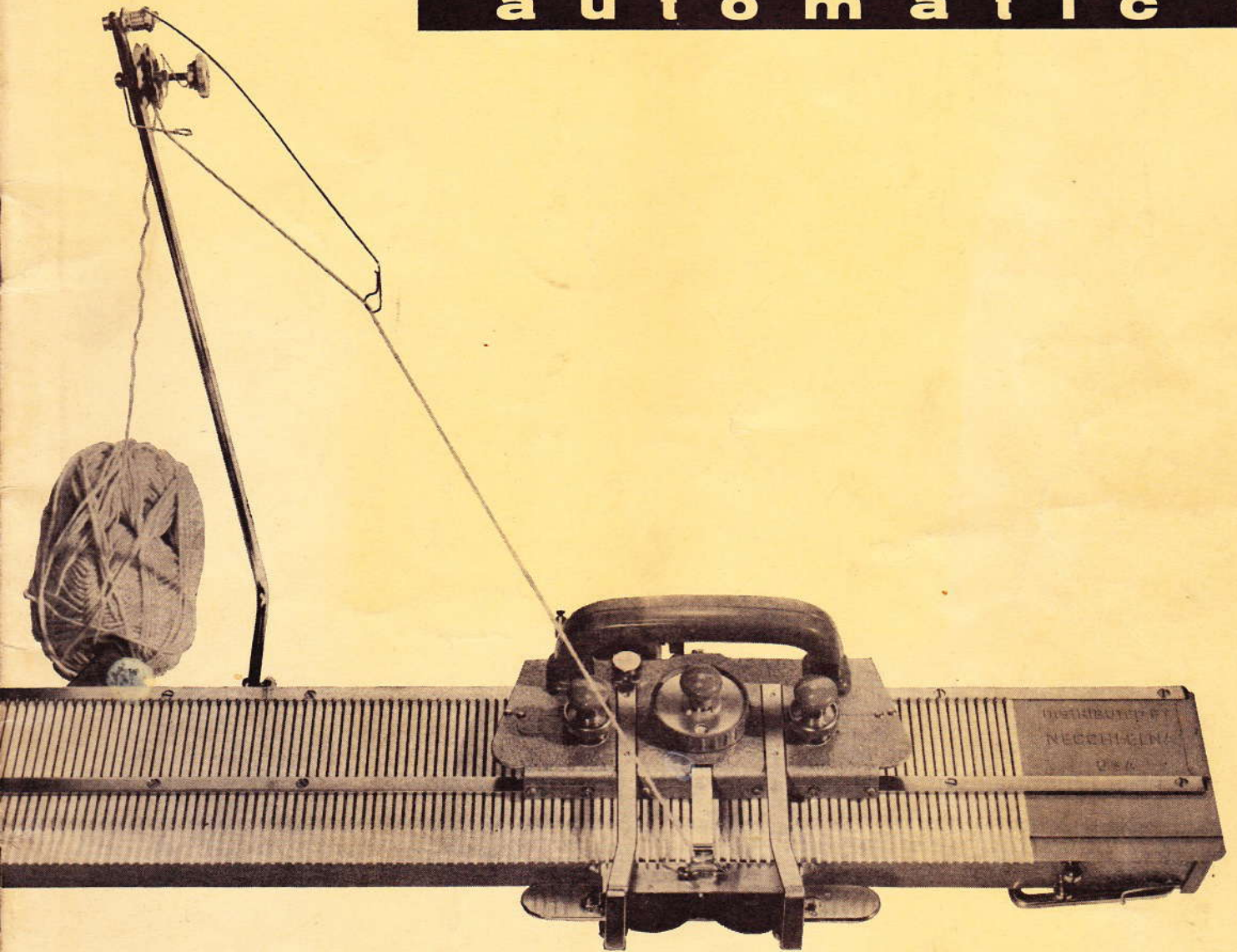


# **MIRACLE** *KNITTER* **a u t o m a t i c**



## **Instructions**

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# Machine

1. Machine base
2. Needle Bed
3. Latch needles
4. Back rail
5. Front rail
6. Index bar for numbering needles, from 00 in the centre to 80 at each side=161 needles
7. 162 small pins, alternating with the needles, on the edge of the needle bed
8. Levers for fixing machine on to the table
9. Yarn stand
10. Cam which operates the row counter
11. Cam box

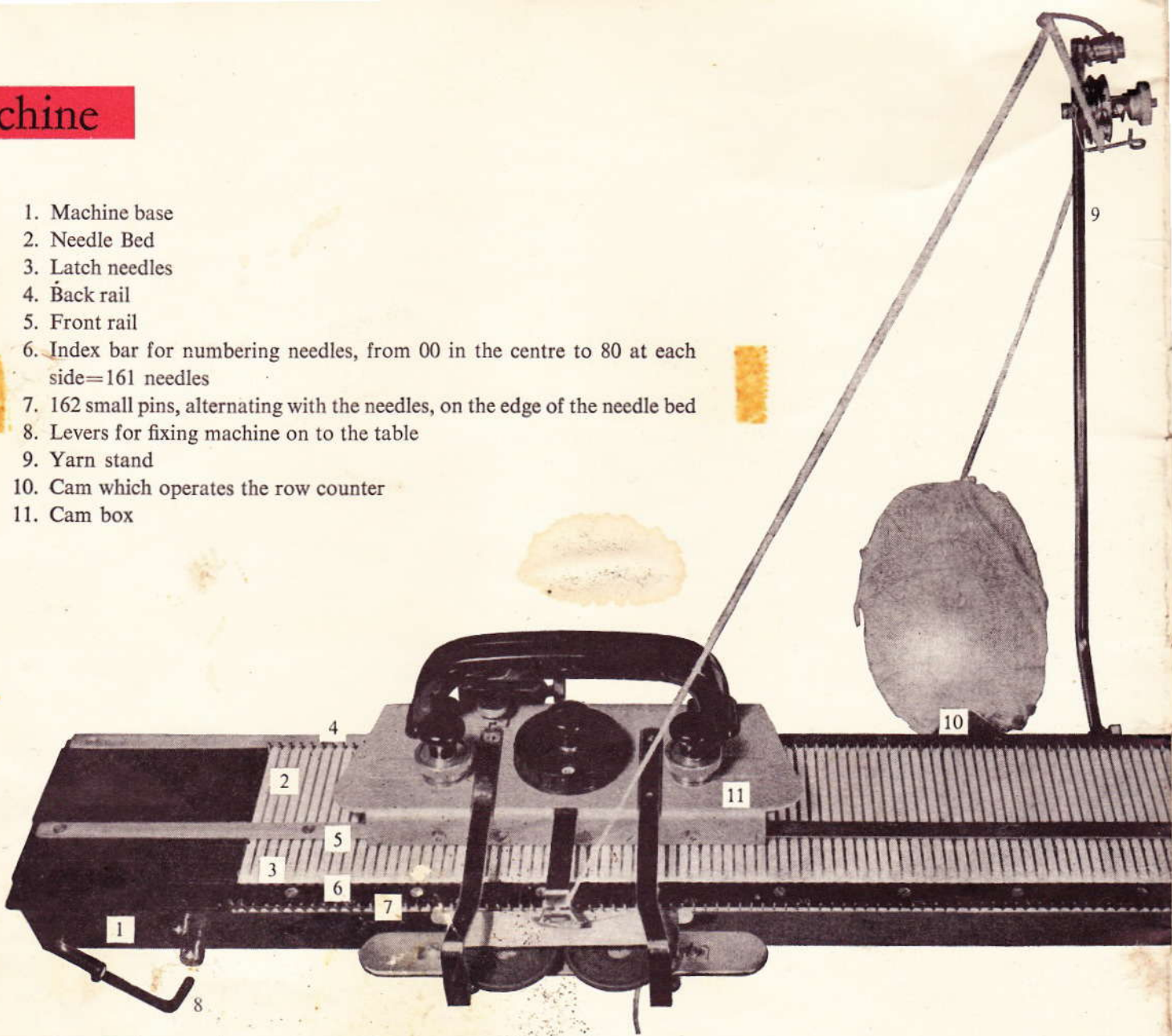


Photo 1

# Cam box

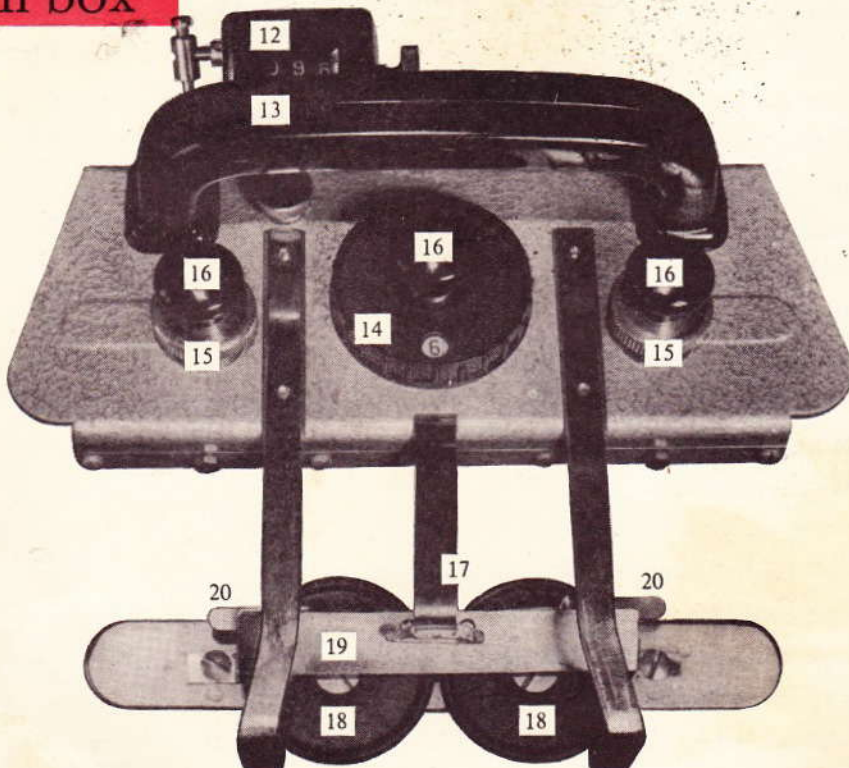


Photo 2

12. Automatic row counter
13. Handle
14. Stitch regulator
15. Two Knurled nuts for setting or releasing stitch tension
16. Three Knobs for lifting the cams
17. Automatic yarn guide
18. Rubber wheels which hold the fabric against the machine while needles move back and forth.
19. Upper cross bar
20. Two spring loaded prongs



Drawing 1

b) a)

a) hook

b) latch (open)

c) foot

## Needle

## How to fix the machine on to the table

Pull down the two fixing levers and close them again under the edge of the table; the machine should not overlap the table edge. The edge of the table should be at least  $2\frac{1}{2}$  inches deep and not more than 3 inches thick. If, however, your table has no suitable edge, the four rubber pads under the machine are sufficient to keep it in place.

## How to fix the yarn stand

Undo the screw which is at the bottom of the rod so that it does not project beyond the rod. Insert the end of the rod well into the holder behind the machine base and screw in tightly.

## How to fix the cam box on to the machine

Slip the front slide and the back castors of the cam box under the two rails of the needle bed (the rubber wheels should be next to the numbering index bar). It may be necessary to press the upper cross bar down a little so that it does not come into contact with the first pin on the edge of the needle bed.

## The row counter

The row counter is automatically brought into action whenever the cam box passes over the cam fixed behind the machine base. This cam can be fixed in *four different positions* depending on the size of your work. Holes already exist for this cam opposite the needles 60 and 15 on the left and 15 and 60 on the right. To move this cam, unscrew it; having chosen one of these positions, insert the two small pins of the cam into the two small outside holes and fix the screw into the central hole, the washer between the cam and the screw.

The row counter can also be worked by hand by pressing on the lever. To bring the counter back to 000, turn the screw backwards.

# Accessories

- a) The wooden slide is for pushing forward needles which will be used to knit with or, on the contrary, to push them back after use. To push

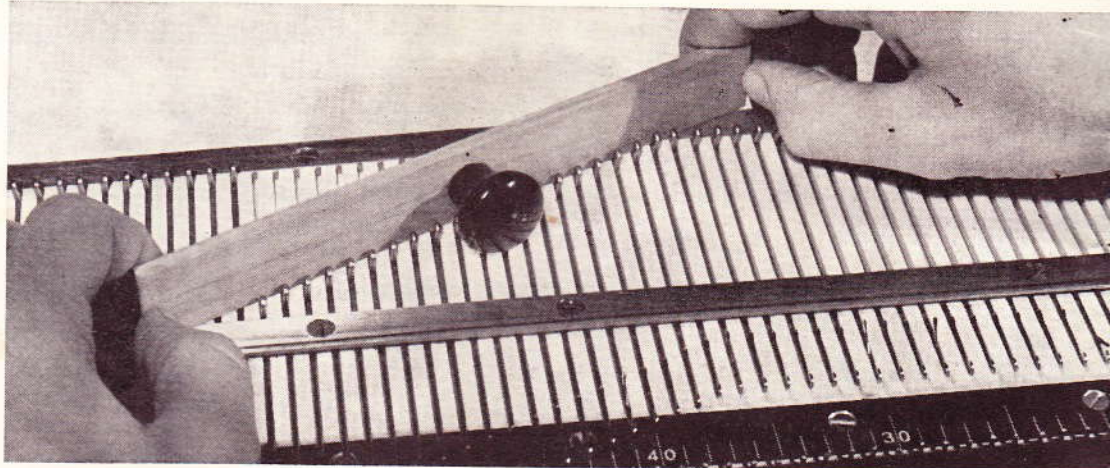


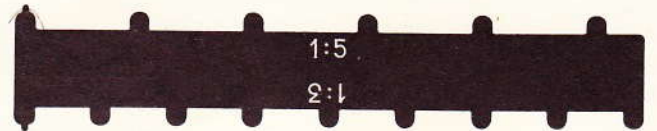
Photo 3

the needles forward hold the slide in both hands in a slanting position behind the feet of the needles (in this way less resistance will be encountered); to push the needles back hold it straight in front of the feet of the needles (less force will be needed). Needles which are out of use should be *locked right* against the back rail.



Drawing 2

- b) The two small selecting combs are used to select needles for a few rows—for example every 2nd, 4th or 6th needle—and put them into another position in order to knit fancy stitches.



Drawing 3



- c) The sharp point of the work hook is for opening needle latches.



Drawing 4

- d) The latch hook is for correcting a dropped stitch or picking up a plain stitch on the purl side.



Drawing 5

- e) The one-eye transfer bodkin is for transferring a stitch on to the adjacent needle (decreases or holes).



Drawing 6

- f) The two-eye transfer bodkins are for making cable pattern or for transferring two stitches simultaneously when decreasing inside the selvedge stitch.



Drawing 7

## Care of the machine

Brush regularly to remove dust and fluff from the needle bed, under the rails and in the cam box slides.

Oil the rails and slides from time to time with a special oil for knitting machines.

Grease the needle bed very lightly with Parafix whenever commencing a garment.

If the grooves on the needle bed become too dirty undo the screws on the front rail, remove it, with all the needles and the foam rubber and clean the needle bed with a brush dipped in soap and warm water. When the needle bed is *completely dry*, put the foam rubber into the groove again, then replace the needles, which must be well oiled. Put the rail back and screw into position.

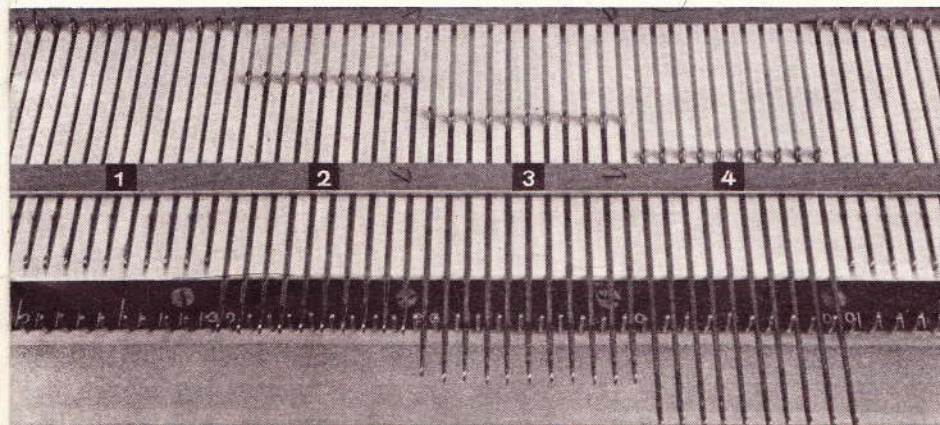
Do not leave the cam box on the machine if it is not going to be used for several weeks.

Do not leave the machine in sunlight, near heat or in a damp place.

To avoid the machine getting rusty when in damp climates, it is recommended that all the metal parts be oiled regularly—needles, rails and cam box—particularly when the machine is out of use for some time.

## Positions of needles

Photo 4



- 1: needles out of action; the feet of these needles are locked *right against* the back rail.
- 2: needles in knitting position; stitches in front of the latches and wool in the automatic yarn guide.
- 3: needles in knitting position; stitches behind the latches, wool laid on the needles by hand. This position is also used when bringing back into action needles which were in holding position.
- 4: needles in holding position; the feet of these needles are brought forward right up against the front rail. These needles do not knit, even when the cam box passes over them.

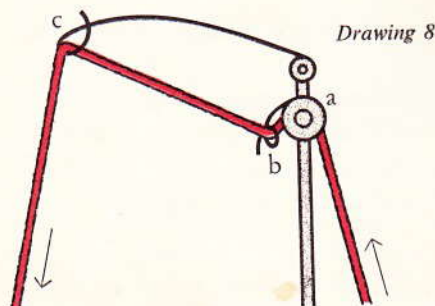
Never slide the cam box on to needles which are not bearing stitches unless they are against either the back or front rails.

# Knitting with the automatic yarn guide

## Threading instructions

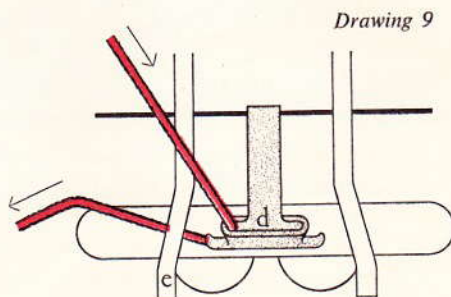
*in the yarn stand*

- a) between discs
- b) in the wire loop
- c) in the ring



*in the yarn guide*

- d) in the guide
- e) under the left cross bar bracket (when the cam box is on the right) and under the right one (when the cam box is on the left).



## How to regulate the stitch tension

The number on the stitch regulator of the cam box indicates the size of the stitches. The numbers are for use with the MIRACLE KNITTER only;

Nos 2 to 4	correspond approximately to hand-knitting needles No. 14
4 to 6	No. 13
6 to 8	No. 10
8 to 10	No. 9

To change the stitch tension loosen the two knurled nuts under the left and right knobs on the cam box; the stitch regulator can then be set at the number desired. Screw up the two knurled nuts fixing the tension.

When enlarging the size of the stitches once the work has been started, it is necessary to knit the first row in the new tension with the first knob on the cam box up (the one nearest to the work) to avoid the sudden change in tension breaking the wool. On the other hand, if the stitches are made smaller during the course of the work it is not necessary to lift this knob. A very attractive pattern can be obtained by knitting in fine wool 8 rows with tension 3 and 8 rows with tension 10.

Really thick wool should be knitted on alternate needles only, not on all the needles. Tension 6, 7 or 8.

## Casting on

The machine is fixed on to the table, the yarn-stand is in position behind the machine, the cam box is fixed on to the machine at the extreme right of the needle bed and the needles which will be used for casting on have been brought right up against the front rail. The wool has been threaded into the yarn stand and the automatic yarn guide. The stitch regulator determining the size of the stitches has been set, taking into account the wool to be used (for the first few tries it is recommended that a fairly fine wool be used, with stitch tension at 6 or 5).

## Ordinary casting on

- Hold the end of the wool in the left hand, under the needles.
- Without letting the end go, take up the wool in the right hand and insert it vertically between the 1st and 2nd needles brought forward on the left (left hand under the needles, right hand over);
- pass the wool back over the 1st needle
- and then under the needle (anti-clockwise).  
The first loop is made.
- Hold this loop against the machine with the left thumb, under the needles (the loop should be behind the latch)
- and pull the wool up between the 2nd and 3rd needles.
- Bring the wool back over the 2nd needle
- and pull it down between the 1st and 2nd needles;

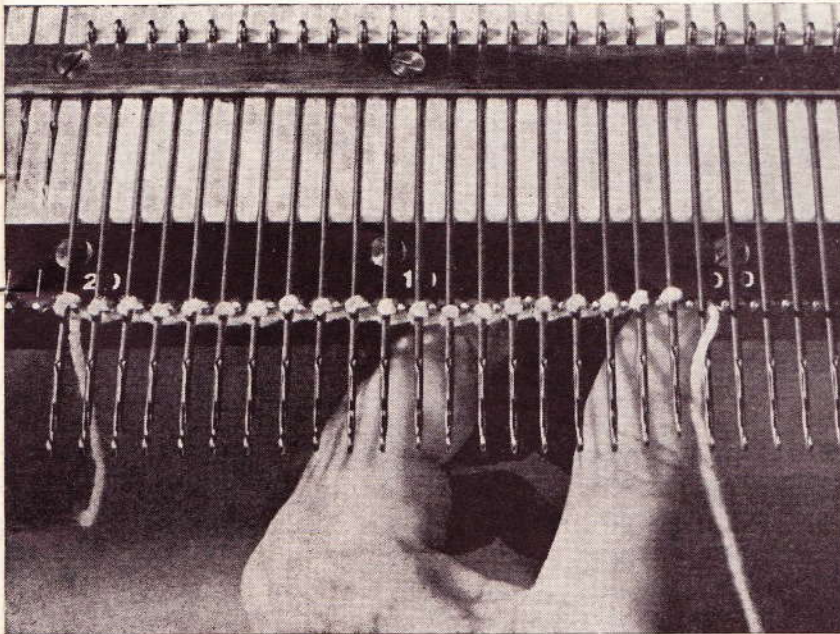
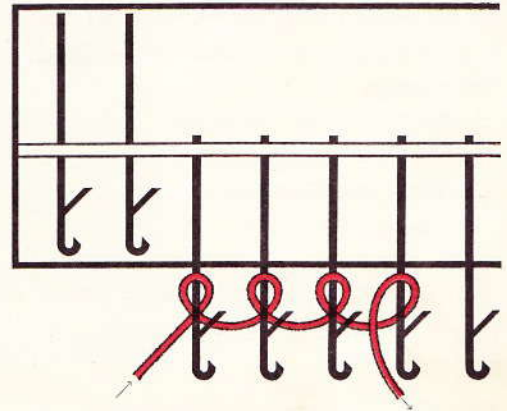


Photo 5



Drawing 10

- with the left thumb slip this loop behind the latch, holding the wool against the machine, thus helping to form the next loop.
- Pull the wool up between the 3rd and 4th needles and so on, looping it round each needle.  
*Do not pull the loops too tight!*

## Knitting

- When all the needles brought forward hold a casting-on loop, push the needles back a little until the end of the *open* latches covers the stitches on the edge of the machine base (position 3).
- The wool and the cam box are on the right.
- Lift the left-hand knob on the cam box; the two others are down.
- Slide the cam box along until the left rubber wheel is in front of the first stitch.
- Hold the wool taut by pulling it between the ball and the disc of the yarn stand.
- The wool must be tight between the yarn guide and the first stitch and pass behind the left spring loaded prong but in front of the small pins at the edge of the needle bed.
- Slide the cam box across from right to left, taking care that the latches remain open;
- stop the cam box when the last stitch on the left has been knitted.
- Lower the knob.



- Slide the cam box across from left to right, taking care that the stitches remain right against the machine, slipping behind the latches when the needles come forward (and not coming forward with the needles on to the the upper cross bar).
- Continue sliding the cam box smoothly across the needles, taking it in each row only far enough to knit the last stitch.  
One row is knitted each time the cam box passes over the work. Stocking stitch is being formed—purl side facing you.

### *Important!*

- The wool must be threaded correctly in the yarn stand and the automatic yarn guide.
- The ball should unwind easily.
- The stitch tension must correspond to the thickness of the wool used.
- The cam box should not be taken further than is necessary to knit the last stitch. Should it be necessary to go beyond this point the wool should be given more play and pulled taut again when bringing the cam box back on to the selvedge.
- Do not turn back once a row has been started.
- Do not lift the work up to look at the other side: it might become unhooked.
- The three knobs should be down (except during the first row, when the 1st knob should be up).
- Never lower a knob when the corresponding part of the cam box is on the work: the feet of the needles would prevent the cam from descending properly.

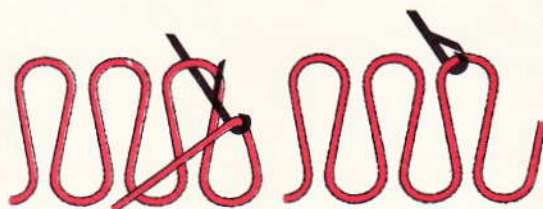
### *Please note*

How the selvedge stitch is formed:

At the beginning of a row the yarn should come from underneath the needle; the stitch should slip behind the latch when the needle comes forward and the wool should be stretched tautly on to the needle in front of the latch.

The stitches are formed as follows :

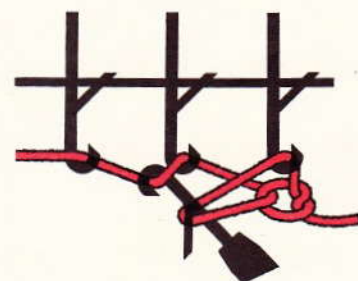
the cams under the cam box push the feet of the needles, thus moving the needles forward and causing the stitches to slip *behind* the latches; the wool is placed *in front* of the open latches; the needles move backwards: the stitches close the latches on to the wool in front of them and slip off the needles, the wool forming the new stitches.



Drawing 11

## Chain casting on

- Bring forward the desired number of needles.
- The cam box should be on the left and the wool threaded in the yarn stand and automatic yarn guide.
- Make the first stitch by hand and hook it on to the first needle brought forward on the right.
- Take up the latch tool in the right hand and insert it into this stitch.
- Hold the length of wool in the left hand, above the needles; pass the latch tool in front of the wool, then pull it up vertically, behind the wool, between the 2nd and 3rd needles, the first stitch thus slipping behind the latch of the latch tool;
- take the wool with the hook of the latch tool and pull it down through the first stitch.
- Pull the latch tool up between the 3rd and 4th needles (slipping the chain behind the latch),
- take the wool which is held in your left hand above the needles and pull it through the chain.



Drawing 12

- Proceed in this way for each needle and hook the last chain on to the last needle brought forward on the left.
- Slip all the loops of the chain behind the latches
- and bring the needles into position 3.
- Lay another length of the same wool on the needles,
- tighten the wool and slide the cam box across with all 3 knobs down.

## Knitted hem

- Cast on the desired number of stitches (ordinary casting on) and knit twice the number of rows which would be needed to form the depth of the hem when turned in.

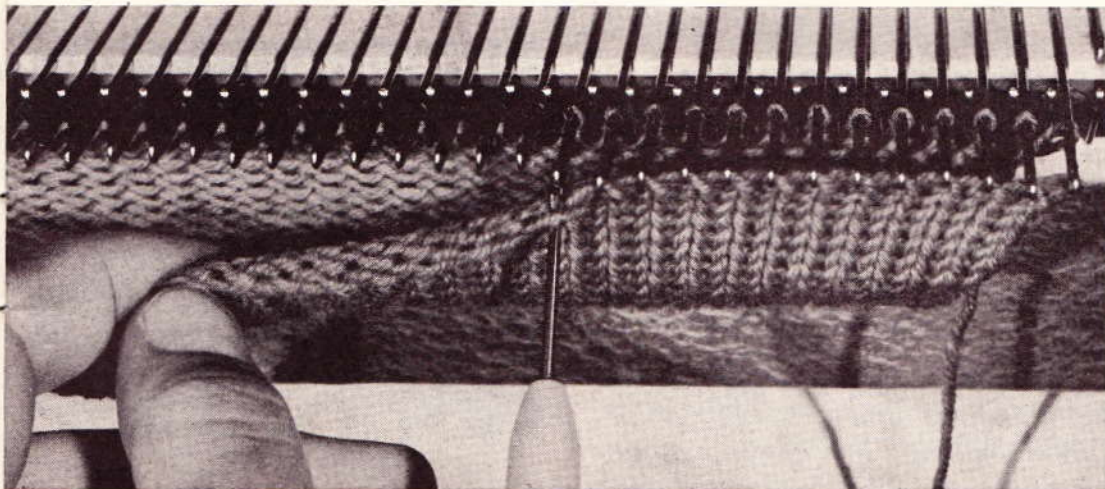


Photo 6

- Using the wooden slide, push the needles right forward (feet against the front rail), the stitches slipping *behind* the latches and remaining against the machine.
- Starting from the right (left-handed people will start from the left), take up with the one-eye transfer bodkin the first stitch on the right from the first row and hook it on to the first needle on the right, in front of the latch.
- Do likewise with all the stitches from the first row.
- When all the stitches from the first row are hooked on to the corresponding needles, push the needles back to position 2 (usual knitting position). The stitches of the last row close the latches on to the stitches transferred from the first row; knit normally (all knobs down).

## Hem in imitation rib

There are various ways of making a ribbed border, even without the MIRACLE RIBBING Attachment. The ribbing can, of course, be knitted by hand and hooked on to the machine. The border may also be knitted in stocking stitch for the desired number of rows; every 2nd or 3rd stitch should then be dropped and allowed to run down as far as the 2nd row; these stitches should be picked up plain on the purl side (see page 14).

However, it is also possible to knit automatically imitation rib which is in fact only stocking stitch knitted on alternate needles (see photo). This imitation rib should be knitted double, to make a hem and give a firmer finish.

- Set the tension at one or two numbers tighter than for stocking stitch.
- Cast on (ordinary casting on) leaving each alternate needle completely locked against the back rail. There should, however, be two adjacent needles at each side.

- Knit double the number of rows necessary,
- then bring right up against the front rail the intermediate needles which do not carry stitches, as well as the last needle on each side.
- In the same way as for the knitted hem, hook each stitch from the first row on to each of the needles brought forward (the needles which already carry stitches remain in position 2) and the last stitch on each side on to its corresponding needle.
- When all the stitches from the first row have been hooked on to the needles, push the needles back into position 2, the stitches from the first row remaining in front of the latches.
- Set the stitch tension for stocking stitch, lift the first knob for one row and knit in the usual way.

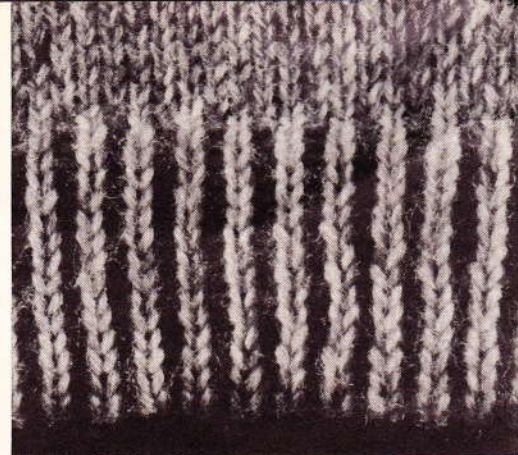


Photo 7

## Holes

- Knit a few rows in stocking stitch, then open all the latches.
- Take up with the one-eye transfer bodkin the second stitch from the left and transfer it on to the adjacent needle, which already carries a stitch.
- Do likewise with every 2nd or 3rd needle.
- When the whole row has been gone through in this way, put into knitting position (open latches) all the empty needles. Knit two rows. Stitches will form automatically on the empty needles and the row of holes will be complete.

An attractive picot edge can be obtained by making a row of holes in the middle of a knitted hem (transferring each alternate stitch).

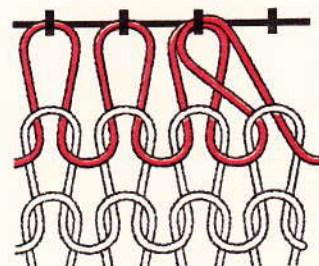


Photo 8

## Decreasing

### a) How to decrease one stitch

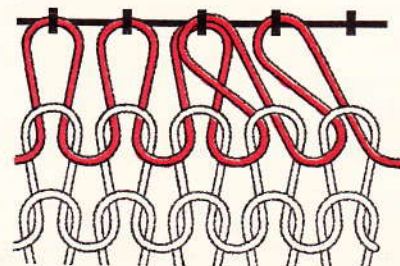
- Beginning at the side furthest away from the cam box (it will therefore not be necessary to move it out of the way, take up the selvedge stitch with the one-eye transfer bodkin;
- Transfer it on to the adjacent needle, which already carries a stitch,
- and push the empty needle right to the back rail.



Drawing 13

### b) How to decrease inside the selvedge stitch

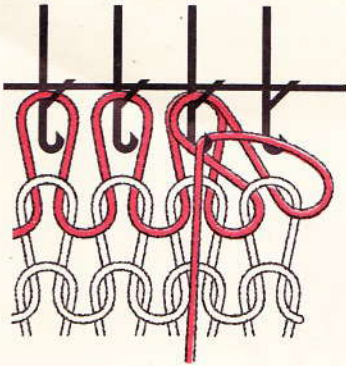
- Beginning on the side furthest away from the cam box, take up the last two stitches with the two-eye transfer bodkin and move them one needle further in, so that there is one empty needle, the selvedge stitch alone on one needle, and two stitches together on the last needle but one.
- This method can also be used for decreasing on the 3rd and 4th stitches, which will make a neater seam (for raglan sleeves, for example).



Drawing 14

### c) How to cast off several stitches

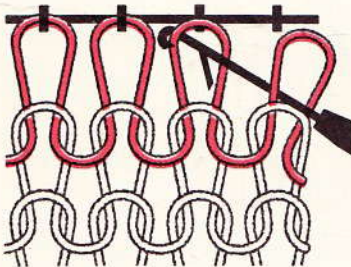
- This time it will be necessary to begin on the side nearest to the cam box (wool being needed). Slide the cam box out of the way beyond the selvedge (easing the wool so as not to pull the first few stitches).



Drawing 15

- Open the latches and, using the one-eye transfer bodkin, hook the selvedge stitch on the adjacent needle which already carries a stitch (as if you were decreasing one stitch).
- Slip these two stitches behind the latch of the needle, lay the wool by hand in front of the latch
- and push the needle back by its foot until the two stitches close the latch on to the wool and slip off the needle, the wool thus forming a new stitch
- which will then be hooked on to the next adjacent needle and the two stitches thus obtained knitted together in the same way.
- When the desired number of stitches have been cast off, lock the empty needles right at the back,
- bring the cam box back on to the selvedge of the work, tighten the wool and knit in the usual way.

## d) How to cast off a whole row



Drawing 16

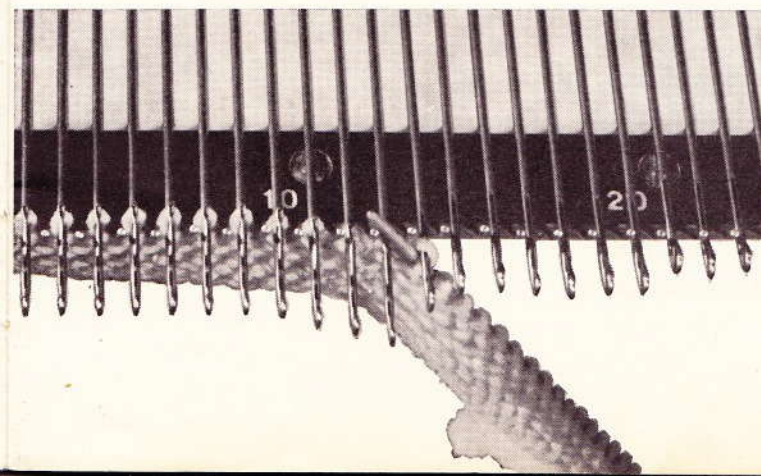
- Using tension 12 and the first knob up (to counteract the greater tension) knit the last row.
- Break off the wool.
- Put all needles into position 3 (stitches behind the latches).
- Starting on the side furthest away from the wool, take up the selvedge stitch and the next stitch with the latch tool. The selvedge stitch is behind the latch and the next stitch in front.
- Pull the latch tool down so that the 2nd stitch slips through the first one.
- Then slip this stitch behind the latch of the latch tool,
- take up the following stitch in front of the latch and slip it in the same way through the 2nd stitch. Continue in this way until only one stitch remains. Pull the end of the wool through this stitch.

## e) How to decrease within the row

- Bring all the needles forward, slipping the stitches behind the latches.
- Starting at the right, take all the stitches off the machine on to a fine knitting needle, inserting the needle into each stitch from behind; by pulling them forward a little the stitches can be slipped off the needles; take care not to pull the adjacent stitches off at the same time.
- Put the stitches back on to the machine, decreasing until the required number of stitches is obtained by hooking two stitches together on to one needle where necessary.
- When hooking the stitches back on to the needles start at the left and insert the machine needles into the back of the stitches, slipping them off the knitting needle.

Note: If you desire to increase or decrease within the row, you can use a broad narrower (obtainable in England) which is used like an ordinary transfer tool and can move up to 20 stitches at a time.

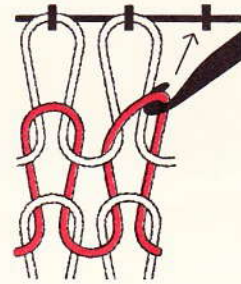
Photo 9



# Increasing

## a) How to increase one stitch

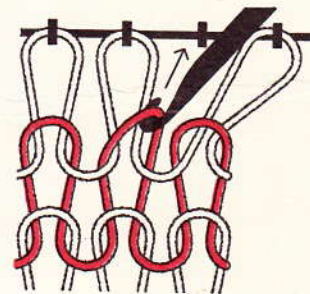
- Starting on the side furthest away from the cam box (it will therefore not be necessary to move it out of the way) bring forward one more needle into the knitting position (open latch)
- and hook the selvedge stitch from the preceding row on to this needle.
- If, when knitting the next row, the tension seems too tight at the point where this stitch has been added, lift the first knob to finish the row and lower it when this has been done.



Drawing 17

## b) How to increase inside the selvedge stitch

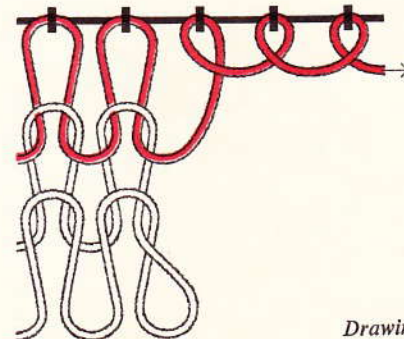
- Starting on the side furthest away from the cam box, bring forward one more needle into the knitting position.
- Using the one-eye transfer bodkin, move the last stitch one needle further along to the outside of the work.
- Hook on to the empty needle the stitch from the 2nd needle of the preceding row.



Drawing 18

## c) How to add several stitches

- This time it will be necessary to start on the side nearest to the cam box (the wool being needed). Slide the cam box out of the way, easing the wool so as not to pull the first few stitches.
- Bring right forward against the front rail the desired number of additional needles (open latches)
- and cast one stitch on to each empty needle, as if you were beginning a garment (see ordinary casting on) beginning by the needle next to the selvedge stitch.
- When adding stitches on the left-hand side of the work, hold the wool in the left hand and loop it round the needles clockwise, holding each loop against the machine with the right thumb.
- When each needle brought forward carries a stitch, push these needles back a little until the open latch covers the stitch.
- Lift the first knob of the cam box.
- slide the cam box back on to the selvedge,
- tighten the wool,
- knit one row
- and lower the knob.



Drawing 19

## d) Increasing within the row

It is not possible to increase a large number of stitches within a single row because of the limited tension of the wool forming the stitches of the last row. If you are following a hand-knitting pattern which necessitates increasing several stitches within the row, it will be necessary to begin the work at the row following these increases. Once the work has been completed, take up the stitches of the first row (ordinary casting on) and hook them back on to the machine, making the necessary *decreases*. Knit the pattern backwards down to the beginning of the garment (i. e. decreasing instead of increasing).

It is however possible to increase within the row (in the same way as for decreasing within the row) if only a few stitches have to be added. In this case the row preceding the increases should be knitted with a much slacker tension.

## How to join on a new ball of wool

- The join should be made at the selvedge.
- Take out of the automatic yarn guide the short length of wool which remains and let it hang down along the selvedge.
- Thread the new wool into the yarn stand and the automatic yarn guide,
- let the end hang down along the same selvedge,
- hold the two ends and slide the cam box across the needles. When the work has been completed the two ends will have to be fastened off by threading them through the work with a darning needle.

## Corrections

### a) If a mistake has been made and one row needs to be undone

- Open the latches,
- pull the work forward a little, until the needles project a little beyond the machine (the stitches *must remain in front* of the latches,
- hold the work, pulling it down slightly
- and pull the wool, horizontally, just after the last stitch which has been knitted; the last row unravels and the preceding row hooks on to the needles.
- If only one row has to be undone it will be found that the cam box is not on the same side as the wool; it will therefore be necessary to push the needles and the work back against the machine (position 2)
- and lift the middle knob; it will then be possible to slide the cam box across the work without bringing the needles into action.
- Slide the cam box beyond the selvedge,
- lower the knob again,
- tighten the wool and knit in the usual way.

### b) How to turn back in the middle of a row

You are in the middle of a row and find that you have made a mistake;

- lift the three knobs on the cam box; the cam box may now be moved over to the selvedge without bringing the needles into action;
- undo that part of the row which has already been knitted,
- open the latches of the needles on which the stitches are already behind the latches (these needles were just under the cam box when the knitting was stopped); these needles must be in position 3.
- lower the middle knob and that furthest away from the work,
- leave the first knob up,

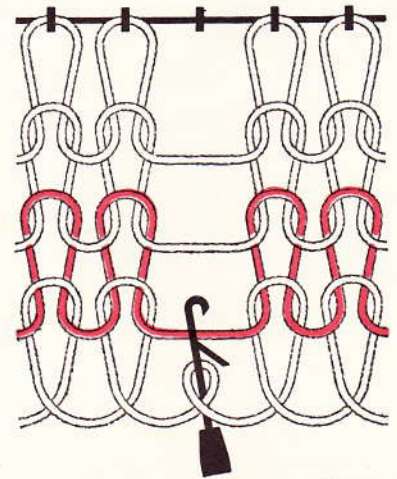
- tighten the wool in the yarn guide and slide the cam box across the work; the needles which were in position 3 knit up automatically with the others.
- Lower the knob when the row is finished.

### c) How to pick up a stitch which has run one row down:

- Put the dropped stitch and the unknitted strand on to the needle, the stitch *behind* the latch and the strand in *front*.
- Use the foot of the needle to pull it back until the stitch from the preceding row, closing the latch on to the strand, slips off the needle; a new stitch is thus formed by the strand.

### d) How to pick up a stitch which has run several rows down:

- Pick it up from behind the work with the latch hook.
- Slip it behind the latch of the hook,
- take up with the hook of the tool the first strand to be re-knitted and, by pulling the latch tool down, pull the strand through the dropped stitch.
- Slip the new stitch thus formed behind the latch,
- take up the next strand with the hook of the latch tool
- and pull it through the stitch in the same way.
- Pick the stitch up in this way until the top is reached; the stitch should always be behind the latch and the strand in front.

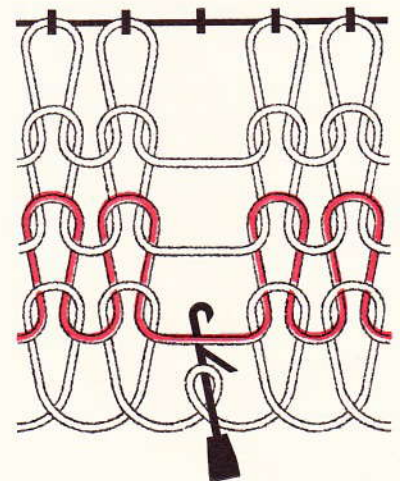


Drawing 20

### e) Ribbing or patterns can be made by

**picking up a plain stitch on the purl side.**

- Let the stitch run down the number of rows necessary to form the pattern or the ribbing.
- Take it up from the *front* of the work on to the latch tool.
- Slip the stitch behind the latch,
- take up, in front of the latch, the strand to be re-knitted
- and pull it through the stitch in the same way as for picking up a purl stitch.



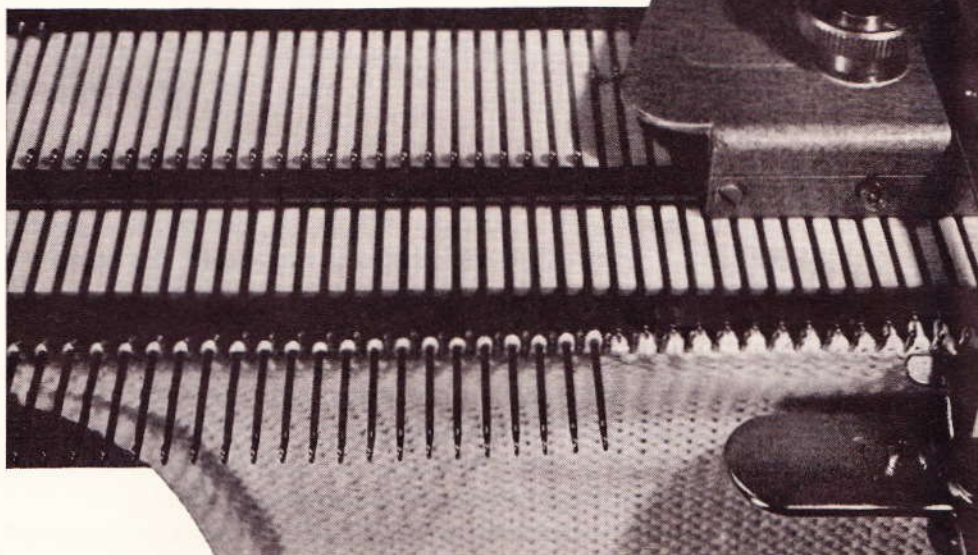
Drawing 21

## Needles in the holding position

Needles in the holding position, that is to say needles which carry stitches but which do not knit (shortened rows) are in position 4; the needles are brought right forward with their feet against the front rail. The stitches are behind the latches, next to the body of the machine. When a few needles are brought forward into this position the work should be held against the machine, pulled down slightly.

Always begin from the side *furthest away* from the cam box when putting needles into the holding position or bringing back into action needles which were in the holding position.

*Needles in holding position*



*Photo 10*

**To put back into the knitting position, after the required number of rows have been knitted, needles which were in the holding position :**

- push them back a little until the open latches cover the stitches (position 3).
- Lift the first knob on the cam box (that nearest to the work)
- and knit one row. The needles in position 3 will knit up automatically with the others.
- Remember to lower the knob after the first row has been knitted.

The holding position enables the knitting of every kind of shaping: all variations of neck openings, buttonholes, heels, darts, pockets, shaping of seats of knickers, etc.

*Needles brought back into the knitting position*



*Photo 11*



# Shaping

## Buttonholes

### a) Vertical

- Supposing that the cam box is on the right, put into the holding position all needles to the left of the buttonhole and knit only the right-hand needles until the desired height of the buttonhole has been made; this forms one side of the buttonhole.
- Break off the wool.
- Now put the right-hand needles also into the holding position,
- slide the cam box over to the left-hand selvedge, without knitting,
- bring back into action all the needles to the left of the buttonhole (position 3, open latches and the first knob on the cam box up for one row)
- and knit the same number of rows as for the right-hand side.
- Bring back into action the needles to the right of the buttonhole (position 3, open latches and the first knob up for one row) and knit right across the row. The vertical buttonhole may also be knitted without the automatic yarn guide, by using two balls of wool which would have to be laid across the needles by hand, one on each side of the buttonhole, thus knitting both sides simultaneously (see knitting without the automatic yarn guide).

### b) Horizontal (open)

- Bring forward the number of needles forming the width of the buttonhole (the stitches slip behind the latches).
- Lay a separate length of wool in front of the latches of these needles
- and push them back a little until the stitches close the latches on to the length of wool.
- Knit in the usual way: the length of wool will knit up automatically. Once the garment is finished, pull this length of wool out, making a buttonhole without cast-off stitches which will have to be finished off by hand with buttonhole stitch.

### c) Horizontal (closed)

Make a trial buttonhole in a fabric 20 stitches wide, the buttonhole being made, for example, from the 4th to the 10th needles on the left. The cam box is on the right.

- Put the 10 left-hand needles into the holding position,
- knit the 10 right-hand needles.
- Cast off the following 6 stitches (from right to left),
- put the 16 right-hand needles into the holding position,
- bring the cam box back to the right,
- put the 4 left-hand needles back into the knitting position and knit them from right to left to finish the row.
- Knit them again (from left to right),
- cast on (from left to right) 6 stitches on to the empty needles,
- put the 10 left-hand needles into the holding position,
- bring the cam box back to the left,
- put the 10 right-hand needles into the knitting position and knit them from left to right to finish the row.
- Put the 10 left-hand needles into action and continue knitting in the usual way.

The following examples are given for a total width of 120 stitches—40 stitches for each shoulder and 40 for the neck opening, which will be 60-80 rows deep. The shoulder stitches are cast off in 10 rows (5 times 8 stitches.)



a) Drawing 22

## a) V-neck

- The cam box being on the right, put 60 needles into the holding position on the left-hand side and knit the right-hand side of the neck opening, decreasing on the neck side one stitch every 4 rows (20 times).
- Simultaneously, cast-off on the shoulder side during the last 10 rows 8 stitches (5 times),
- Lock the empty needles right to the back, slide the cam box over to the left selvedge, bring back into action the 60 left-hand needles (position 3, open latches and first knob up for one row) and knit as for the right-hand side.
- It is also possible, by knitting without the automatic yarn guide, to knit both sides of a neck opening simultaneously (see chapter on this subject).



b) Drawing 23

## b) Slit neckline

- Proceed as for the V-neck, but without decreasing on the neck side.



c) Drawing 24

## c) Square neck

- Supposing that the cam box is on the right, put the 80 left-hand needles into the holding position,
- knit the 40 remaining needles,
- put these also into the holding position,
- bring the cam box back to the right selvedge,
- cast off 40 stitches (in the centre),
- lock the empty needles right to the back,
- bring back into action the 40 left-hand needles (position 3, open latches, first knob up for one row),
- and knit this side only for 60 rows, casting off the shoulder stitches on the last 10 rows.
- When this side is finished, lock the empty needles right to the back,
- slide the cam box over to the right selvedge, without knitting,
- bring back into action the 40 right-hand needles (position 3, open latches, first knob up for one row),
- and knit the right side in the same way as the left one.



d) Drawing 25

- If a neckline as illustrated in drawing d) is desired, all that is necessary is to cast off 20 stitches only in the centre and decrease one stitch on each side of the neck every 6 rows (10 times).



e) Drawing 26

- To make the neckline in drawing e) cast off 60 stitches in the centre, then increase one stitch on each side of the neck every 6 rows (10 times).

## f) Round neck

- Supposing that the cam box is on the right, put into the holding position half the needles, starting from the left, plus a few more (60+5).
- Knit one side at a time (one side of the neck and one shoulder).
- At each alternate row (cam box on the right) put into the holding position on the left (neck side) 3 needles (twice), 2 needles (3 times) and one needle (3 times). When the cam box is next to the needles in the holding position remember to pass the wool under the last needle in the holding position.
- Simultaneously, cast off the shoulder stitches on the last last 10 rows.
- Lock the empty needles right to the back,
- break off the wool,
- slide the cam box over to the left selvedge,
- leave the 20 needles to the right of the neck in the holding position, plus 5 needles=25 needles;
- knit two rows
- and proceed as for the right side.
- When this side is finished lock the empty needles right to the back,
- knit one row with the 40 needles of the neck (to knit up the wool looped round the needles put into the holding position)
- and finish off the neck by a turned-in hem or by a welt in imitation rib.



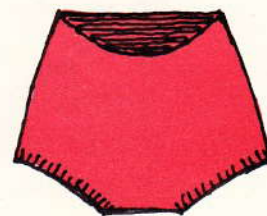
f) Drawing 27

## Shaping for seat of knickers

Examples for a total width of 80 stitches.

### a) For models with side seams

- Just after the waist has been knitted put into the holding position (on the side further away from the cam box) the last 10 needles,
- knit one row,
- loop the wool round the last needle in the holding position,
- put 10 needles into the holding position on the other side also,
- knit one row,
- pass the wool under the last needle in the holding position,
- put 10 more needles into the holding position on the other side and so on, until only the 20 centre needles remain in the knitting position.
- Then, on the side furthest away from the cam box, bring back into action (position 3, open latches and first knob up) the 30 needles which were in the holding position,
- knit one row,
- lower the knob.
- Bring back into action the 30 needles on the other side,
- knit one row with the first knob up,
- lower the knob and continue knitting normally across the whole width.



a) Drawing 28

### b) For models with front and back seams

- Just after the waist has been knitted put 40 stitches into the holding position (on the side furthest away from the cam box),
- knit one row,
- pass the wool under the last needle in the holding position,

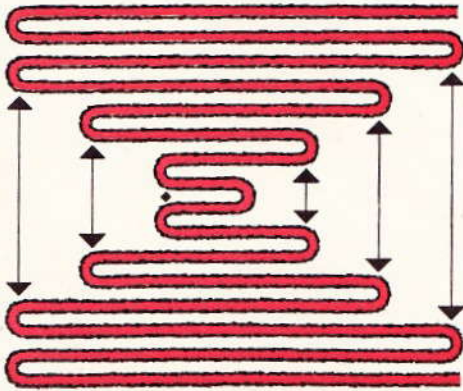


b) Drawing 29

- knit one row.
- Put 10 more needles into the holding position,
- knit one row,
- pass the wool under the last needle in the holding position,
- knit one row, and so on, putting 10 more needles into the holding position at each row until only 10 needles are knitted.
- Then, starting on the side furthest away from the cam box, put back 70 needles into the knitting position (position 3, open latches and first knob up),
- knit one row and lower the knob.

## Heel

Knitted with the automatic yarn guide.  
Example for 30 stitches.



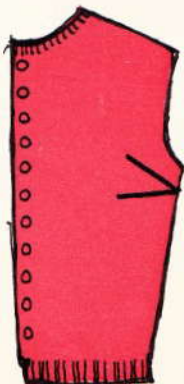
Drawing 30

- Knit a short strip on which to form the heel (14 rows).
- Starting on the side furthest away from the cam box, put the last needle into the holding position,
  - knit one row,
  - pass the wool under the needle in the holding position,
  - put the last needle on the other side also into the holding position,
  - knit one row,
  - pass the wool under this needle,
  - put a second needle into the holding position on the other side,
  - knit one row,
  - pass the wool under the 2nd needle in the holding position,
  - put a second needle into the holding position on the other side and continue in this way until there are 9 needles in the holding position on each side.
  - Starting from the inside, on the side furthest away from the cam box, put back into the knitting position the first needle in the holding position (position 3, open latch, first knob up),
  - knit one row, lower the knob,
  - in the same way, bring a needle back into action on the other side (position 3, open latch, first knob up),
  - knit one row, lower the knob.
  - Continue in this way, bringing one more needle back into action at each row, until all the needles are working again.

## Toe

This is formed in the same way as a heel; however, not more than 7 needles should be put into the holding position on each side.

## Darts



a) Drawing 31

### a) Lateral

Example given for a half-front (60 stitches)

- The cam box being on the left, put 8 needles into the holding position on the side furthest away from it,
- knit two rows (remembering to pass the wool under the last needle in the holding position after the 1st row),
- put 8 more needles into the holding position,
- knit 2 rows,
- put 8 more needles into the holding position; only 36 needles remain in action;

- knit two rows,
- then, the cam box being on the left, bring back into action the 8 needles which were the last to be put into the holding position (position 3, open latches, first knob up),
- knit one row,
- lower the knob,
- knit one row,
- bring 8 more needles back into action and so on, until the 24 right-hand needles are working again.

## b) Dart for shoulder shaping

- Put into the holding position the needles on one side of the dart (side furthest away from the cam box) and knit the other side alone, decreasing, on the dart side, one stitch every four rows (5 times). (Decreasing inside the selvedge stitch.)
- Cast off at the same time the shoulder stitches.
- Break off the wool,
- bring back into action the needles which were in the holding position (position 3, open latches, first knob up)
- and proceed as for the first side.
- Join the two sides of the dart with an invisible seam (see page 25).



b) Drawing 32

## c) Dart for waist shaping

Proceed as for the shoulder dart but, after having decreased one stitch every four rows (5 times), increase in the same way until there are the same number of stitches as at the beginning. Increase also inside the selvedge stitch.



c) Drawing 33

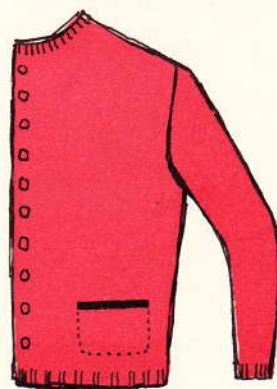
## Pockets

Example for pockets 30 stitches wide.

### a) On the Straight

The cam box being on the right, put into the holding position the needles to the left of the pocket,

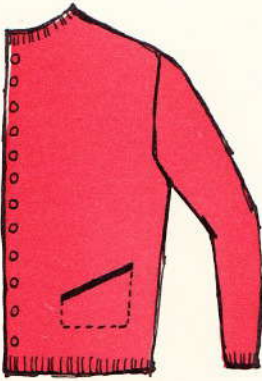
- knit one row. Do not, this time, pass the wool under the last needle in the holding position.
- In order to facilitate folding the top of the pocket, take up with the hook from the preceding row each of the 30 stitches on which the pocket will be knitted and re-knit them plain;
- the cam box being on the left, put the needles to the right of the pocket into the holding position
- and knit 40 rows with the 30 needles forming the pocket.
- Then, starting on the side furthest away from the cam box, put back into the knitting position the needles on that side of the pocket,
- knit one row,
- bring back into action the needles on the other side and continue knitting in the usual way.
- If you find that the pocket as described above is too thick you can knit 12 rows only after the plain row, which, after having been cast off, will be sewn down inside the pocket to form a hem.
- On to the 30 empty needles cast on 30 stitches which will form the bottom of the pocket;
- knit 20 rows



a) Drawing 34

- then bring back into action, one after the other, the needles on each side of the pocket.

## b) On the cross



b) Drawing 35

- The cam box being on the right, put into the holding position the needles to the left of the pocket,
- knit one row;
- knit together the pocket needles and those to the right of them, decreasing on the left-hand side of the pocket 3 stitches on alternate rows (10 times).
- Break off the wool,
- put into the holding position the needles to the right of the pocket,
- cast on 30 stitches on the empty needles
- knit 10 rows for the bottom of the pocket,
- then bring back into action the needles to the left of the pocket;
- knit 20 rows,
- then bring back into action the needles to the right of the pocket.

## Shoulder shaping (on the cross)

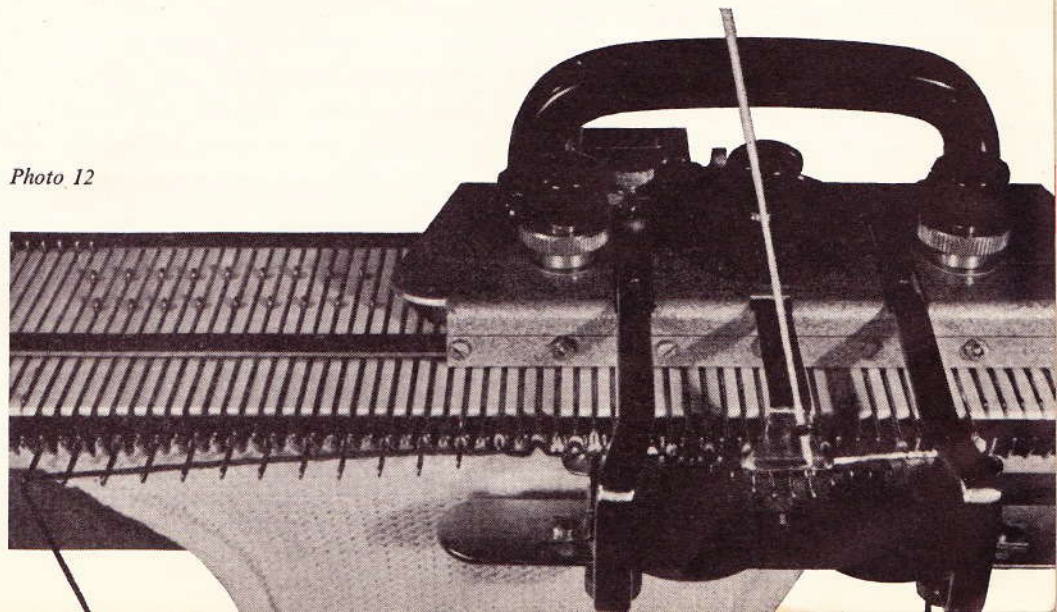
Example given for a shoulder of 40 stitches in width, to be cast off in 5 rows.

- The cam box being on the neck side, put the last 8 needles into the holding position,
  - knit one row,
  - pass the wool under the last needle in the holding position,
  - knit one row,
  - put 8 more needles into the holding position and so on until the 40 needles have been put into the holding position;
- bring them back into action all at once, knit one row with the tension set at 12 and cast off all the stitches as explained in paragraph (d) under the heading **Decreasing**.

## Knitting with elastic yarn

- The wool is threaded in the yarn stand and the yarn guide;
- using the selecting comb, bring forward alternate needles into position 3, lay the elastic thread on to the needles by hand (beginning at the cam box side), stretch the elastic yarn taut and slide the cam box across (all knobs down); this procedure may be repeated for every row or, to make a looser fabric, every 3rd row.
- By putting a different coloured wool on the needles in position 3, instead of the elastic yarn, all the attractive patterns suggested on pages 30-31 can be made.

Photo 12



# Knitting without the automatic yarn guide

## Casting on

Casting on without the automatic yarn guide is the same as given for casting on with it.

However, instead of threading the wool into the yarn stand and the automatic yarn guide, leave the ball of wool on the floor. When stitches have been cast on to all the needles brought forward push the needles back a little until the open latches cover the stitches; this position (position 3) will be used throughout when knitting without the automatic yarn guide.

## Knitting

- Having cast on in the ordinary way the cam box and wool are on the right.
- Lay the wool on to all the needles brought forward, **all latches open**.
- Hold the wool in the left hand, without stretching it too much, but just enough for it to lie flat on the needles and fall down straight after the last needle,
- It should be noted that the wool should never be placed behind the 162 small pins on the edge of the needle bed.
- Lift the last knob on the cam box (that on the right)
- and slide the cam box gently across the needles, taking it right beyond the fabric.
- The needles will have automatically returned to position 3. Check that the stitches are all behind the latches and the latches all open.
- Lower the right-hand knob and lift the left-hand one, which is now the last one.
- Lay the wool on the needles and slide the cam box across.
- Continue in this way, laying the wool on the needles by hand for each row (**open latches**), lifting alternate knobs for each row and taking the cam box well beyond the work each time.

This method of knitting is used when making stripes in different colours, for example four rows in each colour. If the automatic yarn guide were used it would mean having to break off the wool every four rows, taking it out of the yarn guide, threading the second colour, etc...

This method also enables certain patterns to be knitted (see pages 28-29). It is also possible, using this method, to knit both sides of the neck simultaneously, using two balls of wool and laying one ball on the right-hand half of the work and the other ball on the left. It is however preferable and quicker to knit each side separately using the automatic yarn guide.

## To slide the cam box empty across needles in position 3

when knitting for example different coloured three-row stripes, lift the right and left-hand knobs of the cam box.

## The stitch tension

should be set a little looser when knitting without the automatic yarn guide since one always tends to pull the wool too tight.

## Knitted hems,

welts in imitation rib,

holes,

decreases and increases

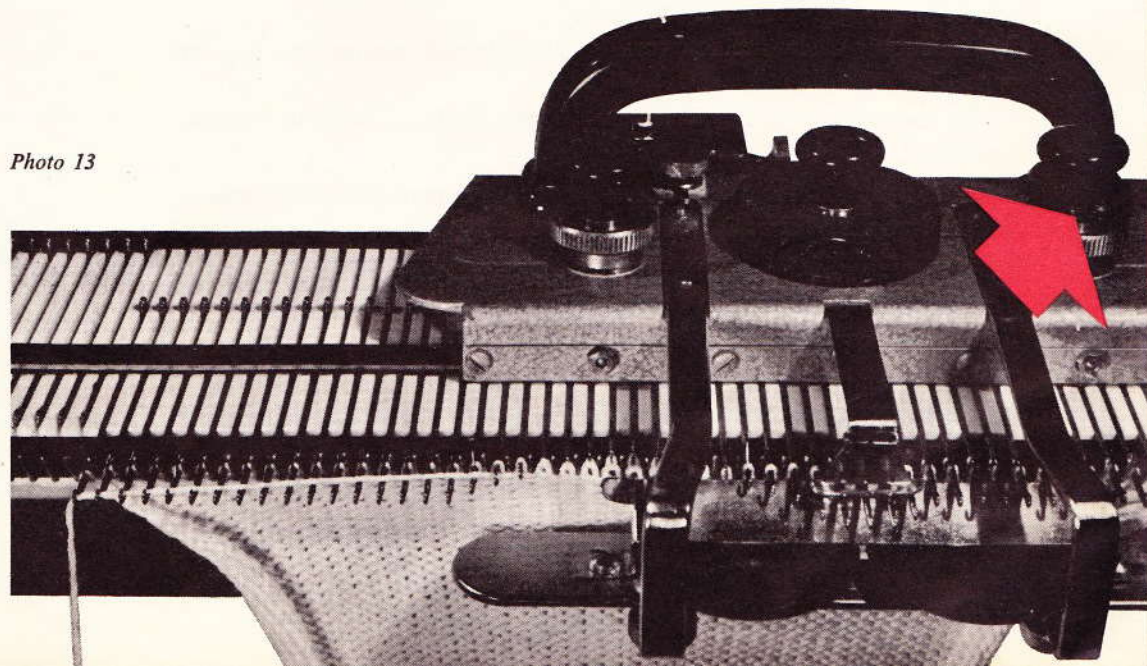
are knitted with this method in exactly the same way as when knitting with the yarn guide. It should however be noted that it is preferable to increase or decrease a stitch on the cam box side, since the cam box is in any case taken well out of the way and the stitch on this side may be slackened as much as is necessary to transfer it more easily on to the adjacent needle brought forward.

## To undo one or more rows

when knitting without the yarn guide, it will first be necessary to put the stitches in *front* of the latches; to do this take up each stitch on to the one-eye transfer bodkin and hook it back on to the same needle, but in *front* of the latch (position 2). If it should be necessary to undo a few rows because too many have been knitted, one more row can be knitted with the middle knob up instead of the last knob, which brings the needles back automatically. One additional row will then have to be undone.

## To put into action needles which were in holding position

Photo 13





when knitting without the yarn guide, push the needles from position 4 into position 3 (the stitches always remain behind the latches) and knit in the usual way with the last knob up.

## To change from knitting with the yarn guide to knitting without it,

break off the wool, bring the needles forward into position 3 (stitches behind the latches and latches open), remove the wool from the yarn guide and the yarn stand, put the ball of wool on the floor, lay the wool on the needles (the end of the wool on the cam box side), lift the last knob on the cam box and knit as explained above.

## To change from knitting without the yarn guide to knitting with it

break off the wool, thread it in the yarn stand and the yarn guide, hold the end of the wool along the selvedge (cam box side), lift the *first* knob (the two others are lowered), check to see that all latches are open, slide the cam box across, not beyond the last stitch, lower the knob and continue in the usual way.

# The knobs on the cam box

**The 3 knobs down:** Normal knitting with yarn guide.

**The 3 knobs up:** To slide the cam box across the needles without moving them, even in the middle of a row.

**The middle knob up:** *a)* To slide the cam box on the needles (position 2) without moving them (for a whole row).

*b)* To let only a few needles work (position 3) with yarn on them (patterns page 32).

*c)* To knit without yarn guide, the needles in position 3 and put them into position 2.

**Both left and right knobs up:** To slide the cam box on the needles in position 3 without moving them. Or to put the needles from position 2 to position 3 (without knitting) and to come back without moving them.

**The last knob up:** *a)* To put the needles from position 2 to position 3.

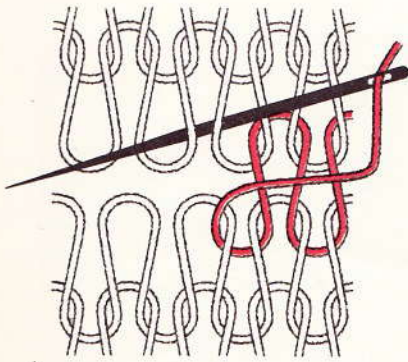
*b)* At every row when knitting without yarn guide.

**The first knob up:** *a)* When one row is hard because of crossed stitches, or double work (knitted hem), or increases, or choice of a looser tension whilst knitting.

*b)* To knit with yarn guide, needles in position 3, and to put them again into position 2.

# Finishing-off Neatly

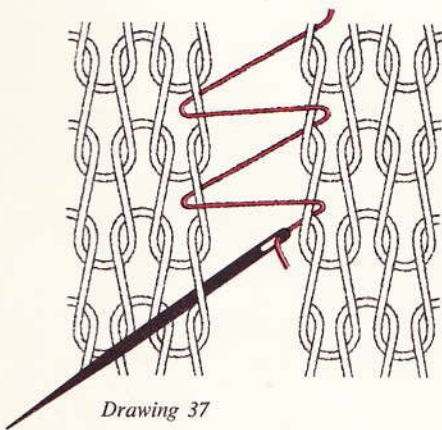
## Grafting



Drawing 36

used for joining together for example the two pieces forming the toe of a sock:

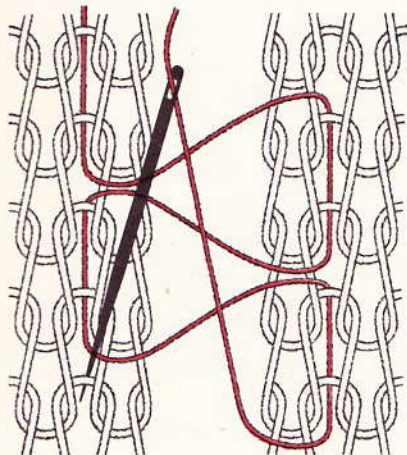
With plain side facing you, and taking care not to twist the stitches, pass a darning needle through the 1st stitch and pull it out through the adjacent stitch; repeat on the stitches exactly opposite; then on the first side, pass the darning needle through the second stitch, bring it out through the 3rd stitch, and so on.



Drawing 37

useful for joining together the sides of a sock: with plain side facing you, take up with the darning needle a loop from the selvage of each side.

## Flat Seam

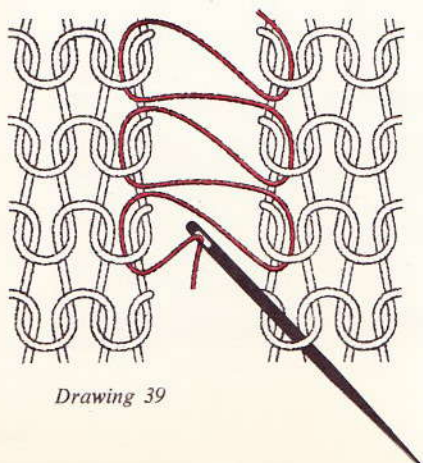


Drawing 38

(on the plain side):

working on the plain side, and leaving the selvage stitch on each side, take up with a darning needle two intermediate strands between the selvage stitch and the 2nd stitch; repeat on the opposite side; then, on the first side put the needle back into the hole from which it was pulled out, and take up the next two intermediate strands. Repeat on the opposite side and continue in this way. After sewing a few stitches pull the wool tight.

## Invisible Seam



Drawing 39

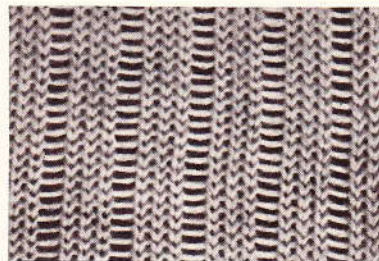
(on the purl side):

working on the purl side, take up from each side the loop of the stitch next to the selvage stitch.

## Invisible Seam

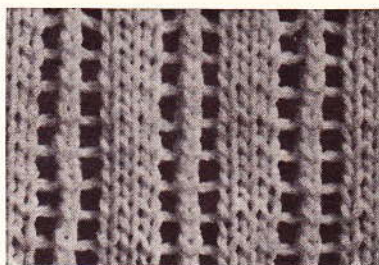
# Stitches and patterns

*The patterns marked with an asterisk are equally attractive on either side.*



## Imitation rib 3-1

Knit stocking stitch, but leave each fourth needle locked at the back.



## Fancy ladder

Transfer on to each 6th needle the adjacent stitch on the left and right, which gives you 3 stitches on one needle; leave the empty needles in knitting position (with open latches) and knit 2 rows. Continue repeating this operation.

## Cable stitch

Use a fairly slack tension.

Take up 2 stitches in the two-eye transfer bodkin, and the next 2 stitches in the other transfer bodkin; cross the stitches, putting the 2 left-hand stitches on to the 2 empty needles and vice-versa. Leave the next 6 stitches and repeat the operation with the following 4 stitches, and so on until the row is completed. Knit 6 rows and cross the same stitches in the same direction. When 24 rows have been knitted drop one stitch on each side of the cable pattern and pick it up plainwise on the purl side.



## Small pleats

Knit 8 rows stocking stitch. Hook on to each corresponding needle every stitch from the 4th preceding row. Repeat the 8 above rows.



## *Holding position—with automatic yarn guide*

*Wool threaded in the yarn stand and yarn guide.  
Needles in position 2.*



### Automatic openwork

At the beginning of the pattern, hook on to each 6th needle the adjacent left and right-hand stitches; lock the empty needles right at the back; knit one row.

Bring right forward into the holding position (position 4) each 6th needle which is between two empty ones; knit 2 rows. Put these needles back into knitting position (position 3, open latches, first knob up for one row) and knit 2 rows. Continue repeating the 4 above rows.



### Diamond pattern

Put each 6th needle into the holding position (position 4): knit 3 rows; push all the needles from position 2 to position 3 (stitches behind the latches); for this the work should be held against the machine and pulled down slightly. Put also into position 3 each 6th needle which was in holding position: all the needles are in position 3.

Take another length of wool of the same kind, lay it on the needles (beginning at the cam box side) and slide the cam box across (all knobs down): 2 rows have been knitted simultaneously, one row with the additional length of wool and one row with the wool threaded in the yarn guide.

Knit one more row (all needles in position 2) without using the additional wool.

Repeat from the beginning but alternate the needles in holding position.



### Two-colour diamonds

Put each 4th needle into the holding position (position 4) and knit 4 rows; push all the needles from position 2 to position 3 (stitches behind the latches); for this the work should be held against the machine and pulled down slightly. Put also into position 3 each 6th needle which was in the holding position: all the needles are in position 3.

Take a separate length of wool of another colour, lay it on the needles (beginning at the cam box side) and slide the cam box across (all knobs down): 2 rows have been knitted simultaneously, one of each colour.

Repeat from the beginning but alternate the needles in holding position.

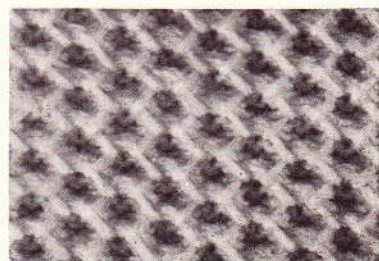
# *Holding position—without automatic yarn guide*

*Wool laid by hand on the needles. Needles in position 3.*

## Honeycomb pattern

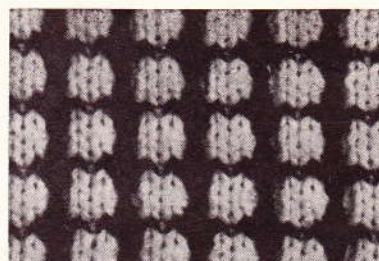
Put 2 adjacent needles into the holding position, leave 2 needles in knitting position (position 3) and so on until the row is completed; knit 3 rows (lifting the last knob on the cam box at each row).

Put into the knitting position the needles which were in the holding position and bring right forward the needles which were in the knitting position; knit 3 rows, (lifting the last knob on the cam box at each row). Repeat the 6 above rows.



## Two-colour ladder

Using fine wool. Put each 3rd needle into the holding position and knit 4 rows with the first colour (lifting the last knob on the cam box at each row). Put into the knitting position (position 3) the needles which were in the holding position and knit 2 rows with the second colour (lifting the last knob on the cam box at each row). Repeat the 6 above rows.



## Woven stitch

Put all the needles into the holding position, except each 3rd needle; knit 2 rows in the first colour (lifting the last knob at each row). Bring all the needles back into action (position 3) and knit 2 rows in the second colour. Slide the cam box across without working (left and right-hand knobs up): the cam box is now on the same side as the first colour. Repeat the 3 above rows but move the needles to be brought forward one stitch over to the right each time.



## Diagonals

Put each 3rd needle into the holding position, knit 2 rows in the first colour (lifting the last knob on the cam box at each row); put into the knitting position (position 3) the needles which were in the holding position and put into the holding position the needle to the right of each 3rd needle brought forward during the preceding 2 rows. Knit 2 rows in the second colour (lifting the last knob at each row). Take the first colour again and knit 2 rows, moving the needles to be brought forward one stitch over to the right.



## Fancy rib

Put each 4th needle into the holding position, knit 1 row; put each right-hand adjacent needle also into the holding position; knit 1 row. Put into the knitting position each 4th needle brought forward in the first row, knit 1 row; put the other needles also into the knitting position and put into the holding position each 4th needle (the same as in the first row); knit 1 row and so on, repeating the 3 above rows.



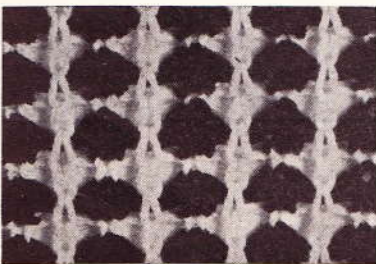
## *Holding position—without automatic yarn guide—using only alternate needles*

*Before beginning the following patterns, put each alternate stitch on to the adjacent needle and lock the empty needles right at the back.*



### Bed-jacket stitch

Put each 2nd needle (which was each 4th) into the holding position knit 2 rows, put these needles into the knitting position, knit 1 row. Repeat the 3 above rows, bringing always the same needles forward each time.



### Flies

Put each 2nd needle (which was each 4th) into the holding position, knit 4 rows in the first colour. Bring these needles back into the knitting position and knit 2 rows in the second colour. Repeat the 6 above rows but alternate the needles which are brought forward.

# Two colours knitted simultaneously

Patterns 15-21 are made as follows:

The main colour is threaded in the yarn stand and yarn guide; the second colour is laid by hand on the needles brought into position 3 with the help of the selecting combs, the intermediate needles remaining in position 2.

Slide the cam box beyond the selvedge at each row giving the wool a little play so as not to stretch the first few stitches. Hold the fabric against the machine whilst pushing for example each 2nd needle into position 3.

Lay the second colour on to the needles in position 3 (beginning at the cam box side).

Pull the main colour taut behind the yarn stand when sliding the cam box back on to the selvedge.

All three knobs must be down.

Slide the cam box across: needles in position 3 knit the second colour and remain in position 2 until the main colour appears again, which knits all the needles. (See photo 12).

## Two-colour rib

Put each 2nd needle into position 3 and knit 1 row with both colours simultaneously. Always put the same needles into position 3.



## Fancy moss stitch

Put each 2nd needle into position 3 and knit 1 row with both colours simultaneously. At every row, put alternate needles into position 3.



## Horizontal stripes

Put all needles into position 3; instead of pushing them with the slide, this can be done automatically by sliding the cam box across twice with both left and right-hand knobs up; the needles do not work, but move from position 2 to position 3. Lower the knobs (the cam box out of the way beyond the selvedge), lay the second colour on to the needles and knit 2 rows simultaneously. Then knit 2 rows, all needles being in position 2 and without using the second colour. Repeat from the beginning.



## Checks



Put needles into position 3, leave 2 needles in position 2 and so on until the row is completed. Knit 1 row with both colours simultaneously; then put the same needles into position 3, knit both colours simultaneously. Repeat from the beginning but alternate the needles which are brought into position 3.

## Trellis pattern



Put each 4th needle into position 3, knit both colours simultaneously; put each 2nd needle into position 3 (not those above the needles brought forward in the preceding row), knit both colours; put each 4th needle into position 3 (in between those of the first row), knit both colours; put each 2nd needle into position 3 (the same as at the 2nd row), knit both colours. Repeat the 4 above rows.

## Norwegian border

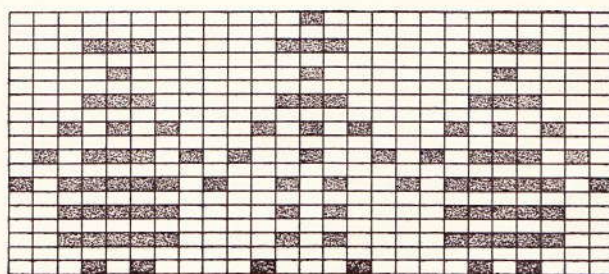


Put all the needles into position 3, knit 1 row with both colours, then knit 2 rows, all needles being in position 2 and without using the second colour. Put each 4th needle into position 3, knit both colours. Put each 2nd needle into position 3 (not above those of the preceding row), knit both colours. Put each 2nd needle into position 3 twice more, alternating the needles each time, then each 4th needle (in between those of the first pattern) and knit both colours. Knit 2 rows, all needles being in position 2 and without using the second colour; then put all the needles into position 3 and knit both colours simultaneously.

## Little folk



Follow diagram.



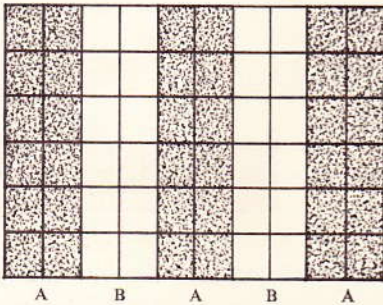


# Two colours knitted separately

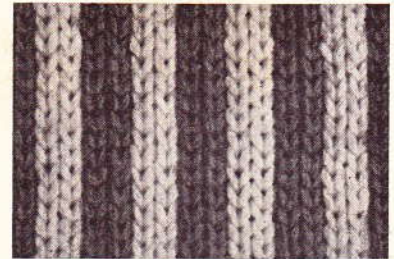
Needles in position 2 do not work even if you slide the cam box over them if the middle knob is up; however, the needles in position 3 return automatically into position 2. Thus, leaving the middle knob up, putting some needles into position 3 (the others remaining in position 2)

laying one colour by hand on the needles in position 3 (this time there is no wool in the automatic yarn guide), knit 2 rows with the same needles and the same colour then knit 2 rows with the other needles and the other colour.

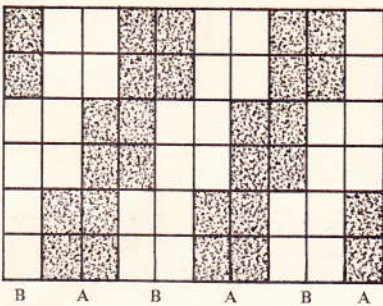
## Vertical stripes



- Middle knob up.
- Black wool on needles A pos. 3: knit 2 rows (needles B pos. 2)
  - White wool on needles B pos. 3: knit 2 rows (needles A pos. 2)
- Repeat from the beginning.



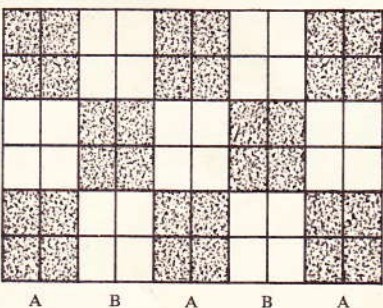
## Birds' eye



- Middle knob up.
- Black wool on needles A pos. 3: knit 2 rows (needles B pos. 2)
  - White wool on needles B pos. 3: knit 2 rows (needles A pos. 2)
  - Repeat from the beginning but moving the needles according to the diagram.



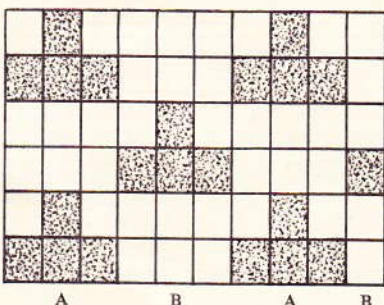
## Two-colour squares



- Middle knob up.
- Black wool on needles A pos. 3: knit 2 rows (needles B pos. 2)
  - White wool on needles B pos. 3: knit 2 rows (needles A pos. 2)
  - Black wool on needles B pos. 3: knit 2 rows (needles A pos. 2)
  - White wool on needles A pos. 3: knit 2 rows (needles B pos. 2)
- Repeat from the beginning.



## Triangles



- Middle knob up.
- Black wool on 3 needles A pos. 3: knit 1 row (needles B pos. 2)
  - Black wool on 1 needle A (in the middle) pos. 3: knit 1 row (needles B pos. 2)
  - White wool on 3 needles B pos. 3: knit 1 row (needles A pos. 2)
  - White wool on 5 needles B pos. 3: knit 1 row (needles A pos. 2)
- Repeat from the beginning but alternate the patterns according to the diagram.



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