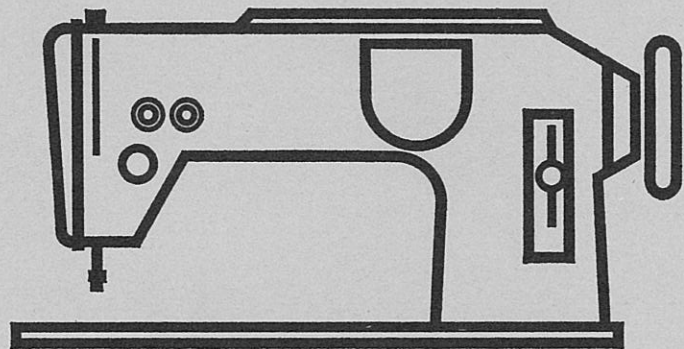

BERNINA



Zig-zag Sewing Machine

MODEL 217

INSTRUCTION-BOOK

Types of machine supplied and general data

Model 217 can be supplied in two types:

- I 217-5 with balance wheel release, bobbin-winder and spool holder on the machine
- II 217-10 with fixed balance wheel, table winder, and cotton stand

Both types are equipped as follows:

1. Sewing feet:

- a) with zig-zag foot 217 06 03 00
- b) with edge foot 217 06 21 00
- c) with lock stitch foot 217 06 44 00

2. Equipment:

- a) Machine Knee lifter
- b) Bench Knee lifter
- c) Drip tray
- d) 2 machine hinges
- e) 1 machine rest pin
- f) 1 locking bolt with wing nut

3. Accessories:

- a) 1 accessory box
- b) 1 large screwdriver
- c) 1 small screwdriver
- d) 1 special screwdriver
- e) 1 "Allen" Key
- f) 1 oilcan

- g) 5 bobbins, one of them in the machine
- h) 5 needles
- i) 1 instruction manual

4. The following sewing feet and accessories are available at extra charge:

- a) embroidery foot
- b) wide hemmer
- c) narrow hemmer
- d) tubular hemmer for stockinet
- e) Edge foot
- f) Gathering foot
- g) zig-zag edge foot
- h) appliqué foot
- i) Buttonhole foot
- k) Keyhole-buttonhole foot
- l) button foot
- m) Pintuck foot with 3 grooves
5 grooves
9 grooves
- n) feed cover plate for darning
- o) blind-stitch foot
- p) ornamental stitching unit
- q) Pintucking equipment
- r) Padding equipment
- s) Special equipment made for customers requirements
- t) Unit stands for motor or treadle
- u) Motors

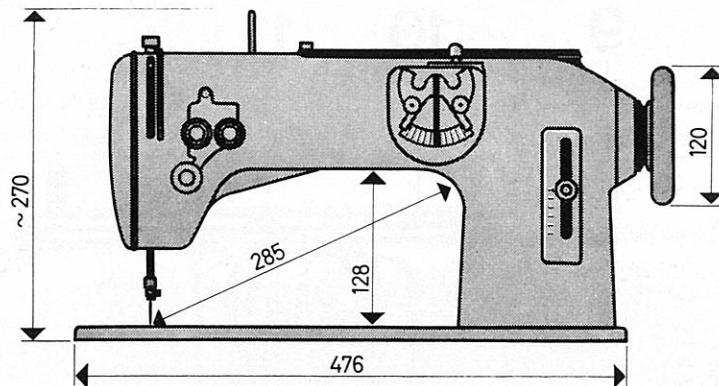
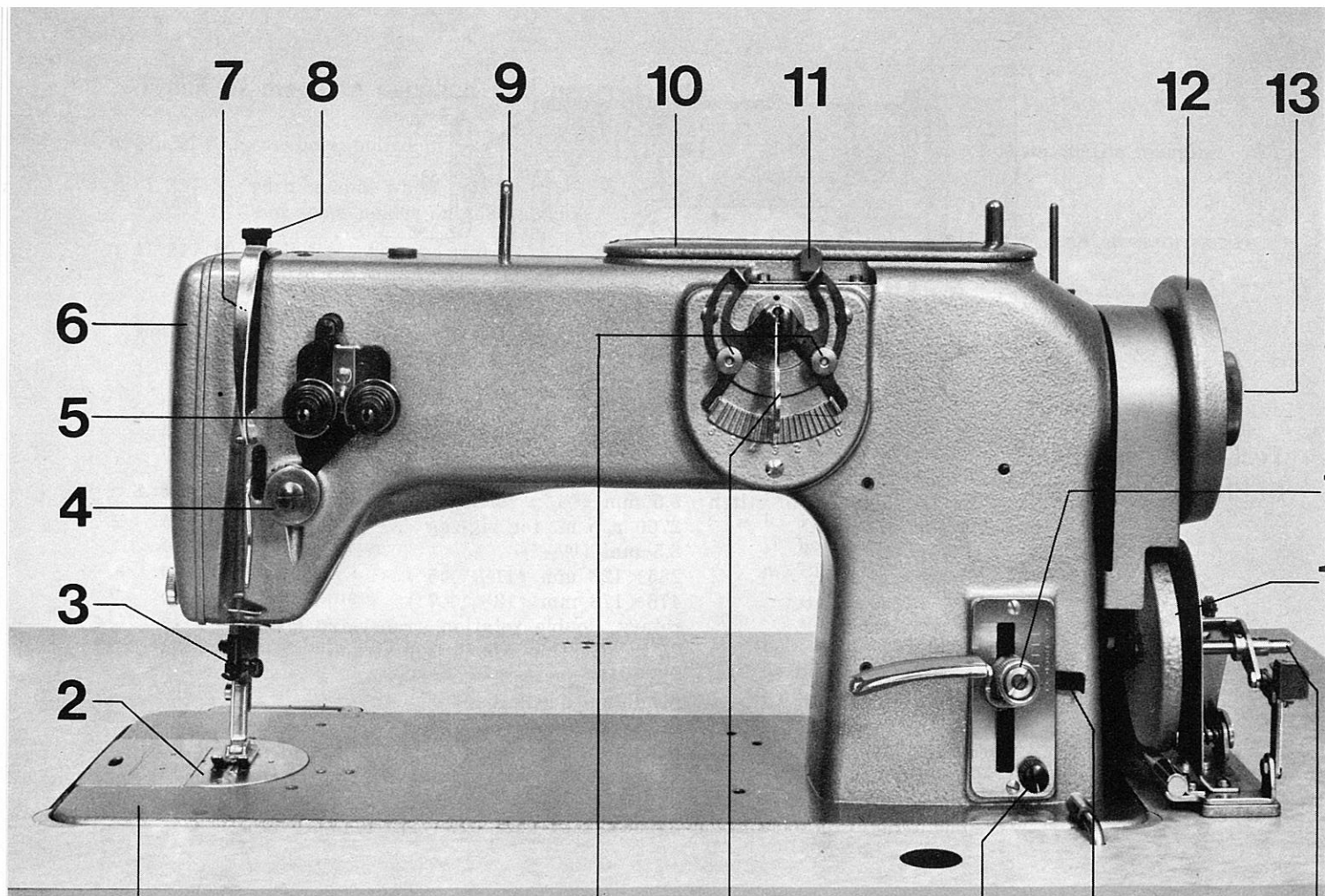


Fig. 1

**Technical data for
BERNINA, Model 217**

Maximum zig-zag width:	6 mm ($\frac{1}{4}$ "
Stitch variation:	left - centre - right
Maximum length of stitch:	5,5 mm ($\frac{7}{32}$ " forward and reverse
Maximum speed:	2700 r. p. m. for zig-zag
Lift of foot:	8,5 mm ($\frac{10}{32}$ "
Under arm area:	285 × 128 mm ($11\frac{5}{8}$ " × 5")
Size of base plate:	476 × 178 mm ($18\frac{3}{4}$ " × 7")
Hook system:	rotary, double rotation, transverse hook
Bobbin capacity:	75 m of cotton No. 80, fourstrand
Needle system:	287 WH
Needle movement:	pendulum needle bar
Take-up lever:	link take-up
Thread tension:	double thread tension with independent tension discs
Bobbin winder:	either power table winder with spool stand, or built-in winder on machine
Foot lifter:	by means of knee lifter fitted under table



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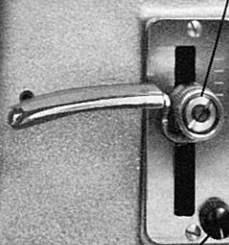
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The illustration facing this page, fig. 2, shows a BERNINA zig-zag sewing machine model 217 (with built-in bobbin winder), on which the various installations etc. are identified by their names, as used in the instruction manual.

- | | |
|---|---|
| 1 Base plate | 11 Left-centre-right needle position lever |
| 2 Throat plate | 12 Spool holder |
| 3 Needle clamp | 13 Balance wheel |
| 4 Thread regulator | 14 Stitch length lever |
| 5 Double thread tension | 15 Bobbin winding wheel |
| 6 Face plate | 16 Bobbin winding spindle |
| 7 Thread take-up lever | 17 Stitch width adjusting lever |
| 8 Regulating nut for foot pressure | 18 Stops for stitch width adjustment |
| 9 Spool pin | 30 Satin stitch stop |
| 10 Top cover plate | 31 Fine adjustment for satin stitch stop |

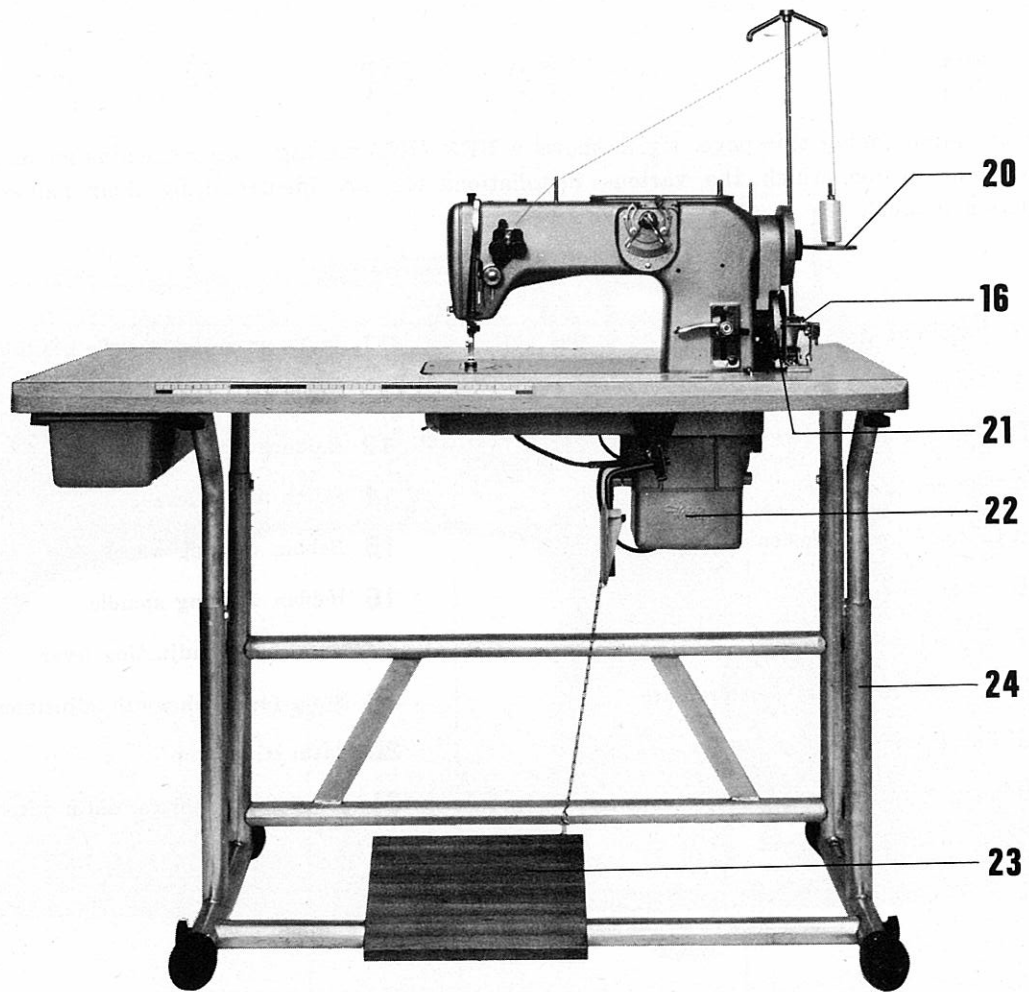


Fig. 3, facing this page, shows a BERNINA zig-zag sewing machine, model 217 (with power table winder), on which the various installations etc. are identified by their names, as used in the instruction manual.

16 Winder spindle

20 Spool stand

21 Bench winder

22 Clutch motor

23 Treadle

24 Machine stand

Cleaning and Oiling

Cleaning the machine

Pieces of cotton and fluff will collect in the course of work, mainly around the hook, also between throat plate and feed dog. This may influence the smooth running of the machine. Therefore it is necessary to remove them frequently. The throatplate 2 (fig. 2) should be unscrewed from time to time, in order to remove the fluff collected underneath.

Lubricating the machine

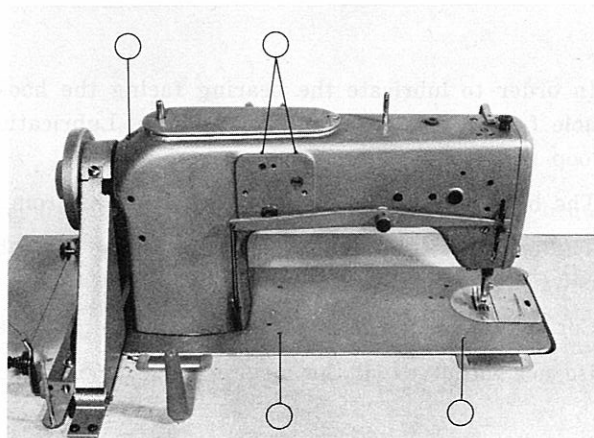
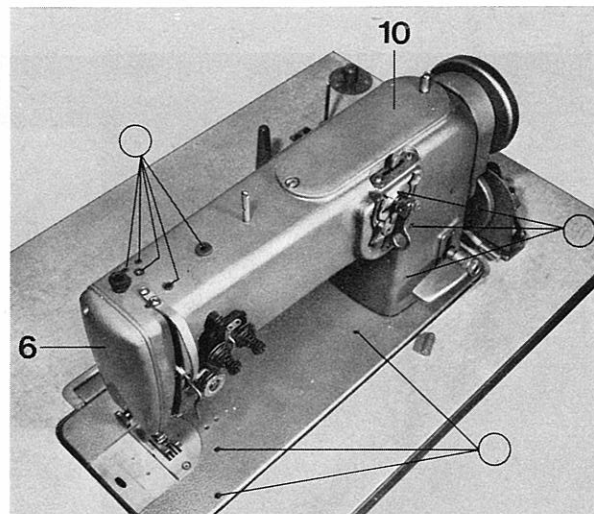
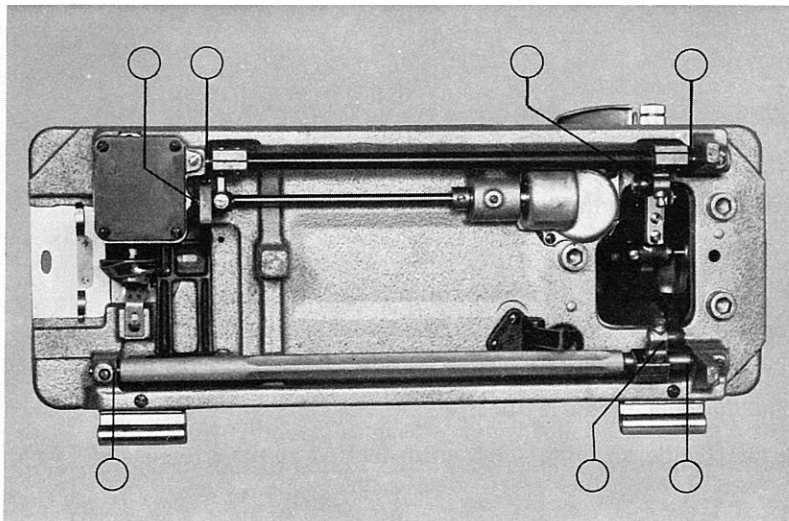
The sewing machine should be lubricated frequently, but not too much oil should be used. A few drops of oil will keep the machine running smoothly. The machine should always be oiled before work is commenced, never after. Clear sewing machine oil, free from acids and resins should be used. This is obtainable from all BERNINA agents. When inferior oil is used there is always the danger of clogging the oil-holes and passages with sludge thereby causing damage to the moving parts.

By means of indicators, figs. 4, 5, and 6, show the lubricating points. They are marked *red on the machine*. By unscrewing the face plate K, access is made to the needle bar and take-up lever, the lubrication of which is essential.

Top plate D can be moved sideways after one of its screws has been removed, thus giving access to inside parts which must be lubricated (fig. 5).

After turning the machine over, the lower lubricating points can be seen. Here the most important and sensitive part of the machine, the hook unit, is situated. It should be maintained with the utmost care.

Fig. 5



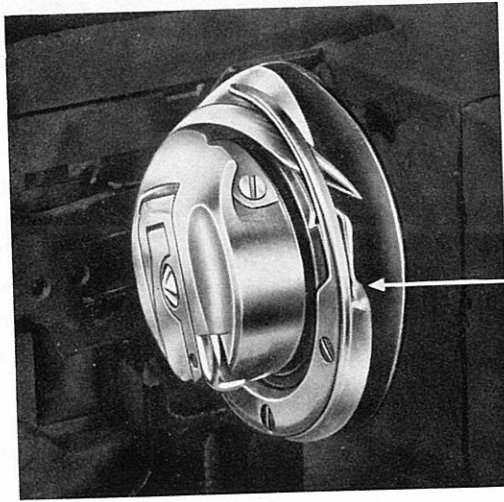


Fig. 7

From time to time the hook race should be oiled with a stainless white oil at the spot marked by an arrow in fig. 7.

In order to lubricate the bearing facing the hook, the throat plate slide should be removed. The lubricating hole for this bearing can then be seen. Lubrication is done through the centre of the fixing bolt for the loop rejector.

The bearing opposite the hook can be oiled from the top of the base plate.

The cross shaft hook gears in the casing are lubricated with a vaseline-type grease which should be renewed from time to time.

Correct lubrication ensures smooth running of the machine and prolongs its life.

Do not forget to oil the moving parts on the stands of treadle machines at the lubrication points provided

Needle and Thread

Insertion of needle

Use only System 287 WH needles with hollow throats. Never use needles which have blunt points or are bent. Turn hand wheel 11 towards you, until the needle bar reaches its highest position. Hold the needle between thumb and index finger of the left hand so that the long groove of the needle points to the front, i. e. faces the machinist. Now loosen the needle clamp bolt by turning it to the left and insert the needle until it touches the top. Now tighten the needle clamp bolt by turning it to the right. It is important to have the needle touching the top and to secure the needle clamp screw satisfactorily.

Correct choice of needle and thread

Only System 287 WH needles with hollow throats should be used for BERNINA model 217 machines. In order to obtain good working results only high quality needles and top grade thread should be used.

First the correct thread for the work concerned should be chosen, then the needle suitable for that thread, as in the table given below.

The correct fit of needle and thread is achieved when the thread, inserted into the long groove of the needle, fills it satisfactorily and can be moved in it backwards and forwards without hindrance.

For sewing, Numbers 80, 90 and 100 are generally used; for darning, Numbers 70 and 80.

Needle and yarn tables

System 278 WH needles No.	Sewing thread		Mending thread
	6-strand (matt)	3-strand (matt)	2-strand
60	-	170-200	80-100
70	70-100	70-140	50-80
80	50-60	50-70	30-40
90	40-50	30-40	-
100	20-30	-	-

Suitable thread for sewing and darning

For lockstitching: Nos. 60-90, 3- and 6strand, matt
For darning: Nos. 50-80, 2strand
For zig-zag sewing: Nos. 60-90, 3strand only
For ornamental stitching: Nos. 30 and 40, 2strand

Sewing- and mending threads, well as needles, should always be bought from a BERNINA retail He can be relied upon to supply goods which are suitable for machine.

Left- and right-twist thread

Top threads for sewing should always be left-twist thread. The lower thread can be either left- or right-twist. The twist of the thread can be ascertained as shown in fig. 8. Take a piece of thread in both hands and roll it towards you with one thumb. Left-twist thread will tighten, right-twist loosen.

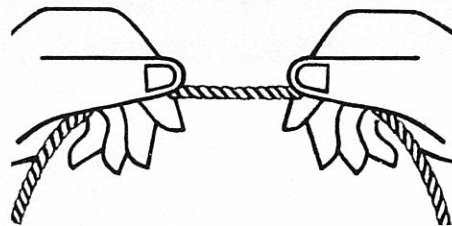
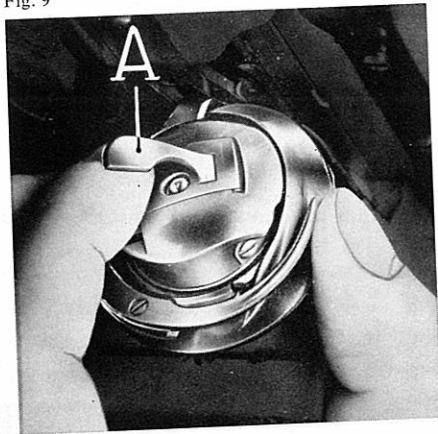


Fig. 8

Bobbin case and Bobbin

Fig. 9



Extraction of bobbin case

Lift thread take-up lever to about its highest position. Open latch A (fig. 9), using left hand index finger and extract the bobbin case and bobbin, using thumb and index finger. By releasing the latch the bobbin is freed and falls out of the bobbin case.

a) Winding the bobbin thread on machines with balance wheel release and built-in winder

So as not to have the whole mechanism in motion when winding, the balance wheel release should be turned with the right hand as far as possible towards the machinist, while the balance wheel is held with the left hand. De-

Fig. 10a

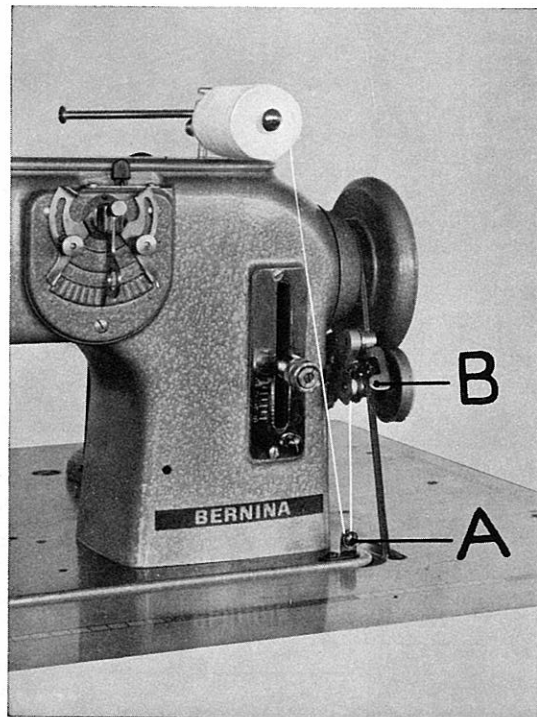
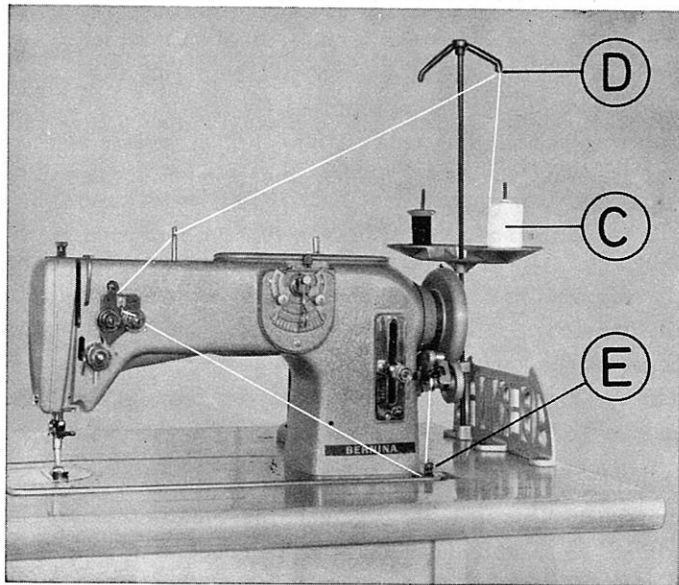


Fig. 10

pending on equipment of the machine, i. e. spool holder on the machine, or bench fitted cotton stand, winding takes place in one of the ways shown in fig. 10 and 10 a respectively.

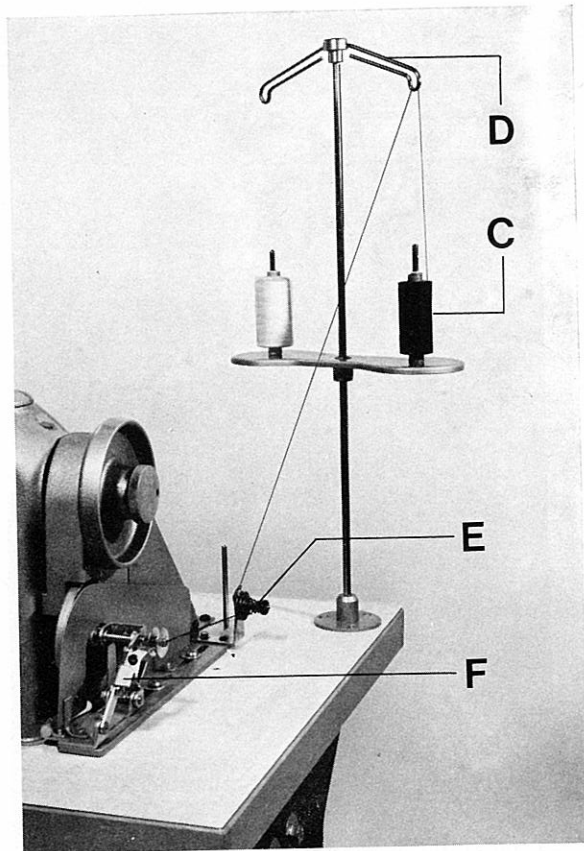


Fig. 11

The thread, coming from the spool, is led through the tension discs A (fig. 10) and from there straight to the metal bobbin. This is placed on the spindle in such a way that the carrier pin is put into the slot of the metal bobbin. By pressing the winder starter lever B the winder is put into action. Immediately the bobbin is full, the winder stops automatically.

b) Winding the bottom thread by power winder

The power winder is used in many cases on machines with a fixed balance wheel, so that winding can take place even while sewing is in progress. It is fitted in such a way that the winding shaft driving wheel presses against the machine drive belt when the winder is put into operation.

When it is switched off, the drive belt runs free. The thread, coming from the spool C, is led over arm D, through the tension E, through its thread guide opening between the tension discs, thence to the bobbin on the winder. The bobbin winder tension can be adjusted several ways, so as to achieve even winding.

On pressing the lever F of the winder, the winding shaft drive wheel is pressed against the running belt. The winder stops automatically once the bobbin is full.

Inserting the bobbin into the bobbincase and threading the bottom thread

When inserting the bobbin into the bobbincase care should be taken that the bobbin turns in the direction of the arrow when the thread is pulled (fig. 12). When the bobbin has been inserted the thread is put through slot 1, pulled underneath the tension spring 2 and comes out at the end of tension spring 3. The thread tension spring is held in place by screw 5. Screw 4 serves for adjusting tension (viz fig. 12).

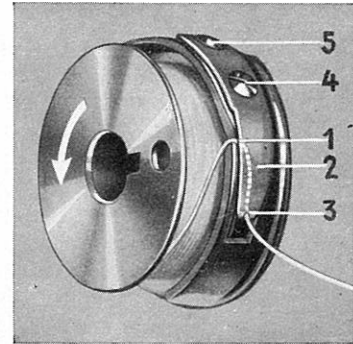


Fig. 12

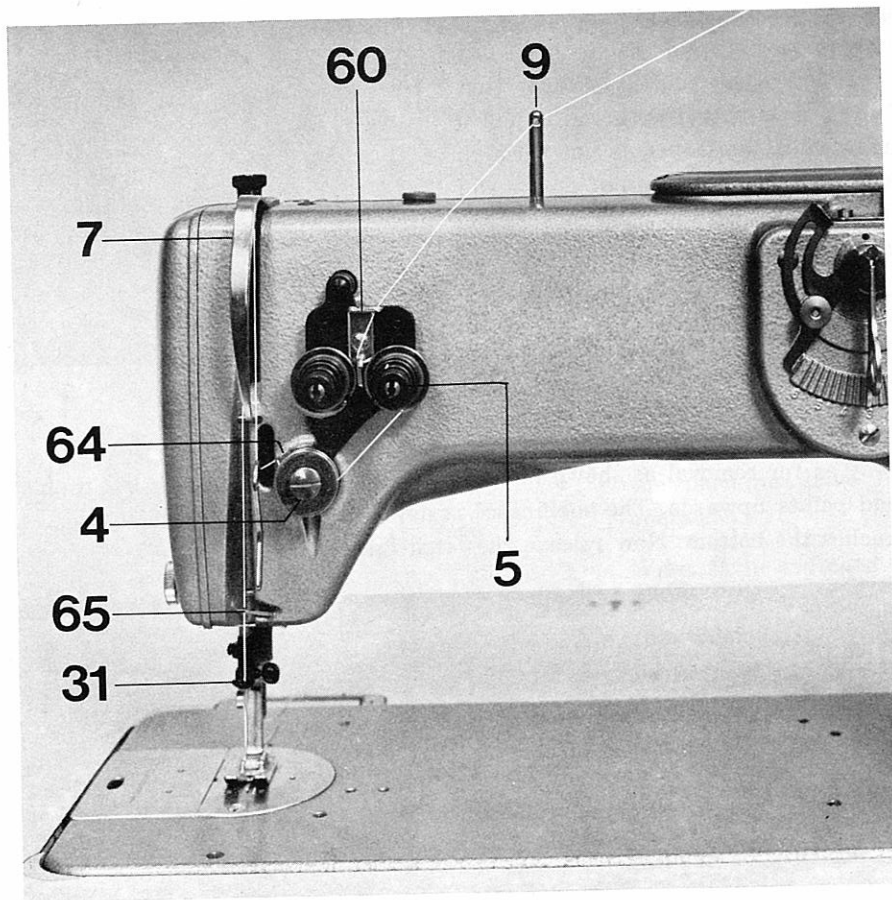
Inserting bobbincase and bobbin in the hook unit

The shuttle can only be inserted when the thread take-up lever is at about its highest position.

The bobbincase is held, in the same way as for removal as shown in fig. 9, by opening latch A with left thumb and index finger, so that the open end points upwards. The bobbincase is now placed on the pin in the centre of the hook and pushed in until it touches the bottom. Now release the latch taking care that the bobbincase is secure and cannot fall out.

Threading the top thread (figs. 13 and 13a)

The thread coming from the spool is taken through the thread guide 9, and from there through one of the two holes of the thread guide 60, behind hook 61, and from there between the tension discs 5, downwards to the guide groove of thread regulator 4. Around check spring 63, from there beneath the thread regulator arm 64 upwards to one of the two holes of the thread take-up lever 7. From there it goes downwards behind the thread guide 65, thence into the thread guard on the needle clamp and finally backwards through the needle's eye.



- 4 Thread regulator
- 5 Thread tension
- 7 Thread take-up lever
- 9 Thread guide pin
- 12 Spool holder
- 31 Needle clamp eye
- 60 Angle eye
- 64 Regulator arm
- 65 Thread guide pin

Fig. 13

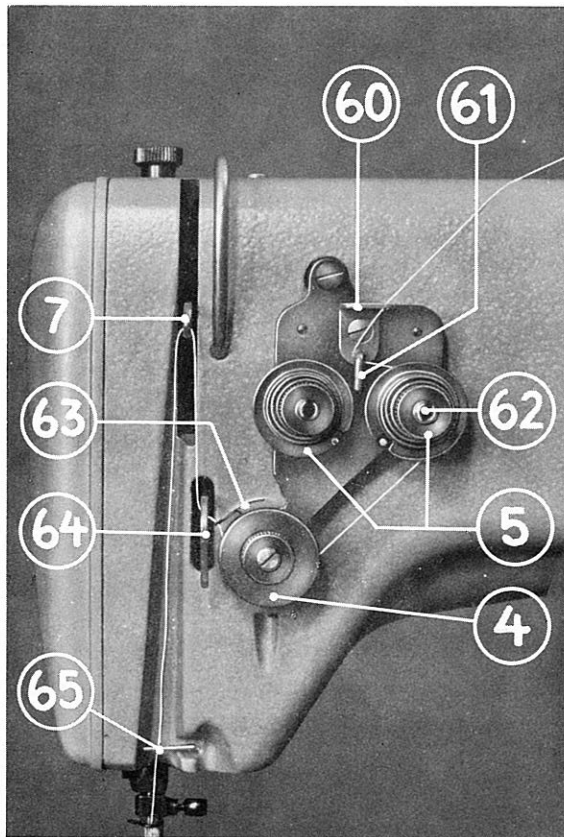


Fig. 13a

Pulling up bottom thread

The end of the top thread emerging from the eye of the needle is held loosely between thumb and index finger of the left hand, while the right hand turns the balance wheel one turn toward the machinist, until the thread take-up lever reaches approximately its highest position. The top thread is now pulled lightly, whereupon the bottom thread emerges (fig. 14). Bottom and top thread are now tightened and placed underneath the presser foot, laying backwards.

Thread tension

By clockwise turning of the thread tension nut 62 thread tension can be increased; by anticlockwise turning it can be reduced.

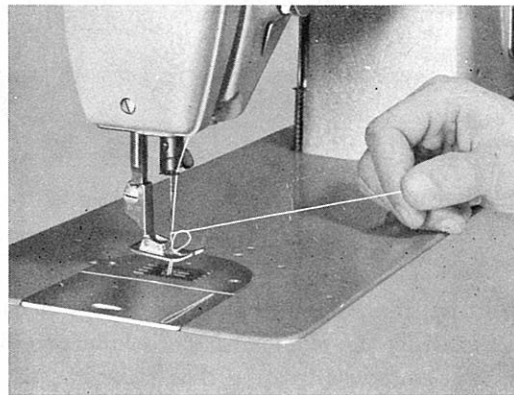


Fig. 14

Tension of top- and bottom thread

The bottom thread should always have less tension than the top thread. The former should always be pulled from the bobbincase with slight, uniform tension. The three diagrams a, b, and c show the effect of correct and incorrect tensions.

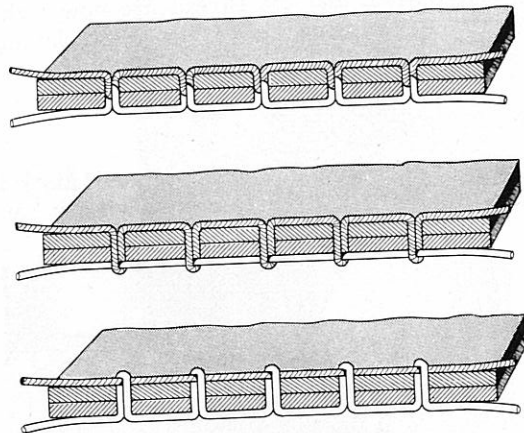


Fig. 15

- a) The top- and bottom thread tensions are correct. The knotting takes place in the centre, between the two cloth layers.
- b) The top thread tension is too loose. The knotting can be seen on the under side of the cloth.
- c) The top thread tension is too tight. The knotting can be seen on the top of the cloth.

Bottom thread tension is regulated by means of a screw 4 (see fig. 12), which tightens or loosens a spring situated on the outside of the bobbincase. By clockwise turning of screw 4 bottom thread tension is increased by anticlockwise turning it is reduced.

Dismantling the hook unit

It only rarely happens that the hook must be dismantled for cleaning. This is done in the following way:

After the bobbin case has been removed from the hook (a), the hook race cover (c), which acts as a thread rejector is taken out.

Now the bobbin case carrier (b) is turned until the thread stop (e) comes to rest next to the hook tip. By a slight tilting motion the bobbin case carrier can now be removed. Bobbin case carrier (b) and hook race cover (c) can now be cleaned easily. Care should be taken that no hard substances are used for cleaning, as the working surfaces of both parts are very sensitive.

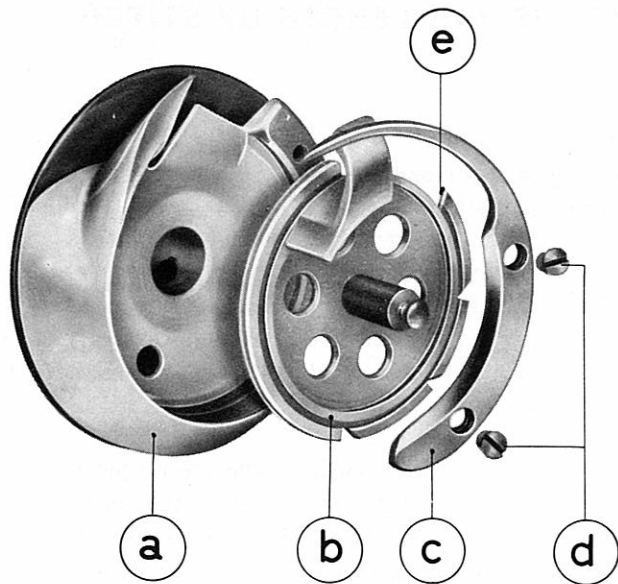


Fig. 16

The re-assembly of the hook takes place in reverse order. After the bobbin case carrier has been inserted the hook race cover is screwed on again by the two screws (d). The smooth movement of both bobbin case carrier and hook should be checked.

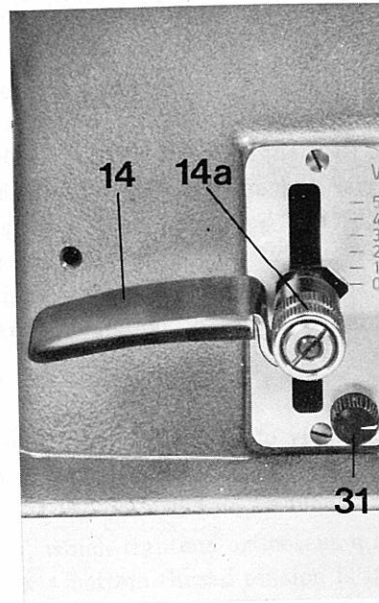
ADJUSTING LENGTH OF STITCH

Sewing forwards and backwards, and setting various stitch lengths

The machine can sew forwards or backwards and makes short or long stitches, depending on the position of adjusting lever 14. Pushing the lever downward, so that the indicator on the lever points below the figure Zero, makes the machine sew forwards.

In the opposite way, pushing the lever upwards, so that the indicator is above Zero, causes the machine to sew backwards. Sewing forwards and backwards helps to strengthen certain places and to lock the stitches. Forward stitches are lengthened by pushing lever 14 further down. Backward stitches are lengthened by moving this lever upwards.

In order to obtain forward and backward stitches of equal length it is necessary to turn the nut 14a of the stitch-length lever 14; this limits its up- and downward movement. Turning it outwards increases the movement of the lever, - turning it inwards decreases it.



The stitch adjuster is provided with a spring pulley, which causes the lever, when in a certain position for forward sewing, to return to that position after a backward stitch of equal length has been set.

Taking finished work out of the machine

The thread take-up lever is put in its highest position. The presser foot is lifted by means of the lifter. This removes the top thread tension, so that the work can be taken out without any thread pulling.

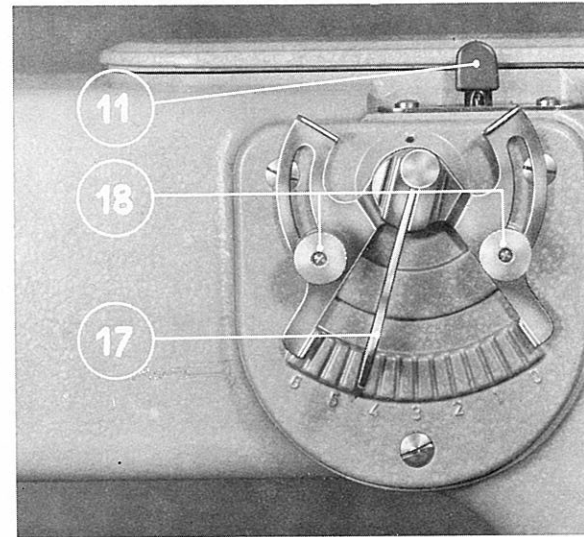
Care should be taken that work is always drawn backwards from under the foot, as otherwise the needle might bend.

Zigzag Mechanism

Adjusting width of stitch

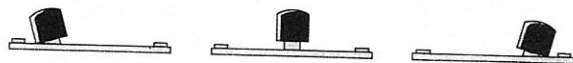
On the right-hand side of the machine head, there is a width adjusting lever 17 for setting the zig-zag width. Underneath is a scale showing the zig-zag width in figures from 0 to 6. For straight stitching the lever should point to 0. Moving the lever 17 to the left causes the needle to swing. The further the lever is moved to the left the greater the width of zig-zag stitch. The lever can be moved backwards and forwards as required while sewing is in progress. When the machine is at rest it may only be moved when the needle is out of the material.

Fig. 19



The zig-zag stops 18 and their uses

To the left and right of the width adjuster 17 two stops are situated. They serve to limit the zig-zag oscillation and can be adjusted by loosening the screws 18. By a combination of the two stop positions any required limitation of sewing-width can be obtained. This is valuable for many types of work. However, the width adjuster can, if necessary, override the stops in each direction if it is pulled slightly forward and moved over their tops.



Needle position "left-centre-right"

On top of the width adjuster 17 there is the left-centre-right-needle position lever 11. With the lever in centre position the needle will oscillate from the centre equally to the right and left (fig. 20 b). With the lever to the left the needle will oscillate from left to right (fig. 20 a). With the lever to the right the needle will oscillate from right to left (fig. 20 c).

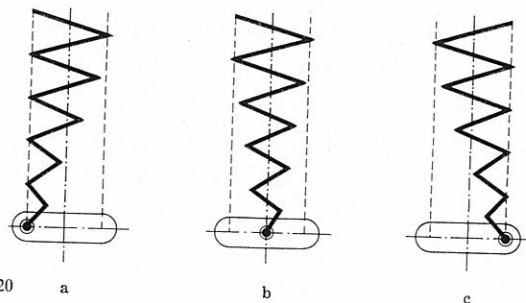


Fig. 20

This needle position lever can also be moved to the centre, left, or right, as required, while sewing is in progress. With the machine at rest it may only be moved when the needle is out of the material.

Most zig-zag work is carried out with centre needle position, while left needle position is used for sewing on buttons and for ornamental work. Right needle position is also used for ornamental work, in many cases combined with the other two positions mentioned.

Zig-zag sewing

(Do not use 6-strand threads, only 2- or 3-strand.) The machine should be set as follows for zig-zag work:

1. Put thread take-up lever 7 (fig. 2) in approximately top position.
2. Attach zig-zag foot. Place top and bottom threads together underneath zig-zag foot, pointing backwards.
3. Set stitch length lever 14 to a point slightly below Zero on the scale. This can only be done when the screw 14a is not completely screwed in.
4. Move zig-zag lever 17 to the left, according to width required (0-6).

Cover plate for feed dog

No feed is required for certain types of work, e. g. mending, sewing on buttons etc. In these cases it is covered by a plate. For straight sewing one with a round hole is used (1), for zig-zag work one with an oblong hole (2).

These plates can easily be inserted. They are put into the hole provided in the throat plate, swung over the front edge, and secured by the throat plate slide.

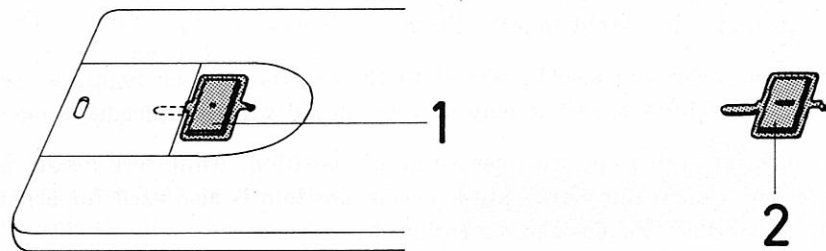


Fig. 21

Foot pressure regulation

The presser foot is set for average work, i. e. thin to medium material. If stronger materials are to be stitched, pressure must be increased. Clockwise turning of the pressure screw 70 increases pressure on the presser bar spring, direction the screw is moved upwards, reducing pressure and thus on the material itself. By turning in the opposite on the material.

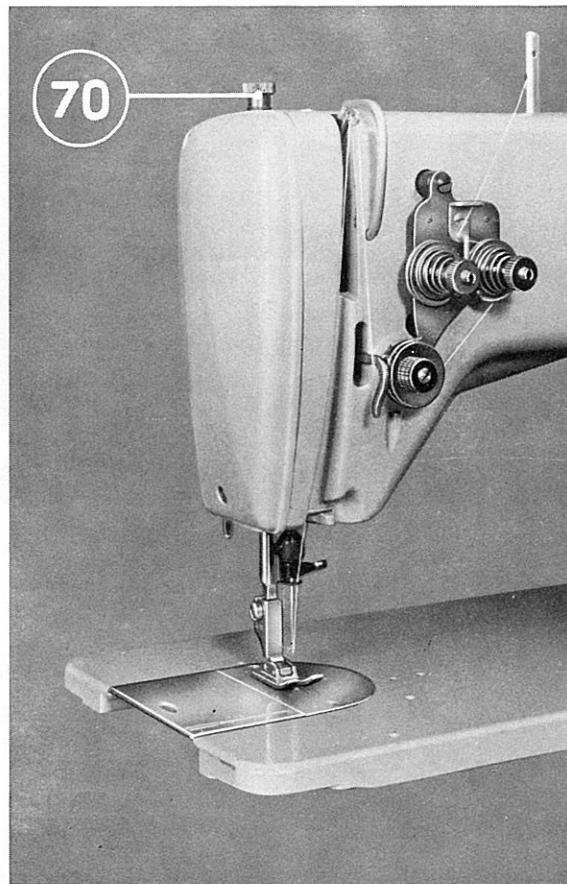


Fig. 22

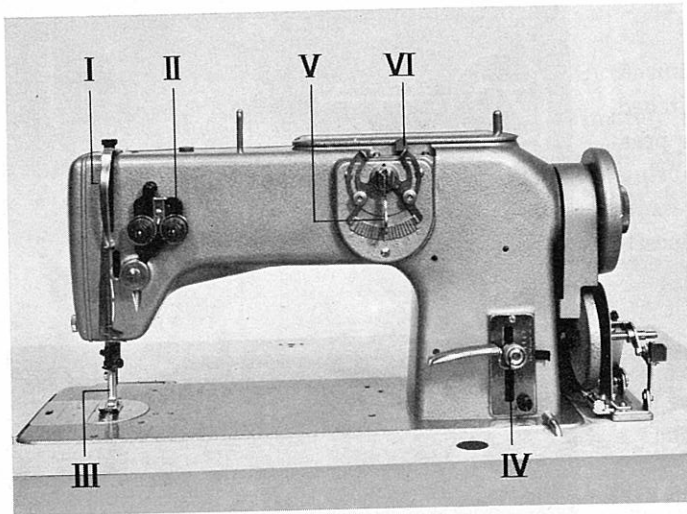


Fig. 23

ORDINARY SEWING

Straight stitching

The machine should be set as follows for straight stitching:

- I. Put thread take-up lever 7 at about its highest position.
 - II. Adjust top thread tension 5 to suit the type of thread being used.
 - III. Attach foot. Put thread into needle from front to rear. Put top and bottom threads under presser foot, leading backwards, and hold these with left thumb and index finger until the first few stitches are made.
 - IV. Indicator of stitch length adjuster 14 should be set slightly below Zero, to the required stitch length.
 - V. Zig-zag width lever 17 should be set to its extreme right position, i. e. on Zero. In this position straight stitching will result. Immediately lever 17 is put to the left, zig-zag stitching will ensue.
 - VI. Needle position lever should be set so that the needle goes down in the centre of the stitch hole (see page 27).
- Care should be taken that the balance wheel is always turned towards the machinist.

LAP HEMMING

Lap hemming seams are intended for extremely firm sewing. There are two stages of the work:

1st stage (fig. 24a): The two pieces of material to be connected are put on top of each other, the lower material projecting slightly. Both are placed inside the lap hemming foot, so that they fold upwards. Care should be taken whilst sewing, that there is always an equal width of material in the foot.

2nd stage (fig. 24b): The two pieces of material are put flat, so that the seam formed in stage 1 stands up like a fold. This fold is now put through the lap hemming foot in the same direction as before, which results in its being turned over and sewn down.

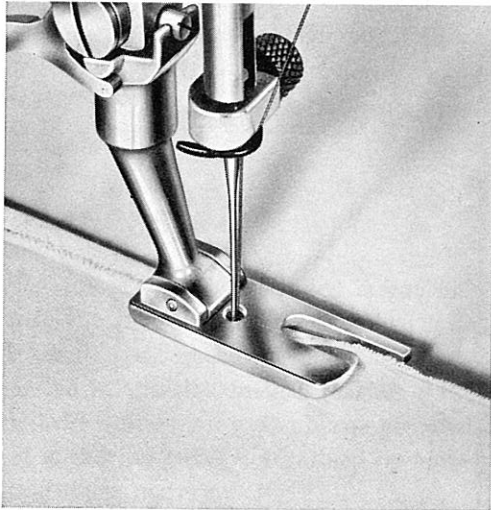


Fig. 24a

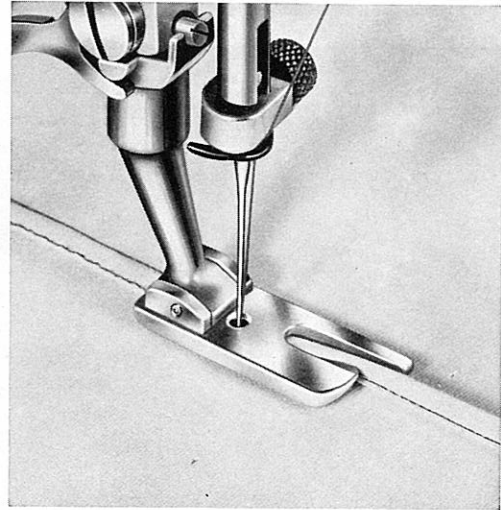


Fig. 24b

EDGE FOOT

(with adjustable quilting guide)

It can be seen that the stitch hole is on the extreme right of the edge foot. This can therefore be used, without the quilting guide, to sew along the edge of the material.

If the quilting guide is fitted to the foot, it can be used for quilting work, as can be seen in fig. 25. First the guide is set to the required distance from the foot. Then a line of stitching is made, whereupon the material is moved to the right, until this line is below the guide. Then a second line of stitching is made, the guide following the first line – and so on. Finally the same work is repeated across these lines.

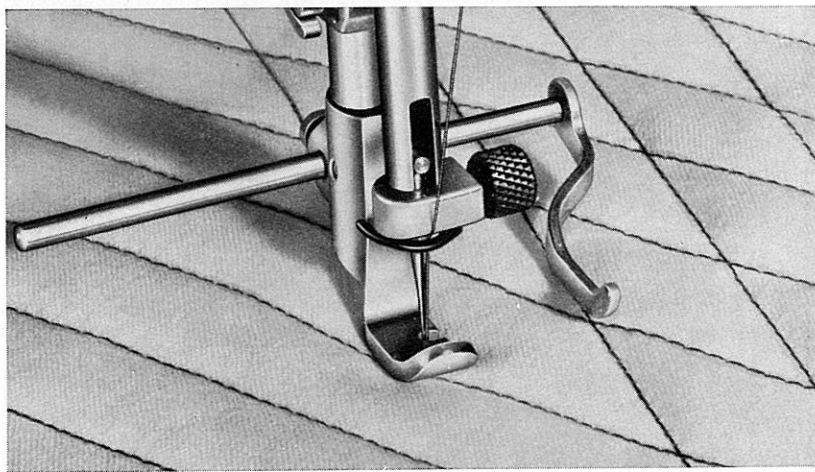


Fig. 25

HEMMER

(Width of hem 4 mm approx.)

The hemmer should be inserted in place of the usual foot, the presser bar being lifted for this purpose.

The edge of the material is folded-in to the width of hem required, and the material thus prepared is slid into the spiral shaped guide of the lifted hemmer until right under the needle. Then the foot is lowered. Whilst sewing, the edge should only be guided lightly by hand (fig. 26). If too much material enters the hemmer the hem will be protruding and uneven; on the other hand, if there is too little the hem will not be sufficiently strong.

GATHERER

The material to be gathered is put underneath the foot, not into the slot, the gatherer is then lowered by means of the lever and the piece of material which is to remain flat is placed in the slot until it reaches the stop. If the flat piece is held while sewing, the lower piece will gather, the amount of gathering being determined by how firmly one holds back the upper material (fig. 27).

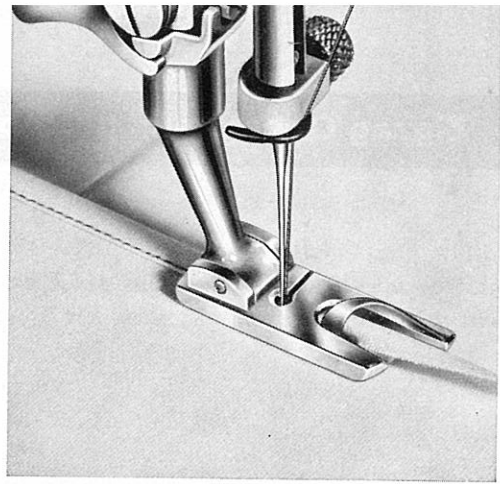
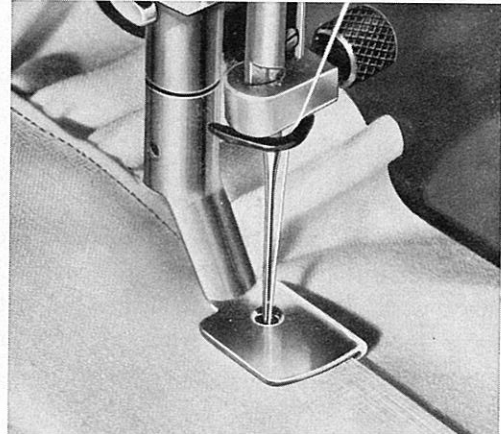


Fig. 26

Fig. 27



Zigzag Operations possible

Patches for stockinet and similar materials

There are several ways of patching stockinet, two of the most usual ones are described below:

1st method

The patch is cut to the required shape and size and then put on top of the damaged part, both with the same grain direction. The reverse side of both pieces should face upwards. The edge of the patch is then over-sewn with zig-zag stitches (length of stitch 1 and width of stitch 3 or 4). On the inside a second zig-zag seam is put on, parallel with the first one and at a distance of about $\frac{1}{2}$ cm. Finally the damaged part is cut out along the inner line of stitching and the tacking thread removed.

2nd method

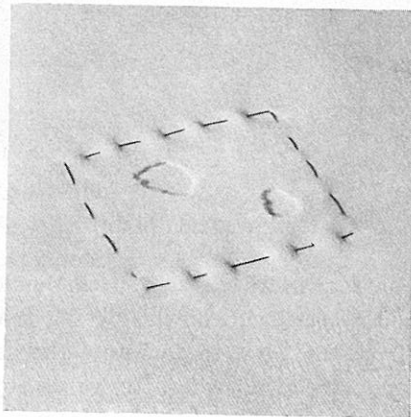
The patch is placed underneath the damaged part with the same grain direction (fig. 28a) with the reverse side of both pieces facing upwards, and is then sewn on (fig. 28b).

Now a zig-zag line of stitching is made along the tacking thread (fig. 28c), length of stitch 1 and width of stitch 3 or 4, and a second zig-zag line at a distance of about $\frac{1}{2}$ cm. Then the damaged part is cut out inside the inner line, whereas the projecting part of the patch is cut off alongside the outer line. Finally the tacking thread is removed.

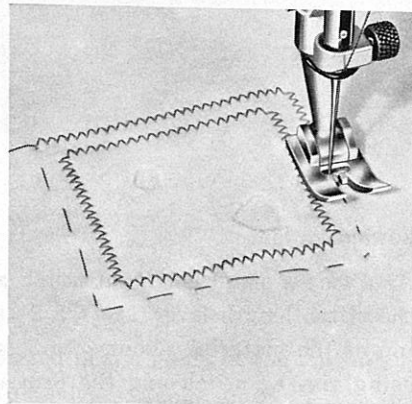
Fig. 28a



b



c



Sewing on cords

A soft cord is threaded through the cord guide of the zig-zag foot and oversewn with zig-zag stitching. Mercerised thread 50/2 or 60/2 should be used. Various effects can be achieved in this work. The effects can be increased by using coloured thread, coloured cord or several seams next to each other.

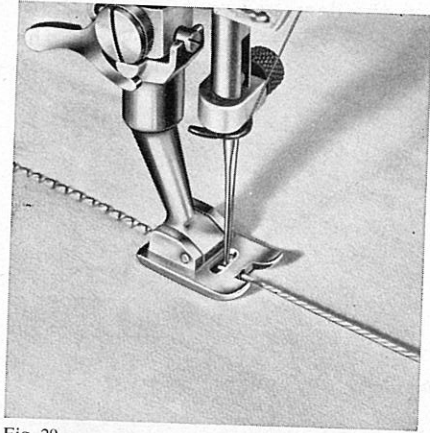


Fig. 29

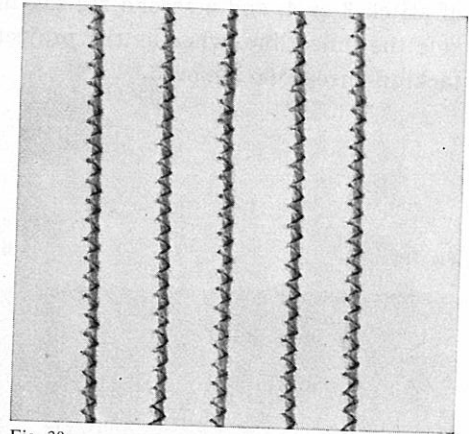


Fig. 30

Sewing on lace

As a rule a small length of stitch and narrow width zig-zag stitch should be used for sewing on lace. Usually the stitch length lever 14 (fig. 2) should be set at 1 and the zig-zag lever 17 at 2 or 3. The lace is placed on top of the material, about 2 to 3 mm from the edge, to facilitate the sewing on. The lace is then sewn on, using zig-zag stitch and the protruding material edge is afterwards cut off along the seam.

Buttonholes

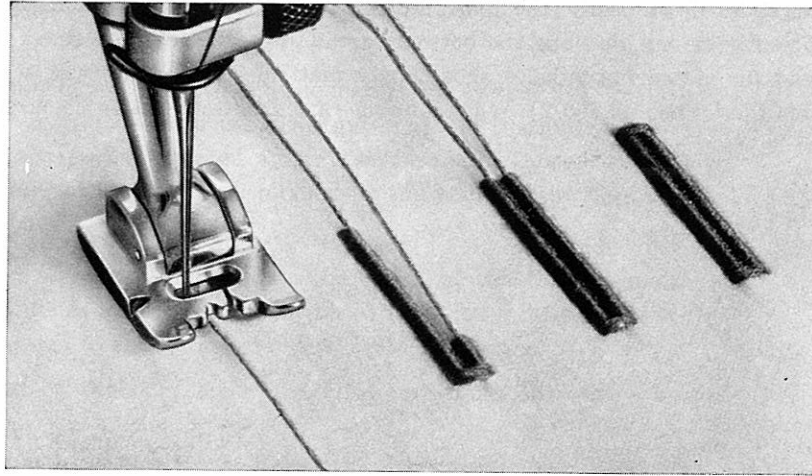


Fig. 31

There are three types of buttonholes:

- a) the ordinary buttonhole
- b) the buttonhole with inlaid cord
- c) the raised buttonhole

Buttonholes a) and b) are made using normal thread tension.

For the buttonhole with inlaid cord, a soft cord should be used. This is inserted in the guide of the buttonhole foot. Apart from that, the procedure is the same as with an ordinary buttonhole.

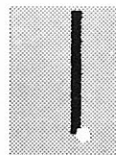
The raised buttonhole is achieved by using a low tension for the bottom thread. In order to ascertain the correct tension, the bobbin case should be suspended from the thread. If the bobbin case pulls down the thread by its own weight, i. e. slides down easily, the tension is correct. On the other hand the tension of the top thread should be sufficiently strong to make the bottom thread appear nicely and smoothly on the top of the material. The top thread for raised buttonholes should be a matt, 6-strand 40 thread, whereas a fine thread is required on the bottom thread bobbin (60/2). When making raised buttonholes in coloured work the coloured 2-strand thread should be on the bobbin.

Sewing a buttonhole

1. Attach buttonhole foot.
2. Set stitch width adjuster to satin stitch width 2.
3. Set needle position lever 11 to the half-left position (see buttonhole marking on the scale plate).

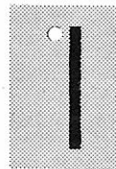
4. Now the left satin stitch bead is made to the required length of the buttonhole. The last stitch of the completed bead must be on the right, leaving the needle point in the material.

Last
stitch



5. Now the buttonhole foot is lifted and the material is turned 180° clockwise, until the bead just made is in the direction in which the material is now moving. Now the foot is lowered again and the needle moved to the left so that the material is again only pierced by the point of the needle.

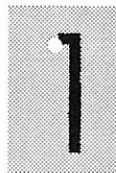
Let needle
pierce to
the left



6. Now the zig-zag lever is set to twice the width of the first bead and a few barring stitches are made. The material is pulled lightly towards the machinist in order to counteract the feed teeth movement.

The last stitch of the barr is on the left. Material again only pierced by needle point.

Last stitch
left



7. The zig-zag lever is reset to No. 2 and the second bead is made, slightly shorter than the first one.

Last stitch to end on the left.

Last stitch
left



8. The zig-zag lever is re-set to double width and the closing barring stitches are made. Again the material should be held back slightly to counteract feed teeth movement.

End bead with last stitch on the left.

Last stitch



9. Now the zig-zag lever is set at Zero and a few locking stitches are made. Again the material should be pulled lightly to counteract feed teeth movement.
10. Now the finished work is placed on a wooden base and cut with the buttonhole knife between the beads of the buttonhole.

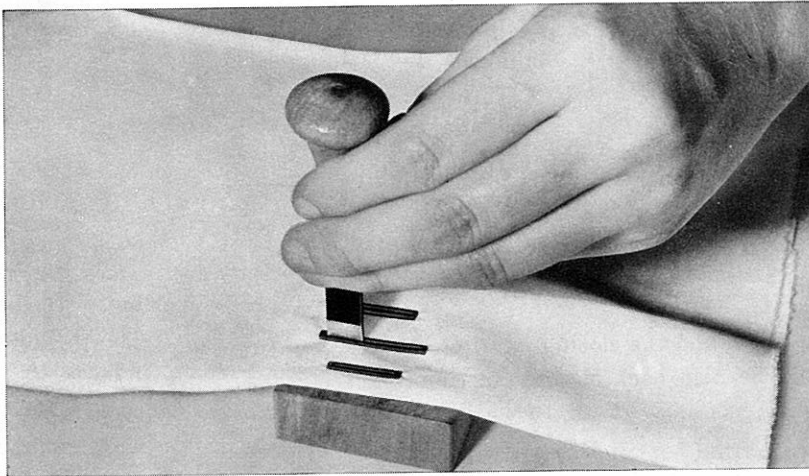
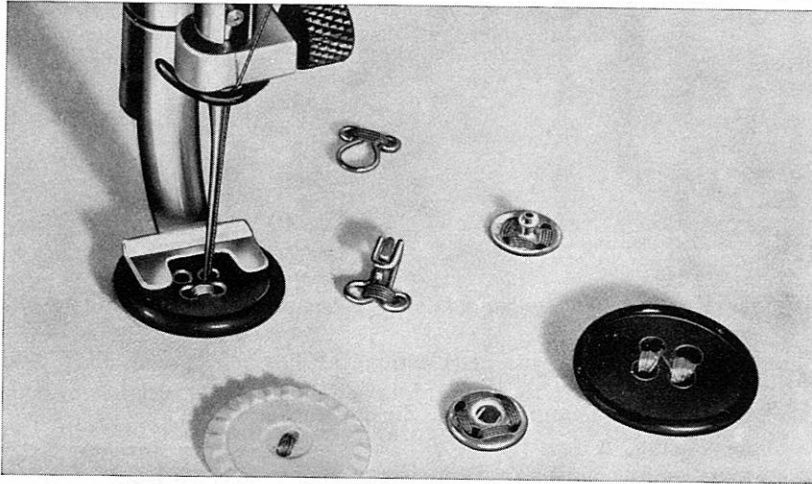


Fig. 32

SEWING ON BUTTONS

Fig. 33



1. Move needle position lever to the left.
2. Insert cover plate over teeth (feed dog).
3. Attach button foot and place button underneath.
4. Set zig-zag width to the distance between holes in button and sew on button with 6 or 8 over-stitches.

5. For securing, the needle is left in the hole of the button. The foot is lifted, the zig-zag lever set at Zero, the foot lowered and a few securing stitches made.

In the case of four-hole buttons the material and button are moved and another 6 to 8 stitches made into the second set of holes. Press studs and hooks are sewn on in similar fashion.

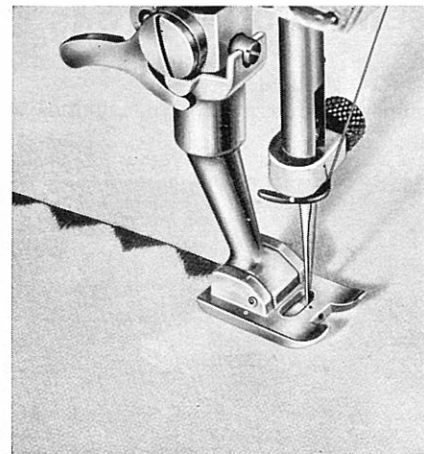
Ornamental Stitches, hand-operated

(without apparatus)

The zig-zag ornamental stitch

By using the zig-zag mechanism of the BERNINA Model 217 sewing machine, many types of ornamental stitches can be made in a very simple manner. The stitch length lever is moved upwards or downwards according to the type of ornamental stitch required, and the zig-zag lever 17 moved from side to side during sewing. A few trial stitches are necessary to acquaint the machinist with the method of making ornamental patterns.

For ornamental work of normal stitch length (pattern a as shown in fig. 36) the zig-zag sewing foot (fig. 35) is used. For ornamental work of very short stitch length (pattern b as shown in fig. 36) the zig-zag embroidery foot should be used (fig. 34). The latter is moulded on its lower edge.

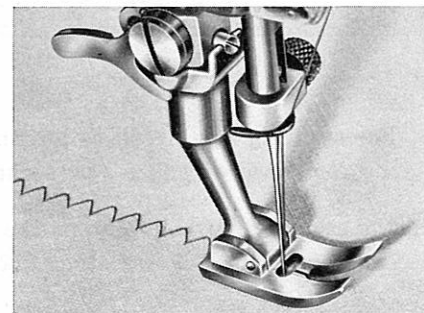


Zig-zag embroidery foot

Fig. 34

Zig-zag sewing foot

Fig. 35



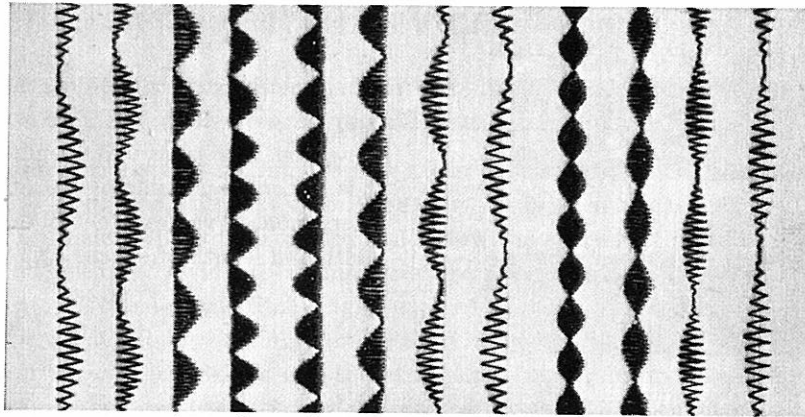


Fig. 36

a = normal stitch length, zig-zag sewing foot
 b = short stitch length, zig-zag embroidery foot

Zig-zag ornamental stitches and their combinations

It can be seen from the foregoing that the zig-zag stitch results from the combination of

1. Length of stitch (cloth movement) from Zero to 5,5 mm ($\frac{1}{45}$ ")
2. Width of stitch (needle oscillation) from Zero to 6 ($\frac{1}{4}$ ")
3. Stitch position (setting left-centre-right)

Ornamental stitches result from continual adjusting of the various control knobs during sewing.

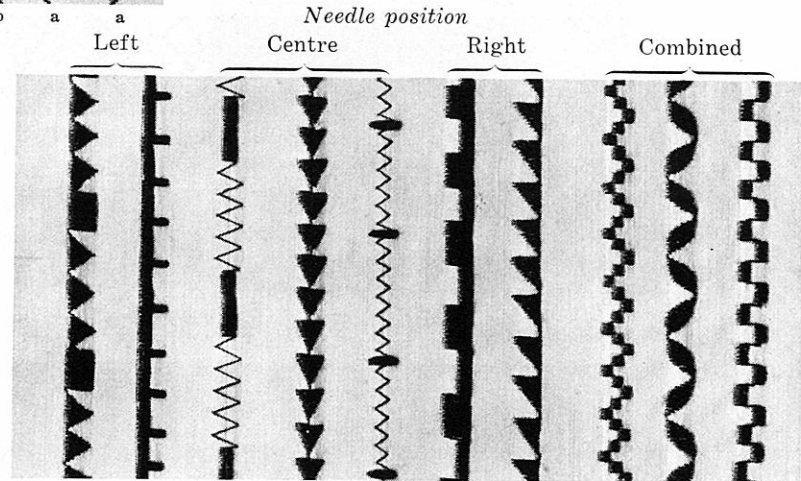


Fig. 37

Stitch position centre

Stitch width

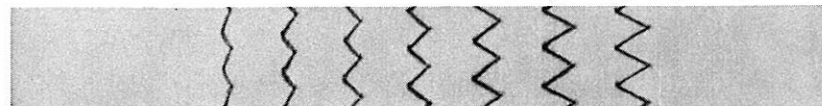
Stitch length 1

1 1.5 2 3 4 5 6

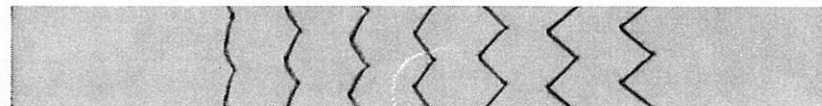
Fig. 38



Stitch length 2



Stitch length 3



Stitch length 4



Stitch length nearly zero



When sewing with set length and width of stitch, patterns as shown on this page will result. It is of course possible to use all intermediate values for both width and length of stitch.

THE SATIN STITCH DEVICE

The setting of the correct stitch length for ornamental work and buttonholes is an easy matter on the BERNINA, thanks to its patented satin stitch device.

First the stitch setting lever is taken by its handle and lifted to backward stitch position. The stop 30 is then pushed with the index finger towards the scale. Now the stitch setting lever is released; owing to spring pressure it will now rest on the stop. Thus a short stitch length, such as required for ornamental work, is set. By pulling part 30 away from the scale, the satin stitch stop is released and thus the stitch setting lever is freed again and can be set to any forward or reverse stitch length required. The length of stitch depends on the thickness of the thread used for various types of work. Therefore the satin stitch stop is fitted to an eccentric axis. By turning button 31 slightly to the right a small decrease of stitch length is obtained, which is necessary when thin thread is being used. A slight turn of button 59 to the left somewhat increases the stitch length, which is necessary in order to obtain a firm even stitch when using thicker thread.

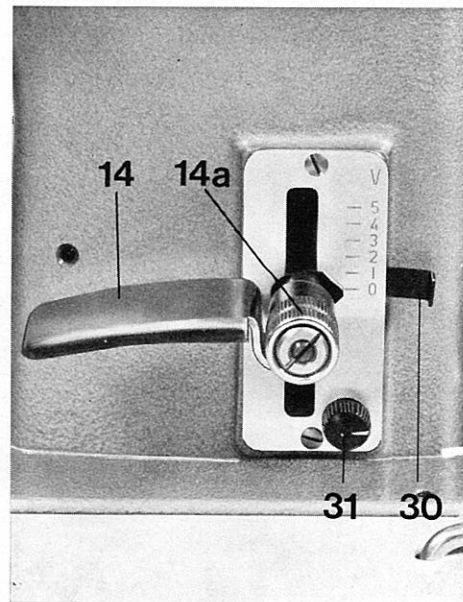


Fig. 48

Automatic Ornamental Stitches

The BERNINA Model 217 can be supplied with an automatic pattern attachment (against firm order and at extra charge). For this purpose a special unit is fitted to the back of the machine. This can be switched on and off, as required, and has exchangeable pattern cams.

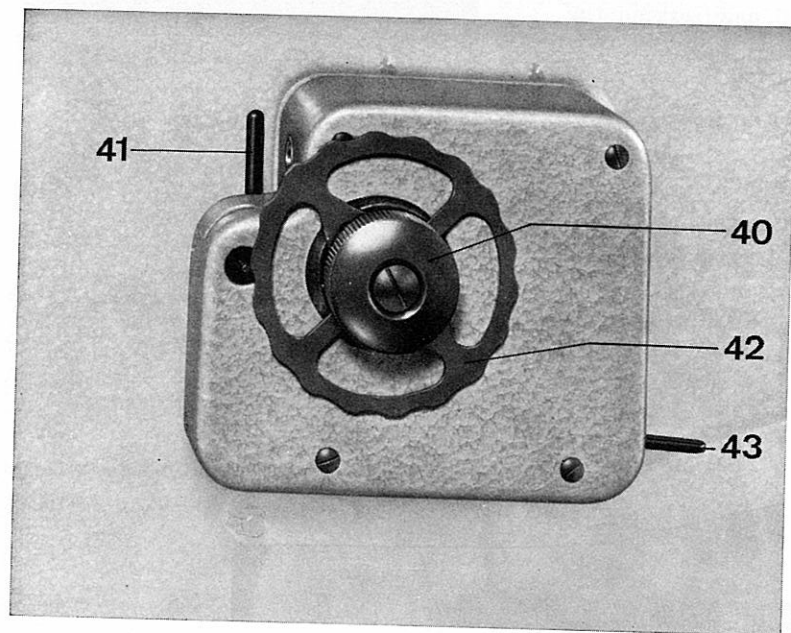


Fig. 49


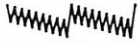


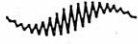
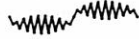


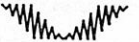


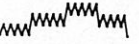

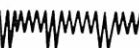
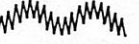


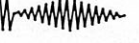


Changing the pattern cams

By turning the cam nut 40 anti-clockwise, it can be screwed off completely. Pattern cam 42 can then be lifted off and exchanged for another. Care should be taken when inserting the new cam that the pin in the flange is put into one of the two holes on the cam. The cam identification (Number) should face outwards. The nut should be re-placed and tightened. Another point to be noted on insertion of the cam is that the sprung key should be pressed downwards by the lever 41, so that the key is removed from contact with the cam face. When lever 41 is released, the key closes on the outer shape of the cam. By moving the connecting lever 43 towards the machine body the automatic mechanism is switched off and the machine can be used for zig-zag work in the usual manner.

By moving the lever in the opposite direction the pattern mechanism is engaged and automatic ornamental work can commence.

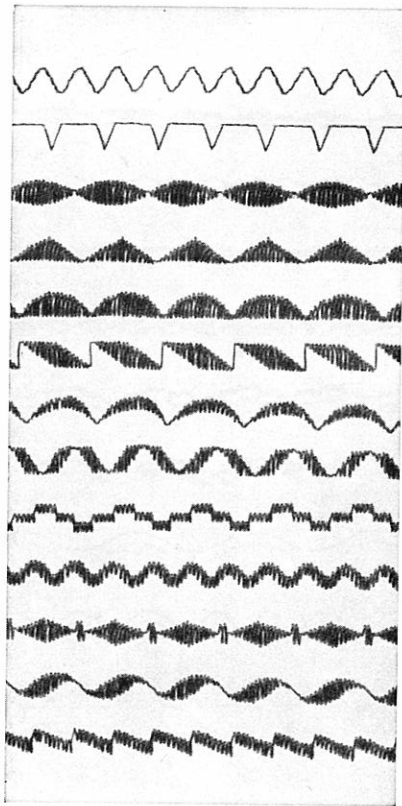
The equipping of existing machines with an automatic ornamental mechanism should only be carried out by a skilled sewing machine mechanic or Bernina agent.

Available pattern cams and their numbers

310 102 13		310 119 13		310 114 23	
310 105 13		310 110 13		310 115 23	
310 111 13		310 101 13			
310 106 13		310 104 13		310 118 13	
310 107 13		310 117 23		310 175 03	
310 108 13		310 100 13		310 167 03	
310 109 13		310 103 13		310 176 03	

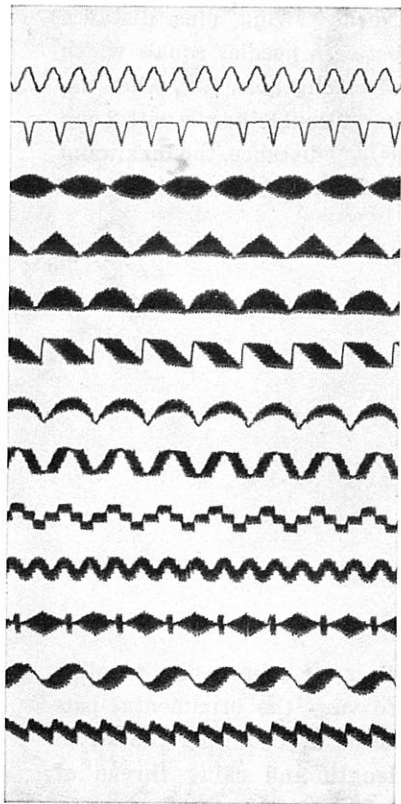
Special pattern cams for other types of fancy stitches can be produced and supplied against firm orders and at extra charge.

Fig. 50



Stitch length nearly 0
Stitch width 6

Fig. 51



Stitch length $\frac{1}{2}$
Stitch width 6

Automatic ornamental patterns with one needle

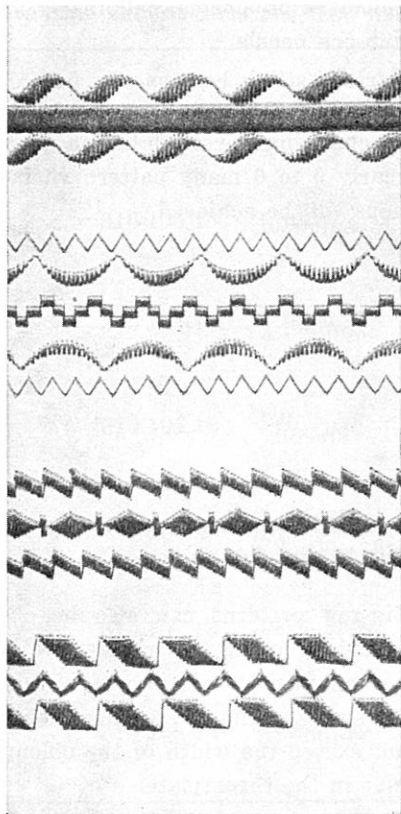
Various stitch lengths, fig. 51.

By changing the stitch length from nearly 0 to 6 many pattern variations can be achieved.

Automatic ornamental patterns with two needles

Zig-zag patterns can also be obtained by using two needles. It is a fundamental rule, however, that the swing of the two needles should not exceed the width of the oblong hole in the throatplate.

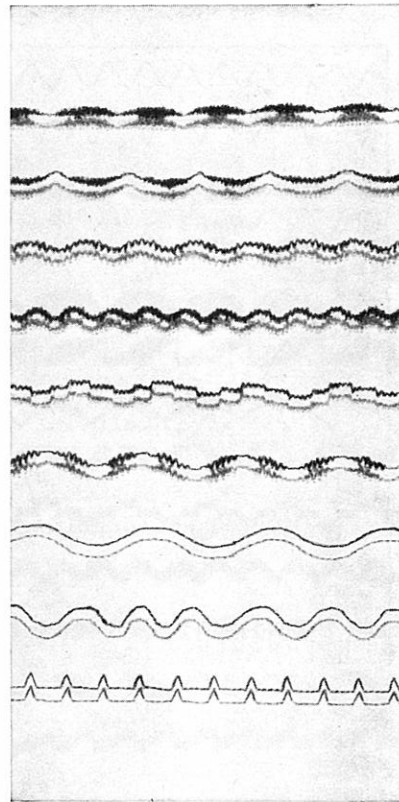
Fig. 52

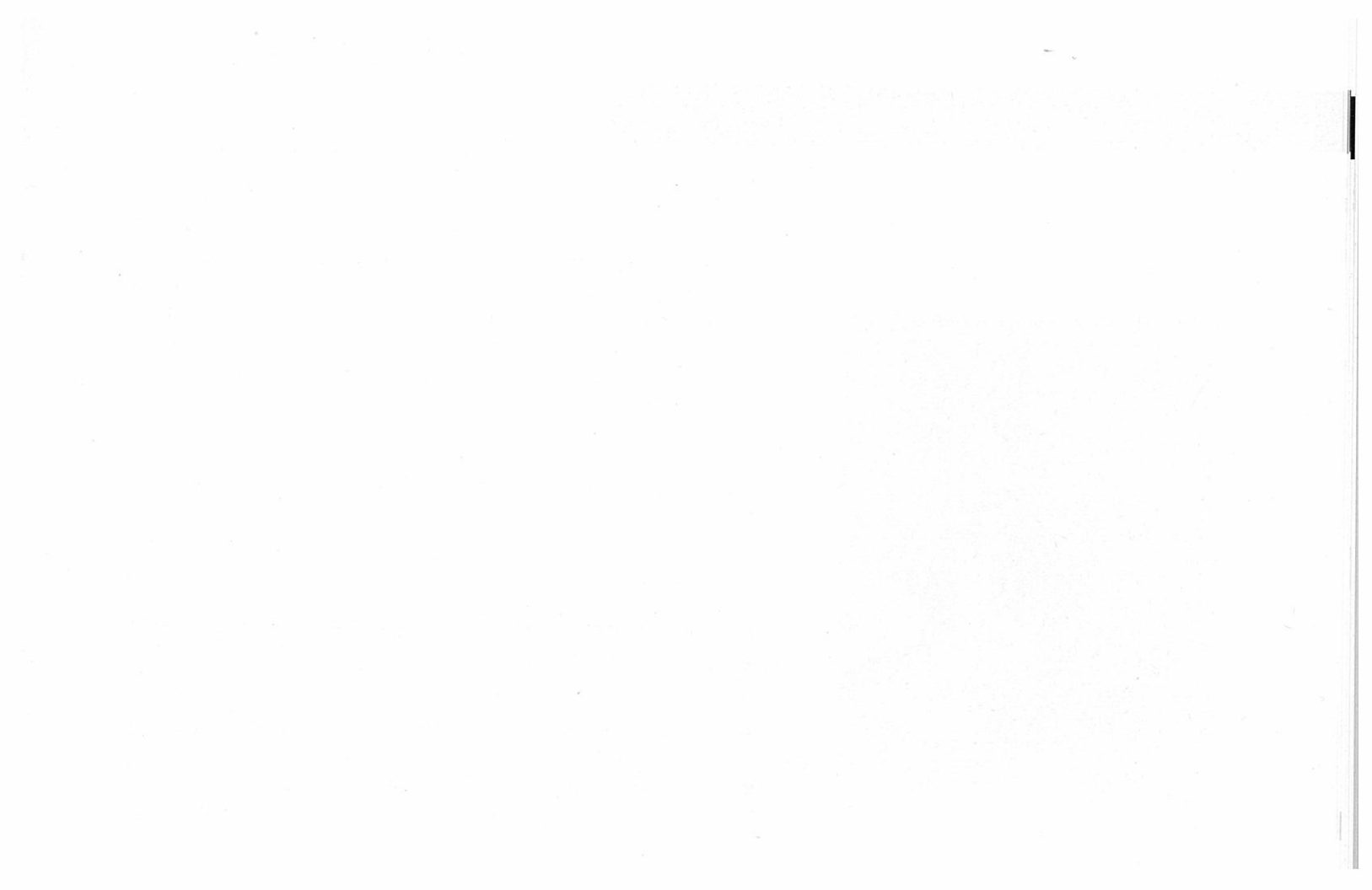


Needle swing plus distance between needles equals width of oblong hole. I. e., when using a double needle with 2 mm ($\frac{1}{12}$ ") distance, the maximum stitch width is 4 mm ($\frac{1}{6}$ "):

It is, of course, also possible to vary the ornamental patterns by changing the stitch length and using thread of two different colours.

Fig. 53





Blindstitch sewing

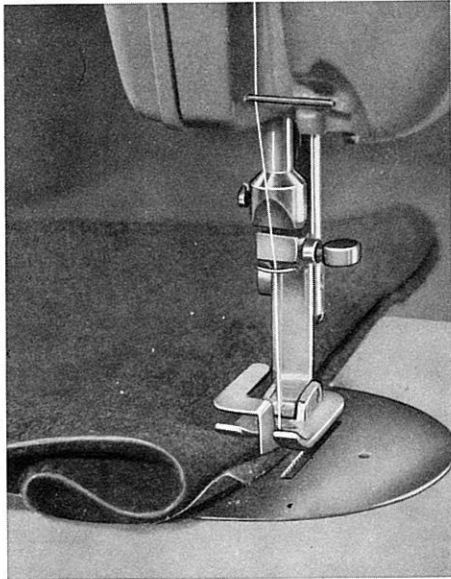


Fig. 54

Blind-stitch sewing is the sewing together of two pieces of material, the upper of which is sewn to the lower in such a manner that the seam becomes invisible. This is achieved by means of the blind-stitch foot, which has a sprung cloth-guide between the toes of the foot sole, but otherwise looks like an ordinary foot.

Blind-stitch sewing can be carried out using ordinary zig-zag stitching, or by using the automatic device with a blind-stitch pattern cam inserted.

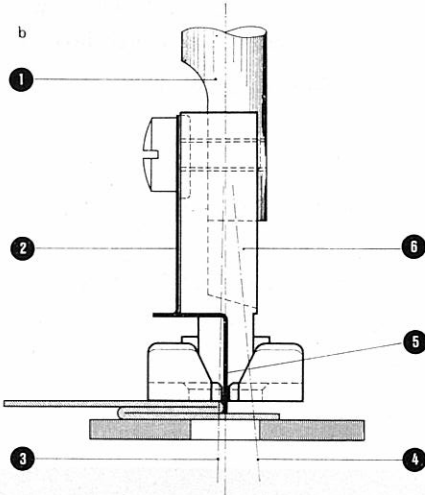
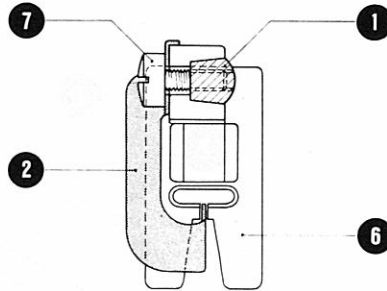
1. Setting the machine when sewing with ordinary zig-zag stitching

- a) Attach the blind-stitch foot
- b) Needle position: right
- c) Set zig-zag lever between 2 and 3, according to thickness of material
- d) Set stitch length lever to stitch length 6

After the machine has been threaded place the first piece of material underneath the foot, and on top of it put the second, folded piece, in such a manner that it closely touches the guide on the foot, then lower the foot and start sewing.

The stitch width should be set by means of the zig-zag lever in such a way that on its left swing the needle penetrates at the very edge of the fold, so that when this is flattened out the stitch will be invisible on the upper piece. The stitch width will need to be between 2 and 3, depending on the thickness of the material.

Fig. 55a



Diagram

- ① Blindstitch foot
- ② Needle position left
- ③ Folded upper piece of material
- ④ Throat plate
- ⑤ Material stop and guide
- ⑥ Needle position right
- ⑦ Flat lower piece of material

2. Setting the machine for sewing by means of a blindstitch cam

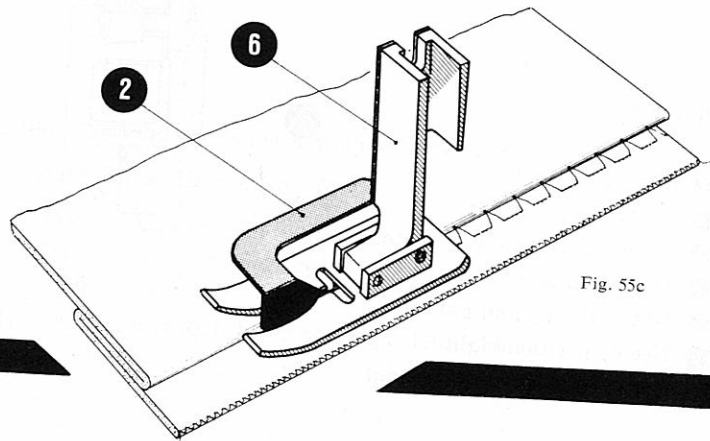
(Only for machines with automatic pattern cam mechanism)

Whereas in blindstitching with ordinary zig-zag stitch the folded piece of material is caught by the needle after every other stitch, when using the blindstitch cam there are five straight stitches between each zig-zag stitch on the folded piece.

The machine should be set as follows:

- a) Attach the blindstitch foot
- b) Fit the blindstitch cam
- c) Engage the automatic mechanism (see page 46)
- d) Needle position: *centre*
- e) Set zig-zag lever to width 2 or 3, depending on thickness of material
- f) Set stitch length lever to length 2, 3 or 4, depending on type of cloth.

Actual sewing as under 1.



Pintucking

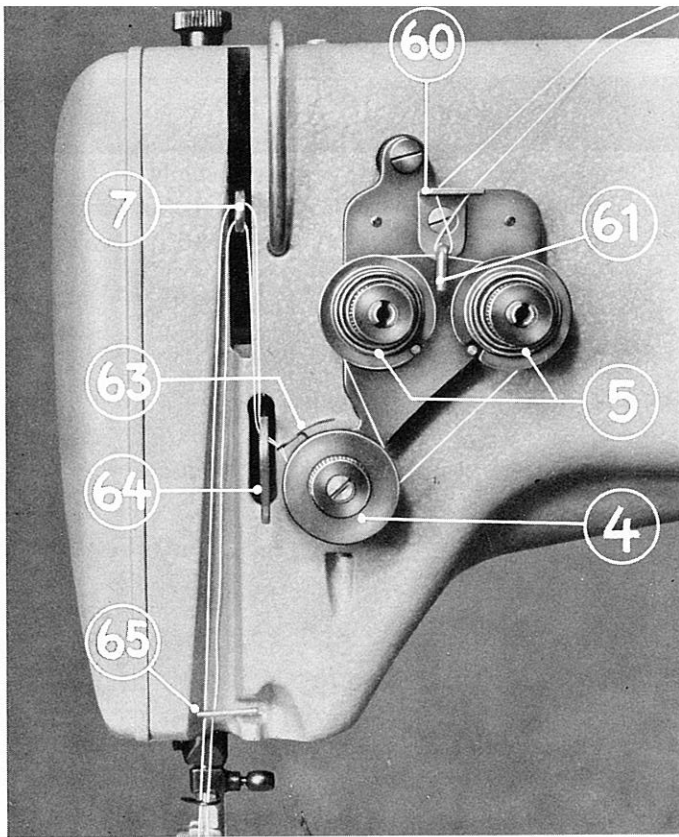
(Attachment supplied at extra charge)

The complete pintucking set consists of the following parts:

- 3 Twin-needle clamps for pintucking seams of about 1.8, 2.9, and 4 mm distance between needles
- 3 Pintucking feet with 3, 5 and 9 grooves
- 1 Pintucking tongue plate
- 1 Pintucking cord guide
- 1 Pintucking cord threader

To prepare the machine for pintucking, the following should be done:

1. Select centre needle position.
2. Set zig-zag lever 17, fig. 19, to Zero.
3. Take off needle clamp from needle bar and insert instead the twin needle clamp. Care should be taken that the guide pin on the needle bar is put in the slot on the right side of the clamp.
4. Insert the pintucking foot suitable for the distance between needles, i. e.:
 - Three-groove foot and needle clamp for 4 mm ($\frac{1}{6}$ ") pintucking
 - Five-groove foot and needle clamp for 2.9 mm ($\frac{1}{8}$ ") pintucking
 - Nine-groove foot and needle clamp for 1,8 mm ($\frac{10}{136}$ ") pintucking



Threading the machine for pintucking

Threading is done in the same manner as for ordinary sewing (see figs. 13 and 14). As two top threads are used for pintucking and other twin-needle work, the threads for each needle should be put through a separate tension.

1st thread: The thread is led from one of the spools through the hole of the thread guide 9, from there through one of the holes of the guide angle 60, behind its hook 61, and from there through the right-hand tension disc 5, downwards through the guide groove of the regulator 4. Then around the check spring 63, and taken underneath the regulator arm 64, upwards to one of the two holes of thread take-up lever 7. Then it goes downwards behind the thread guide pin 65, into the right-hand hole of the needle-clamp, and finally through the eye of the needle from front to rear.

2nd thread: Coming from the other spool, the thread for the left needle, after having been threaded through the other hole of guide pin 9, is taken through the second, vacant hole of guide

angle 60 and then through the left tension disc 5. From there it goes the same way as thread 1, and finally through the left-hand hole of the needle-clamp and through the eye of the left needle.

Pintucking

The pintuck develops through the bottom thread drawing together both top threads, thus shaping the cloth between the two needles into a kind of rib. Two tensions are fitted to the machine, in order to give independent regulation to the tensions of the right and left thread. The regulation depends on the type of material and the pintucking effect required.

If a cord inlay is required, this should be threaded from below through the cord guide and the small oblique hole in front of the throat plate slot, making use of the cord threader provided. The two front screws of the gear box cover serve for securing the cord guide.

In order to obtain pleasing and strongly defined ridges in the case of large pintucking, the pintucking tongue plate should be used. It is put on top of the throat plate in the same way as the darning cover plate.

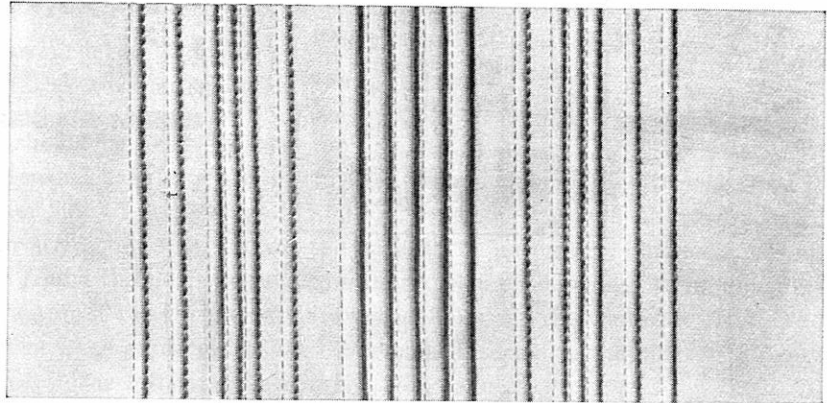


Fig. 57

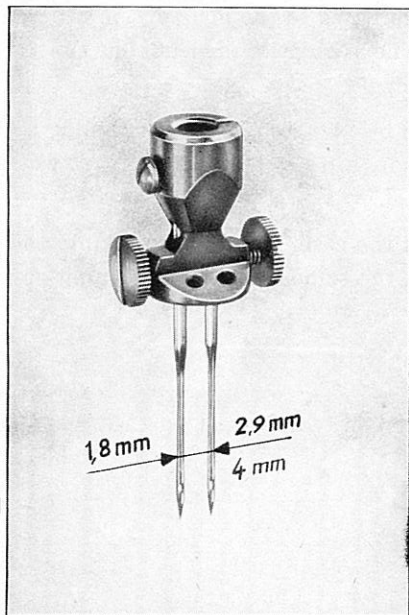


Fig. 58

Embroidering around holes

The complete eyelet attachment, which is not included in the normal accessories, consists of the following:

- 3 needle plates with different pin diameters
- 1 eyelet foot No. 315 091 03
- 3 eyelet stamps No. 334 052 03 for 1½ mm ($\frac{1}{16}$ ") dia., No. 334 053 03 for 2 mm ($\frac{1}{12}$ ") dia.
 No. 334 054 03 for 3 mm ($\frac{1}{8}$ ") dia.
- 1 wooden block No. 334 055 03

The machine should be set as follows for eyelet work:

1. Move needle position to the *left*, by moving lever 11, fig. 2, to the left.
2. Fit needle plate with pin suitable for the work intended.

Embroidery thread No. 60-80, 2-strand, should be used for both top and bottom thread, in order to achieve all-round symmetry. The bottom thread tension should be slightly tighter than that of the top thread, so that the knotting of the threads is on the under side of the material. Embroidery frames should always be used. It is advisable to pad the outer rim with strips of cloth, so that the material is held tight, but not strained. After the material has been put into the frame the holes are made on the wooden block, using the stamps provided. Awls can be used instead of the stamps. It is advisable to draw the holes on the material first. The material is then put under the eyelet foot and the guide pin of the cover plate inserted in the hole. As already mentioned, the needle must first be moved to the left, as shown in fig. 20 a, page 27.

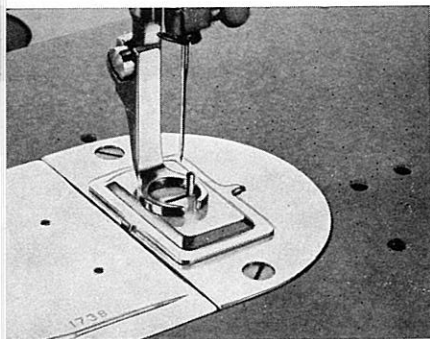


Fig. 60

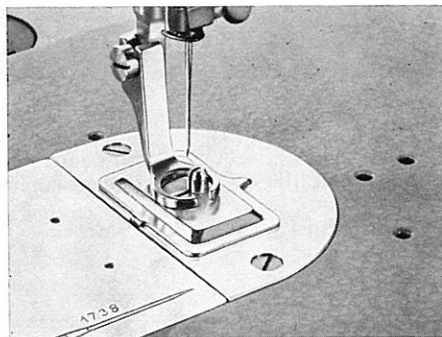


Fig. 61

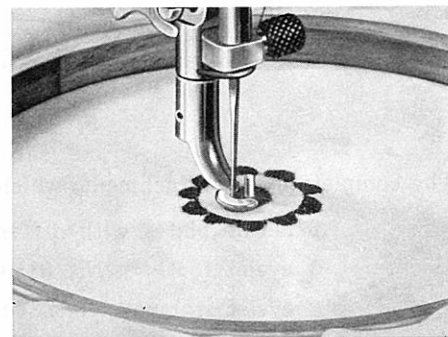
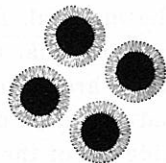


Fig. 62

In its right position the needle should just go into the slot of the guide pin over the edge of the material. This setting varies according to stitch width and should, therefore, be repeated from time to time. Then the machine should be allowed to continue at uniform speed, while the embroidery frame is turned, also at uniform speed, in a clockwise direction 3 to 4 times round the guide pin. After this has been done, the zig-zag lever 17, fig. 2, should be set to Zero and a few locking stitches made. These should be parallel with the eyelet threads, so that they remain invisible.



Useful Hints

We give you below various causes of minor trouble, which can easily be remedied:

Top thread breakages

Low grade, badly polished needle.

Badly inserted needle. Long groove must point to the front.

The needle is blunt or crooked.

The needle is too fine for the thread used.

The tension is too tight.

The thread guides are not polished.

The thread tension spring is broken.

The throat plate hole is distorted and needs polishing.

The hook point has been sharpened by contact with the needle. (Call mechanic.)

The hook is not oiled.

Bad thread or knots in thread.

The thread is dry owing to long storage. It should never be stored in heated rooms.

Bottom thread breakages

Tension is too high.

Thread is badly wound on bobbin.

The bobbin is distorted or is sticking in some way in the bobbincase.

The throat plate hole is distorted and needs polishing.

Unwanted holes in material

Wrong needle. Use only system 287 WH with hollow throats.

Blunt or crooked needle.

Badly inserted needle. Long groove must point forward. Needle should be touching the top of the needle clamp.

Low-grade, badly polished needle.

Cheap needles tear the thread often and break easily. This can cause expensive damage to hook and throat plate. The best needle will therefore be cheapest in the long run.

Needle is not the right size in relation to the thread being used.

Needle breakages

The needle is crooked.

The needle is too fine for the thread being used.

The needle fixing screw is not tight enough.

The top thread tension is too high.

If the finished work is taken out towards the machinist it often happens that the needle is bent. When sewing is continued the needle immediately hits the throat plate and breaks. Finished work should, therefore, always be drawn out backwards from under the foot.

During sewing, however, the material should not be pulled backwards too strongly. Use of cheap thread, which is uneven or has knots. A single knot on a bobbin can break the needle, or even damage the throat plate, so that the risk is far greater than when using highclass thread.

Bad, uneven sewing

Pieces of thread are between the tension discs.

Pieces of thread are under the bobbin case spring.

The bobbin is distorted or sticks.

The bottom thread is not smaller than the top thread.

The hook is not oiled.

The thread is uneven.

Puckering of material

Usually the fault lies in too high a tension in relation to the cloth.

When sewing stockinet-type fabrics the material should never be pulled backwards by hand, as it would then pucker. On the contrary, it is better to ease the material forward gently by hand.

Sluggish machine movement

If the machine has been standing unused for some time in a damp place, or if lowgrade oil has become resinous while the machine has been standing, sluggish movement will result. In such a case paraffin should be put into all lubrication points, the machine should be allowed to run until all the sediment has dissolved and then fresh oil injected. This procedure should be repeated until all foreign elements have been removed from the bearings. In difficult cases the machine should be dismantled and cleaned by a mechanic.

If the machine goes easily when the hand wheel is turned, but is hard with the treadle, the belt is too tight.

Thread is stuck in the hook

This can occur as a result of bad handling. The needle should be unthreaded. After the top part has been swung back, all visible scraps of thread should be removed from the hook. Now the race should be lightly oiled and the oil allowed to react on the stuck thread for 1 to 2 minutes. Then the hand wheel should be turned a few times backwards and forwards. The stuck thread ends are cut by that movement and can now be removed. In no case should the fixing screws be loosened, or the hook be removed – or pressed by screw-driver or scissors – as it is made from tempered material and is very sensitive indeed.

Prevention of thread jamming in hook

The jamming of thread in the hook is caused by bad handling of the machine, mainly by disregarding of the following points:

1. If the hand wheel is turned in the wrong direction after the needle is threaded, the top thread will catch and jam the hook. Always turn the hand wheel towards you.
2. Before sewing is started the bottom thread should be pulled up and placed together with the top thread underneath the presser foot, facing backwards, and held with left thumb and index finger until the first few stitches have been made.
3. After each sewing operation care should be taken that the thread take-up lever is in its highest position.
4. When sewing a corner the thread take-up lever should first be lifted, then the material slightly pierced by the needle point, and only then should the cloth be turned for sewing the corner.
5. When the machine is not in use the needle should be unthreaded and a piece of cloth put under the foot.

For general attention

In order to preserve the foot, a piece of cloth should be placed under it whenever possible.

This should be done especially when the machine is not in use.

After each sewing operation care should be taken that the thread lever is in its highest position, so as to prevent thread jamming.

Accessories for model 217

Normal accessories :

1 zig-zag foot	315 049 04
1 Edge foot	315 055 04
1 straight stitch foot	315 052 14
1 accessory box	330 008 04
1 large screwdriver	330 032 18
1 small screwdriver	330 015 03
1 special screwdriver	330 016 03
1 plastic oilcan	330 021 04
5 bobbins	330 026 03
1 set of 5 needles 287 WH	
1 knee lifter, complete	405 000 09
2 hinges	302 113 03
1 oil plate	405 013 03
1 securing bolt with wing nut	406 000 03
1 machine layer pin	406 003 03
1 instruction manual	

Accessories at extra charge :

Embroidery foot	315 099 04
Wide hemmer	315 058 03
Narrow hemmer, 2 mm	315 066 03
Roll-hemmer for stockinet	315 085 03
Lap-hemming foot	315 062 03
Gatherer	315 064 03
Zig-zag edge foot	315 090 03
Appliqué foot	315 088 04
Buttonhole foot	315 111 04
Buttonhole cutter	330 017 04
Wooden block	330 019 03
Keyhole buttonhole foot	315 115 04
Button sew-on foot	315 087 03
Pintucking foot with 3 grooves	315 069 04
Pintucking foot with 5 grooves	315 071 04
Pintucking foot with 9 grooves	315 073 04
Blindstitch foot	315 387 04
Plastic cover	331 040 03
Padding mechanism	334 027 04
Darning plate with round hole	315 096 03
Darning plate with oblong hole	315 095 03