

**INSTRUCTIONS**  
**FOR**  
**ADJUSTING AND OPERATING**  
**“ COLUMBIA 600 ”**  
**OVERLOCK MACHINE**

THE UNIVERSITY OF CHICAGO

1964

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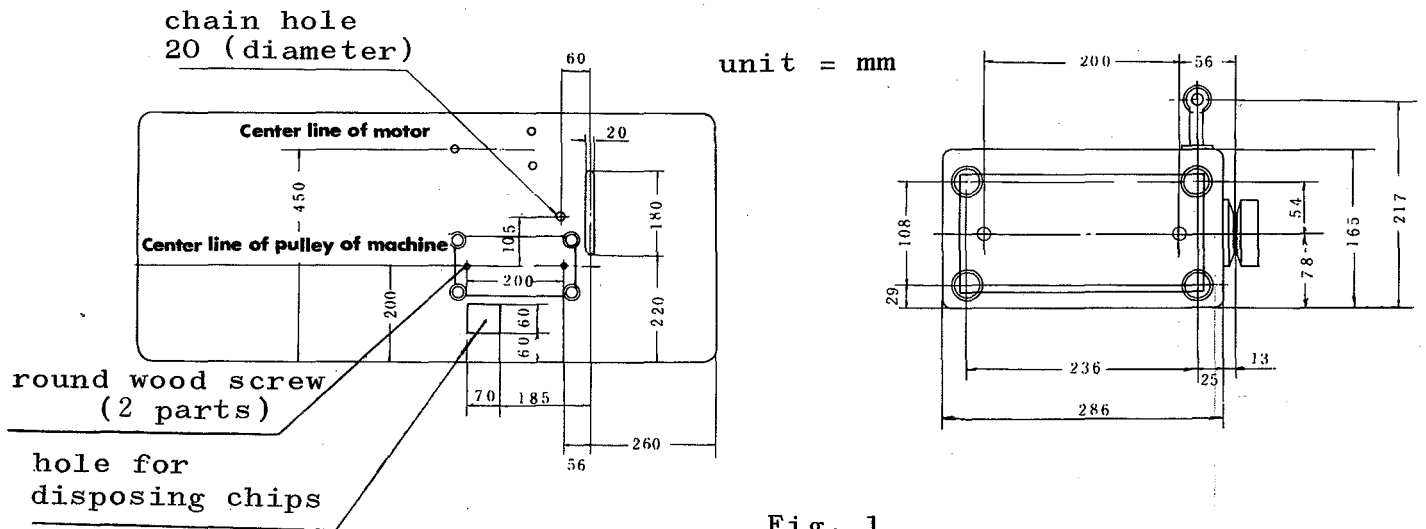
## General Instructions for Using the Machine

### 1. Sewing speed

The maximum speed for this machine is 6000 stitches per minute and the speed of 5500 stitches per minute is recommended for normal use. In starting a new machine, it is advisable to run it at the speed of 5000 stitches per minute for the first 200 hours or so (ca. 1 month) and then use it at the normal sewing speed, when considered from the point of durability of the machine.

### 2. Installation

Figure 1 shows the standard measurements when the machine is fixed on the table. In submerged installation, cut in the table board referring to these measurements. You can place an order with us for the top board ready for use in submerged installation with the machine head.



### 3) Oil supply

As the oil has been completely drained from the machine when the shipment. Be sure to fill the oil reservoir before starting the operation, through the oil hole removing the screw indicated by "OIL" mark (Figure 2 - 1).

Fill oil until the oil level comes up to the upper line "H" on the oil sight gauge window (Figure 2 - 2).

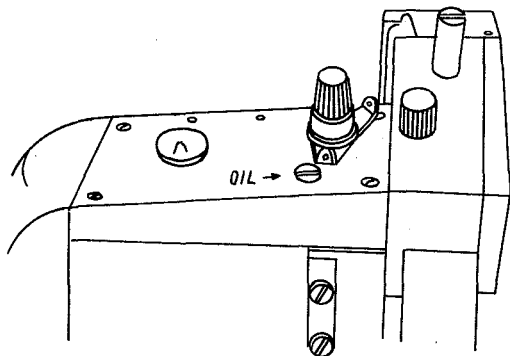


Fig. 2-1

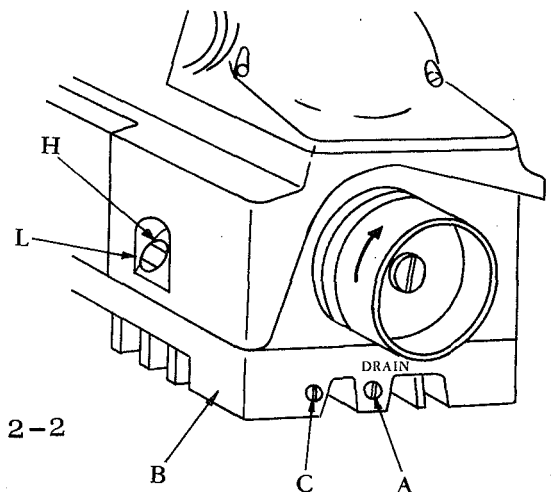


Fig. 2-2

Be sure to inspect oil level daily before the morning start.

If the oil level is dwindled below the lower line "L", fresh oil must be replenished.

After oiling, screw of oil hole must be replaced and be tightened.

In order to keep the machine life longer, it is advisable to exchange the oil completely after the operation for first 250 hours and every 750 hours or so.

To exchange the oil, drain the used oil from the reservoir by removing the drain screw (A, Figure 2 - 2), indicated by "DRAIN" mark. And fill the new fresh oil through the oil hole (Fig. 2 - 1).

The oil filter net is fixed to the oil pump inside the machine. Clean this net and the reservoir two or three times per year. To do this, 1) drain the oil completely, 2) remove the machine base (B, Fig. 2 - 2) by removing its set screws from the bottom of the machine, then, 3) the machine base can be separated from the machine. When replacing the machine base to the machine, the base must be fixed together with its packing to the machine.

When the oil stay the space between the machine base and the machine, these oil can be drained by removing the screw (C, Fig.2-2).

#### 4. Direction of revolution

The pulley of the machine should be revolved to the right (clock-wise) facing the pulley.

#### 5. Needle to be used

The type of the needles to be used is 29-C600. There are some sizes of it available. They should be selected depending on uses.

#### 6. How to set the needle

Raise the needle bar near its highest position by turning the pulley away from you, pull up the presser bar lifter A in the arrow direction and swing out the presser foot B to the left as shown in Fig. 3. Then loosen the needle clamping nut, insert the needle into the needle bar as far as it will go with its scarfed side at the back and tighten the nut.

There is a type of machine whose presser foot B cannot be swung aside due to its special uses, but the above instructions also apply to this type except the presser foot.

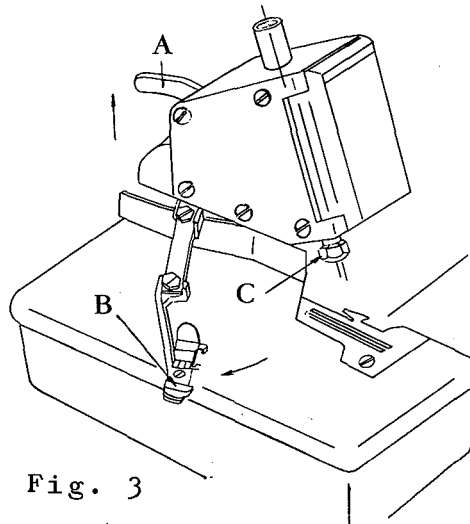


Fig. 3

## 7. Threading

Thread the machine as shown in Figure 4. A is needle thread, B is upper looper thread, and C is lower looper thread.

Thread as above  
for blindstitch  
hemming.

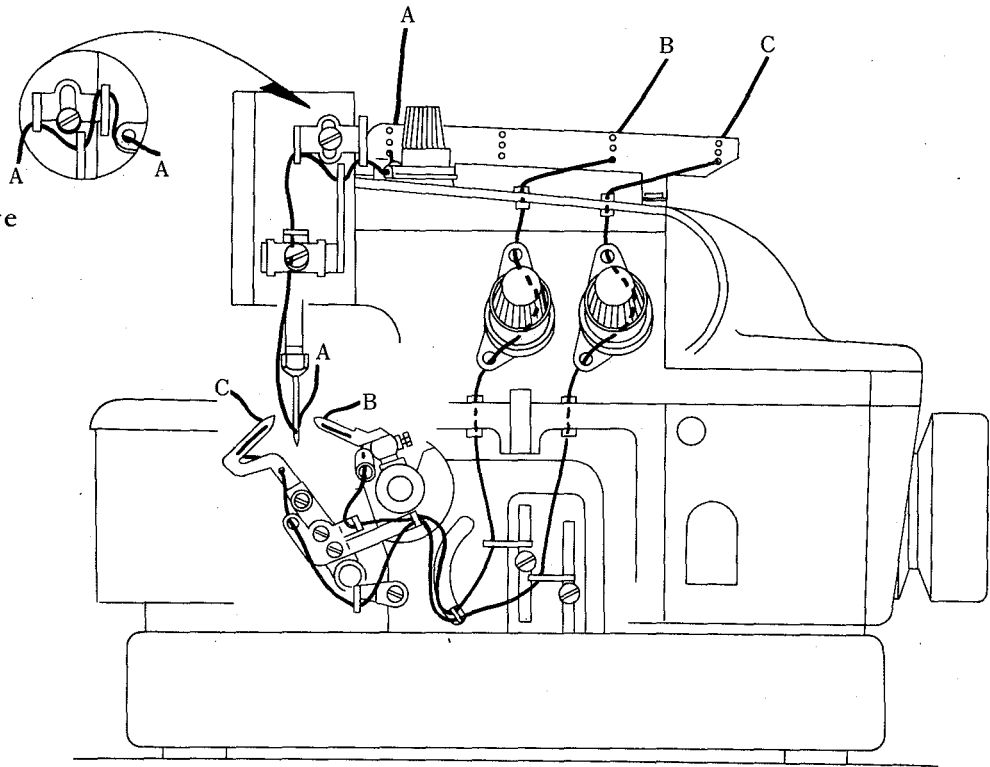


Fig. 4

Threading for two needle machine

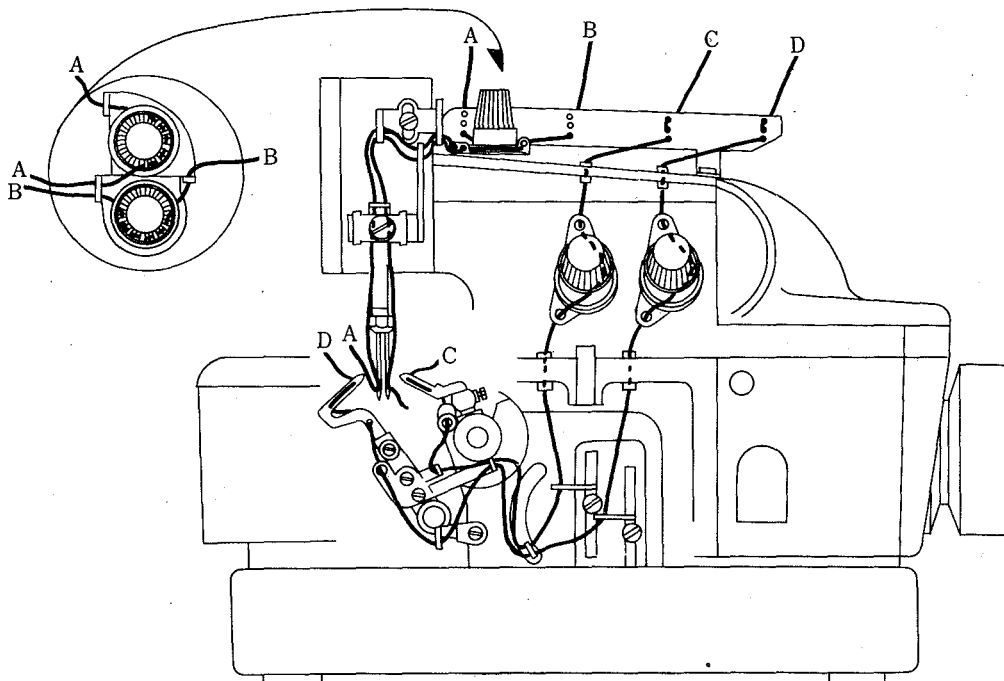


Fig. 5

Threading chart for 600-4

In the figure above (Fig. 5), A is needle thread (left), B is needle thread (right), C is upper looper thread, and D is lower looper thread.

## Threading for looper (upper)

Open frame side cover at the front of the machine. Get looper (upper) at the lowest position and thread up through thread hole (A) from you and thread again through the hole (B) toward you. Next get looper (upper) at the highest position, turning balance wheel away from you by hand and thread up through the hole at the point of looper (upper) at C.

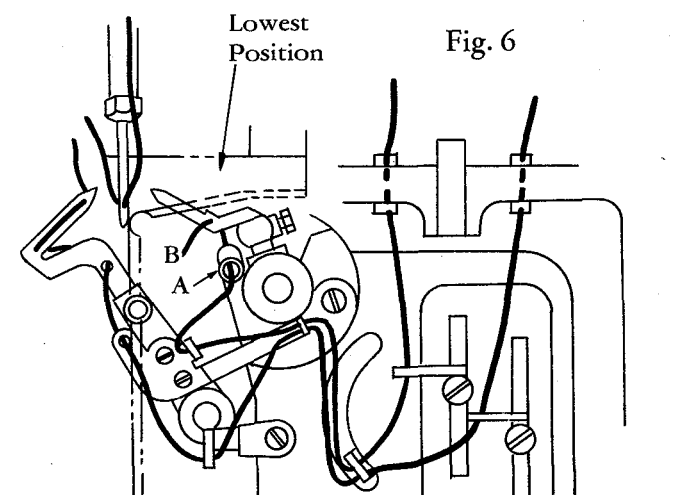


Fig. 6

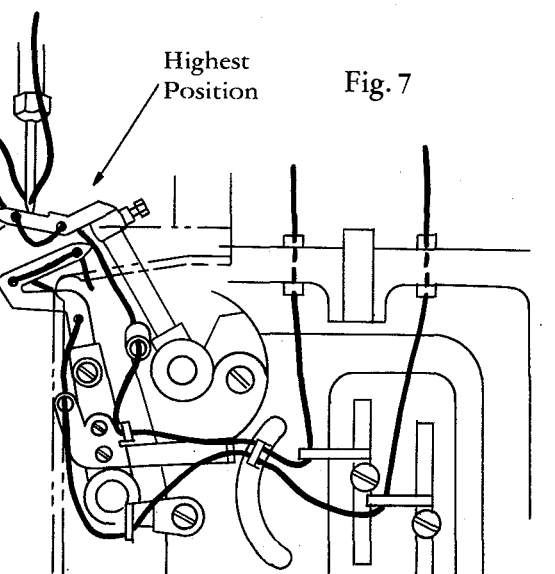


Fig. 7

### 8. Various Stitch Formations

Fig. a - Stitch formation in ordinary overedging seam (with three threads)

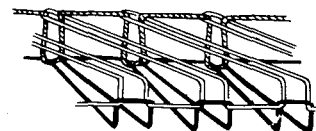


Fig. b - Stitch formation in blindstitch hemming seam (with three threads)



Fig. c - Stitch formation when a spreader is substituted for the upper looper (with two threads)

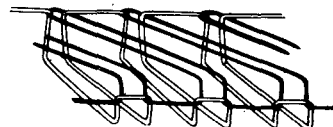


Fig. d - Stitch formation in two needle, four thread, safety stitch overedging (the upper looper thread is caught by both needles)

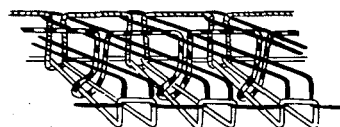
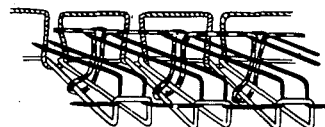


Fig. e - Stitch formation in two needle, four thread, safety stitch overedging (the upper looper thread is caught by the right needle only)



## 9. Thread Tension

The thread tension should be adjusted in accordance with the difference in fabrics, threads, width of bight, stitch length, etc. in order to obtain a proper stitch formation each time when the above-mentioned factors have been altered. To tighten the Upper Looper Thread, lower the Thread Guide marked R a little by loosening the screw A. To tighten the Lower Looper Thread, lower the Thread Guide marked L a little by loosening the screw B. (See Fig. 8) To loosen the Upper or Lower Looper Thread, raise the respective guide.

To loosen the Needle Thread, move the Needle Thread Eyelet C (Fig. 9) towards F by loosening the screw K (Fig. 9), and to tighten, move C towards J.

To make the stitch as shown in Fig. a, thread this Eyelet at the hole E and to make the stitches as shown in Figs. b and c. thread at D.

When these adjustments have been completed, be sure to tighten each set screw.

It is one of the features of this machine that the adjustment of the tension can be made precisely by means of the expedients as shown in Figs. 8 and 9.

Make final micro-adjustment by turning the regulating knob on the tension device.

In this machine, it is so designed that the produced seam may not be influenced by the unwinding condition of the spool thread even in high speed-sewing operation. Therefore do not adjust tension only by pressing down or releasing the tension spring to the extreme degree.

Fig. 8

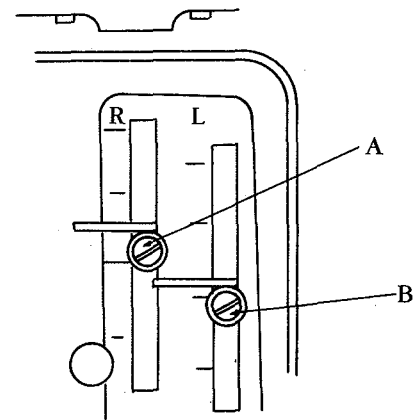
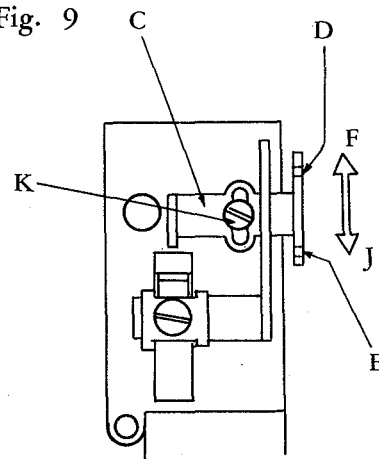


Fig. 9



10. Regulation of pressure of presser foot and height of feed dog

It is necessary to regulate the pressure of presser foot and the height of feed dog depending on the type and thickness of fabrics to be sewn.

For thin fabrics, it is advisable to apply a lower pressure on the presser foot and thrust the feed dog less above the throat plate. For thick fabrics, it is advisable to apply a higher pressure on the presser foot and thrust the feed dog more above the throat plate.

The pressure of presser foot is regulated by turning the adjusting screw shown in Figure 10. The pressure gets higher when the adjusting screw is turned to the direction of A, while it gets lower when the screw is turned to the direction of B. When the feed dog is raised to the highest point, the bottom of the feed dog teeth should be nearly on the same level as the upper side of the throat plate. Almost all kinds of fabrics can be sewn satisfactorily at this position.

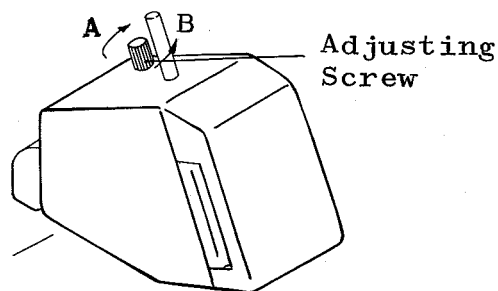


Fig. 10

11. Regulation of seam width (See Figure 11)

Loosen the lower knife holder set screw A first, and then loosen the upper knife holder set screw B in order to adjust the upper knife holder C horizontally. When it is fixed in a proper position, tighten the upper knife holder set screw B. In this case, the lower knife D is to be pushed closely against the upper knife F by the appropriate pressure of the spring inside the lower knife holder. Then tighten the lower knife holder set screw A.

A convenient way to check up the sharpness of the knives is to put a thread between the upper and lower knives after adjustment and run the machine by hand to see how sharply the thread is cut. The upper knife is exchanged by loosening the screw G and the lower knife by loosening the screw H.

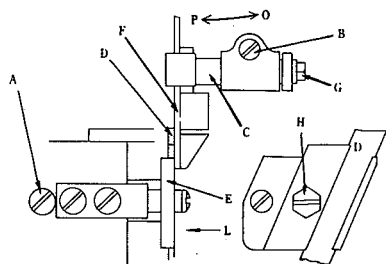


Fig. 11



## 12. Regulation of stitch length

The stitch length is regulated by exchanging the feed eccentric cam. There are various types of feed eccentric cams available as shown in the list on the next page. The machine is initially equipped with two of them for making the stitch length most frequently used, and two different eccentric cams are supplied as spare parts in the accessories box. If other stitch lengths are required, please let us know your wishes.

Each feed eccentric is stamped in with the number of stitches per inch that it makes, but it indicates only a standard and varies more or less depending on the type and thickness of fabrics and degree of differential effect.

For regulation, open the cloth cover A and the feed link cover B as shown in Figure 12. When the front feed eccentric cam C alone is exchanged, remove the nut E with the socket wrench D, and then take out the eccentric cam by inserting the eccentric cam remover F into its threaded hole. After replacing another eccentric cam, tighten the nut E. How to exchange the back feed eccentric cam G is shown in Figure 13.

Remove the nut H and the front feed link I, and then follow the same procedure as the above. When the feed eccentric cam is replaced, it is of course necessary to fit the slot in the eccentric cam on the key of the crank shaft, and care should also be taken so that the stepped side faces outwards.

The differential feed is profitably used for elastic fabrics. In this case it is advisable to use an eccentric cam C with higher eccentricity than the eccentric cam G, e.g., pairing C for 13 stitches per inch or 9 s.p.i. with G for 14 s.p.i., depending on the fabrics to be sewn.

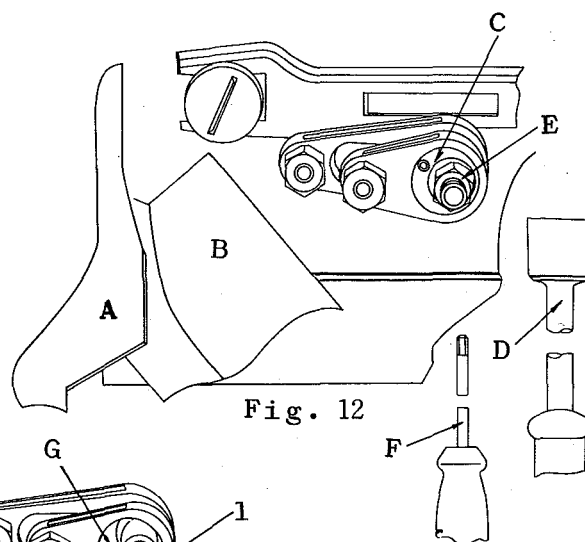


Fig. 12

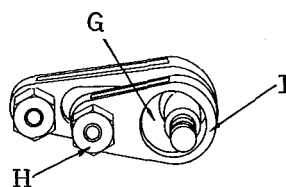


Fig. 13

List of Feed Eccentric cams available for 600 Series

A	B	C	A	B	C	A	B	C
Y4	4	Y32834	Y13	13	Y32827	Y24	24	Y32842
Y5	5	Y32821	Y14	14	Y32828	Y26	26	Y32832
Y6	6	Y32822	Y15	15	Y32837	Y28	28	Y32843
Y7	7	Y32835	Y16	16	Y32838	Y30	30	Y32844
Y8	8	Y32823	Y17	17	Y32829	Y40	40	Y32845
Y9	9	Y32824	Y18	18	Y32839	Y50	50	Y32833
Y10	10	Y32825	Y19	19	Y32830	Y70	70	Y32846
Y11	11	Y32836	Y20	20	Y32840	Y100	100	Y32847
Y12	12	Y32826	Y22	22	Y32841			

A: Stamped No.      B: Stitches per inch.      C: Parts No.

(Note) This list shows the standard numbers of stitches per inch which may actually vary more or less depending on the type of fabrics and differential ratios.

Instructions for adjusting the machine

1. Relation between needle and lower looper

When the lower looper comes to the leftmost point in its movement, the distance from the tip of the lower looper to the center of the needle should be 3-4 mm. (See Figure 14)

When the lower looper starts its motion to the right from the left end of its movement and its tip reaches the center of the needle, the distance from the tip of the lower looper to the top of the needle's eye should be 2-2.5 mm. (See Figure 15) Adjust the height of the needle so that the above conditions may be satisfied. In this case, the lower looper passes behind the needle, and the clearance between the needle and the tip of the lower looper should be as small as possible without touching each other. The lower looper being fixed closely on the top surface B of the lower looper holder A, the height of the lower looper is always identical, which implies no need for regulation.

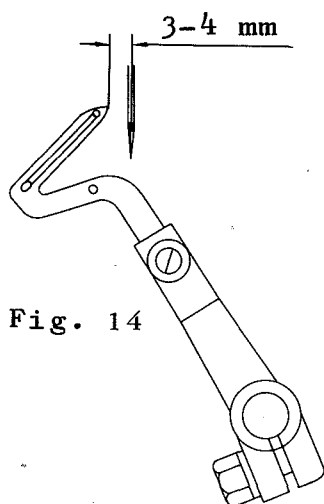


Fig. 14

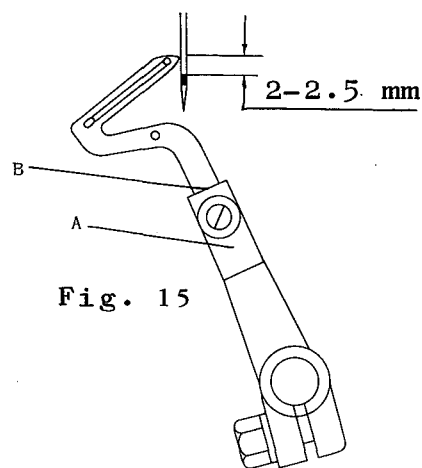
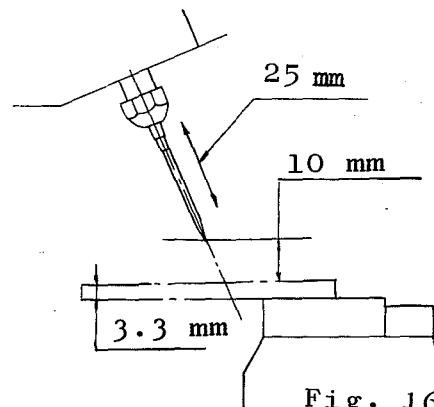


Fig. 15

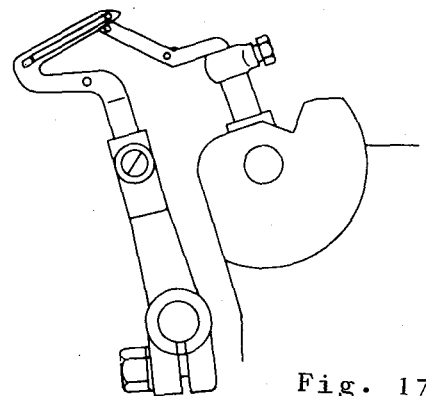
## 2. Height of Needle

The height of the needle is determined of itself from its relation with the lower looper as mentioned above. Speaking for reference, when the needle is raised to the highest point, the distance between the point of the needle and the upper side of the throat plate is 10 mm. The needle stroke is 25 mm, and the throat plate is 3.3 mm in thickness. (See Figure 16)



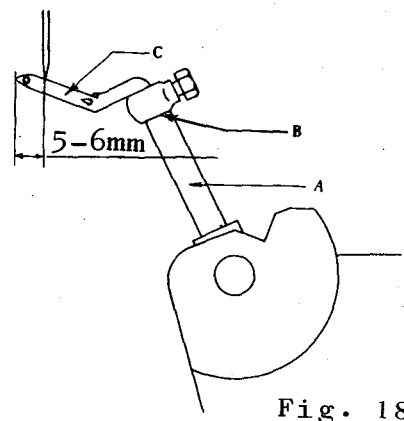
## 3. Relation between lower looper and upper looper

When the lower looper moves from the left to the right, the upper looper passes by the hollow directly under the swelling of the backside of its tip. In this case the tip of the upper looper should pass as close to the backside of the lower looper as possible without touching it. (See Figure 17)



## 4. Relation between needle and upper looper

Since the upper looper C is immovably fixed to the upper looper holder A at the point of B, the height and position of the upper looper are determined accordingly, which involves no need for adjustment of the projection or height of the tip of the upper looper. When the needle starts to come down, it passes by the backside of the upper looper. In this case it is necessary to bring the upper looper as close to the needle as possible without touching each other. This, however, must be determined in consideration of the position of the lower looper. When the upper looper reaches the leftmost point the suitable distance from its tip to the center of the needle is 5-6 mm. (See Figure 18)



5. Relation between upper side of feed dog and upper side of throat plate

Remove the rear cover A.

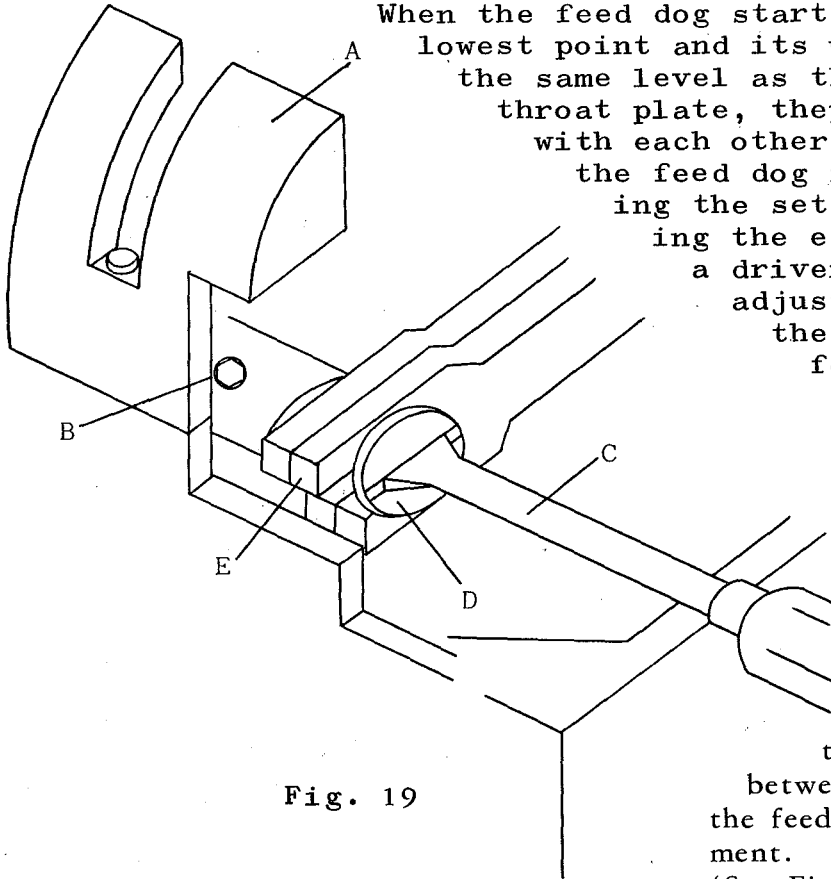


Fig. 19

When the feed dog starts to come up from the lowest point and its upper side reaches the same level as the upper side of the throat plate, they must be parallel with each other. The inclination of the feed dog is changed by loosening the set screw B and revolving the eccentric pin D with a driver C, and so it can be adjusted while observing the relation between the feed dog and the throat plate. In this case see to it that the eccentric pin D does not move to either side. The set screw B must be tightened after adjustment. (See Figure 19)

Care must be taken so that there may be no opening between the eccentric pin D and the feed bar E, after this adjustment. (See Figure 19)

6. Fitting and removal of feed dog, and regulation of its height  
(See Figure 20)

- 1) The front feed dog A is regulated by the set screw D.
- 2) The back feed dog B and the auxiliary feed dog C are regulated by the set screw E.
- 3) The auxiliary feed dog C is fixed to the back feed dog B by the set screw F. Therefore, even if the back feed dog B is removed by loosening the set screw E, the auxiliary feed dog C is fixed to the back feed dog B by the set screw F.
- 4) When there is a need for a difference in height between the upper side of the back feed dog B and that of the auxiliary feed dog C, it is made so by loosening the set screw F. But both of the set screws

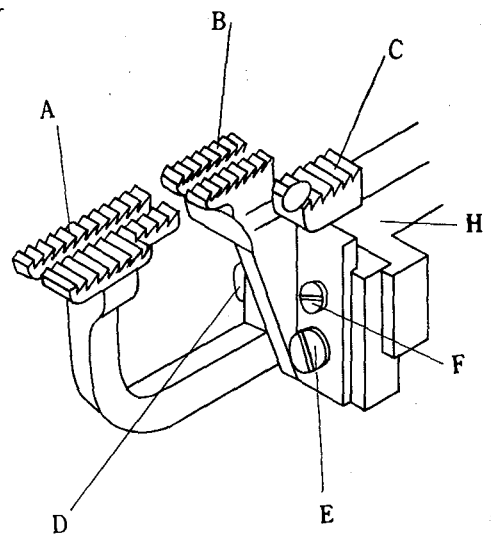


Fig. 20

E and F must be loosened to make the difference in height, when the back feed dog B and the auxiliary feed C are fixed on the back feed dog holder H.

- 5) In standard setting, the upper side of the auxiliary feed dog C is fixed 1-1.5 mm lower than that of the back feed dog B.

#### 7. How to grind the knife

When the upper or lower knife gets dull, it must be ground. Figure 21 shows the sharpening angle of the upper knife, and Figure 22 shows that of the lower knife.

(Note) The upper knife should be cut at the point of A so that the part indicated may measure 10 mm exactly.

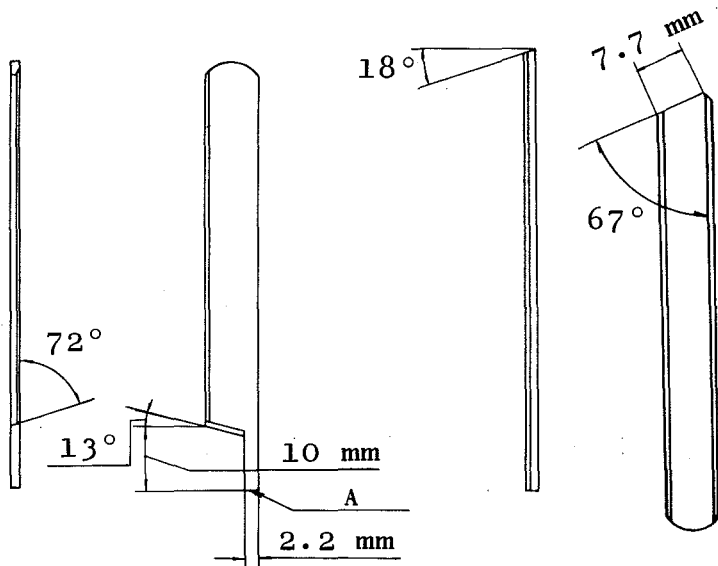


Fig. 21

Fig. 22

#### Reference items for regulation of the machine

##### A. Skipping of stitches

1. Make sure whether the needle thread, the upper looper thread and lower looper thread are all correctly passed through the thread guides and eyelets.
2. Check up whether the needle is straight. If it is bent, replace it by a new one.
3. Check up whether there is any dust in the recess of the needle bar, resulting in the wrong setting of the needle.
4. Make sure whether the needle, the upper looper and the lower looper are rightly set in their relative position.
5. A wrong selection of needle is sometimes a cause of the skipping of stitches.

6. Nylon thread is more subject to skipping than cotton thread, because it is difficult to make a loop of needle thread due to its high stretchiness. This can be prevented by setting the needle a little lower than the standard.

**B. Breakage of thread**

1. Check up whether there is a flaw, caused by the running thread, on the throat plate, chaining-off finger of the presser foot, loopers or thread guides.
2. A wrong relative position of the needle and upper or lower looper can be a cause of breakage of thread.
3. An inferior quality thread should not be used.

**C. Loose stitches**

1. If there is dust in the thread path of the tension disc, proper tension is not given on the thread.
2. A wrong relative position of the needle and the upper or lower looper can be a cause of it.

**D. Irregular stitch formation**

1. Irregular stitch formation may be sometimes improved by adjusting the position of the looper thread guides to increase the supply of the thread to the loopers and tightening the tension spring.
2. It occurs when there are flaws on the upper side of the throat plate, preventing the smooth feed of the fabric.
3. When the upper end of the lower knife comes up higher than the upper side of the throat plate, the fabric is not fed smoothly.
4. It occurs when the knives are not sharp enough.
5. It often occurs when the thread is not twisted properly.

**E. Excessive stretching or shrinkage of seam**

1. It occurs when the differential feed is not adjusted properly.
2. It occurs when the presser bar spring is not adjusted properly too strong or too weak.
3. It occurs when the presser foot, the throat plate and the feed dog are not positioned in parallel.

4. If the feed dog declines forward, the seam may stretch, and if it declines backward the seam may shrink.
5. This often occurs when the height of the feed dog is not adjusted properly.

F. Too big punctures caused on seam

1. If the needle's point is dull, it must be replaced by a new one.
2. This may be improved by a little smoothing out of the upper side around the needle hole of the throat plate.

G. Flaws caused by feed dog (on thin fabrics)

1. They are caused by too sharp feed dog. This can be improved by grinding its upper side a little with an oil-stone.
2. If the upper side of the feed dog is inclined horizontally, it is apt to give flaws to the work, as the fabric is fed by the either edge of the feed dog teeth. This can also be improved by levelling off the feed dog teeth a little with an oil-stone.

Additional note

The above are the general instructions for the use and adjustment of this sewing machine. There will be some cases when the machine must be adjusted in a different manner from the above standards, depending on the kind of fabrics and thread and other conditions. But the above instructions will also be helpful to meet the requirements of these cases.

