



INSTRUCTIONS
FOR RATIONAL USE
OF THE
BERNINA ZIGZAG
SEWING MACHINE
CLASS 117

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THE OILING OF THE MACHINE

The machine should often be oiled, but never too much. Use only pure vaseline oil free of any resinous or acid substances. In fig. 1 and 2 the holes to be oiled are marked with a \circ .

Do not forget to oil as well the holes beneath the cover plate on the right top side of the arm of the machine. Turn sideways the cover plate under screw A.

In the head of the machine, at the spot where the needle bar goes up and down, **only one single drop of oil** should be poured; then let the machine run without thread for a few moments and remove any surplus with a rag. In doing so, no stains will damage the sewing material.

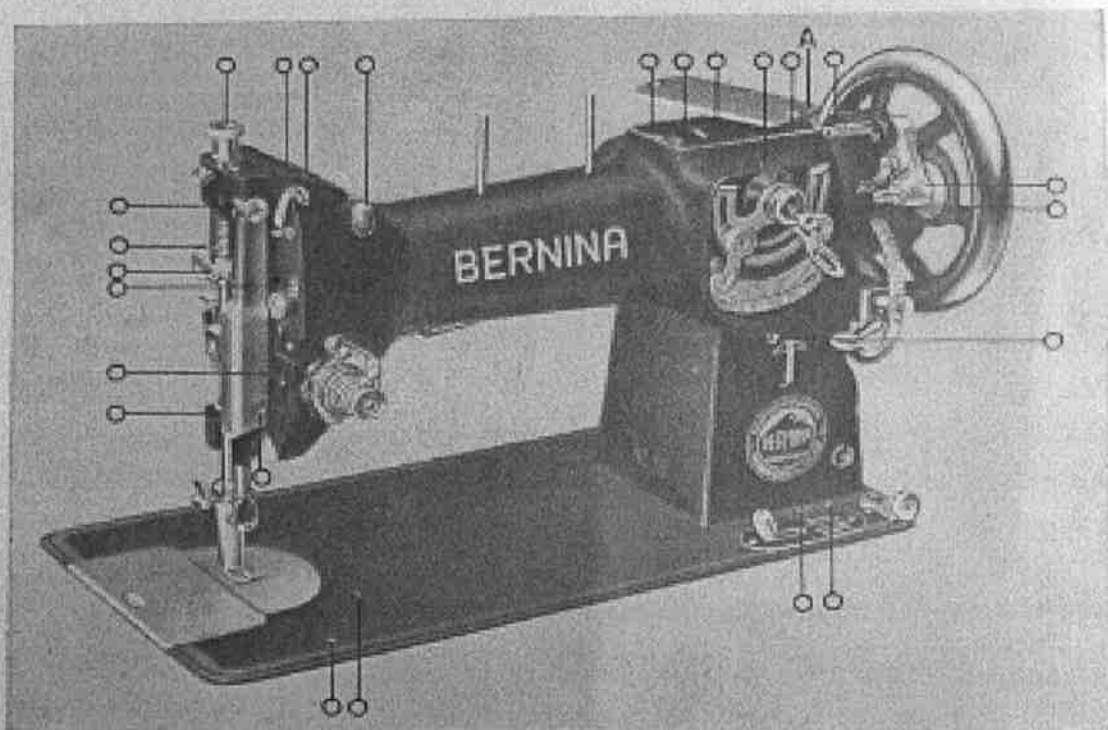
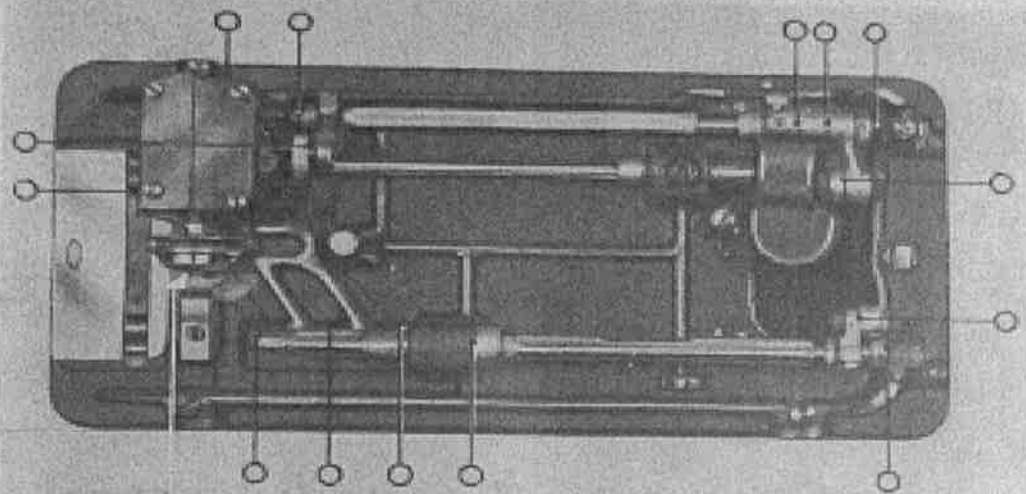


Fig. 1

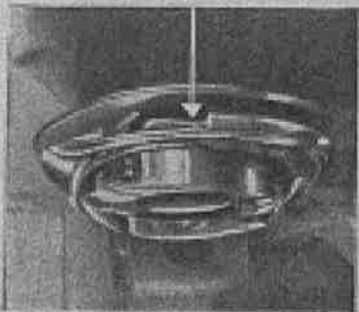
Side view of oil holes

At least once a year the whole machine head should be cleaned thoroughly with a brush dipped in paraffin, so that residues from previous oiling might disappear. Then leave the wet machine over night, dry with a cloth, and oil everywhere.

Oil the machine before use, and not afterwards, when you put it aside. Point A [fig. 2 and 3] is the most important spot to be oiled.



A - the most important spot to be oiled



The hook race (fig. 3, point A) has to be oiled from time to time. Frequent oiling allows the mechanism to run easier, smoother and the machine will last longer.

Fig. 3

In fig. 3 the spot where the hook has to be oiled, is marked with an «A». The hook is the most important and at the same time the most sensitive part of a sewing machine. If you will get the best use out of your machine, you ought to pay particular attention to the hook. If a sewing machine is not used daily, it often happens that residues of oil will get dry, especially if bad oil is used. Then the oil instead of favouring an easy running of the machine, hinders its mechanism. It is particularly disadvantageous if oil is getting dry into the hook. In such a case, thread will easily break, especially when darning.

Whenever thread should break frequently, we recommend to inject paraffin into the hook, in order to dissolve any dry residues of oil. At the same time, any dust that might have entered into the hook race, will be eliminated.

Do not forget to oil now and then all the holes, articulations, and frictional surfaces of the treadle and balance wheel.

THE MOST APPROPRIATE SEWING MATERIALS.

SEWING THREAD: No. 60 to 90 (3 and 6 ply) are the most current numbers. For zigzag sewing only 3 ply cotton should be used, and for ornamental stitches cotton No. 30 and 40 (2 ply).

DARNING THREAD: No. 50 to 80 (2 ply) should generally be employed.

NEEDLES: Use exclusively needles, system 287 WH, which you will obtain from your Bernina supplier.

No. 2 to 4 are the most current numbers for sewing,

No. 1 and 2 the most current ones for darning.

Comparative List of Needles and Threads.

No. of Needles System 287 WH	Sewing Cotton		Darning Cotton 2 ply
	6 ply mat.	3 ply mat.	
1	—	170 to 200	80 to 100
2	70 to 100	70 to 140	50 to 80
3	50 and 60	50 to 70	30 to 40
4	40 and 50	30 to 40	—
5	20 to 30	—	—

For sewing silk take needles No. 2, 3 or 4.

If you wish to keep your sewing machine in good running order for years and years, we recommend to use mat thread only.

With mat thread a more regular and nicer seam is obtained on all sewing machines, especially in case of narrow stitches. Seams with glacé thread are not lasting, the dress of the thread being dissolved when washing, and the stitches getting loose.

Mat thread is preserving your machine in many respects much more than glacé thread, this being true for all brands.

THE REMOVAL OF THE BOBBIN CASE

Place take-up lever E (fig. 7) at its highest point.

With the forefinger of the left hand open latch A; then, by means of thumb and forefinger lift out bobbin case.

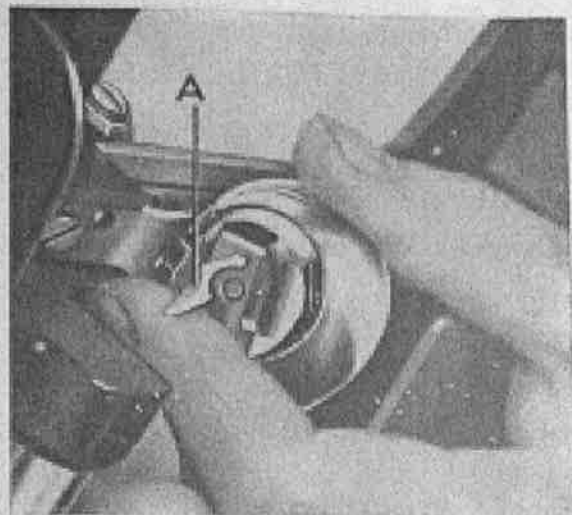


Fig. 4

THE BOBBIN WINDER AND THE SPOOLING

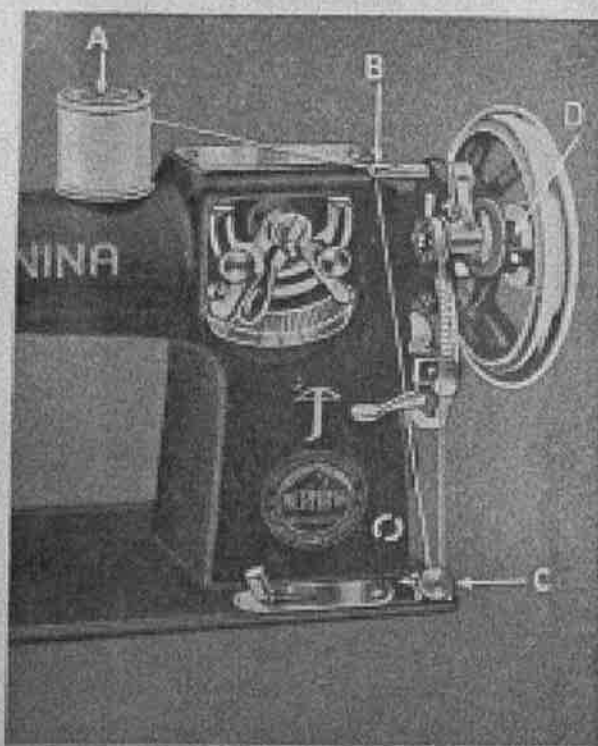


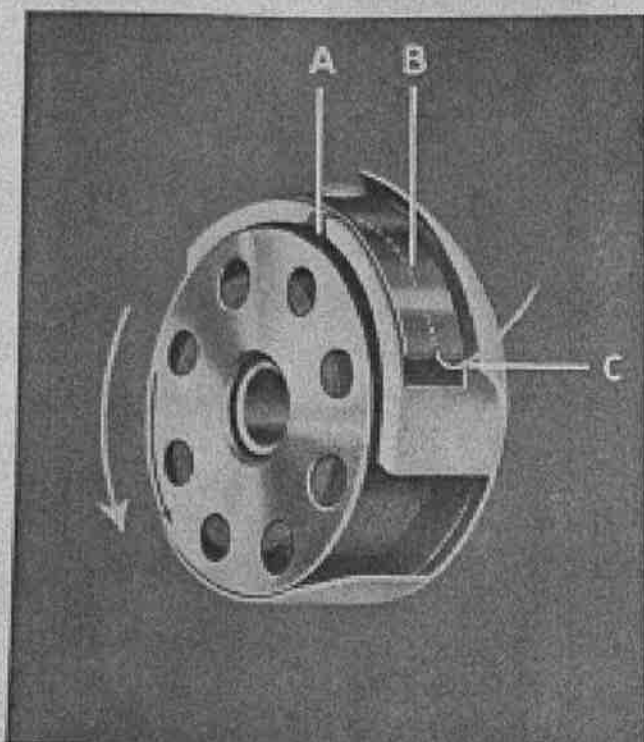
Fig. 5

In order to avoid that the whole machine is running unnecessarily when spooling, balance wheel loosening screw D (fig. 5) should be drawn with the right hand as far as possible towards oneself, whilst the left hand holds the balance wheel.

Thread coming from reel A (fig. 5) is first led through eye B, then down between the small tension discs C, and from there directly upon the empty bobbin, which has been put entirely on the bobbin pin.

As soon as a pressure is exerted upon bobbin engaging lever, winder begins to work. When the bobbin is filled, lever disengages automatically, thus allowing bobbin winding even when sewing.

THE THREADING OF THE NEEDLE AND THE REPLACING OF THE BOBBIN IN ITS CASE



When inserting bobbin into case, take care that bobbin should turn in the direction of arrow (fig. 6). After having inserted bobbin into case, draw the thread through first slit A and underneath tension spring B. Point C is thus the outlet of thread from case.

Fig. 6

THE INSERTION OF THE BOBBIN CASE INTO THE ROTARY HOOK

Hold bobbin case as you did when removing it (fig. 4) at the opened latch A (hold with forefinger and thumb of left hand) in such a way, that bobbin case opening should be on top.

Then put the bobbin case on the hook pin, until it touches the base. Now release latch and check if the whole bobbin case is tight in a manner that it can no more fall out. Insertion of bobbin case is only possible, when needle and take-up lever E (Fig. 7) are at their highest point.

THE SETTING OF THE NEEDLE

Long groove of needle should always face the seamstress. Push the needle upwards as far as possible.

THE THREADING OF THE UPPER THREAD

(Apply driving belt before threading)

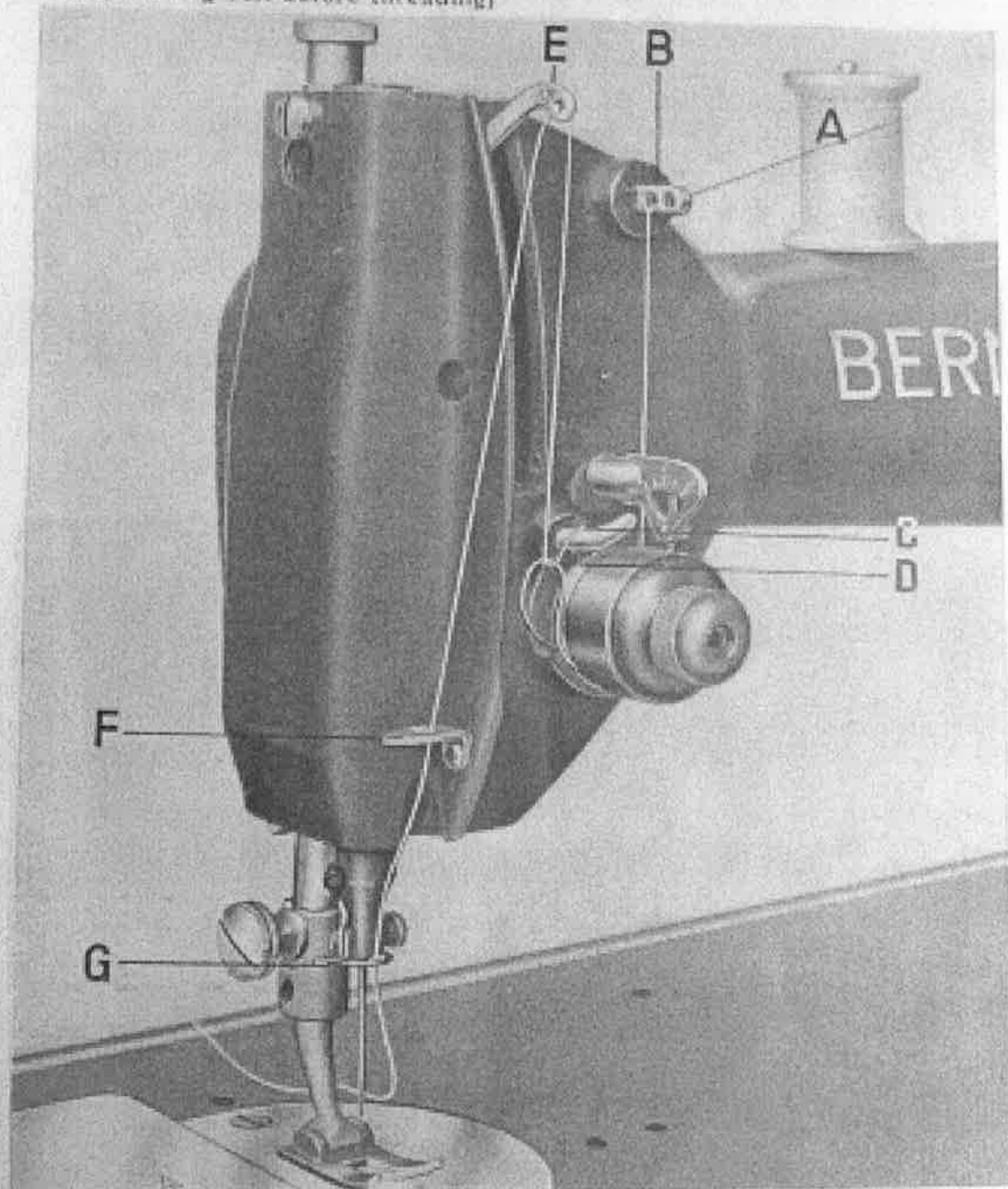


Fig. 7

From spool A thread is guided through eye B, down between the large tension discs, behind guide C, under control spring D, and again upwards into take-up lever E, then down through eye F and guide G, this latter being situated on the needle holder.

The needle should always be threaded from front to back.

THE TAKING-UP OF THE LOWER THREAD

Needle thread (upper thread) is loosely held with the left hand, whereas the right hand gives the balance wheel one complete rotation towards oneself (fig. 10), until take-up lever E (fig. 7) is again at its highest point. Now tighten needle thread a little, and lower thread will appear from below (fig. 8). Finally upper and lower thread together are slightly spanned and placed under and to the back of the presser foot.

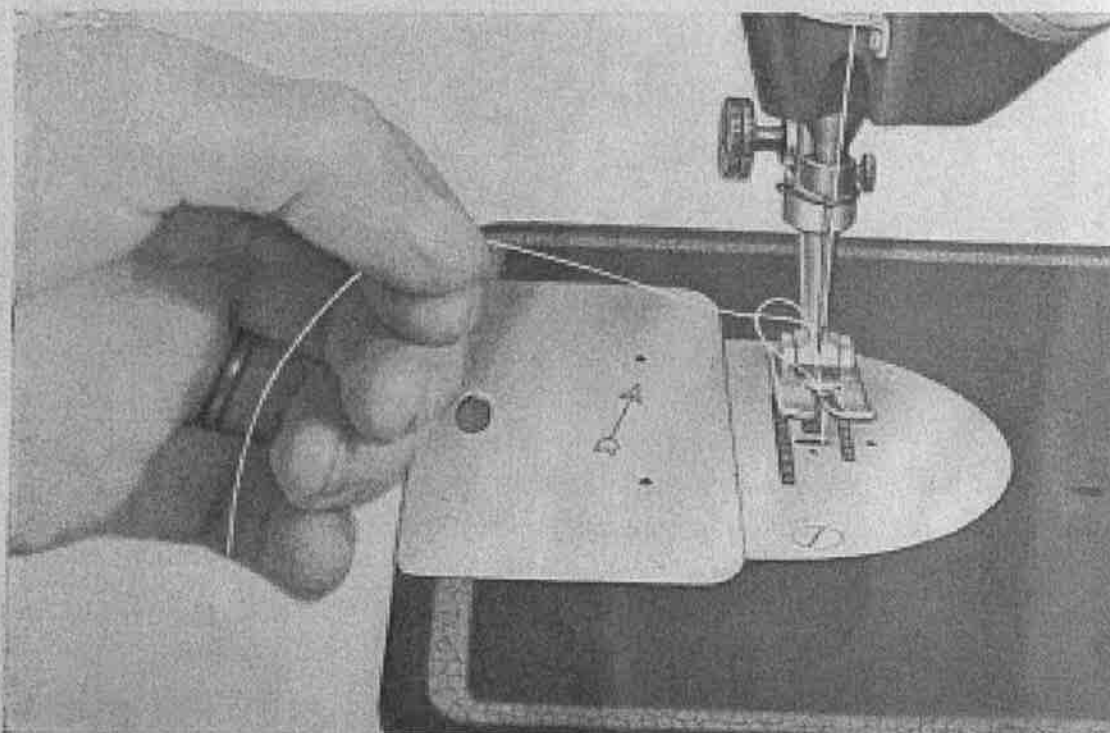


Fig. 8

THE REGULATION OF UPPER AND LOWER THREAD TENSION

Bobbin thread should run a little looser than needle thread. It is necessary that bobbin thread can be drawn with a slight, even tension from bobbin case. The three schematic designs on the following page, which show needle thread in white and bobbin thread in black, are clearly illustrating the effects of right and wrong thread tension.



Fig. a Tensions of needle and bobbin thread are right; twisting takes place in the centre of both cloth layers.



Fig. b Tension of needle thread is too strong or tension of bobbin thread is too weak. Twisting is to be seen on upper edge of cloth.



Fig. c Tension of needle thread is too weak or tension of bobbin thread is much too strong. Twisting is to be seen on lower edge of cloth.

As a rule, tension of bobbin thread should not be altered; in most cases adjustment of needle thread tension will do.

The machine sews much nicer stitches, if bobbin thread is chosen one number finer than upper thread. Stitches ought not to be too narrow, because they would damage the fabric.

Mark on this list the most convenient dial position for the different threads.

Needle thread No.	Bobbin thread No.	Dial No.

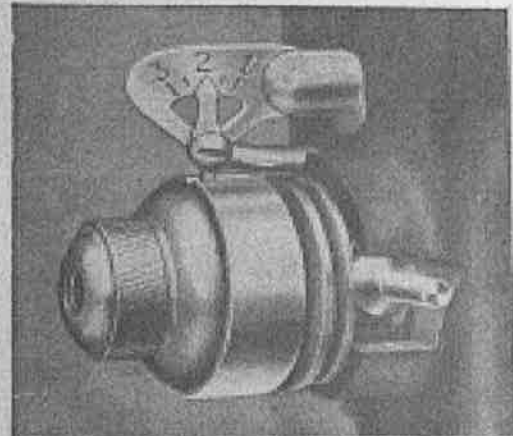


Fig. 9

Dial from 1 to 2 (weak tension)
for sewing with very thin thread,
for embroidery and darning.

Dial from 1 1/2 to 2 1/2
(normal tension)
for normal sewing work.

Dial from 2 1/2 to 3
(strong tension)
for sewing with very thick thread.

THE ORDINARY STRAIGHT STITCH

When you begin sewing, take care of the following items:

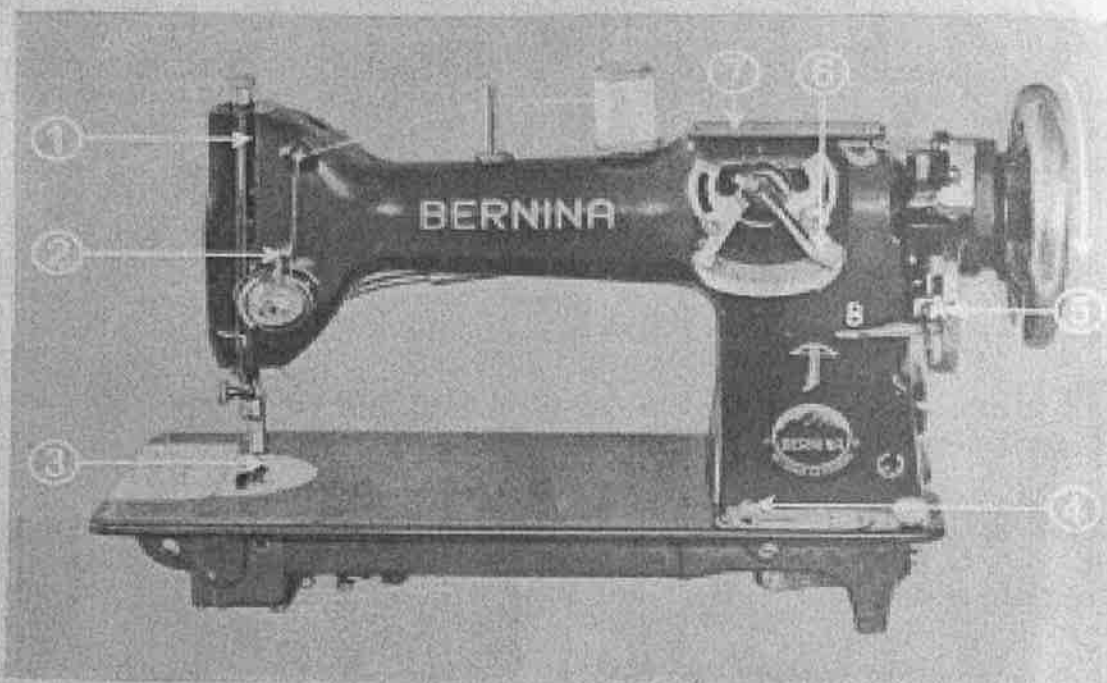


Fig. 10

1. Lift take-up lever to its highest point.
2. Adjust thread tension between $1\frac{1}{2}$ and $2\frac{1}{2}$.
3. Apply presser foot for ordinary straight stitch. Thread needle from front to back. Take needle and bobbin thread together and place them under and to the back of the presser foot.
4. Thumb screw must be to the left, upon « Nähen » (sewing).
5. Stich regulator should be a trifle under zero position. In loosening screw A, lever B can be adjusted to the widest stitch.
6. Stitch width lever should be quite on the right, upon zero. In this position, the machine is sewing straightforward. If lever is adjusted from zero position towards the left, the machine will sew zigzag stitches.
7. Needle should start exactly from central position of the stitch-hole (Fig. 19).

Balance wheel should never be turned otherwise than in the direction of arrow, namely towards oneself.

Sewing backwards and forwards, and adjustment of different stitch lengths. Sewing backwards and forwards allows easy reinforcing of certain parts of the fabric, and fastening of the end of a seam. According to the position of lever B (fig. 10, no. 5), the machine sews backwards or forwards, and at the same time makes narrow or wide stitches. Pressing lever B downwards under zero position, the machine sews forwards, pressing it upwards over zero position, the machine will sew backwards. The farther the lever is set from zero position, either downwards or upwards, the wider the forward or backward stitch will be.

In order to maintain an even wide stitch, when fastening backwards and forwards, a stop screw A (fig. 10) will limit the up and down movement of lever B, by turning it to the right. If screw A is turned to the left, shifting possibilities of lever B will be enlarged.

HOW TO TURN A SQUARE CORNER

When you wish to obtain a perfect corner at the end of a seam, turn the balance wheel towards you until take-up lever is at its highest point. Now go on turning the balance wheel until the needle point has gone through the fabric and even 3 to 4 mm into the stitch-hole of the throat plate. Lift the presser foot and turn the fabric round the stitched-in needle point, at a right angle to the seam. Lower the presser foot and restart sewing in the new direction. Never turn the fabric when the needle is lifting, but only when — coming down — it has gone through the fabric.

THE FASTENING OF THE THREADS.

Use backward and forward stitch regulator (fig. 10, no. 5, lever B).

In order to get the same length of stitches, backwards and forwards, when fastening, stop screw A should be screwed upon the wanted length of stitches.

By turning this stop screw to the right, movement up and down of lever B is limited. When turning screw A to the left, shifting possibilities of lever B will be enlarged.

With the aid of stitch regulator scale the machine can always be adjusted upon the desired length of stitches.

THE REMOVAL OF THE WORK FROM THE MACHINE

Put take-up lever E (fig. 7) to its highest point. Do not brake with the aid of the feet, nor use the treadle for balancing the needle, as is often seen, but turn balance wheel with the right hand, until take-up lever has reached its **highest** position.

Now presser foot is lifted by means of its lever; at the same time needle thread tension gets entirely loose and the work can be easily removed **backwards**, without having to draw the thread previously towards oneself.

Please take care to remove the fabric always **backwards**; otherwise the needle is bent and the machine will skip a series of stitches!

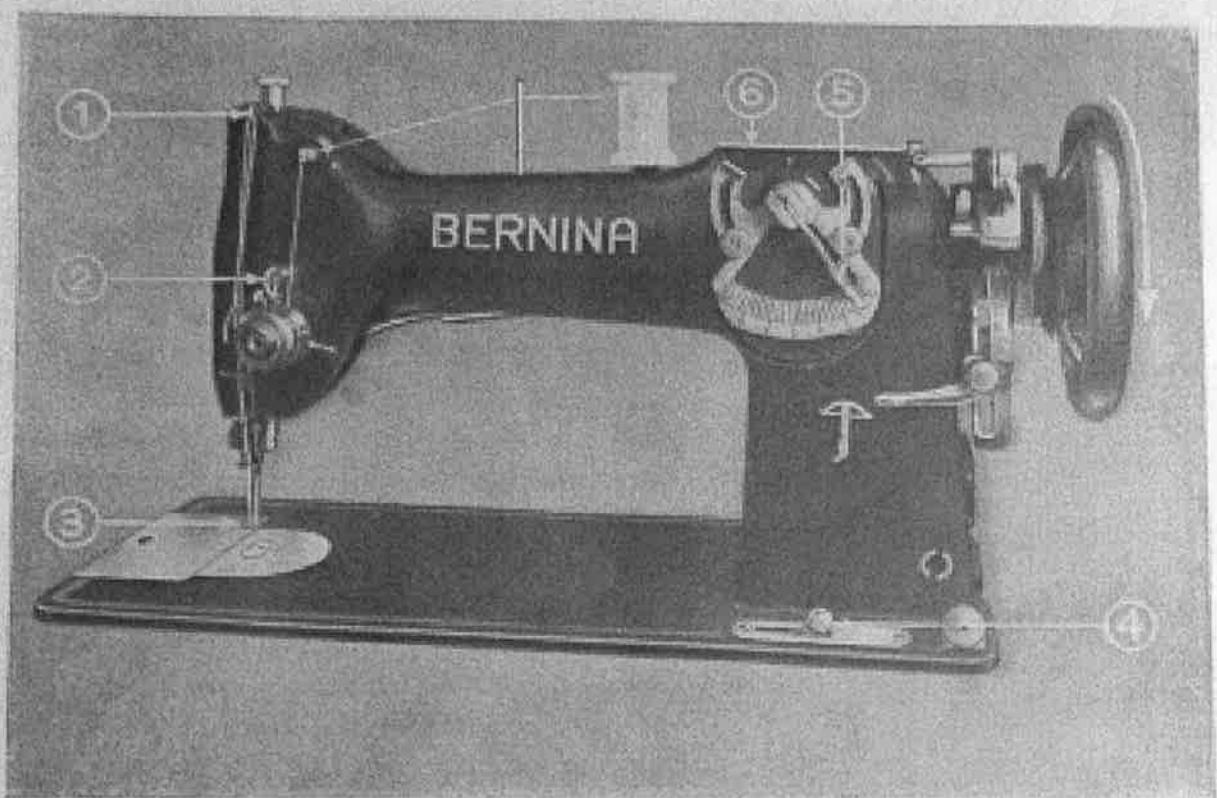


Fig. 11

1. Lift take-up lever to its highest point.
2. Loosen thread tension, by adjusting between 1 and 2.
3. Remove presser foot together with prolongation and insert darning foot.
Put needle plate cover upon throat plate.
4. Thumb screw must be to the right, upon «Sticken».
5. The lever for the width of stitches must be to the right, upon zero position.
6. Needle should start exactly from central position of the stitch-hole (fig. 19).
7. It is recomendable to inject some drops of paraffin into the hook. Paraffin is cleaning the hook race.

THE LAP HEMMER

(Needle should start exactly from central position, Fig. 19.)

The lap hemmer is similar in shape to the hemmer just described, but without spiral form.

Lap seams serve for extremely solid assembling of two pieces of cloth. They have to be done in two different operations.

Operation No. 1

Both cloth parts which are to be stitched together are laid one upon the other, in such a way that the under cloth is protruding a little bit. Then both cloth parts are turned into the lap hemmer in just the same manner as was done with the ordinary hemmer, so that they are turned down. When sewing take care that the cloth, when entering the lap hemmer, is always equally wide.

Operation No. 2

Unfold and lay flat both cloth parts, so that the seam stands up like a little pleat. This pleat is now introduced a second time into the lap hemmer, in the same direction as previously, by means of which it is turned down and sewn on.

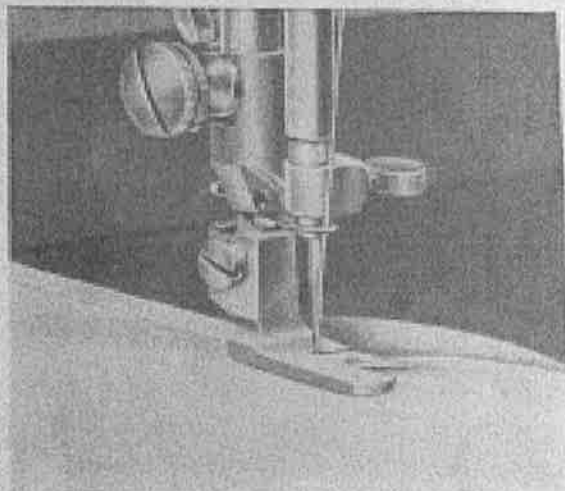


Fig. 15

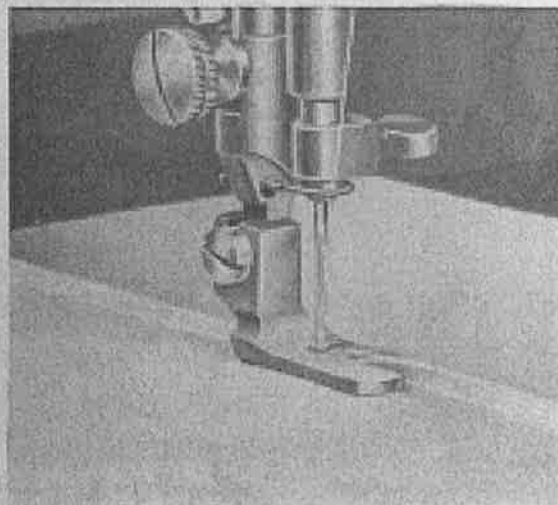
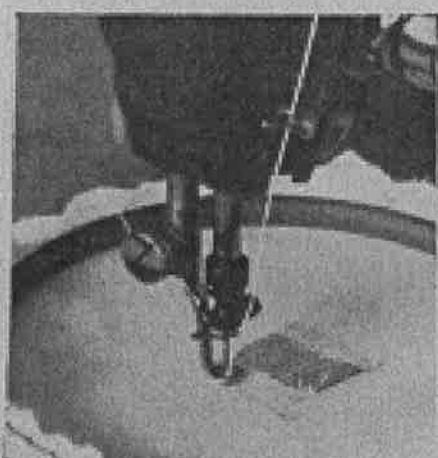


Fig. 16



A



B



C

Fig. 12

THE DARNING OF HOUSEHOLD LINEN

The darning of household linen with the BERNINA is made as easy as ABC, with the help of the novel patented darning foot. One begins with the spanning of threads from left to right (fig. A), one line of stitches nicely close to the other. These spannings should only be machined as far into the undamaged fabric as is absolutely necessary for securing the stitches and these should be of different lengths. Then follows the covering of the spanning stitches up and down (fig. B).

The first stitches are put a little outside the outer spanning stitches, in order to get a most even square of weaving.

These covering tours up and down and vice-versa should run quite parallel. Therefore it will be necessary to machine one or two horizontal side stitches at the beginning and the end of each tour, in order to obtain straight lines of stitches. Finally covering tours are again sewn over the former hole, until it is filled (fig. C).

If a darning frame is used, the outer ring should be covered with stuff, thus allowing a better tightening of the fabric to be darned. The inner ring should be well pressed downwards, so that the fabric comes to lie directly on the needle plate, without any space between plate and fabric. The fabric should be as tight as a drum skin.

Only left-twisted thread should be used for darning household linen.

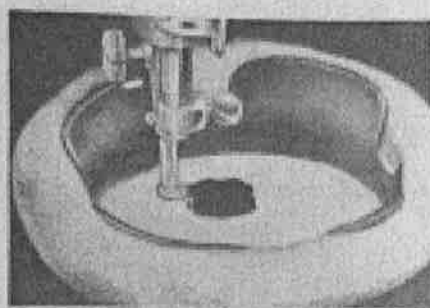
THE DARNING OF STOCKINGS

We are using the darning apparatus for stockings, which is delivered with every Bernina Sewing Machine Type 117.

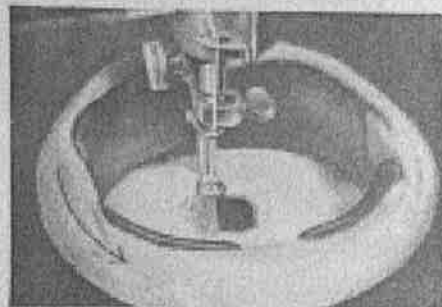
The damaged place is stretched into the frame, as appears from the directions for use, which are supplied with every darning apparatus.

We lead the stretched stocking under the darning foot and are sewing a tour of ordinary stitches round the damaged place. This precaution prevents from getting ladders (Fig. A). Then we machine across the hole, from front to back, across the course of the meshes, one tour next to the other, as close as possible (fig. B). Afterwards we turn the darning apparatus a quarter-wheel in direction of the arrow and begin with the covering of the stitches already made. To make these covering tours less visible, we machine them in the direction of the course of the meshes, beginning a little outside the outer spanning stitches (fig. C). These covering tours, which we sew at irregular distances farther into the stocking, must come to lie one next to the other, in the direction of the meshes. That is why we do not only guide the darning apparatus forwards and backwards, but after every vertical tour we are making one or two horizontal stitches (fig. D).

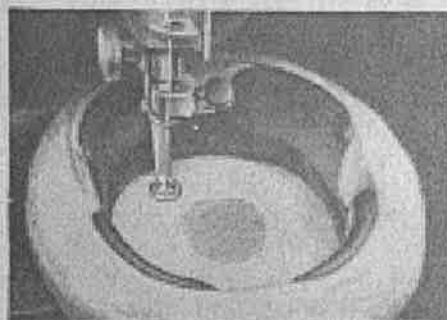
Now we are filling the small intermediary spaces in the just mended hole, again sewing a covering tour between them, in the same direction. This last covering tour has to be stitched just the same length as the former hole.



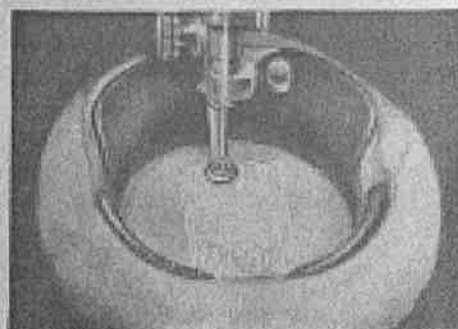
A



B



C



D

Fig. 13

THE USE OF THE ATTACHEMENTS

THE HEMMER (Width of hem 5 mm)

(Needle should start exactly from central position, Fig. 19.)

Insert the hemmer on the machine, instead of the ordinary presser foot. For doing so, loosen screw O by a few turnings and mount hemmer in place of presser foot.

If you prefer a thumb screw to the ordinary screw O (fig. 14), you might change it at the next BERNINA Shop.

The material is placed as follows into the hemmer:

Turn edge of material in the usual manner to a hem, of the width of the hemmer and push the prepared piece of fabric from front to back so far into the spiral formed guide of the lifted hemmer, till needle catches the hem. When sewing, guide the upright edge of material very slightly (fig. 14).

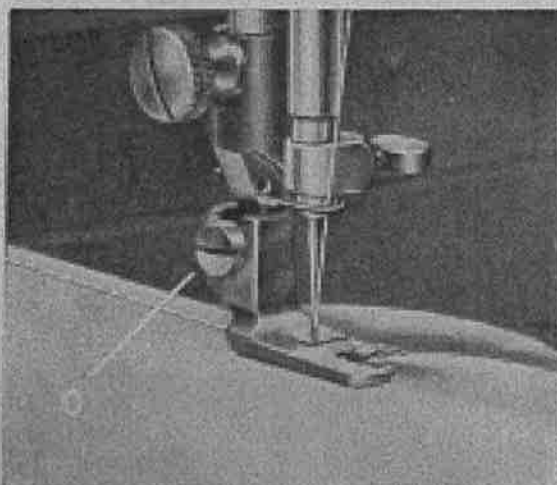


Fig. 14

If too much material should run into the hemmer, the seam will get padded and uneven; if there enters not enough, it will not be sufficiently turned in.

The oblique slit in the hemmer foot, immediately to the right of the stitch hole, allows simultaneous sewing on of laces, a. s. o.

If you wish to obtain a small hem of about 3 mm, use the shell rolling hemmer, marked with 3 red stripes (see fig. 26).

SINGLE LEFT-SIDE PRESSER FOOT COMBINED WITH QUILTER GUIDE

(Needle should start from central position, fig. 19-20)

You will notice that the stitch-hole in the throat plate, where the needle is passing through, is exactly at the right border of the presser foot (fig. 17). In such a manner, this presser foot (without quilter guide) is particularly suitable for sewing nearest along edges of the fabric (corsets and similar works) or for obtaining pleats on blouses, shirts, etc. For this latter case, fold your fabric where you wish to obtain a pleat, place it under the presser foot and now sew quite near along the edge. Then, unfold the fabric and you will see that a nice pleat is formed. Near this, you may sew some further

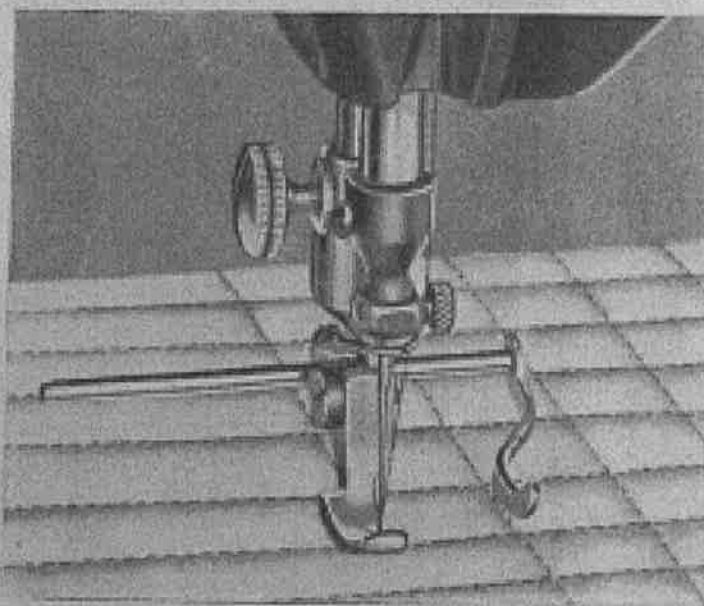


Fig. 17

parallel pleats, according to the kind of fabric and the effect you wish to obtain. Applying the Quilter Guide to said presser foot, it becomes suitable for wadding works, as shown in fig. 17. First fix the guide at the desired distance from presser foot, according to the width of the parallel seams. Then make the first seam, remove the fabric in such a manner that the seam is exactly under the quilter guide, start sewing again in following said line and you obtain a parallel second seam, and so on. When you have obtained the desired number of parallel seams, you can do the same across, so to obtain perfect squares. Instead of parallel seams you can make for certain works round or ornamental seams.

THE ZIGZAG SEWING

The zigzag sewing gives you the possibility to make a lot of different sewing works never dreamt of. The elastic clothes now so generally in use (wool dresses, jersey underwear, etc.) **should be sewn with zigzag stitches only**, because these only offer elastic seams!

THE ZIGZAG SEWING

(Use only 2 or 3 ply threads, never 6 ply!)

When starting to sew zigzag stitches, you will proceed in the following manner:

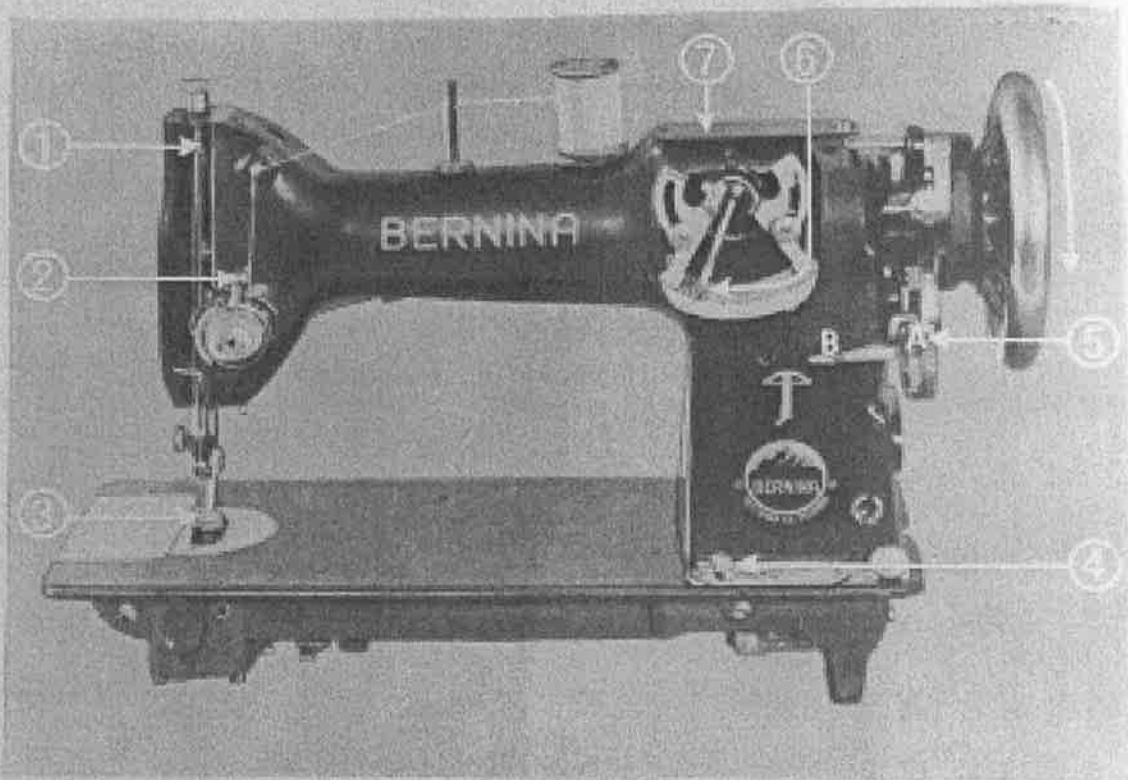


Fig. 18

1. Lift take-up lever to its highest point.
2. Adjust thread tension between $1\frac{1}{2}$ and $2\frac{1}{2}$.
3. Instead of the ordinary presser foot, insert the ordinary zigzag presser foot. Take both needle and bobbin thread together and place them under and at the back of zigzag presser foot.
4. Thumb screw should be placed to the left, upon « Nähen » (sewing).
5. Stitch regulator should be a trifle under zero position. In loosening screw A, lever B can be adjusted to the longest stitch. The more

- the stitch regulator B will be placed under zero position, the longer the stitch will be.
6. **Stitch width lever** must be placed from zero position to the left. The more the lever will be placed to the left, the wider the zigzag seam will be.
 7. **Needle** should start exactly from central position of the stitch-hole, or from the left (see fig. 19-20-21).

By turning this knob at the back of the machine

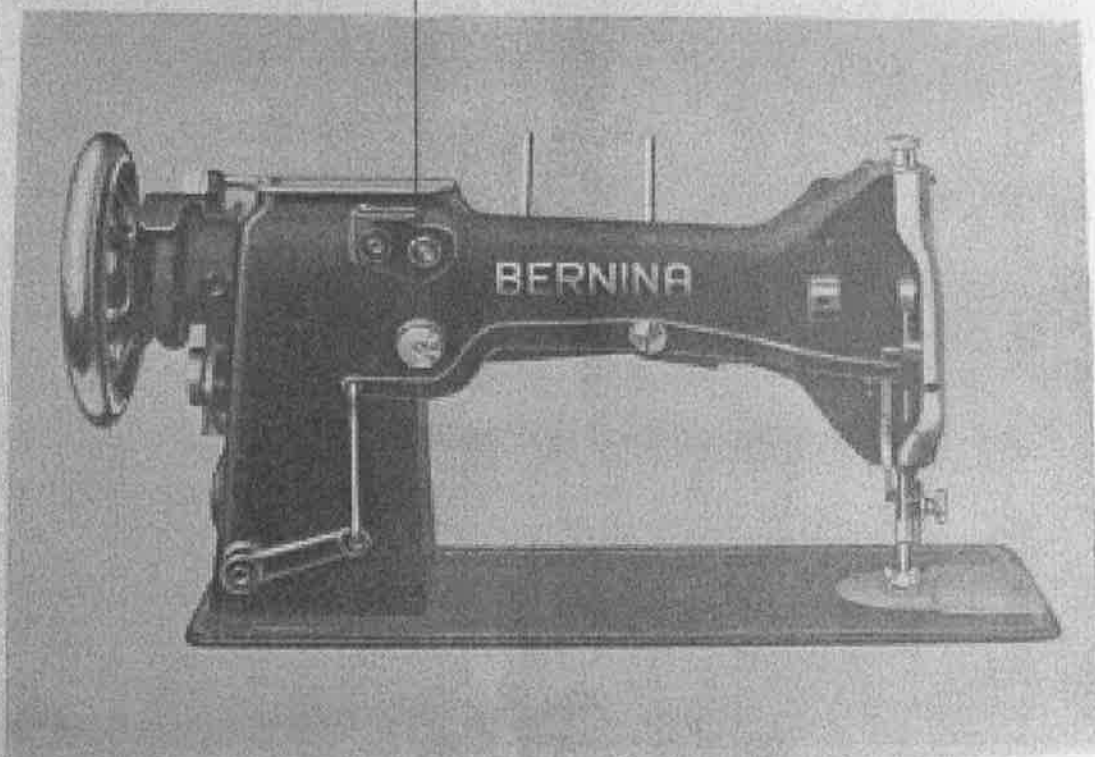


Fig. 19

you can adjust in a different manner the initial position of the needle and where it will stitch.

If **stitch width lever** is placed upon zero, you will notice that the needle stitches in the **middle** of the stitch-hole and after having turned the knob, at the left.



a) needle stitches beginning from the middle are spreading evenly over both sides

Fig. 20



b) needle stitches beginning from the left are directed to the right only

Fig. 21

THE ORNAMENTAL ZIGZAG STITCHES

According to the adjustment of stitch length, stitch width, and position of needle (beginning from the left or from the center), you will obtain the most various effects.

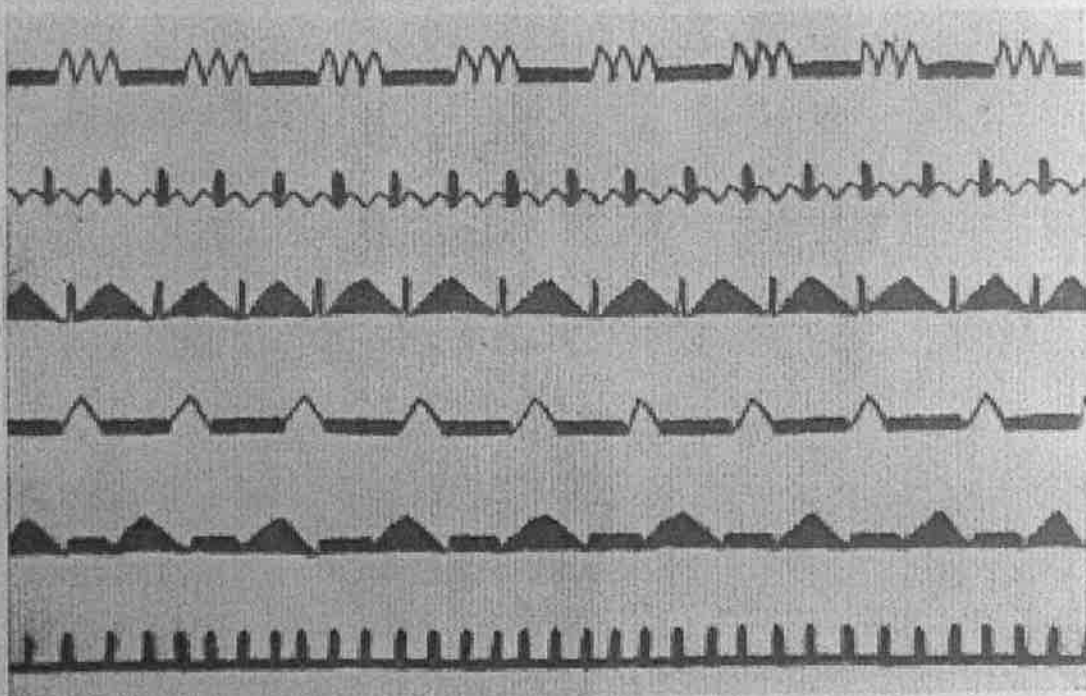


Fig. 22

These ornamental zigzag stitches have been executed with needle stitch beginning from the left (fig. 19 and 21), applying the embroidery presser foot, marked with 1 red stripe.

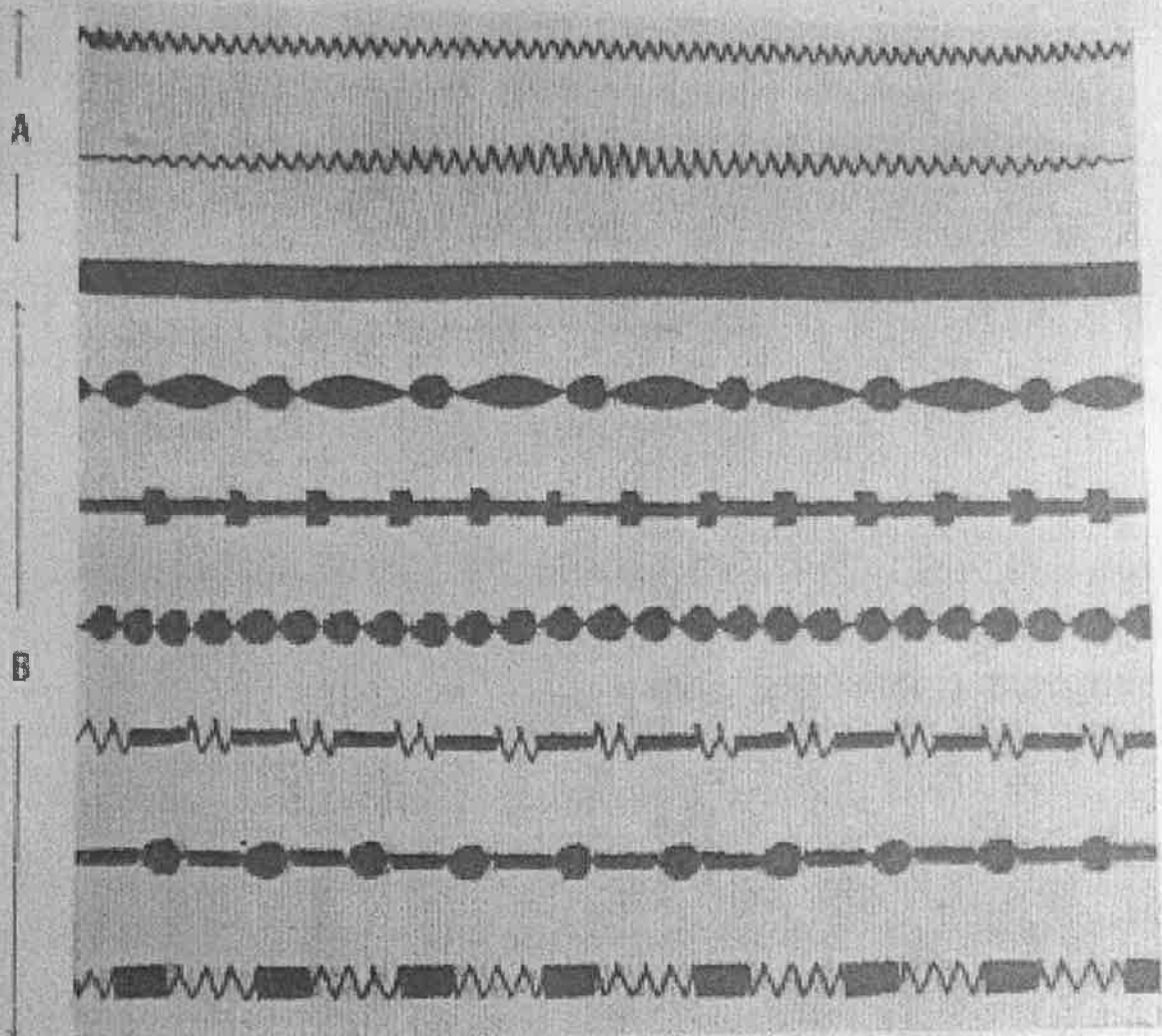


Fig. 24

These ornamental stitches have been sewn with needle stitch beginning from the middle (fig. 19-20).

The ornamental stitches A with the ordinary zigzag sewing presser foot and stitches B with the zigzag embroidery presser foot, which is hollow ground underneath and marked with 1 red stripe.

THE ROLLING HEM

(Needle should start exactly from central position, fig. 19-20)

Instead of the ordinary zigzag presser foot insert the rolling hemmer,

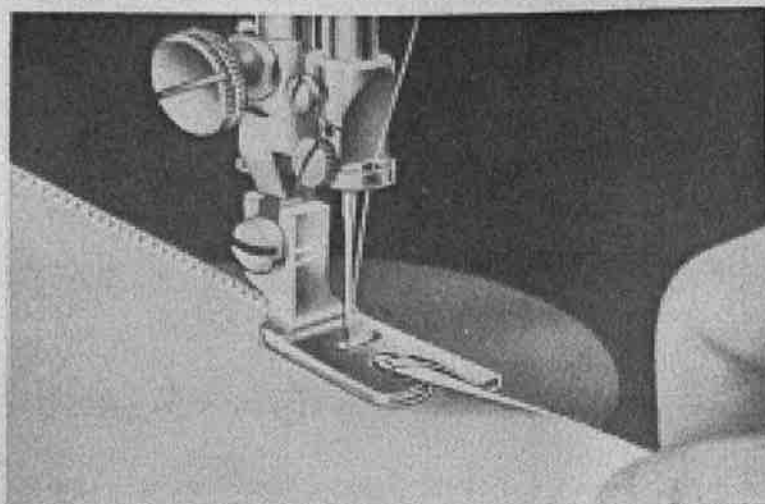


Fig. 25

marked with two red stripes.

The use of the rolling hemmer is the same as that of the ordinary hemmer. Zigzag stitch will be adjusted approximately upon no. 3 to 4. Use normal stitch length, not too wide!

The rolling hem serves especially for edging thin material.

THE SHELL ROLLING HEM

(Needle should start exactly from central position, fig. 19-20)

This hem is suitable only for jersey and bias cut material. Instead

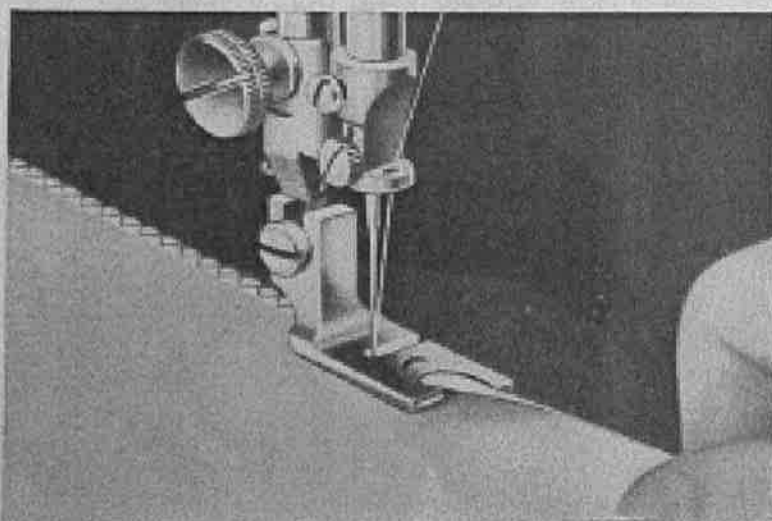
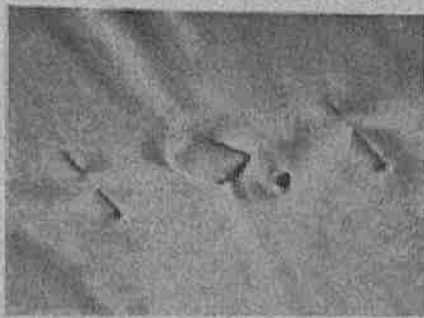


Fig. 26

of the ordinary zigzag presser foot insert the shell rolling hemmer, marked with three red stripes. The material is laid into the shell guide in the same manner as you do with other hemmers. The zigzag stitch covers the whole hem. — With the aid of strong thread tension and great stitch lengths the shell-like effect is ob-

tained. — The shell rolling hem is especially suitable for edging jersey underwear. Said hemmer can be used as well as a narrow ordinary hemmer (width of hem 3 mm). In this case the stitch width lever 6, fig. 10, must of course be put on 0 position.

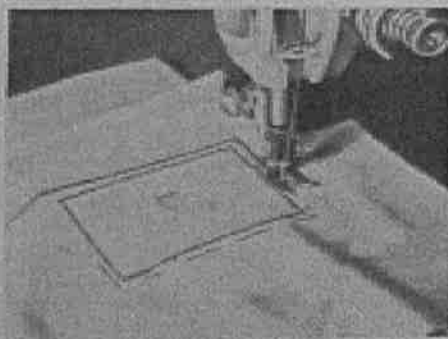
THE ELASTIC MENDING OF JERSEY



A



B



C

Fig. 27

First manner.

The mending piece is laid in the direction of the meshes under the place to be repaired, and fixed by means of long stitches (A and B).

Now a zigzag tour is machined, following these long stitches, and a second one at the distance of the presser-foot (C).

The damaged piece as well as the surplus of the mending piece are cut out, and the elastic repair of the jersey is already finished.

Second manner.

The mending piece is laid in the direction of the meshes under the place to be repaired. Now you sew it with an ordinary average stitch length, following the contours of the long stitches, using thin darning thread.

Then the damaged piece is cut out about 2 mm inside and alongside seam contours; the same is done with the mending piece, but on the outer side of seam.

Finally the cut edges are oversewn on both sides, by means of a zigzag tour.

Put the stitch width lever upon No. 3 to 4, and the stitch length lever upon No. $\frac{1}{2}$ to 1.

THE HEMSTITCH SUBSTITUTE AND PICOT EDGE

(Needle should start exactly from central position of the stitch-hole, fig. 19-20)

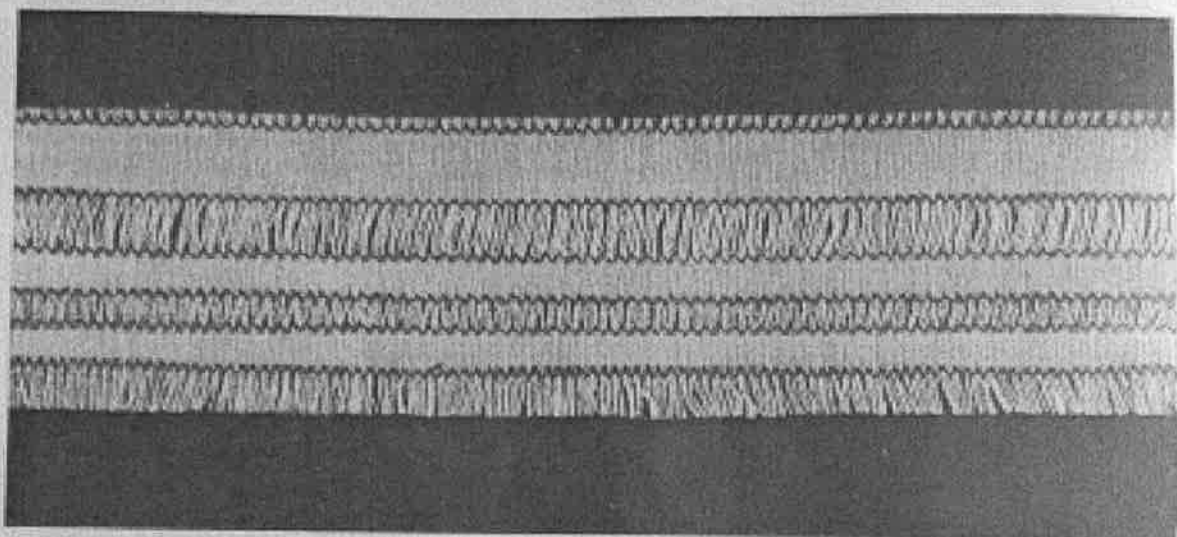


Fig. 28

First the threads of the cloth are drawn out in the desired width and in the same manner as you do when hemstitching by hand. Then both edges are sewn with the zigzag stitch, using the normal zigzag presser foot.

Certain materials have to be stretched into the embroidery frame, thus allowing to stitch the second edge, with the zigzag stitch, easier into the same hemstitch thread of the first sewn edge.

If a zigzag edge of such a hemstitch is cut off, there remains the so-called picot edge (fig. 28, P), which is very often used for lamp-screens, fine shawls, etc.

THE BRAIDING

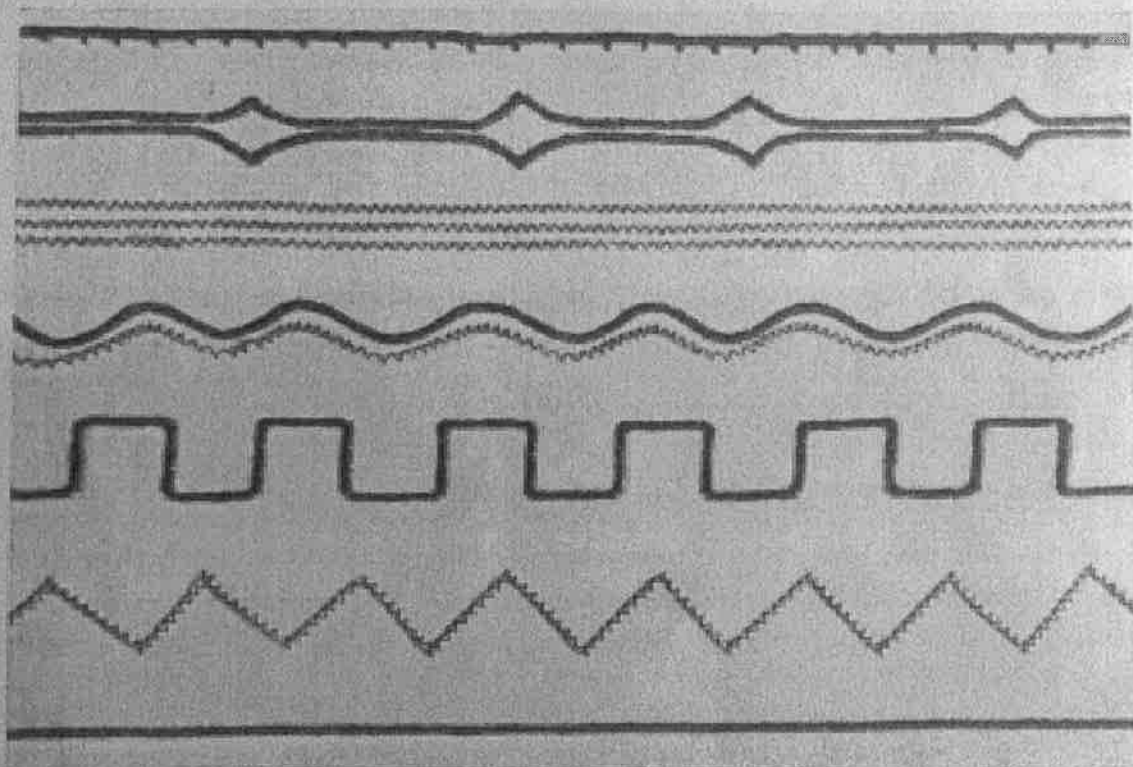
[Needle should start exactly from central position of the stitch-hole, fig. 19-20]

A soft cord is put into the guidance of the braiding presser foot, marked with 1 red stripe, and oversewn with zig-zag stitches. Use mercerised cotton 2/50 or 2/60. The most various effects are obtained with this kind of work. The effect can yet be raised, when using coloured cotton, coloured braid, some rows of seams one next to the other, etc.

This presser foot is often used for attaching a braid to the edge of a seam.



Fig. 29



THE APPLICATIONS

(Needle should start exactly from central position of the stitch-hole, fig. 19-20)

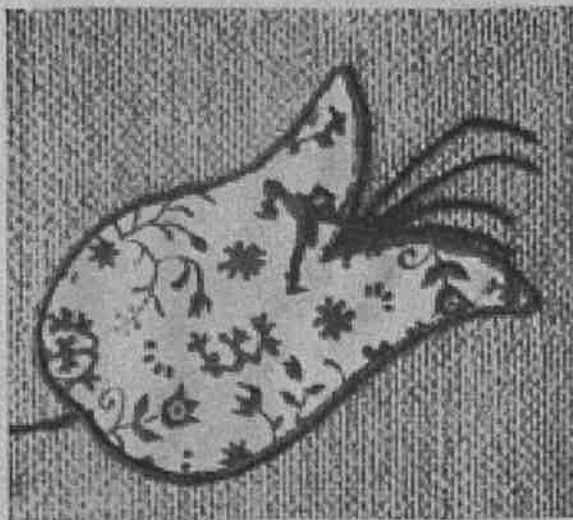


Fig. 31

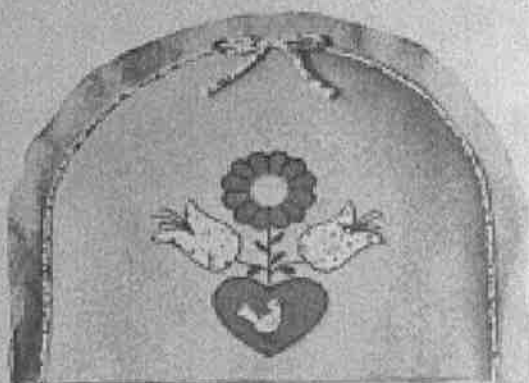


Fig. 32 (Cosy)

By sewing on scraps of cloth or tulle of a different colour, the decorative effect will be much increased. This kind of applications is especially employed with collars, ladies' and children's dresses, lingerie, etc.

Both parts of the material must be previously and adequately drawn as a pattern.

The material to be sewn on will be cut a little bit larger than the pattern. Now both parts are laid one upon the other, so that the patterns are covered, and tacked together.

With a narrow, not too close zigzag stitch the lines of the design are followed and the protruding edges of the pattern sewn on are cut off. Then a wider and closer zigzag seam is machined over the sewn line.

For normal work the ordinary zigzag presser foot will do, whereas, when sewing on a cord as a lining, the braiding presser foot (with 1 red stripe) should be employed.

THE SEWING ON OF BUTTONS

[Needle starts from the left of the stitch-hole, fig. 19 and 21]

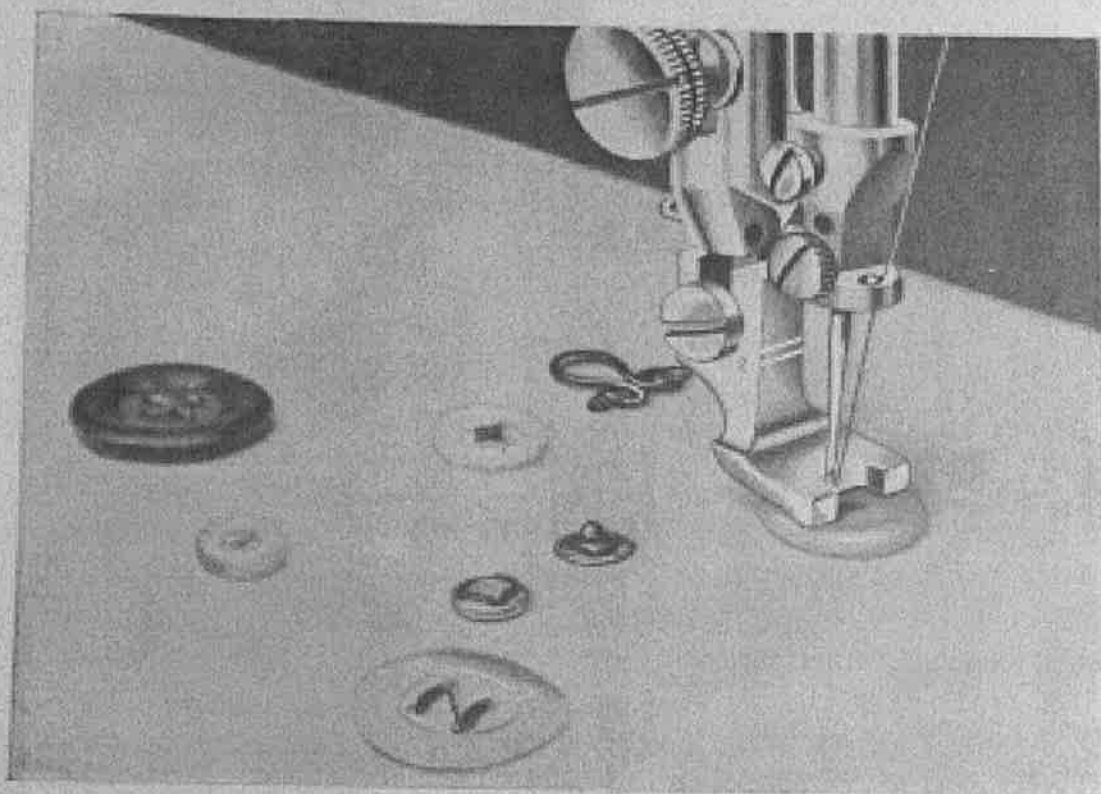


Fig. 33

1. Push thumb screw to the right on "Sticken" (fig. 11 no. 4) and feed dog will drop.
2. Insert button presser foot, marked with two black stripes, and put the button under the presser foot, as shown in fig. 33.
3. Adjust needle so that it starts **from the left** of the stitch-hole.
4. Adjust zigzag stitch width according to the distance between the holes in the button.
5. Fix the button by six to eight stitches.
6. This being done, the **stitch width lever no. 6, fig. 18 should always be placed upon zero position**; then, make some fastening stitches.

If there are four holes in the button, cloth with button is displaced, and the other two holes are also oversewn by another six to eight stitches.

Snap fasteners and hooks are fixed in the same manner.

THE BUTTONHOLE SEWING

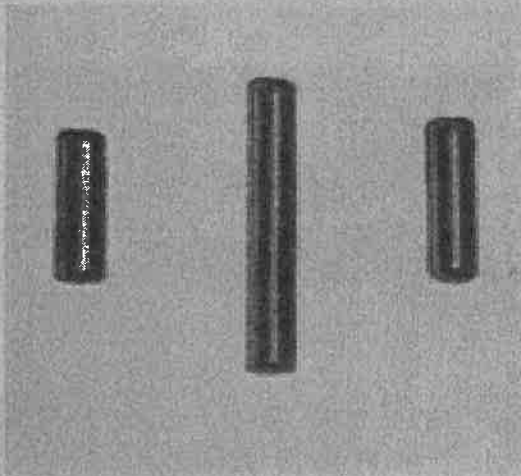


Fig. 34

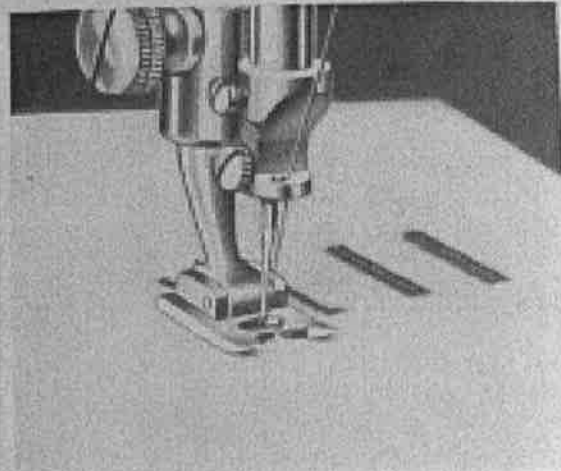


Fig. 35

We distinguish three sorts of buttonholes :

- A. The ordinary or stitched buttonhole.
- B. The braided buttonhole.
- C. The raised buttonhole.






The A and B buttonholes are made with normal thread tension.

C buttonhole is obtained by tightening the bobbin thread so slightly, that bobbin case drops easily by itself, when thread end is taken up. To the contrary, the upper tension should be so tight as to allow the bobbin thread to appear nice and even on the upper side of the material.

For raised buttonholes it is absolutely necessary to use as needle thread cotton no. 40, mat, 6 ply, whereas on the bobbin ought to be a very thin thread (No. 2/60). Tension dial should be nearly upon no. 3.

THE SEWING OF A BUTTONHOLE

(Needle starts from the left of the stitch-hole, fig. 19 and 21)

1. Insert buttonhole presser foot, marked with 3 black stripes.
2. Adjust needle so that it starts from the left of the stitch-hole.
3. Place stitch length lever B no. 5 fig. 18 slightly under zero position.
4. Adjust stitch width lever no. 6 fig. 18 upon width of buttonhole. (In general approximately upon No. 2 $\frac{1}{2}$.) Fix by means of right stop (fig. 18, no. 6).
5. Now sew the first half of the buttonhole. Last stitch to the right. (The cloth should only be just touched by the needle point.)
 Last stitch to the right
6. Then raise the buttonhole presser foot and turn the cloth from right to left for half a rotation, round the stitched-in needle. Lower the presser foot and let needle stitch in to the left. (Again, cloth should only be just touched by the needle point.)
 Let needle stitch in to the left
7. Afterwards adjust stitch regulator upon double width of the first half just finished, fixing it by means of left stop, and sew a few fastening stitches. In order to avoid that fabric be transported, same should be drawn a little bit towards oneself. Last needle stitch should be on the left. (Let cloth be only touched by the needle point.)
 Last stitch to the left
8. Stitch width lever is again adjusted to width of first half of buttonhole, and then the second half is sewn, but a trifle shorter than the first. Last needle stitch should be on the left.
 Last stitch to the left
9. Stitch width lever is again adjusted upon the width of the whole buttonhole and final fastening is sewn. (Draw cloth a little bit towards you, as explained under no. 7). Last stitch should be on the left.
 Last stitch to the left
10. Finally stitch width lever is replaced upon zero position and some fastening stitches are sewn, whereby cloth should be drawn a little bit towards oneself, in order to avoid its transport.
11. Place the just finished buttonhole upon the small wooden piece contained in the box for accessories and with the special cutter open the buttonhole between the two borders.

THE BUTTONHOLE WITH INLAID CORD

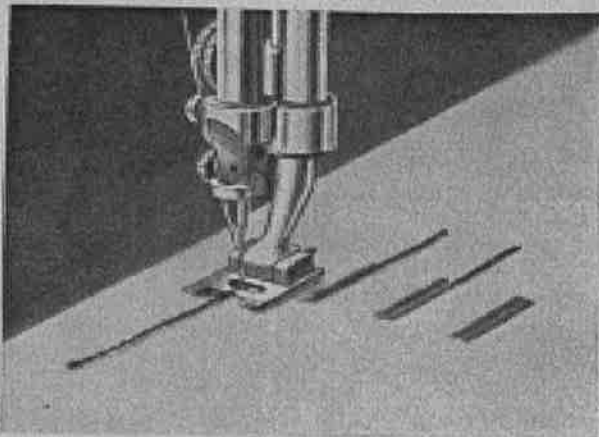
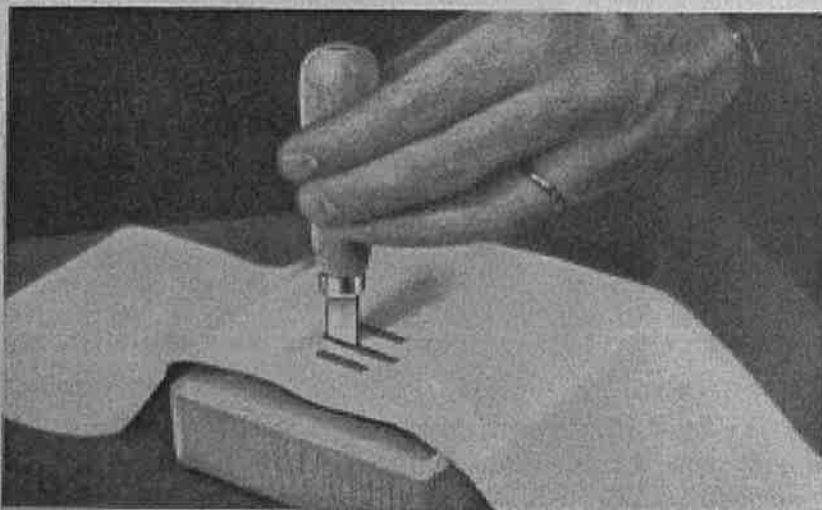


Fig. 36

A soft cord is laid into the guide of the presser foot. This cord will be oversewn whilst the buttonhole is made, as described on page 31.

When the first half of the buttonhole is finished, the cord is drawn a little bit towards oneself, when fastening is made, so that it will be covered with stitches.

At the end of the buttonhole, before sewing the final stitches, the inlaid cords are put one upon the other, crosswise, then the final sewing is made and the threads are fastened.



The buttonhole is opened by means of the cutter.

Fig. 37

THE BERNINA ZIGZAG SEWING MACHINE WITH TWO NEEDLES (Against extra charge)

(Needle should start exactly from central position of the stitch-hole, fig. 19-20)

The Two-Needle Device consists of:

- 2 needle holders, each one with 2 needles at different distances.
- 2 special presser feet.
- 1 threader for cord.
- 1 second needle thread tension.

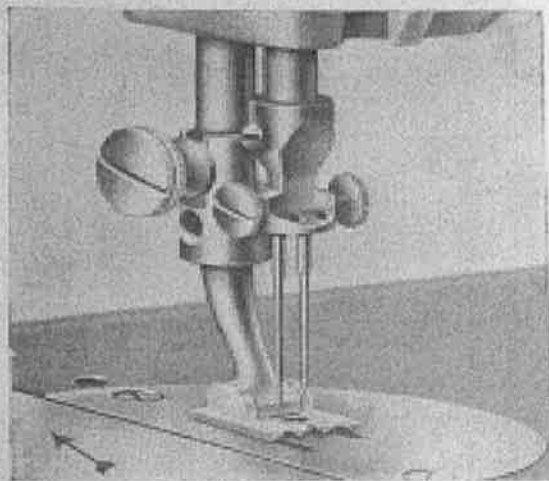


Fig. 38

Samples made with two-needle device

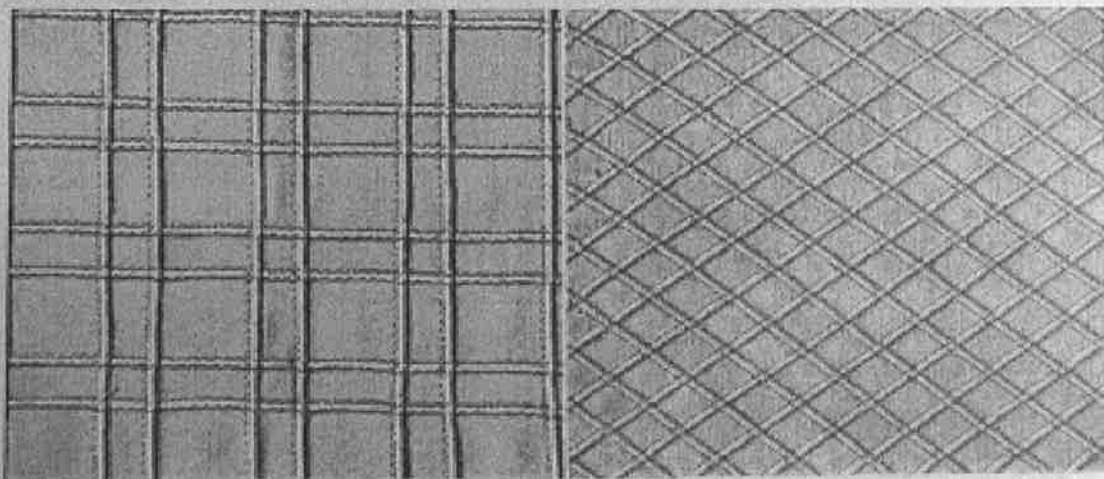


Fig. 39 Made with zigzag stitch

Fig. 40 Made with ordinary stitch

If the machine is to be arranged for two-needle works, the following should be noticed:

1. Needle should start exactly from **central** position of the stitch-hole (fig. 19-20).
2. Remove from needle bar the ordinary needle holder with 1 needle and replace it by a two-needle holder with 2 needles.
3. Insert the corresponding special presser foot, according to the width of the needles.
4. Threading of machine is to be seen in fig. 41.

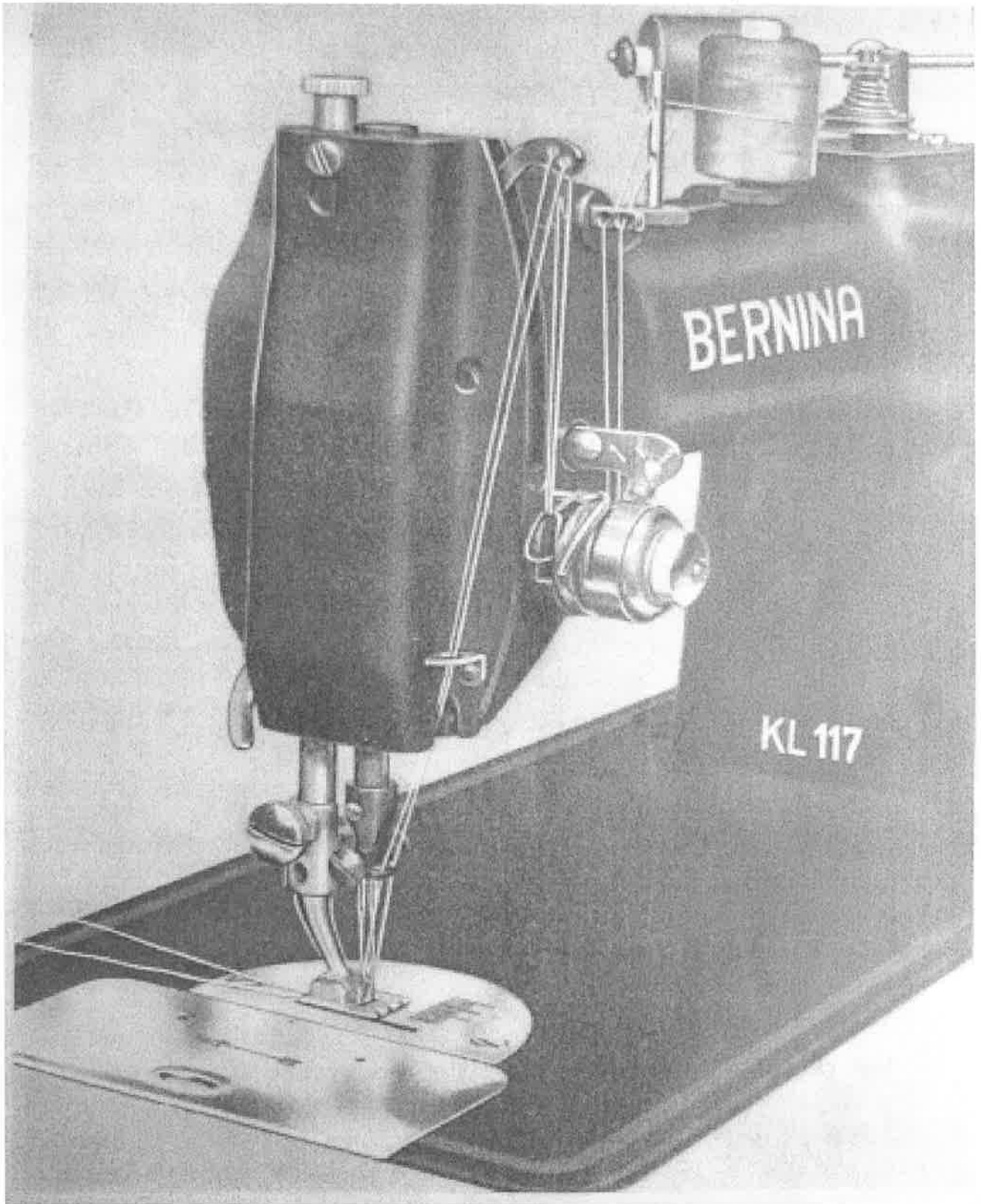
Adjustment of tension for both needle threads takes place by means of auxiliary tension.

The **ordinary two-needle seam** is made in sewing straight forward.

The **two-needle seam with zigzag stitch** is obtained in adjusting the stitch width lever just a trifle to the left, but only so far, that no needle touches the presser foot or the throat plate, neither to the left nor to the right.

For **two-needle seams with inlaid cords** a soft cord should be guided from underneath through the small cord-hole of the throat plate.

For **very narrow two-needle seams**, excentric needles should be used instead of needles 287 WH. Take care that the long groove of the needle be always in front, facing the seamstress (on that side, where needle is threaded). No. of excentric left needle: 287 FE, of excentric right needle: 287 FER.



WHAT TO DO IN CASE OF DISTURBANCES?

10 useful hints for the housewife.

1. If, through wrong manipulation, thread enters into the hook race and machine gets blocked: see page 39.
2. If latch of bobbin case does not close when this latter is inserted into the hook, there are thread remnants upon the hook pin.
3. Bent bobbins should not be used any more. Test if bobbin thread can always be drawn out in a equally easy manner. If this is not the case, an uneven seam will result.
4. Blunt and bent needles are the cause of thread breaking, skipping of stitches, and damage of the material.
5. If, when sewing, the needle is falling out of the needle bar, in spite of having it well fixed before, needle screw should be changed.
6. Pressure of presser foot upon the material can be lessened or reinforced by means of the knurled guidance screw on the top part of the presser foot bar.
7. The machine should be oiled in all its parts. It is advisable to oil new machines more frequently than older ones.
8. When oiling, front cover should be removed. When replacing same, take care that said cover be **pressed quite downwards** when tightening the screw.
The articulations under the front cover should be oiled very cautiously, **each one with only one little drop of oil**. Then let the machine run a few times and clean all oil points. In doing so, no stains will damage the sewing material.
9. If the machine is getting noisy, the hook race (fig. 3, point A) should be oiled. It is the most important part of the machine, which must get only very few oil at a time, but more frequently. Also the pin in the bobbin case should be oiled a little from time to time. When darning, it is recommendable to inject some drops of paraffin into the hook.
10. If, though tightened very slightly, the needle thread lies loose on the upper side of the material, there must be thread remnants under the bobbin case tension spring.

Thread breaking may be due to the following causes:

1. The needle is wrongly inserted. (If done the right way, long groove should be in front, towards oneself.)
2. The needle is blunt or bent, or wrongly threaded.
3. The needle, compared with the thread used, is too thin (see needle and thread list on page 4).
4. Thread tensions are too strong or hook insufficiently oiled. When darning, it is recommendable to inject paraffin instead of oil.
5. The small control spring, which is used for the needle thread tension, and goes up and down during sewing, is broken (see fig. 7, «D»).
6. Needle of inferior quality has been employed. Cheap needles frequently break the thread and easily break themselves. This may lead to costly repairs of the throat plate and the hook. The best needle will finally prove to be the cheapest!

If bobbin thread breaks, the following may be the cause:

1. The border of the stitch-hole in the throat plate is damaged. Unscrew throat plate and have it ground by a specialist for sewing machines.
2. Bobbin thread tension is too tight.
3. There are thread remnants and fluffs under the bobbin case tension spring.
4. The bobbin got jammed within its case, because remnants of thread are hindering the free turning, or bobbin is bent.

If stitches are skipping, it is mostly because:

1. Wrong type of needle has been used, or needle is blunt or bent, or wrongly inserted.
2. Thread remnants and fluffs are under the throat plate, and feed dog is hindered from working well.
3. Needle of inferior quality has been employed. Cheap needles frequently break the thread and easily break themselves. This may lead to costly repairs of throat plate and hook. The best needle will finally prove to be the cheapest!

If the seam is uneven, or if the lower thread cannot be raised, in spite of strongest tension, it may be due to the following causes:

1. There are thread remnants under the bobbin case tension spring.
2. Needle thread does not lie between both tension discs.
3. Bobbin thread should be finer than needle thread.
4. The needle, compared with the thread used, is too thin.

Needle breaking may be due to the following causes :

1. The needle is blunt or bent, or wrongly threaded.
2. The needle, compared with the thread used, is too thin (see needle and thread list, page 4).
3. Thread tensions are too tight.
4. Needle of inferior quality has been employed. Cheap needles frequently break the thread and easily break themselves. This may lead to costly repairs of throat plate and hook. The best needle will finally prove to be the cheapest !
5. Cheap cotton, irregularly twisted, or even containing knots, has been used.

During the last few years, there have been cheap cottons in the market, which, owing to their cheapness, contain knots or are irregularly twisted. One single knot in your cotton may break the needle and, under certain circumstances, even damage the throat plate. Thus you are risking to pay much more than the additional price for a first-class thread. Before purchasing thread, ask your sewing machine supplier for his advice.

6. During sewing, the material has been drawn too much to the back.
7. If, after having finished the work, the material is drawn out against oneself, the needle will get bent, and at the next stitch it will touch the throat plate and break. Material should always be drawn out backwards !

Machine working heavily. This may happen after the machine having been idle for some time in a damp room, or if unsuitable oil has become resinous during a more or less long period of rest. In this case, paraffin should be poured into all the oil holes (see fig. 1 and 2), then the machine should be run slowly for a while, afterwards the paraffin should be expelled by means of sewing machine oil. This process has to be repeated until all the resinous oil is swept out of the bearings.

In serious cases of resinification, the machine must be demounted and cleaned at the nearest Bernina Shop.

If the machine works smoothly, when turning the balance wheel, but very heavily when treading, the tension of the driving belt is too tight.

During winter time, when displacing your machine from a cold room into a heated one, you will soon remark precipitations on the machine. Same **should not** be employed in this state, because there is a great risk of the bearings getting moist. Let the machine rest, until it has accepted the room temperature and then wipe dry with a towel.

If the machine refuses to work backwards and forwards, needle thread has been jammed in the hook owing to wrong manipulation. Remove thread from needle. Turn the machine to the back and remove all thread remnants from the bobbin case. Now oil the hook race slightly and let the oil work especially upon the jammed thread ends during 1 or 2 minutes. Then the special key is applied to the neck of the hook, as shown in fig. 45. Now execute some short movements, in the direction of rotation of the bobbin case, up and down round the hook axle. The jammed thread ends will be cut at once by these movements, they can be removed and the machine will restart work easily. If the thread is not jammed too strongly, some movements of the balance wheel, to and fro, may be sufficient to cut and free the jammed thread.

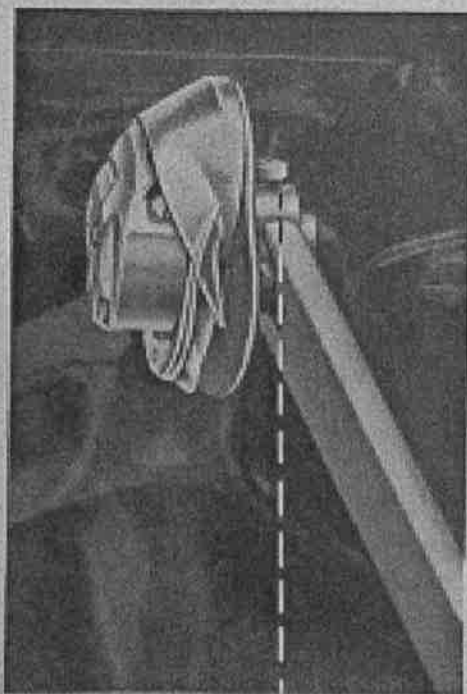
Under no circumstances hook screws should be loosened or hook removed. Neither should you press upon the hook with hard tools, as for instance with screwdriver, scissors, etc. The hook is as hard as glass and may easily break!

How to prevent jamming of thread into the hook? The thread jamming within the hook is due to wrong manipulation, for not having observed one of the following 5 points:

1. If the balance wheel of the threaded machine is turned in the wrong direction, upper thread will be jammed within the hook.
2. Before beginning to sew, lower thread should always be raised and together with the needle thread placed under and at the back of the presser foot.
3. When starting or finishing work, as well as when threading the needle anew, take-up lever E (fig. 7) should always be at its highest point.
4. When turning a corner, take-up lever E should first of all be placed at its highest point. Then stitch slightly into the material with the needle point and then only the material should be turned in order to obtain a corner.
5. When the machine is idle, needle should either be unthreaded or a little piece of cloth laid under the presser foot.

All the hook parts are as hard as glass. Therefore, they should never be touched with hard objects, otherwise they would break and be subject to expensive repairs.

Oil from time to time but just a little the hook race.



In order to loosen the thread, the key should be applied at a right angle to the neck of the hook, as shown by the white dotted line.

In fig. 45, the key is oblique in order to show how the opening of the key should be applied to the screw.

Fig. 45

How to take off the machine head from its table

There is really an easy way to do so:

Remove driving belt from balance wheel and turn the machine quite backwards, as shown in fig. 46. Now loosen both screws «A», and head of machine can be removed upwards, out of the hinged bolts, in the direction of the arrows «B».

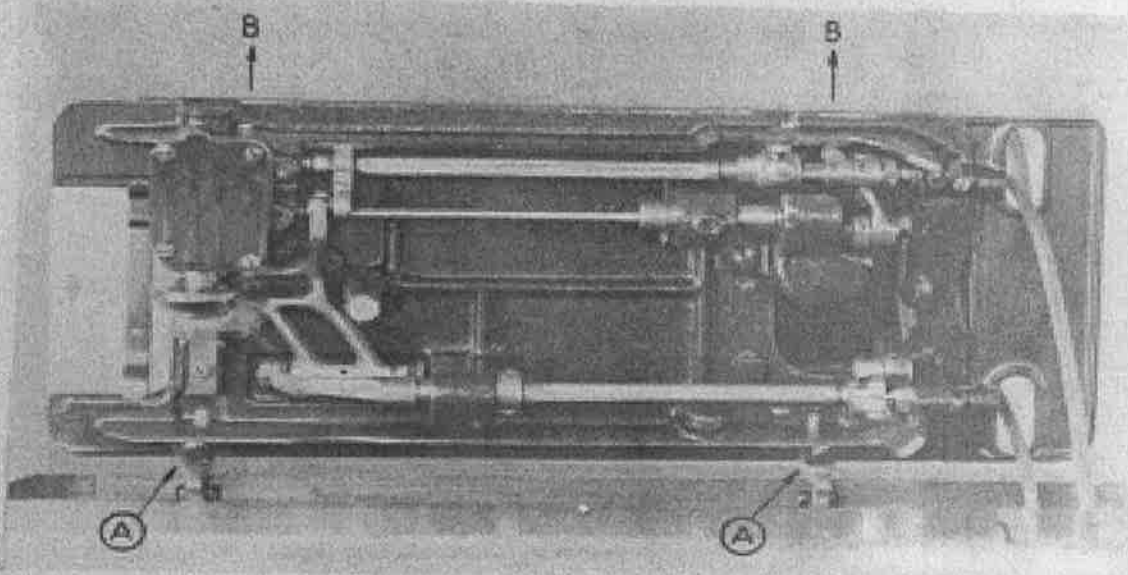


Fig. 46

How to pack up the machine head for shipment

Whenever you have to ship the machine head, take a good case, large enough to take up the machine head easily.

First stuff the bottom of the case with wood-wool or crumpled newspapers, about 5 cm high. Then wrap the head into a **good strong paper** and put it into the case. A cross-piece should fix the machine well, thus avoiding its displacement during transport. The still empty place will be filled with more wood-wool or creased paper.

Take care that the stuffing material is quite dry, otherwise the machine might get rusty.

It is **indispensable** that the head be wrapped in paper, in order to prevent dust of packing material from entering into the bearings!

Normal attachments and accessories for the Bernina Universal Zigzag Sewing Machine Type 117

- 1 packet of needles system 287 W.H. assorted
- 5 extra bobbins
- 1 zigzag sewing presser foot, hinged
- 1 zigzag embroidery presser foot, hinged,
suitable as well for braiding, marked with 1 red stripe
- 1 shell rolling hemmer for jersey only, to be
used also as narrow hemmer marked with 3 red stripes
- 1 button presser foot marked with 2 black stripes
- 1 buttonhole presser foot marked with 3 black stripes
- 1 lap hemmer
- 1 left-side presser foot with quilter guide
- 1 darning foot
- 1 darning plate
- 1 kneelever (to lift presser foot)
- 1 buttonhole cutter
- 1 wooden piece for buttonhole cutting
- 1 oil can
- 2 screwdrivers
- 1 hook key
- 1 instruction book

Against extra charge will be supplied at request:

 sewing presser foot, hinged
 rolling hemmer, marked with 2 red stripes
 ordinary wide hemmer
 embroidery frame
 darning ring for stockings
 two-needle device

The factory reserves the right to modify the construction of the machine
with respect to clichés and description.