of the upper shaft at 2 places on the left and right, match to the proper position and tighten the set screws (12). The timing will advance when the eccentrics (11) are turned towards the machine turning direction.



Lower Feed Adjustment

Feed Gear Height Adjustment

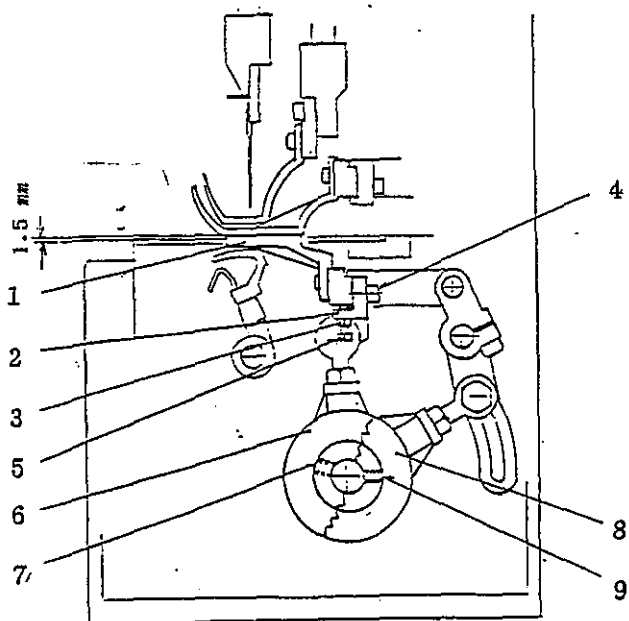
1. The feed gear (1) should stick out 1.5mm from the needle plate face when raised to the topmost position.

Adjustment: Loosen the adjust nuts (3) of the lifting lock feed base (2) at 2 places on the left and right, match to the proper height with the adjust bolt (5) and tighten the adjust nuts (3).

Feed up-down timing

The feed gear (1) functions to the position of the needle plate face when the needle is in raised position up to the needle plate face from the lowermost position.

Adjustment: Loosen the set screws (7) of the up-down eccentrics (8) at 2 places on the left and right, match to the proper position and tighten the set screws (7). The timing advances when the eccentrics (6) are turned towards the machine turning direction.



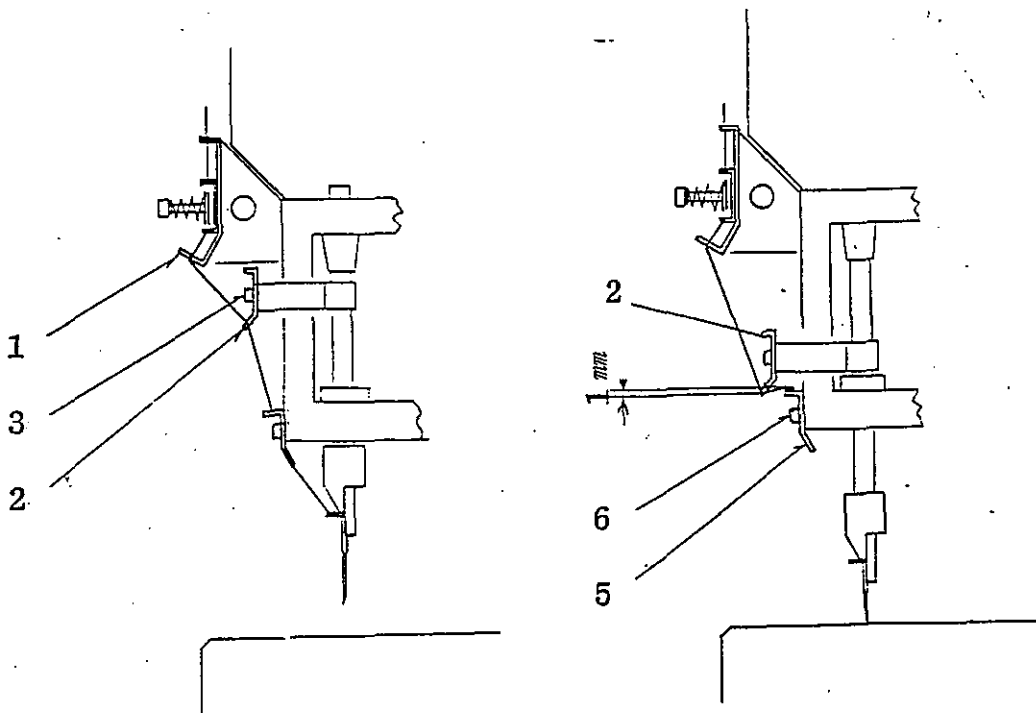
Forward-backward feed timing

The feed gear ① starts to retract from the feed groove front position of the needle plate face with the needle in the raised position up to the needle plate face from the lowermost point.

Adjustment: Loosen the set screws ⑨ of the feed eccentric ⑧, match to the proper position and tighten the set screws ⑨. The timing advances when the eccentric ⑧ is turned towards the machine turning direction.

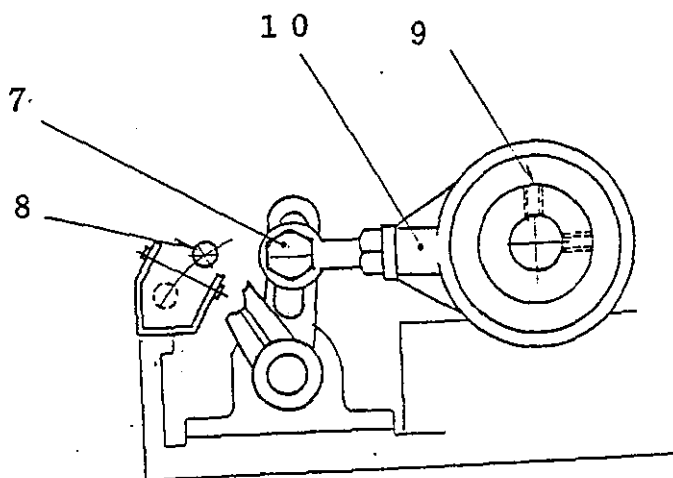
Adjustment of upper thread take-up tension

1. Adjust so that there is no slack in the thread between the tension disc thread guide ① and the upper thread take-up tension ② with the needle at the topmost point. Adjustment is done by loosening the upper thread take-up tension set screw ③ and changing the height of the upper thread take-up tension ①.
2. It shall be normal when the upper thread take-up tension ② hole drops 1mm below the upper thread guide ⑤ hole with the needle bar in the lowermost point. Adjustment is done by loosening the upper thread guide set screw ⑥ and changing the height of the upper thread guide ⑤.



Adjustment of lower thread take-up tension

1. Adjustment of the lower thread pull is done by loosening the take-up tension adjust nut (7). The pull increases when brought closer to the shaft or conversely decreases when separated away from the shaft.
2. Timing of take-up tension.
 - a. The thread take-up tension shaft (3) moves to the lowermost position when the needle drops from the uppermost point and the needle tip can be seen from the needle plate backside.
 - b. Adjustment is done by loosening the lower thread take-up tension eccentric screw (9) and turning the take-up eccentric forward when the timing is fast or toward the machine turning direction when slow.



1. Mounting

1.1 Package type

- (1) Adjust the idle turning direction.

The idle turning direction is shown with the arrow on the inner ring side as (スベル), (See Fig.19), therefore, correctly mount in accordance with the purpose of use.

- (2) When fitting on one-way clutch onto the shaft, apply force only onto the inner ring as shown in Fig. 20. The bearing can be damaged when force is applied onto the outer ring.
- (3) Seal in proper amount of correct lubricant prior to using the clutch.
- (4) Tightly wrap seal tape onto the plug after sealing so that leaks will not take place.
- (5) Initially turn with hands and operate after confirming that it works correctly.

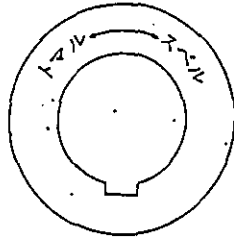


Fig. 19

The idle turning direction (スベル) is inscribed with an arrow on the side of the inner ring.

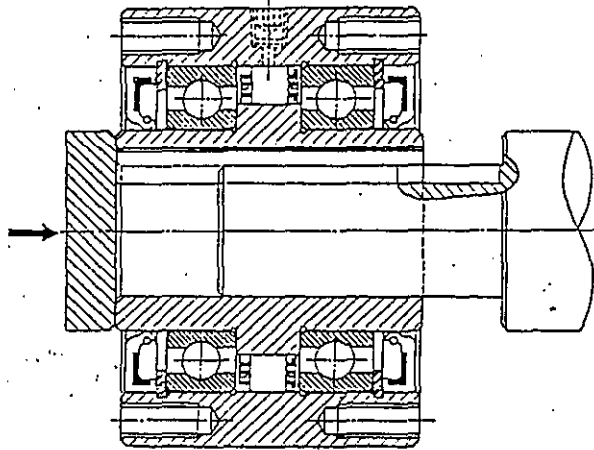


Fig. 20 Mounting of Package onto Shaft