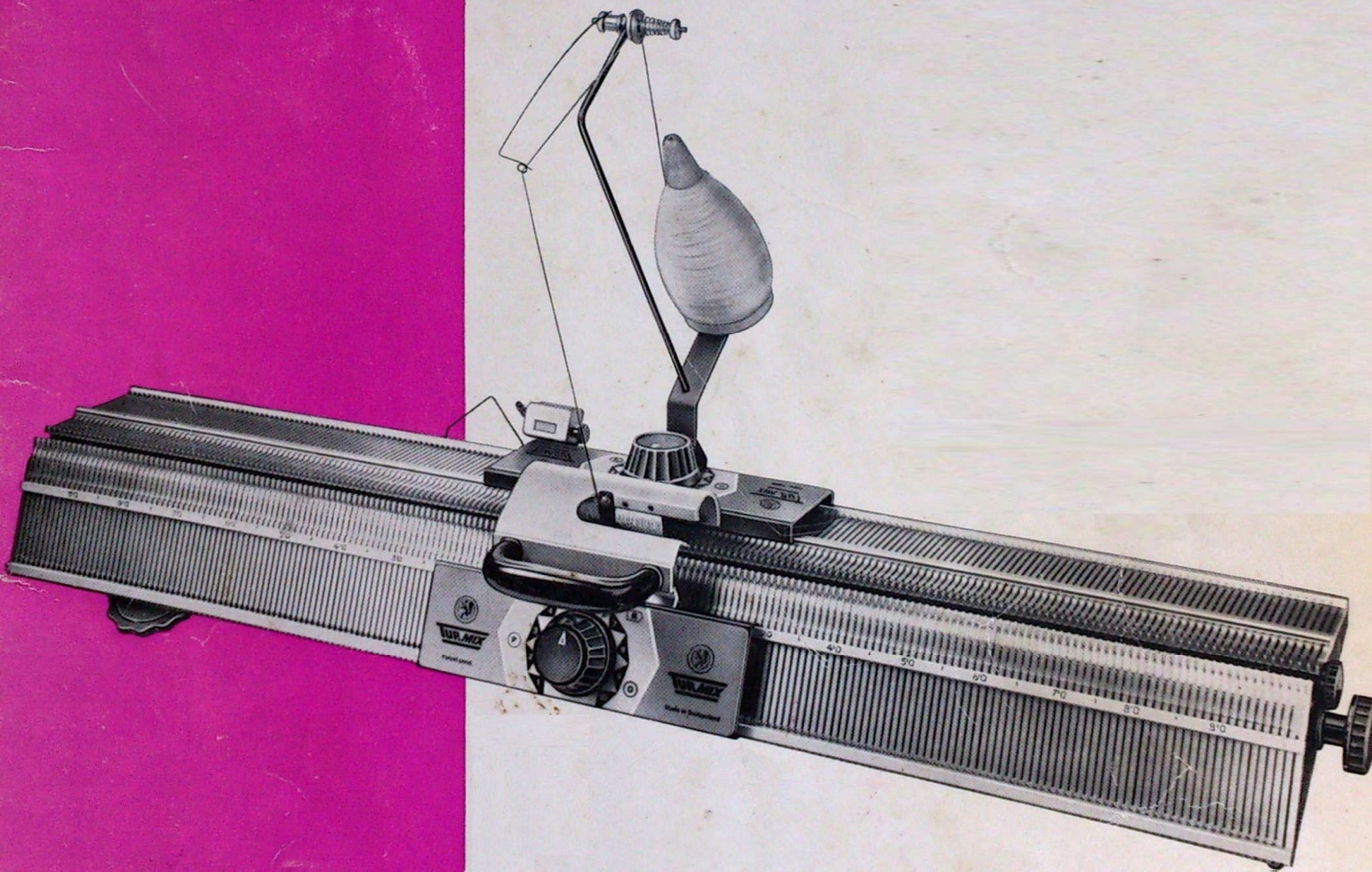


TURMIX



We thank you for purchasing this TURMIX double-bed knitting machine and we are sure you will agree that you have selected the best and easiest to use machine available on the market today.

The machines are made in Switzerland of the finest Swiss precision engineering and should never let you down.

Before completely unpacking the machine and starting to knit, we would ask you to read the following instructions in this book, which are set out for your general guidance, and carefully observe them. Basic tuition would have been given to you when the machine was delivered and if further tuition, service or any knowledge at all of the machine is required, you should write direct to the Head Office and a demonstrator will call upon you. If the machine is purchased from a store, tuition and service will be given from wherever you purchased the machine. We are quite confident that as soon as you can use this machine to its full capacity, you will appreciate the machine will save you money, that you can make money and the machine will be your best friend.

We thus welcome you as a member of the steadily increasing number of contented TURMIX knitters and we wish you every success in the use of your machine.

Yours sincerely,
TURMIX SA., Kusnacht / ZH

Instructions for unpacking and setting-up of the machine for use:

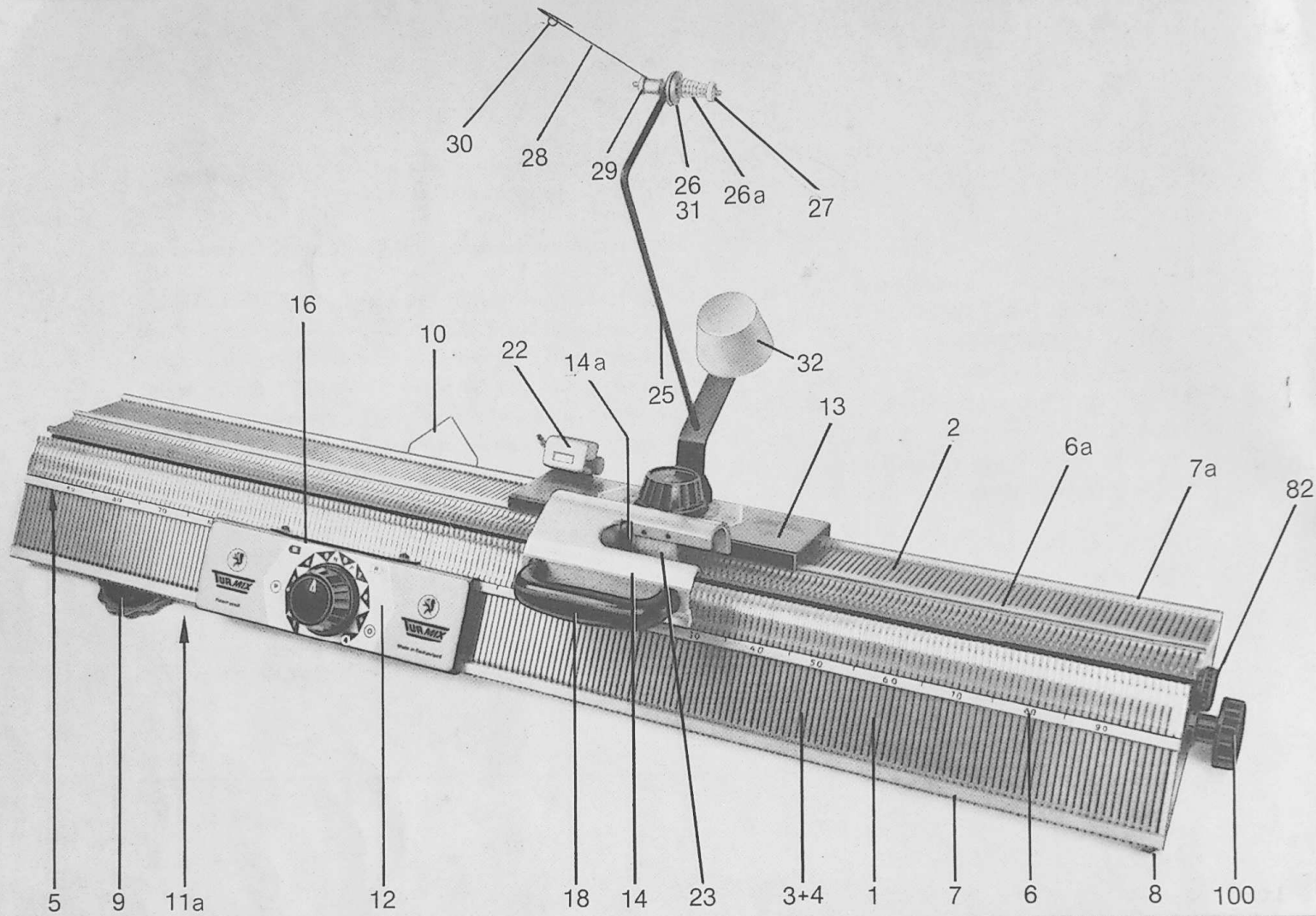
The first thing that is required is a table onto which the machine can be clamped and it is necessary for this table to have a square edge and be perfectly firm on the floor. An unsteady table will, of course, give uneven knitting and here we would like to say that portable tables can be purchased from the above company at extra cost. Information on these tables can be supplied on request.

Unpacking and setting-up of the machine for use:

1. When first opening the box, examine the machine. If you find any damage has occurred during transit, notify the transport company, post office, or delivering agency immediately.
2. Make sure that all the accessories shown in the photograph on page 2 of the instruction book are supplied with the machine. If anything is missing, notify the supplier immediately.
3. Lift the machine out of the box horizontally to prevent the cam-box from running off the needle-bed.
4. Lower the screw clamps (11a) fixed at each end of the base of the rear needle-bed and place the machine on the table so that the clamps are flush with the edge of the table.
5. Secure the clamps tightly.

Setting-up of the wool feed carrier

The wool-feed carrier is fitted at the back of the rear cam-box. Insert the upright of the wool-feed carrier so that the pin on the back part of the upright engages into the notch of the carrier.



Needle-bed

- 1 Front needle-bed
- 2 Rear needle-bed
- 3 Needle grooves
- 4 Latch needle
- 5 Holding spring (under 6)
- 6 Front upper cam-box rail
- 6a Rear upper cam-box rail
- 7 Front lower cam-box rail
- 7a Rear lower cam-box rail
- 8 Cam-box rail fastener
- 9 Racking wheel
- 10 Row counter trip
- 11a Screw-clamp
- 82 Distance regulator
- 100 Star handle

Cam-box

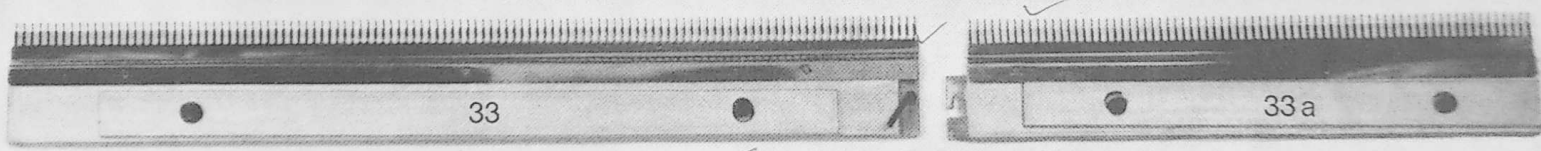
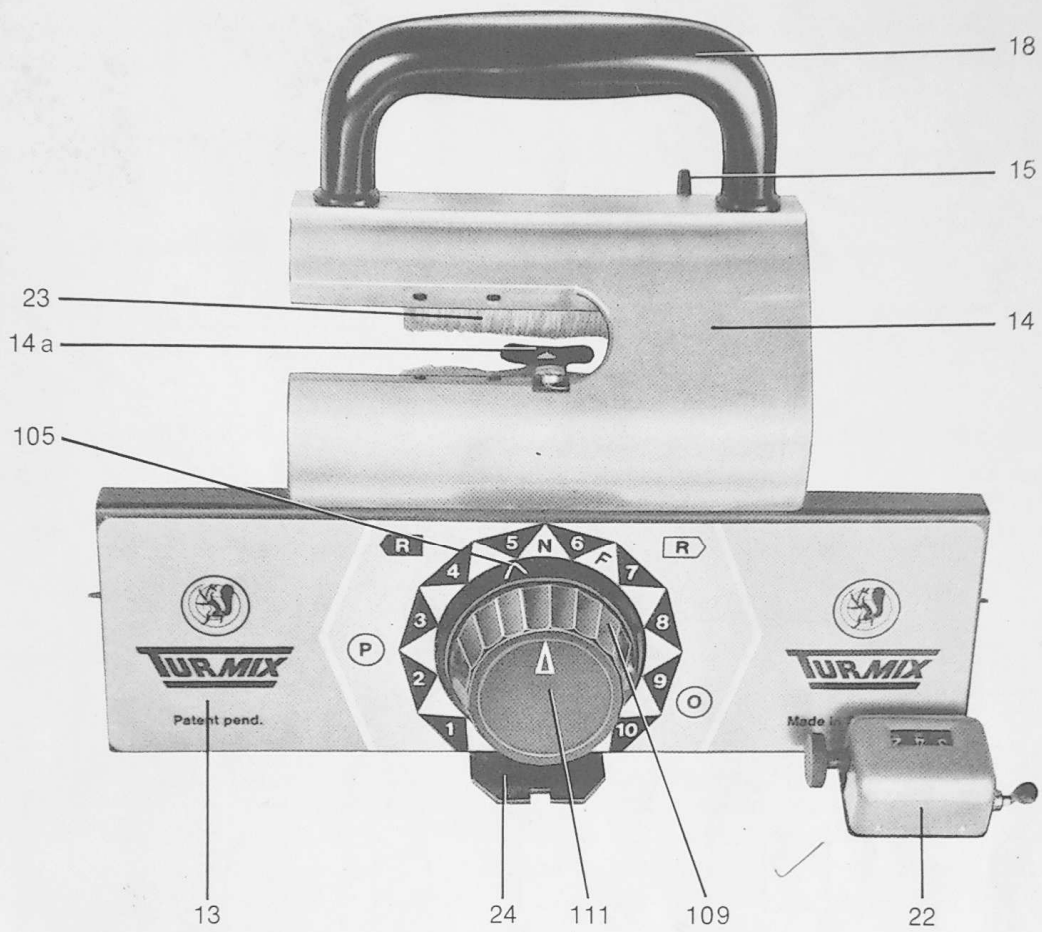
- 12 Front cam-box
- 13 Rear cam-box
- 14 Connector plate for the two cam-boxes
- 14a Wool guide
- 15 Unfastening lever
- 16 Driving rail
- 18 Handle
- 22 Row counter
- 23 Latch opening brush
- 24 Fitting for wool feed carrier
- 105 Stitch size control
- 109 Turning knob
- 111 Stitch type control

Wool Feed Carrier

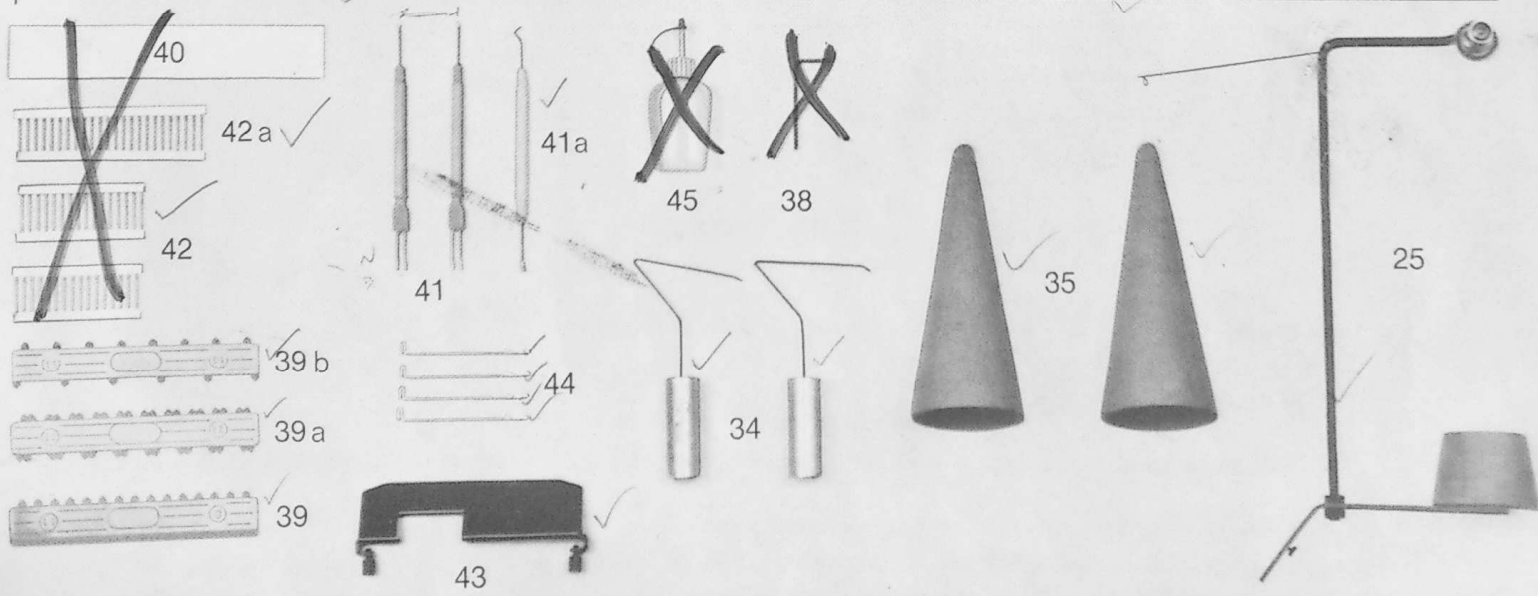
- 25 Upright
- 26 Wool brake
- 26a Conic spring
- 27 Tension screw for wool brake
- 28 Tension wire
- 29 Tension screw for tension wire
- 30 Tension wire eye
- 31 Wool channel
- 32 Wooden cone holder

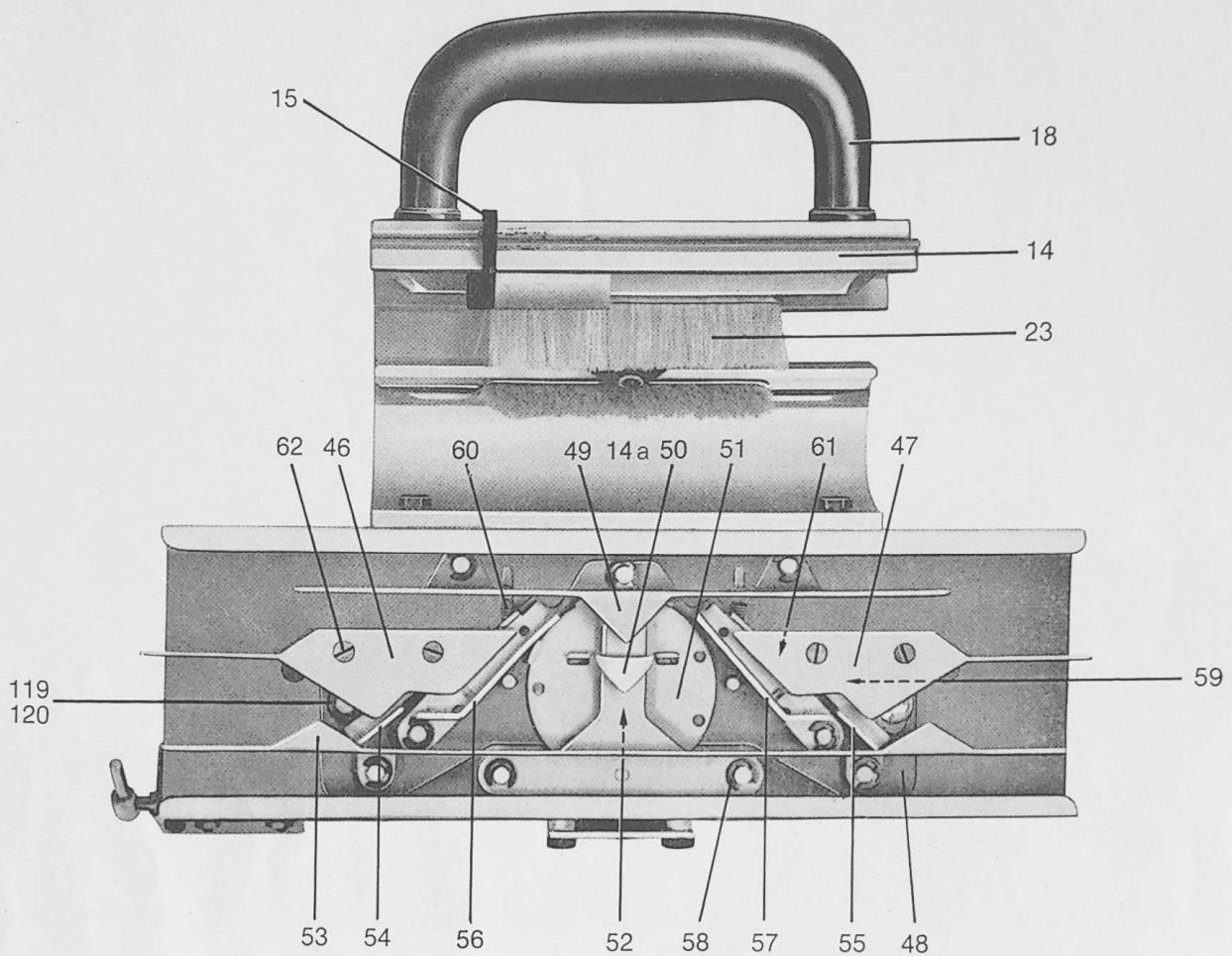
Accessories (page 3)

- 33 Casting-on comb, long part
- 33a Casting-on comb, short part
- 33b Long wire (for casting-on comb)
- 33c Medium size wire
- 33d Short wire
- 34 Side weights
- 35 Wool cones
- 38 Small key spanner
- 39 Needle selector green
- 39a Needle selector yellow
- 39b Needle selector red
- 40 Needle setter
- 41 Transfer tools (2)
- 41a Transfer tool with latch needle
- 42 Multi-transfer tool 16 (2)
- 42a Multi-transfer tool 24 (1)
- 43* Stocking stitch bar
- 45 Oil can
- * extra charge



33 b c d





View of the cam-box from below

- | | | | |
|----|--|-----|-------------------------|
| 46 | Left hand fixed cam | 56 | Large movable-cam left |
| 47 | Right hand fixed cam | 57 | Large movable-cam right |
| 48 | Movable-cam mounting | 58 | Small spring clip |
| 49 | Centre cam (upper cross bar) | 59 | Large spring clip |
| 50 | Stitch-dropping preventer | 60 | Cam mounting spring |
| 51 | Cam position-selector disc | 61 | Movable-cam spring |
| 52 | Tension control plate (invisible beneath 51) | 62 | Fixed-cam screw M 3 |
| 53 | Lower cross bar | 119 | Washer 0.1 mm |
| 54 | Small movable-cam left | 120 | Brass washer 0.3 mm (2) |
| 55 | Small movable-cam right | | |

The Accessories

The **casting-on comb** (33) forms the cast on edge and also acts as a weight. The weight is essential for good knitting operation as it pulls the knitting down and prevents dropped stitches. As the weight is distributed evenly over the whole width, it guarantees an even pull-down.

The comb consists of two halves screwed together, which are the same width as the needle-bed when joined.

The comb is hung into the cast on stitches immediately after the first row (cast on—see page 11). The weights additional to the comb may be put on or taken off according to the material used for knitting in order to increase or decrease the tension on the knitting.

The **side weights** (34) should be used when the side stitches require some additional tension. They should always be used in every case when every other needle is in operation or for circular, half circular or single-bed knitting.

The **tools** (41 and 41a). The latch hook tool, the single and double transfer tools (green and yellow) are used for increasing, decreasing, finishing edges and for patterns.

The **multi-transfer tools** (42 and 42a) are used for transferring several stitches at a time.

The **needle selectors** (39) are used to bring the needles into the required position. The points of the needle selectors are pushed into the needlebed grooves. These three needle selectors provide 5 different positions of needle setting.

The **needle setter** (40) has a width of 40 needles (the 40 stitches for a test piece) and is used for setting up the machine each time it is to be operated.

The **cam-box rail fasteners** (8) on the last needle groove to the right, both on the front and on the rear needle-bed, are used to secure the four cam-box rails. If they are removed, the rails are released and can be moved sideways (they should always be moved to the right).

The **stocking stitch bar** (43). When casting on single-bed, if thick wool is used, cast on with every other needle.

The front needlebed is always disconnected when using the stocking stitch bar.

Fixing of the stocking stitch bar. Disconnect front cam-box from rear cam-box and move to the side. Move rear cam-box completely to the side, so that the connector plate with handle stands free. Pick up stocking stitch bar, making sure the screws are loose on the tension clamp and pull apart, pull up stocking stitch bar in front of the connector plate. Then engage tension clamp into the front notch of the connector plate, push towards each other and secure screws.

Description of the Machine and Functioning of the Various Parts

Setting and regulating the distance between the two needle-beds

The distance between the front and the rear needle-bed is adjustable to 4.5 or 6 cm, i.e. it can be narrowed for very fine wool and enlarged for thicker wool. To set the desired distance, use the distance regulator (82), located on the right side at the top, outside the two needle-beds.

To set the distance regulator at a different position, loosen both star handles (100) half a turn and after fixing position, secure again.

4 — for circular knitting, for knitting fine wool on the double-bed as well as for knitting on single-bed.

5 — standard position.

6 — for thicker wools.

Past 6, turned to 0, the knob serves to disconnect the front needle-bed.

To open the needle-beds

Separate the two cam-boxes (see cam-boxes), loosen both star handles (100) half a turn. Turn distance regulator (82) to 0. Thus, the front needlebed is disconnected at the top and the distance between the two needle-beds is enlarged.

To close the needle-beds

Pull up front needle-bed. Thus, the latches at the top of the needle-beds close automatically on position 6. Turn the distance regulator to the desired position and secure both star handles. Re-engage cam-boxes.

The racking wheel (9)

The front needle-bed can be racked over seven needles by turning the racking wheel. This is called racking over seven needles. Through racking, the stitches are knitted diagonally. Racking is used for a great number of diagonal and interesting patterns.

In addition to racking over seven needles, there is the half-position also named medium position. In this position, the needles are facing each other on both beds (see Ill. 1a). This half-position is the basic position for all standard knitting, i.e. for normal rib, single fishermans rib (semi-patent), fishermans rib (patent—every second needle) and for circular knitting (all needles).



b

Ill. 1

a

The numbering simplifies the setting of the knitting and controls the size of the garment. The centre of your knitting should always be on 0 for symmetrical garments.

The needle positions

There are four basic needle positions (Ill. 2)

R.P. = **Rest position:** The needle does not knit, thus it is out of action. Needle butt rests against lower cam-box rail.

W.P. = **Working position:** Needle knits, needle heads just protruding in front of needle bed.

U.W. = **Upper working position:** This is used for certain working (knitting) operations. Needle heads are visible with open latches.

When using odd needles for patterns, i.e. all needles back bed, alternate needles front bed, racking wheel **MUST BE** on 1, otherwise needles will clash.

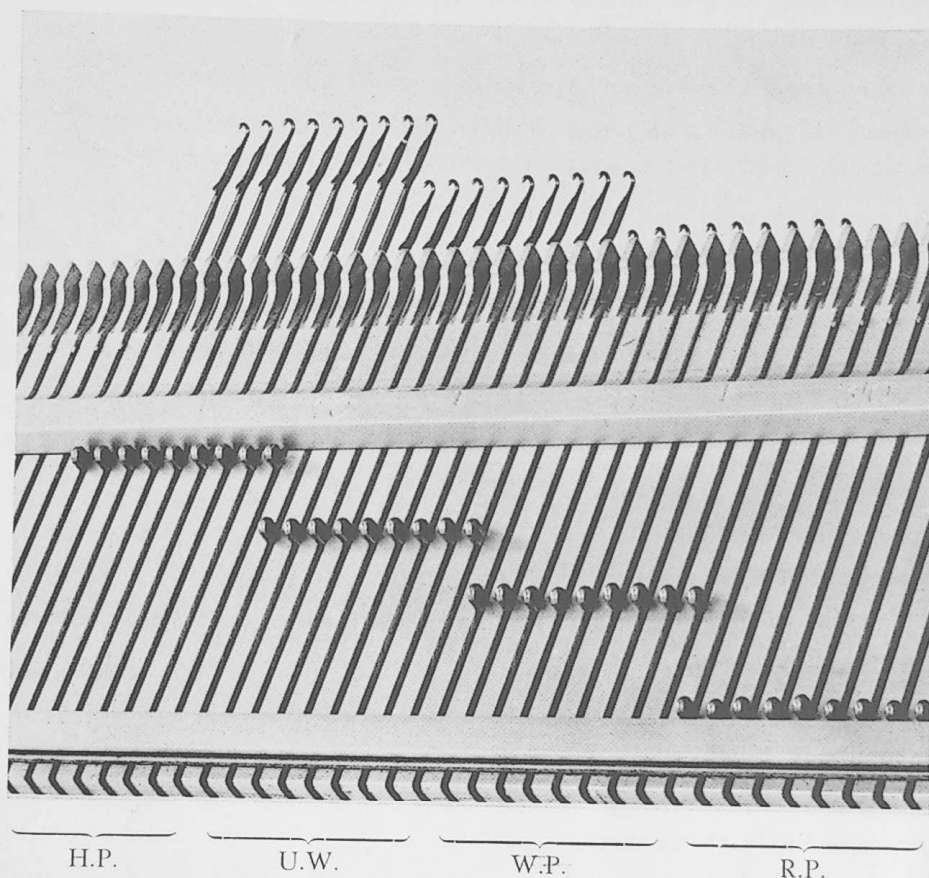
Please note: Standard knitting is applied to pullovers, socks etc. made of average wool (except for very fine wools) and knitted with normal knitting position, i.e. ribbing, single fishermans rib and fishermans rib. In this case, every second needle in working position on one needle-bed faces the needles in rest position on the other needle-bed (see Ill. 1b).

Circular knitting. All needles on the front and the rear needle-bed knit (Ill. 1a). The racking wheel is first put on position 1 and then changed to $\frac{1}{2}$ -position. When pushing the cam-box over the needles for circular knitting, all needles knit, but only those of one bed at a time,—either one way on the front needle-bed and the other on the rear bed or vice versa.

The counting rail (6), the upper cam-box rail is numbered according to the number of machines, needles from the centre 0 to the sides

numbers = needles = stitches

H.P. = **Holding position:** Needle temporarily excluded from operation, rests until used for knitting again. Needle butt rests against upper cam-box rail.



Please note: These four needle positions are described R.P., W.P., U.W. and H.P. in the following instructions.

The cam-boxes (12 and 13)

Both cam-boxes (12 and 13) are connected through the connector plate fastened to the rear cam-box and are automatically joined firmly together when the unfastening lever on the rear cam-box (15) engages properly into the notch of the driving plate (16) situated on the front cam-box.

— To separate cam-boxes, lift unfastening lever (15) and push front cam-box to the side.

Please note: Before moving both cam-boxes or before connecting front cam-box, check carefully that the needles are in the desired needle position and also whether **all needles out of action rest with their butts against the lower cam-box rail.**

When pushing the cam-box over empty needles, go very slowly.

Setting of cam-box

The dial (109) is in the centre of the front and rear cam-box. It is combined with the stitch type control (111) to select the pattern. When pushed down, it engages with the stitch size control (105) to set the required tension.

Pattern Setting (111)

For selecting the patterns, the arrow on the control knob and the letters on the cam-box are used.

The letters mean:

N = **Normal knitting.** This is the position for normal rib, stocking stitch and every cast-on.

R = **Circular knitting** in stocking stitch.

P = **Fishermans Rib.**

O = **Cam-box out of action.** Cam-box can be pushed over needles without knitting.

F = **Lace pattern.** This position is only used together with N, i.e. two rows F, one row N, change control knob accordingly. Under no circumstances, must the «F» position be used on both beds.

To set the pattern, turn the knob (109) until the arrow of the stitch type control points to the desired letter. Take care that the knob engages properly into the stop.

Tension Setting (105)

The control dial (109) when pushed down connects automatically into the tension setting.

The tension scale ranges from 1—10.

1— 3 for very fine wool (2-ply)

4— 7 for average 3-ply and fine 4-ply wool.

6—10 for thick 4-ply and double-knitting wool.

These general rules apply only to double bed knitting.

For single bed and circular knitting, the tension must be set 2—3 numbers higher for the same wool.

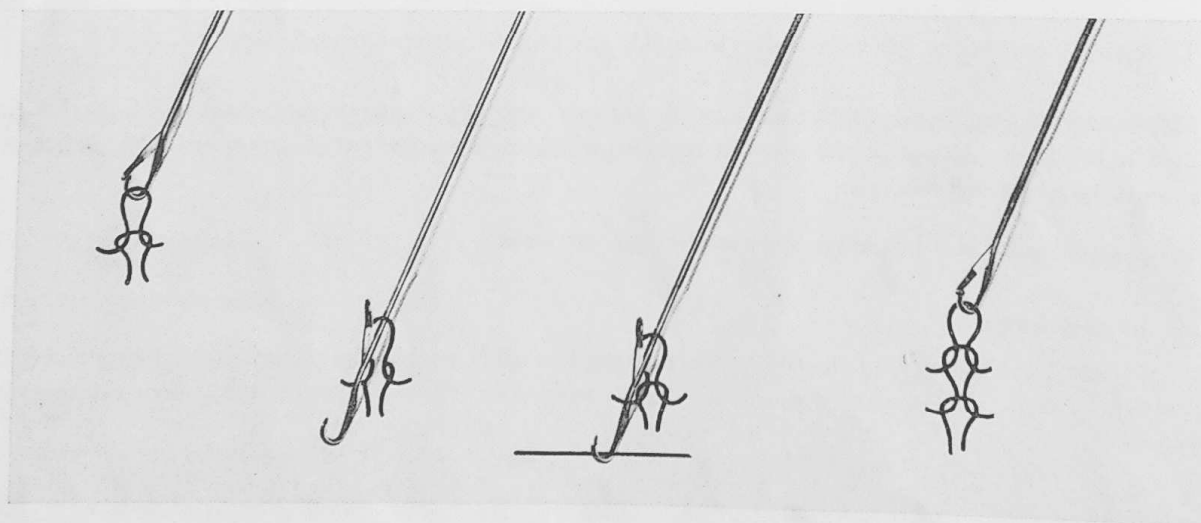
Please note: When altering the tension to a higher setting, do not change to more than two numbers higher at a time.

— To set the tension, push down the control knob, making sure it engages with the bottom tension ring. Then turn control knob until arrow on tension ring points to the tension required. Take care that the control ring engages firmly into the stop.

Please note: It is most important, both for pattern and tension setting, that the control knob engages correctly into the stops.

Formation of stitches (Ill. 3)

The needle is brought forward from position I to II until the stitch in the hook will open the latch needle, clear it and rest behind the latch on the needle shaft. At this moment, the open needle hook picks up the wool (III). As the needle moves backwards, the latch is closed automatically and a new stitch (IV) is formed.



Ill. 3

I

II

III

IV

The wool feed (25) ensures a perfectly even flow of wool and even knitting texture.

The cone (35). The wool should only be wound on the lower part of the cone and should not be too tight. It should not cover the upper third because this might lead to loops which would hinder the flow of wool and cause interruptions. Leave about 1/2" free at the bottom so that the wool cannot slip off.

This cone (35) is put on the wooden cone holder (32).

Threading: Bring the end of the wool from the cone upwards and place between the two ends of the wool brake (26) and feed into the wool channel (31). Then place wool through the tension wire eye (30) and through the wool guide (14a) between the two halves of the cam-box. Make sure the wool is threaded correctly.

Fasten the wool on the right hand clamp screw, before commencing knitting.

Control and regulation of wool feeding

The tension wire (28) should always be in a horizontal position when knitting and should never point upwards (see illustration on cover).

The tension screw (27) of the wool brake must be tightened or loosened according to the thickness of the wool to ensure free running. This regulates braking effect.

With very thick wool, the tension wire fastening screw (29) should be loosened. The wire should then be turned slightly back, sloping away from you. The tension screw should then be fastened again.

The row counter (22) counts the knitted rows automatically with every movement of the cam-box. With circular knitting, it counts two rows (one for the rear and one for the front part of the knitted piece) for each round, and this has, of course, to be allowed for. To get the correct number of rows, just divide by two. Before starting to knit, the row counter is put to 0 by turning its knob backwards until the numbers 000 come up.

A few hints for knitting

Have all your tools and accessories, including scissors, paper and pencil, within easy reach.

It is essential to knit a test piece if you wish to knit a well-fitted garment. Repeat the test when you have to buy more wool, even if it is the identical brand and shade. There is always a slight difference due to spinning, dyeing etc. which cannot be helped. They influence the number of stitches and rows and thus alter the texture. Knit your test piece large enough and of the identical pattern, and before counting stitches and rows, press it. Your machine knits a perfect cast on edge. However, to give cast on edge more elasticity, after knitting two circular rows, lay across the wool as in weaving, one piece of double-knitting wool which, on removal when garment is finished, will improve the cast-on edge.

Experiments have shown that best quality wool can be knitted up to 20 times without any deterioration. Even cheaper quality can be knitted up to 6 times. This also shows that it pays to use best quality wool which may be knitted over and over again.

Before starting to use light coloured wool, brush machine thoroughly and run a length of light coloured wool through. This prevents dark wool fragments from showing on your knitting.

On page 27, you will find **maintenance instructions** for your machine. Should the machine stop operating, try to find the cause of the fault by using the table on page 28 and read the instructions on how to repair the fault.

If leaving partly finished garment on the machine over night etc. reduce the tension of the weight, so that garment is not stretched too much.

Working on the double-bed machine

Schematic description of the needle selection and the settings

Explanation of letters and signs:

R.B.	=	rear needle-bed
F.B.	=	front needle-bed
D	=	distance regulator
N	=	arrow on stitch type control points to N (normal rib)
R	=	arrow on stitch type control points to R (circular knitting)
P	=	arrow on stitch type control points to P (patent—fishermans rib)
F	=	arrow on stitch type control points to F (lace pattern)
	=	needle in working position
.	=	needle in rest position

For every cast-on the stitch type control has to be set on N.

Please note: In working position, the outside needle on your left should always be on the front bed, the outside needle on the right should always be on the rear bed.

Notice the following knitting schemes and settings:

A. for 1 plain / 1 purl:

racking wheel on $1/2$

D for average wool on 5
for thick wool on 6

R.B.	\overline{N}	
F.B.	\overline{N}	

B. for 1 plain / 1 purl using very fine wool:

racking wheel on 1
D on 4

R.B.	\overline{N}	
F.B.	\overline{N}	

C. for 2 plain / 2 purl:

Cast on:

racking wheel on 2
D for average wool on 5
for thick wool on 6

R.B.	\overline{N}
F.B.	\overline{N}

After hanging comb into the cast-on stitches:

racking wheel on 1
D identical with above

R.B.	\overline{N}
F.B.	\overline{N}

With above, cast off one outside stitch both sides of knitting to give better edge.

D. for 2 plain / 2 purl for hems and socks (if transferred later to single bed)

Cast-on:

racking wheel on 2
D for average wool on 4
for thick wool on 5 to 6

R.B.	\overline{N}
F.B.	\overline{N}

After hanging comb into the cast-on stitches:

racking wheel on $1/2$
D identical with above

R.B.	\overline{N}
F.B.	\overline{N}

With above, cast off one outside stitch both sides of knitting to give better edge.

E. Circular knitting

for average wool:

Cast-on, racking wheel on 1
D on 4

R.B.	$\overline{R^*}$	
F.B.	\overline{R}	

Una vez colgado el montapuntos

After hanging comb into the cast-on stitches, put racking wheel on $1/2$.

Circular knitting

for thick wool with every second needle:

racking wheel as above	R.B.	R*	1.1.1.1.1.1.1.1.1.1.1
D on 5	F.B.	R	1.1.1.1.1.1.1.1.1.1.1

* When setting the cam-boxes, please note that it is **essential to point either both arrows on R-white or both on R-black.**

Important for all knitting operations:

The racking wheel has to engage exactly into the desired position.

All needles out of action rest their butts on the lower cam-box rail.

For every double-bed cast-on, the arrows of the stitch type control used to form the row of stitches, must point to N = normal.

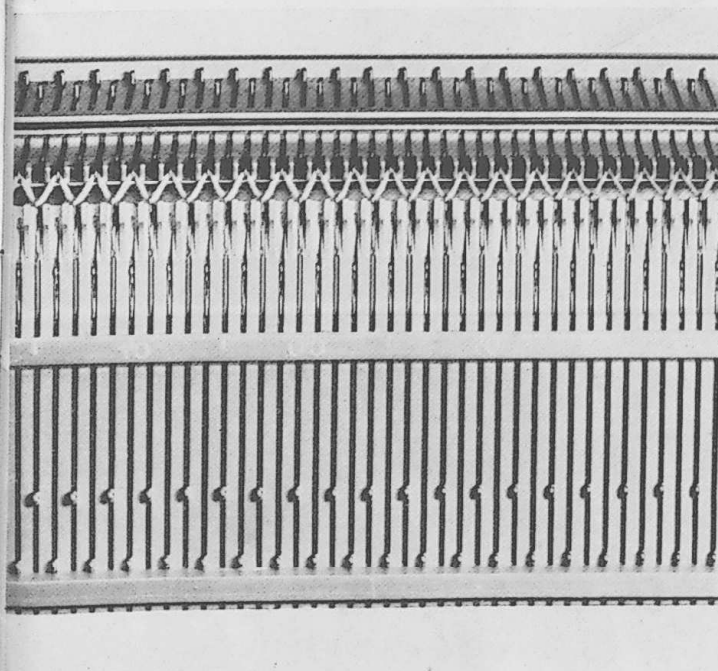
When knitting a row of cast-on stitches, the stitch size control may be set 2—3 numbers smaller than for regular knitting.

- i.e. cast on stitches tension 2
- two rows circular on tension 4
- 1 plain / 1 purl tension N 4

For plain knitting = circular and single bed, the stitch size should always be 2—3 numbers higher than normal rib and using the same wool.

Double-bed cast on

Make sure that the outside needle is on the left hand side of the front bed and the outside needle on the right hand side is on the rear bed. Push cam-box slowly over needles in working position twice in order to line them up evenly and to open the needle latches. Thread the wool (see illustration on cover) and tie the end of the wool to the right screw clamp. Push cam-box over the needles. This casts on the stitches and forms the first row (Ill. 4). Then the weights and cast-on comb are hung into this row of stitches.



Ill. 4

Push cast-on comb up from below between the two needle-beds and between the cast-on stitches, and let the comb hang down.

Please note: Hang the comb symmetrically so that the weight is evenly distributed, i.e. the middle of the comb should correspond with the middle of the cast on row to avoid an uneven flow of knitting. If the comb is not hung centrally, one side of the knitting gets pulled down much more than the opposite side and this can distort the knitting and may also result in end stitches being dropped and would certainly show a very bad cast off edge.

After hanging the comb, set controls on R white and knit two circular rows (move cam-box four times).

Return row counter to 000.

Set arrows of stitch type control on N and start knitting 1 plain / 1 purl.

Additional cast-on 1 plain / 1 purl

Cam-box is positioned on the right. Set needles with open latches to W.P. as above. Needle selection according to scheme A.

Thread wool. Push up cast on comb with wire between rear and front needle-bed, so that the needles may move freely between the teeth of the cast on comb underneath the wire. Push cam-box slowly to the left and be careful to leave comb in its position. Leave comb hanging. Thus the comb hangs automatically in the cast on row. Knit two circular rows with the controls on R-white. Set stitch type control on N = 1 plain / 1 purl.

The hand cast-on for single bed (stocking stitch) see page 18, may also be used for a cast-on for double bed knitting like needle work (1 plain / 1 purl, 2 plain / purl) by transferring the single stitches with the multi-transfer tool after hanging the comb in the desired needle selection.

General rules for knitting

The cam-boxes move over all of the stitches that are knitting and each row must be completed before you attempt to push the opposite way to complete a further row with the cam-box. Never attempt to push the cam-box in the opposite direction before completing a row. An automatic braking device is fitted to the cam-box which makes it virtually impossible to move the cam-box, once a row has begun, in the opposite direction, which would cause stitches to drop if there was no brake or locking device fitted. It is also impossible to move the cam-box in the opposite direction once a row has been started even with the dials on position «0». Do not push the cam-box too far over the end stitches otherwise you will loosen the tension and the wool may not feed evenly. However, should you go too far across the knitting and the tension goes slack, it is necessary to pull on the wool and increase the tension before you commence the next row. The dial for patterns or tension control must not be altered in the middle of a row. Any alterations should only be done when the row has been completed.

Fishermans Rib (Patent): Needle position is set on 1 plain / 1 purl. Both control arrows are on P.

Single Fishermans Rib (Semi-Patent) is also knitted 1 plain / 1 purl. Set stitch type control on one bed on P and on the other bed on N. It is of no importance whether the control points to P on the rear bed and to N on the front bed or vice versa.

Please note: The stitch size control on the bed with N should always be one number higher than on the bed with P.

The setting F = lace pattern can only be knitted together with the position N = normal.

For instance: 2 row F = lace pattern, 1 row N = normal. Alternate continuously.

The dial should always be changed on the front needle bed for better control. The dial on the rear bed should constantly be on N = normal and not moved at all.

Circular knitting. Needles on each bed knit plain or purl respectively, to form a hose shape with a plain exterior and a purl interior. Set the two stitch type controls on R, i.e. either on R-white or R-black.

Needle selection see page 10, description E.

Please note: The stitch size control is set 2—3 numbers higher than for ribbing, using the same wool.

To get the narrowest distance between needle-beds, set distance regulator (82) on 4.

Semi-circular knitting. This is suitable for extremely wide garments (Kimono, covers, scarfs). In order to keep one side of the knitting open, turn arrows of the stitch type control every round (2 rows) to the side of the opening. Should the arrows have been turned on R-white, change to R-black and vice versa.

Needle setting, needle-bed distance and stitch size are the same as with circular knitting.

With circular and semi-circular knitting use side weights.

Special Instructions

The undoing of stitches and full rows: By pulling the wool upwards, the last knitted row is taken off the needle hooks stitch by stitch, this automatically brings the previous row of knitting onto the needles (Ill. 5).

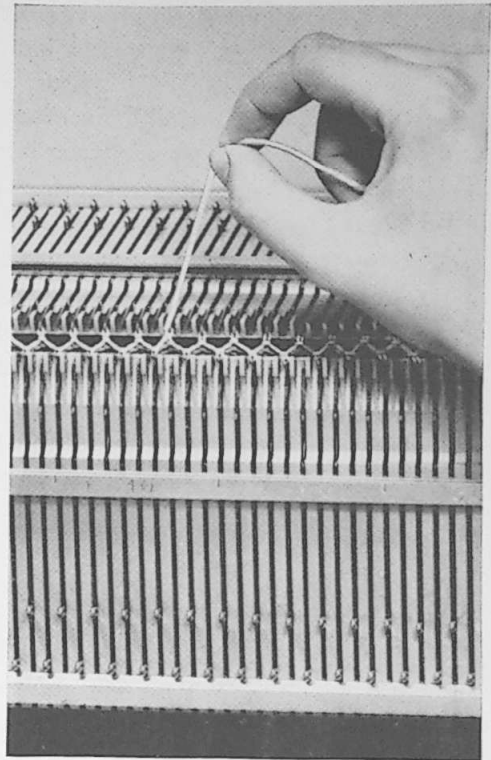
Interruption of wool feeding: The wool must never leave the wool guide during knitting as stitches will otherwise drop. A new cone of wool is best started at the beginning of a row.

Take out the end of the wool from the wool guide. The new wool should be threaded through the tension wire eye and through the wool guide and the new end of the wool should be kept in hand until the first few stitches are knitted. Upon finishing the knitting, when the piece is finally taken from the machine, the wool ends can be sewn. (The wool may also be knotted and the ends cut if they form part of the edge and are not visible.)

Taking knitting off without casting off stitches: Unthread and break wool. Hold middle of the comb with one hand. Push cam-box across the needle-bed, thus releasing the knitting.

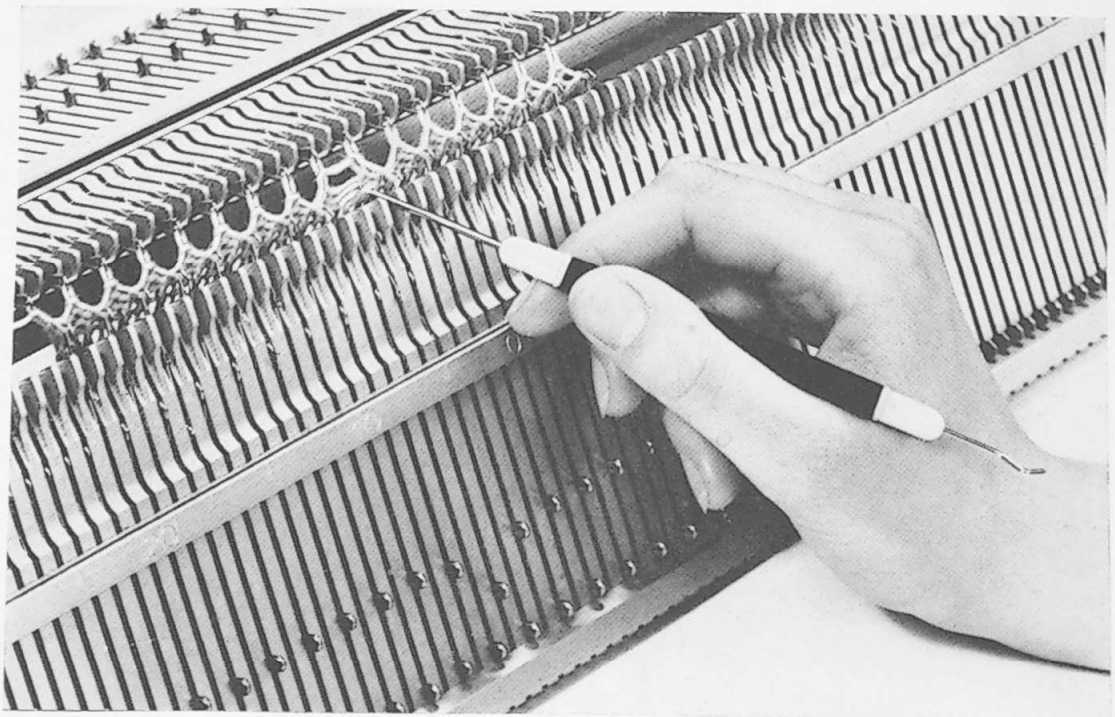
We would suggest you knit 2—4 rows in addition to the desired number in normal rib (both stitch type controls on N). Undo carefully these additional rows, pick up stitches with a knitting needle and take off by hand.

Picking up dropped stitches: Separate both cam-boxes, loosen both star handles half a turn. Turn distance regulator (82) to 0. This connects automatically with the front needle-bed and the distance between the two needle-beds is enlarged. With your latch hook tool, pick up a plain stitch from the front, and a purl stitch from the rear (Ill. 6). When knitting very fine wool, it is advisable to undo the last row before continuing so that the last row during the picking up of stitches may not be shown in the finished garment.



III. 5

III. 6



Increasing on the sides of the knitting. To increase one stitch only, it is necessary to bring up one needle nearest to the cam-box. To increase two or more stitches, it is necessary to bring up the needles on both the front and rear bed but on the opposite side to the cam-box and insert side weight.

Large increases on single-bed. Bring into U.W. as many needles as required nearest the cam-box. Wind the wool round the needles (anti-clockwise right hand side, clockwise left hand side). Then with different coloured wool, cast on round the needles in front of the latch and in a figure of 8 round either side weight or weight off long comb where greater increases are required. Now pull back each needle to form stitch.

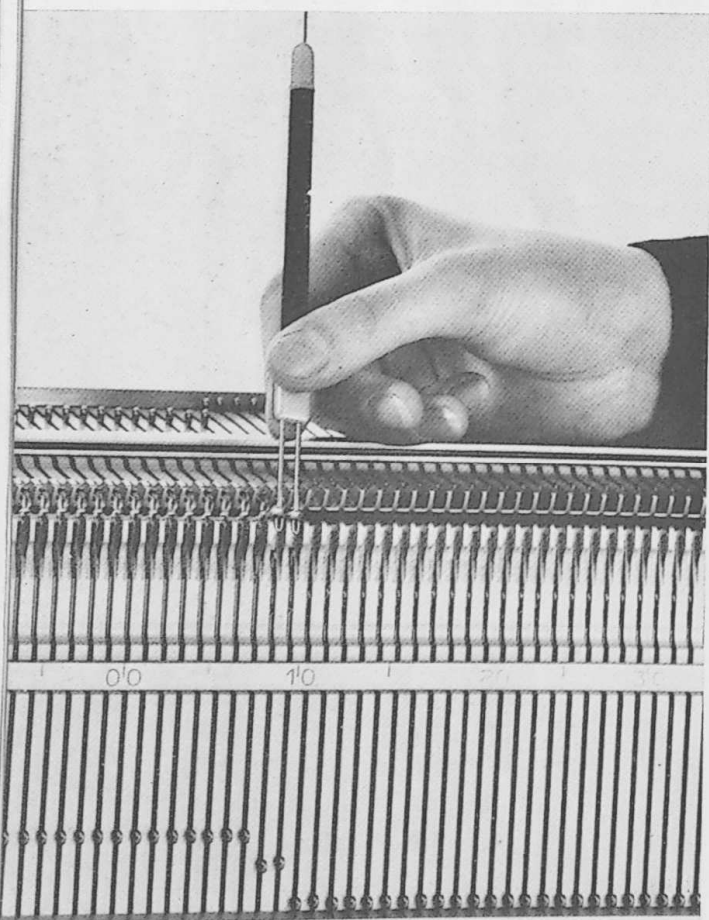
Decreasing on the sides of the knitting. On the front and on the rear needle-bed and if desired on both sides of the knitting at the same time, lift the last stitch with the single transfer tool and put this stitch onto the next needle. Return empty needle to R.P.

Please note: When increasing or decreasing on the double-bed machine, always be sure that the first needle in W.P. is situated on the rear needle-bed to the right and on the front needle-bed to the left. **When using either «P» position or «F» position and the needles are not in this formation, the outside stitch has to be knitted by hand to avoid stitch dropping.**

Decreasing of several stitches at the same time from the sides of the knitting.

It is a rule that stitches are decreased on the side where the cam-box with the wool is situated. Lift last stitch with the single transfer tool and transfer it to the last but one needle. Decrease these two stitches by hand-operating the needle, i.e. use your left hand to hold small butt of the needle, push forward and thus lay both stitches behind the open needle latches. Lay wool into the empty needle head and pull back needle until needle latch is closed and both stitches glide over it. With single transfer tool, transfer this stitch to the next needle and repeat decrease without interruption. Let wool run smoothly and keep loose to form an elastic smooth edge. Return empty needles to R.P.

When knitting on the double-bed, transfer from front to rear or from rear to front, just according to the needle position. When knitting stocking stitch, circular knitting and single-bed knitting, stitches are decreased inwards. There is also a method to cast off stitches openly (see page 13), transfer to a hand knitting needle and decrease.



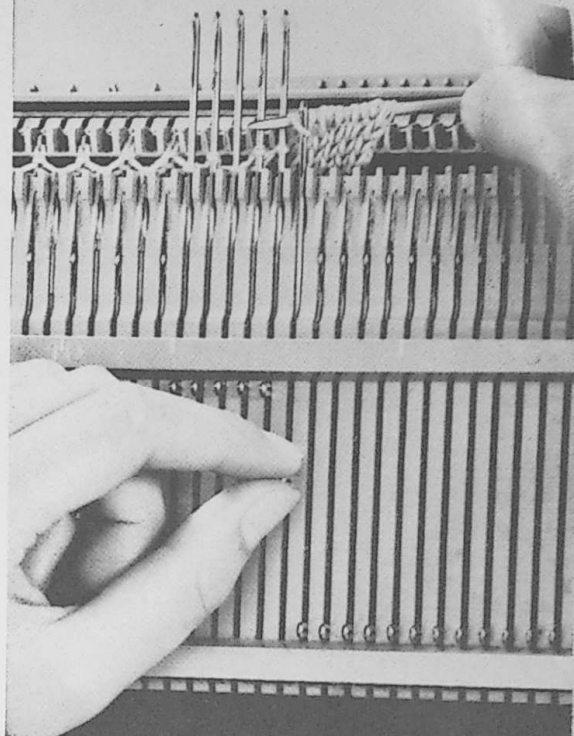
Increasing with circular knitting. Set one needle with open latch in W.P. on the front and on the rear bed and if convenient, on both sides of the knitting at the same time. Use single transfer tool to take off every outer stitch and transfer to the new needle in W.P. This will leave a small hole when proceeding to knit, therefore, use transfer tool (green) and pick up the last but one knitted stitch 1 row below and insert into the empty needle. Put in side weights.

Decreasing with circular knitting: Using the double transfer tool, lift off two stitches on the front and rear needle-bed and transfer onto the next two needles. You can decrease at both ends of the knitting at the same time if required (Ill. 7). Return empty needles to R.P.

Decreasing (casting off) as above.

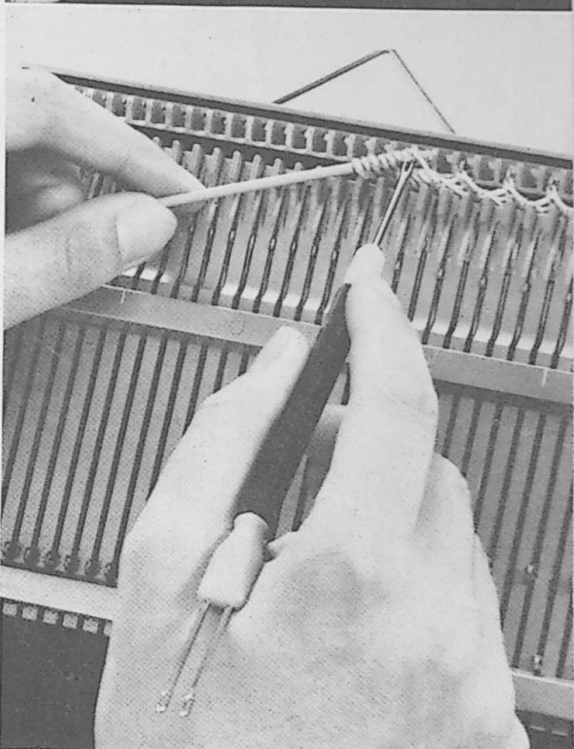
Ill. 7

Transfer of stitches to hand knitting needle. Push needles to be transferred into the H.P. position. Using the hand knitting needle, take up the stitches from behind and with the other hand, pull back latch needle (Ill. 8). Return empty needles to the R.P. position.



Ill. 8

Transfer of stitches from hand knitting needle to machine needles. Depending on your skill, either transfer every stitch first to single transfer tool and then to the latch needles (Ill. 9) or hold stitches to the latch needle in a way that the latch needles can be pushed directly into the stitches. Hang cast-on comb (use side weights instead for smaller pieces).



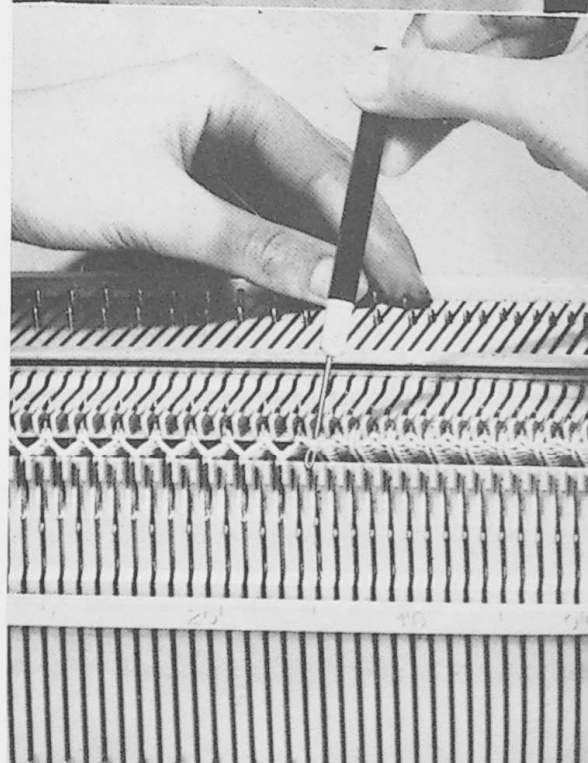
Ill. 9

Transfer from rib to stocking stitch (jersey). With single transfer tool, lift stitches from front needle-bed and transfer to corresponding needle on the rear bed.

How to transfer to stocking stitch from rib. Use single transfer tool and point in the same direction as the needle on the front bed. Put eyelet of transfer tool into the hook of the needle latch and pull forward the needle into the holding position. Then the stitch will glide backwards over the needle head and over the latch hook. Push back needle into R.P. Thus the wool will glide over the closed needle latch and head into the single transfer tool. Move the single transfer tool with the stitch directly in front of the corresponding needle on the rear bed, and push this needle forward through the stitch by using your free hand. N.P. When all the needles have been transferred from the front bed to the rear bed, disconnect the front cam-box and if a stocking stitch bar is to be used, remove the front cam-box completely from the machine. If the front bed is to be kept in position, loosen the two star handles (100) located on each side of the needle beds, by half a turn, set distance regulator (82) on 4 and tighten up again the star handles.

Make sure that the tension on the rear bed is 2—3 numbers higher for stocking stitch than for rib.

Please note: When altering tension to a higher setting, you must not increase more than two tensions at a time.



15

Ill. 10

Hem, rib and transfer to stocking stitch without changing tension.

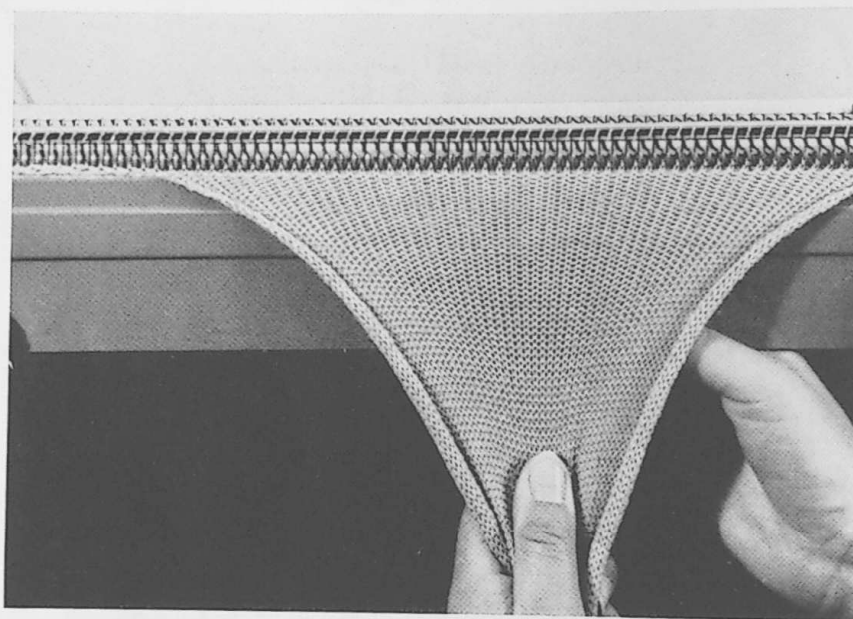
Cast on as described or hand cast on.

Following cast on 1 plain / 1 purl

R.B.	$\frac{N}{N}$	Stitch size control on 7
F.B.	$\frac{N}{N}$	Stitch size control on 3

Knit desired length for hem, then transfer stitches from front needle-bed to rear needle-bed and knit stocking stitch with the stitch size control on 7.

When knitting a hem and transferring to stocking stitch, make sure that the tension knob on the rear bed is set on tension 7 (which is used for normal stocking stitch) and the front bed is set on tension 3 (normal ribbing tension). The front tension, therefore, is always 4 tensions lower than the rear cam-box.



Ill. 11

Re-hanging comb

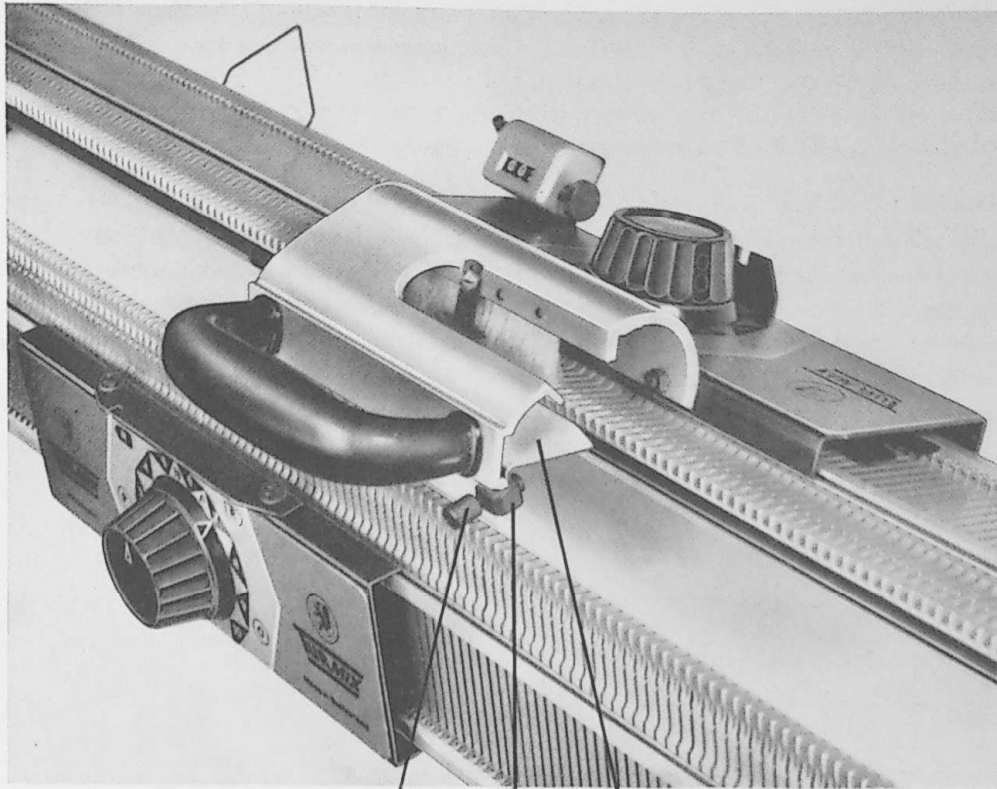
a) for single-bed knitting

Hold knitting with your hand or use the side weights. Take out the comb, push needles slightly forward to open a gap of approximately 1 cm (half an inch) between the stitches in the needles and the needle-bed. Push the knitting with your free hand towards you and push the comb between the knitting and the needle-bed without the wire, insert the wire, re-hang the comb by pushing the comb upwards and then forwards over the needle hooks (Ill. 11).

With single-bed knitting, the comb must be re-hung more frequently.

b) for double-bed knitting

Separate cam-boxes and take out comb. Turn distance regulator to 6. Push needles on the rear needle-bed somewhat forward to open a gap of approximately 1 cm between the stitches in the needles and the needle-bed. Push up comb without the wire between the knitting and the rear needle-bed using your free hand. Insert wire and hang comb into the stitches, moving forward and above the needle hooks. Return distance regulator to the normal distance position of the needle-beds.



screw tension clamp 43
(stocking stitch bar)

Ill. 12

Single-bed knitting

General instructions for all knitting operations on a single needle-bed

Stocking stitch is always knitted on the rear needle-bed, the plain side facing you.

Move rear cam-box to the right and disconnect front needle-bed. When using the full length of the bed, remove front cam-box.

The stitch type control always points to N.

Put **distance regulator** on position 4. Loosen both star handles by $\frac{1}{2}$ a turn and switch to position desired. Then fasten again. Thus, the front needle-bed comes to serve as a stocking stitch bar when using normal wool and patterns. Re-hang side weights frequently.

Should the end stitches, even when you are using side weights, not knit properly when using very fine wool, yarn or cotton, or very thick wool (using every other needle), we suggest the purchase of the stocking stitch bar (Ill. 12).

When using the stocking stitch bar, disconnect and lower front needle-bed. To do this, slacken star handles and put distance regulator onto position 0. You can now lower the front bed. Fasten stocking stitch bar into position (see page 5).

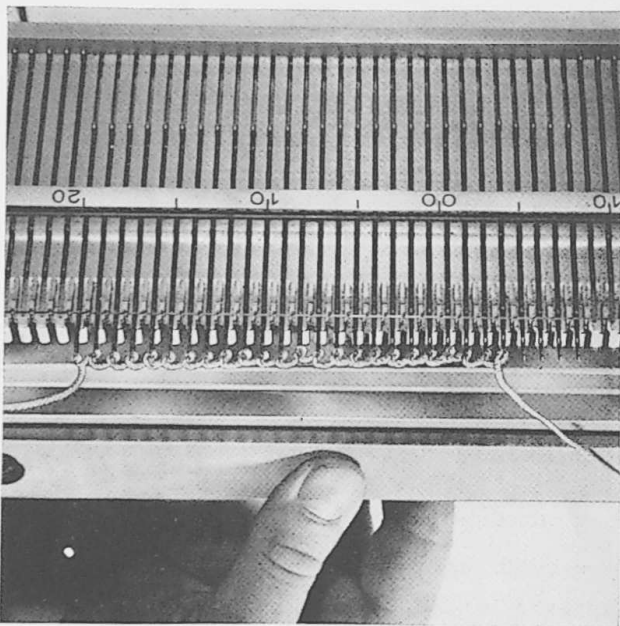
Fast open-edge cast-on (with comb and open latches): Set desired number of needles in W.P. all latches open. Thread wool through wool feed and wool guide and fasten wool end to screw-clamp. Hold cast-on comb with wire in front of the needle-bed in such a way that the needles will move freely between the teeth of the comb underneath the wire. Knit one row. Leave comb in stitches and continue to knit.

Set stitch size control correctly from the start, i.e. for cast-on row.

Fast closed-edge cast-on: Set every second needle of desired number to W.P. position, all latches open. Hold up cast-on comb with wire between the needles and knit over one row like you do for open-edge cast-on. Set stitch size control according to the wool being used.

Then all needles are set to W.P. Knit over one row. Continue to knit.

Closed-edge cast-on: Cam-box on the right. Set desired number of needles to U.W. all latches open, standing back to needle-bed approximately $\frac{1}{8}$ ". Hang cast-on comb with inserted wire evenly over the open needle latches into the stitches. Thread wool end through wool feed but not through wool guide. Form loose loop and lay round first needle to the left and continue fastening wool around every needle from left to right anticlockwise using your free hand. Hold back stitches with your left forefinger to keep them under the needles and be careful to obtain an even loose tension. Thread wool into wool guide. Then lift comb, pass it forward over needle heads and hang into stitches. Set needles on W.P. Please remember to hang comb into stitches only and not touching the needle heads. Knit one row with stitch size control on 5, later on 7 or 10 according to the thickness of the wool.



Ill. 13a



Ill. 13b

This closed edge cast-on may also be used for ribbing 1 plain / 1 purl or 2 plain / 2 purl if the effect of a hand knitted edge cast-on is desired on the double-bed. After inserting comb, the stitches corresponding to the desired needle setting are transferred to the front needle-bed with the single transfer tool.

Please note: When knitting thick wool for which stitch size 10 is not sufficient to produce an even texture, use every second needle with stitch size control on 6—10. Re-hang side weights more frequently. If using every other needle, make a sample piece of knitting to make sure of stitch size. After casting off, pull knitting evenly and leave sample to settle before measuring.

Knitted hem (double): Knit fast open-edge cast on. Example: Knit 10 rows for welt, then one row with tension setting two numbers higher. Re-hang comb into this row. Tension normal. Knit 10 more rows, then hang first row of open stitches from open-edge cast on onto the needles. Please remember to knit the first row, (after turning up hem) very slowly.

If you want a double hem without showing a welt, to allow you to lengthen it later (childrens' garments), use a closed-edge cast on (without comb).

Increasing of stitches at the side of the knitting: On the side of the cam-box, set needle with open latch into W.P. and knit. The new stitch is cast on by itself.

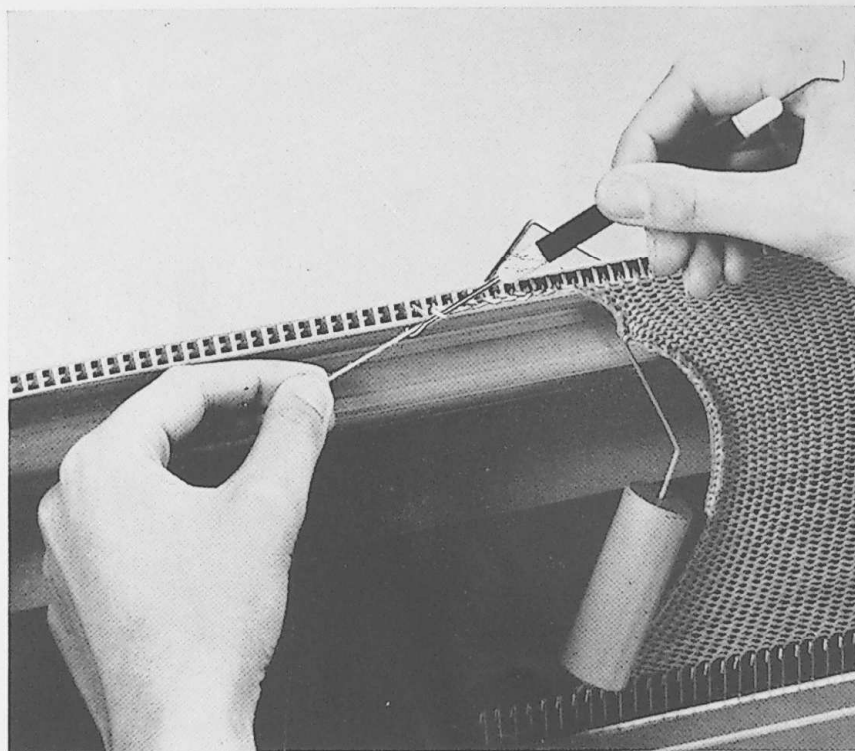
Increasing two stitches at the side of the knitting: At the side of the cam-box, set 2 needles with open latches in W.P. The lower stitch part of the outer stitch is put on the inner needle whereas the outer needle casts on by itself (see above).

Increasing within the knitted piece: Bring up one empty needle at edge of work. Starting from the point where you wish to increase, transfer all stitches by one needle going outwards using single or double transfer tool or multi-transfer tool. To prevent the formation of a hole, when continuing to knit, pick up stitch beside emptied needle from one row below and hang into the empty needle.

Please note: For repeated increases, re-hang side weights more frequently.

Increasing of several stitches at a time: Insert latch hook tool into the outside stitch at the side of the cam-box, wind wool around the hook and crochet. Transfer crocheted stitch onto the next needle. Then insert into this stitch and continue crocheting and transferring (Ill. 14). The crocheted stitch should be loose. Insert side weights and knit.

When increasing by large number of stitches, it is advisable to re-hang cast-on comb.



Ill. 14

Decreasing one stitch on the outside of the knitting: Take off last stitch with single transfer tool and transfer to next inner needle. Return empty needle to R.P.

Decreasing within the outside stitch: With double transfer tool, take off the two outside stitches and transfer one needle to the centre. Return empty needle to R.P.

Decreasing of stitches in the centre of the knitted piece: Transfer stitches to be decreased with single transfer tool onto the neighbouring needle and transfer the other stitches with multi-transfer tool to prevent empty needles. All empty needles at the side of the cam-box must be returned to R.P.

Decreasing several stitches at the side of the knitting (see page 14).

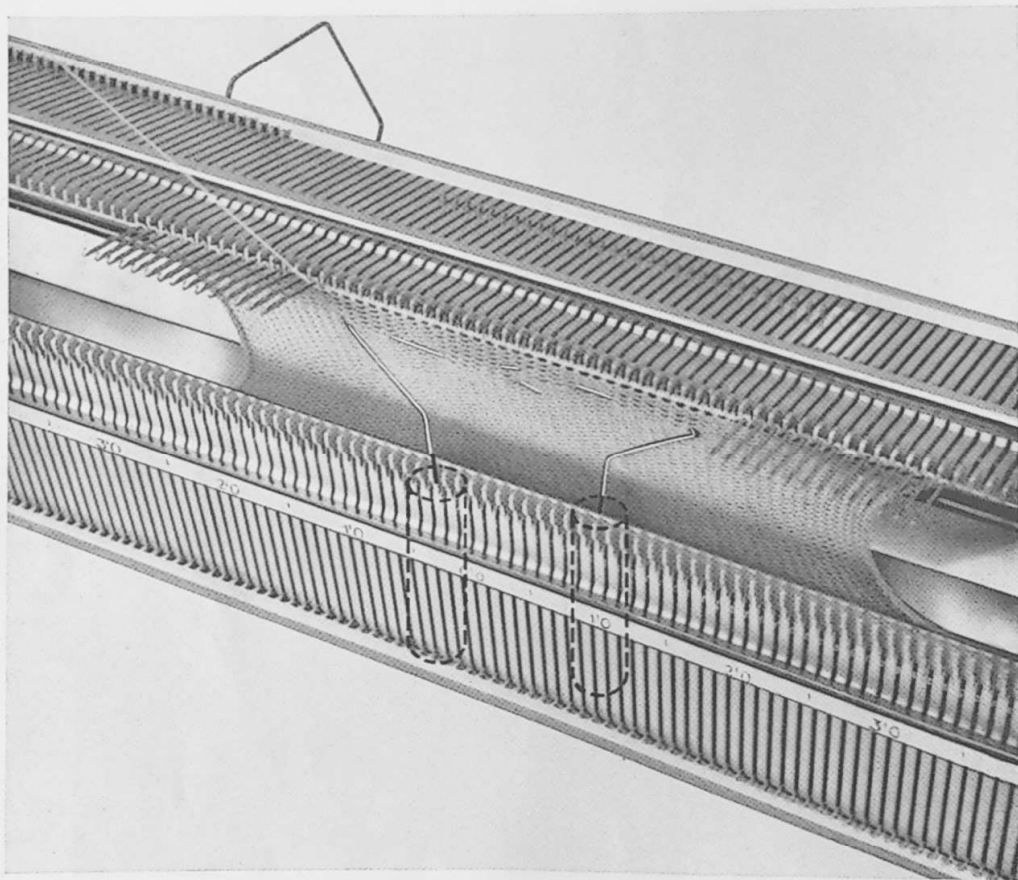
Shortened rows (knitting in the centre part not completing row fully) e.g. turning heel of sock.

a) **Increase on one side** (for seat of trousers)

Shortened rows on one side of the work (when shaping pants, darts etc.).

The cam-box must be on the side on which the garment has to be increased. On the side opposite the cam-box, push as many needles fully upwards into H.P. that are not wanted for knitting, i.e. leave as many needles in W.P. as needed for the first shortened row. *Knit one row. Now the cam-box with the wool is positioned on the side where the needles are in H.P.

In order to avoid occurrence of holes when turning the row, the wool should always be wound round the nearest needle in H.P. Knit one row. Place nearest needle to cam-box from H.P. to U.W. (make sure latches open). Knit one row. Following the needles in W.P., set all desired needles with open latches in U.W. (approx. $\frac{3}{8}$ " backwards)*. From * to * repeat continuously until all turns of shortened rows are knitted and all needles returned to W.P.



Ill. 15

b) **Shortened rows in the centre of the work:** (e.g. shaping shoulders). On the side opposite to the cam-box, bring the required number of needles into H.P. Knit one row with those needles still in W.P. Put needle with stitch knitted last also in H.P. On the other side, place the same number of needles into H.P. Knit one row with needles in W.P. *In addition put needle knitted last into H.P. On the opposite side following the needles in W.P., set as many needles to U.W. as desired for every turn (Ill. 15). Knit one row*. Repeat from * to * continuously.

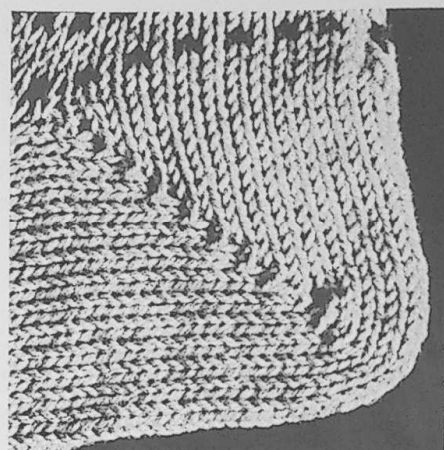
Please note: All needles in R.P. should be against lower cam-box rail. Needles to be put into U.W. should be pushed back $\frac{3}{8}$ " and care should be taken that all needle latches are open. Hang side weights into needles in W.P.

The American Heel (Ill. 16). This kind of heel is knitted with shortened rows and the following is the easiest method for turning these heels.

Decreasing: *On the side where the cam-box is positioned, put the outermost needles which are in W.P. into H.P. Knit one row*. Repeat continuously from * to * until about one third of the needles are still remaining in W.P. in the centre of the work.

In order to hold down the forming bulge, the side weights have to be re-hung more frequently into the needles in W.P., pushing the weight wire towards the centre of the knitting.

Ill. 16



Increasing: Make sure all needle latches are open. *On the side where the cam-box is positioned, retract the needle by approx. $\frac{3}{8}$ " which had been previously put into H.P. Knit one row. Repeat continuously from * to * until all needles have again been placed into W.P.

Another heel description can be found on page 24 under «Socks».

Horizontal Button Holes and Pocket Holes: Put the number of needles equivalent to the width of the button hole or horizontal hole, into U.W., stitches behind the open latches. Knit these stitches one after the other by hand using a contrasting shade of wool, i.e. insert wool into the empty needle heads and bring back into W.P. Continue to knit.

When the piece is finished and taken off the machine, pull out contrasting wool.

For the button hole, it is sufficient to pass the wool through the open stitches twice (Ill. 17) and then finish off the button hole with button hole stitching.

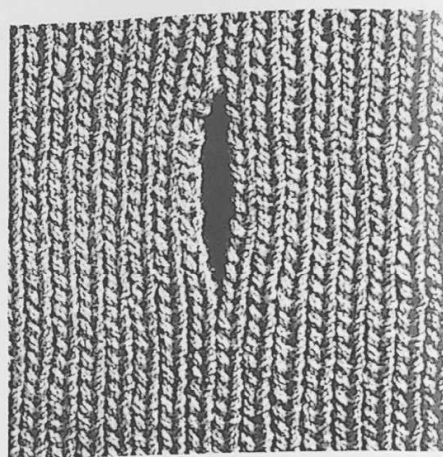
With larger horizontal openings, the open stitches can be knitted off with hand needles or crocketed off with the latch hook tool. In the case of a pocket opening, the stitches can be re-transferred from hand needles to the machine to knit the pocket interior (see page 15).

Vertical button holes (Ill. 18): Set one needle to H.P. to indicate position of button hole. Starting from this needle, bring all needles on the side opposite to the cam-box into H.P. Knit on one side the desired number of rows for height of button hole. Hang side weights into the needles in W.P.

Ill. 17



Break the wool. Put stitch type control to 0 and cam-box onto the other side. Put needles which have been in W.P. into H.P. and push needles in H.P. approximately $\frac{3}{8}$ " downwards. Make sure all needle latches are open and knit second half of button hole. Then push back needles in H.P. approximately $\frac{3}{8}$ ". Make sure needle latches are open and continue to knit.



Ill. 18

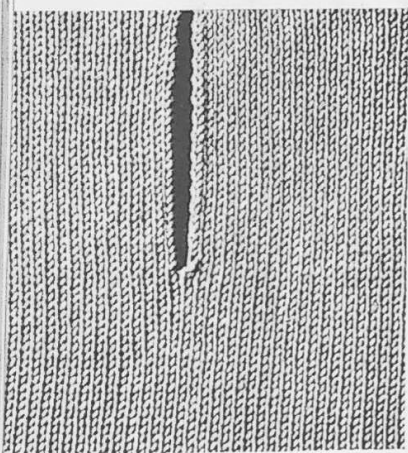
Larger vertical openings (Ill. 19): The working process is similar to the one for button holes if used for front or back neck openings. Please note: This method cannot be used when round neck and shoulder shapings have to be considered.

Neck openings: These are knitted as vertical openings. Decrease or crochet off stitches desired for neck opening as to the required shape (Ill. 20 and 21).

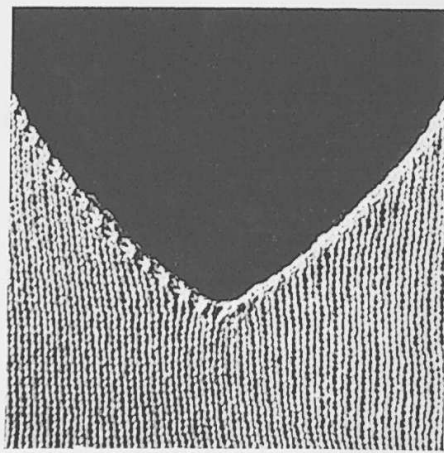
Please note: You are recommended to use side weights, rehangng them frequently. When knitting second half, preferably take off casting-on comb and re-hang centrally or insert side weights to avoid too much weight on the knitting.

For rib, single fishermans rib or fishermans rib **on the double-bed**, put needles on back and front beds into H.P.

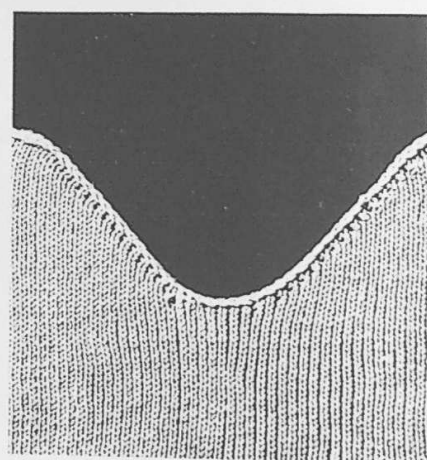
When **racking** it is essential to transfer stitches from front needle-bed to needles on rear needle-bed before putting needles into H.P.



Ill. 19



Ill. 20



Ill. 21

Socks - Circular knitting method

General: Knit hem in open rib and use circular knitting for length of leg and foot. The number of stitches and rows indicated is for size 10—11 inches, using regular 4-ply sock wool.

S = stitches, R = rows, T = rounds (two rounds equal one row).

Cast on 64 stitches 1 plain / 1 purl rib. Knit desired length of rib. On the last row, put tension one number higher.

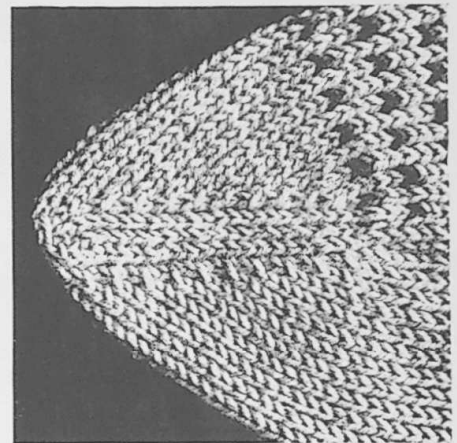
Transfer for circular knitting: Cam-box to the right. Unravel 16 stitches (see page 13 special instructions) right hand machine, leaving this wool in place when continuing to knit. Transfer all stitches to front needle bed. Now transfer outer 16 stitches each side onto multi-transfer tools and secure. Insert immediately side

weights into stitches between those in working position and those on multi-transfer tools. Put the 32 needles onto the rear needle bed, which are exactly facing those on the front needle-bed, into W.P. Open needle-beds, turn both multi-transfer tools inwards and pull up to the front needle-bed. Close needle-beds and set distance regulator on 4. Transfer stitches one after the other from multi-transfer tools onto the needles in W.P. on rear bed. Put stitch type control on circular and set stitch type control size two numbers higher (3 numbers higher than for ribbing). Knit plain length required for leg. Cam-box to the right.

Heel: Transfer 16 stitches from each end of front bed onto multi-transfer tools and remove front bed. This leaves 32 stitches in W.P. on rear bed. Change stitch type control to N, fit stocking stitch bar. Put the nearest needle to the cam-box into H.P. Knit one row. Again put needle nearest to the cam-box in H.P. and repeat 19 times (use side weights or pull down by hand to prevent the bulge of the work lifting stitches off needles in use). Note: To prevent series of holes, wind wool round the last needle put into H.P. On the side opposite the cam-box, return the inner needle from H.P. to U.W. with latch open. Knit one row and again on the side opposite the cam-box, return the inner needle in H.P. to U.W. with latch open. Repeat 19 times. This completes heel shaping. Remove stocking stitch bar and replace stitches from multi-transfer tools onto front bed needles. Set both stitch type controls on «R» and continue knitting circular for length of foot required, approximately 60 rows.

The Toe: Working on both beds, decrease one stitch both sides by transferring second stitch into third needle and first stitch into second needle, putting empty needle in R.P. Knit two circular rows and repeat this whole process 6 times. Continue decreasing in this way, but knit one row only in between. Repeat until 8 stitches remain. Cast off.

Make up: Join seams for foot and back and press.



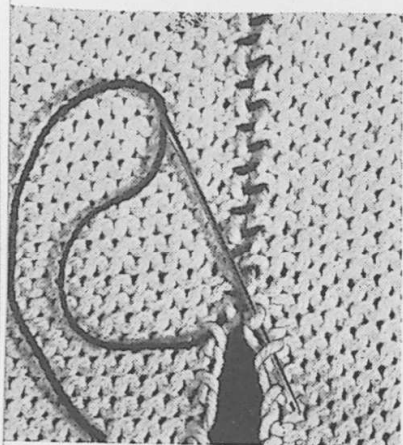
Ill. 22

Socks - Single bed method

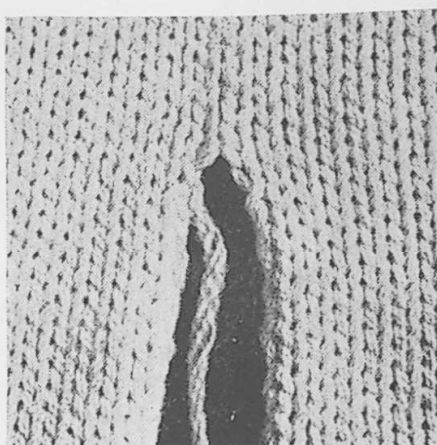
Cast on 72 stitches and knit 40 rows either in 1 plain / 1 purl rib or Continental rib. Note: On the last 20 rows, weave shirring elastic if desired. Change to stocking stitch and knit 34 rows (adjust length as required at this stage). Transfer the 5th stitch into the 6th needle and move the 4 end stitches one needle in. Decrease one stitch at the end of the next two rows and every following 5th and 6th row 10 times altogether, (52 stitches remain). Knit 16 rows and break off wool. Slip 13 stitches from both edges onto stitch holders (26 stitches remain). Knit 68 rows (or as many as required).

Shape Toe: Always taking the wool round the first inside needle in H.P., push one needle opposite the cam-box into H.P. of next 14 rows, then push one needle opposite the cam-box from H.P. back into U.W. on next 14 rows. Knit 68 rows (or as many as required). Shape heel as for toe, slip stitches onto a stitch holder. Graft stitches on the top. Knit the second sock in the same way.

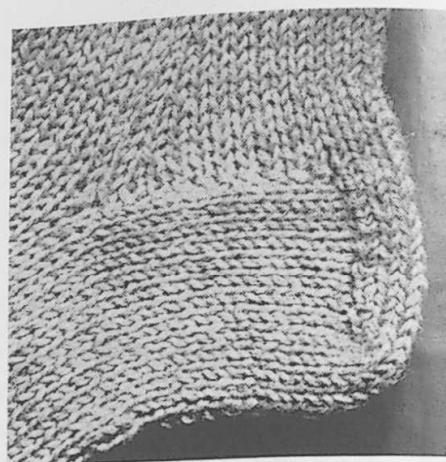
To make up: Join seams of foot and back and press.



Ill. 23



Ill. 23



Ill. 24

Tights I (trousers and stockings combined) (Size for a child of 2—3 years)

Material: 4-ply sock wool
Stitch size: 8
Test piece: 28 S = 4"
 36 R = 4", 36 T = 4"

When knitting on single-bed, every row counts;
 knitting circular every round = 2 rows counts.

General: The combined trousers and stockings are knitted in two parts, with a front and a back seam, i.e. each part separate and on rear needle-bed. Leg and foot only are made in circular knitting.

First part:

Cam-box to the right. Cast on 80 stitches with open cast-on. Knit 16 rows for the hem. Re-hang cast-on comb. Knit two rows, then start to knit shortened rows for back of trousers. Cam-box is positioned again to the right. From the left side, put all needles into H.P. except 11. *Then knit one row over those needles in W.P. Retract $\frac{3}{8}$ " approximately the 11 needles in H.P., which are situated next to those in W.P. and knit one row. *Repeat from * to * until all needles are back in their position. Set row counter to 0. Knit 50 rows straight (the piece is now 6" long from the front centre to the end of the hem).

Start increasing for gusset: On both sides of every fourth row, increase by one stitch 10 times. Note: For the first increases, use the double-transfer tool to transfer the two outermost stitches by one needle outwards. Use latch hook tool to pick up from the last but one knitted stitch on the previous row and hang it twisted outwards and again pick up from the last but one stitch knitted on the previous row and hang it onto the empty needle. Then transfer the four outermost stitches etc. until the piece is increased by 10 stitches which is used for knitting the gusset. Knit four rows straight.

Transfer for circular knitting: Firstly, unravel 30 stitches nearest to the cam-box (10 stitches from the gusset and one-quarter of the total number of stitches), so that the wool is in the correct position to continue knitting. Then transfer from both sides, the 10 stitches for gusset onto a spare needle. Then pick-up from both sides 20 stitches with multi-transfer tool (16) and transfer to front needle-bed. Set row counter on 0. Set both beds on circular knitting. Please make sure that the wool end comes from the stitches on the rear needle-bed. It is essential to start knitting the first round on the front needle-bed. Knit 4 rounds (8 rows) then start decreasing for shaping upper leg. This has to be done on the same side as the increases for the back of the trousers. Use double transfer tool to decrease by 1 stitch simultaneously on the front and on the rear needle-bed. Repeat these decreases every 4th round 6 times. Then knit 20 rounds straight. Start decreasing for instep. On the same side where decreases for shaping upper leg were knitted, again decrease with double transfer tool by 1 stitch simultaneously on the front and on the rear needle-bed. Repeat these decreases every fourth round 10 times. Then knit 20 rounds straight.

Transfer for heel and foot: Transfer your work in such a manner that the selvedge stitches of the legs (seams) are placed in the centre of the rear needle-bed. Push front cam-box aside and set stitch type control on N. To knit heel *put the outermost needle on the rear needle-bed nearest the cam-box into H.P. and knit one row. * Repeat from * to * until you have 8 needles in W.P. left in the centre. Make sure that all needles in H.P. are with their latches open. *On the side opposite to the cam-box, push back the last needle in H.P. next to needles in W.P. by $\frac{3}{8}$ " and knit one row*. Repeat from * to * until all needles are in W.P. Connect front needle-bed and set rear cam-box again on circular knitting. Row counter on 0. Knit 25 rounds straight for foot.

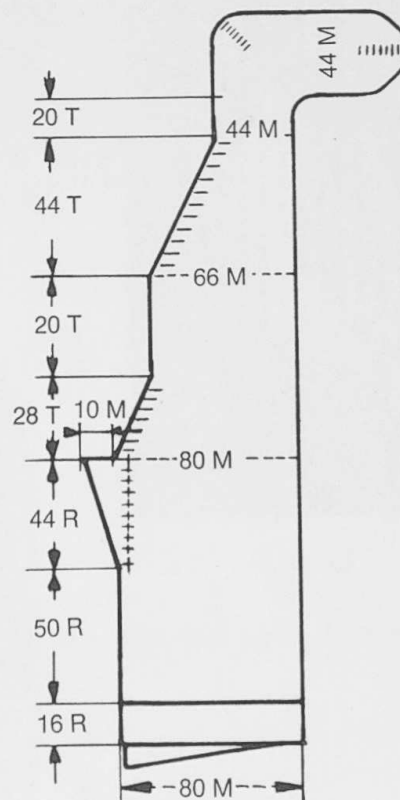
Final decreasing: With double transfer tool, decrease by 1 stitch simultaneously on the front and rear needle-bed. Repeat this decreasing in the following manner: After first decrease, knit three rounds. After the next three decreases, knit two rounds. Finally, only knit one row after decreasing until 4 stitches are left both on the front and on the rear needle-bed. Cast-off and join with a knitting stitch.

Second part: Work the same as first part but start with cam-box to the left.

III. 25



III. 26



Measurements for combined trousers and stockings

Age	Trousers	Leg	Foot	Cast-on for 1st part of trousers
6 months	11"	8 ³ / ₄ "	4 ³ / ₄ "	76 stitches
1 year	11"	9"	5"	80 stitches
2 years	11 ¹ / ₄ "	9 ¹ / ₂ "	5 ¹ / ₂ "	84 stitches
3 years	11 ³ / ₄ "	10"	6"	88 stitches
4 years	11 ³ / ₄ "	10"	6"	92 stitches
5 years	12"	10 ¹ / ₂ "	6 ¹ / ₂ "	96 stitches
6 years	12 ¹ / ₂ "	11"	7"	100 stitches
7 years	12 ¹ / ₂ "	11 ¹ / ₄ "	7 ¹ / ₂ "	104 stitches
8 years	13"	11 ³ / ₄ "	8"	108 stitches
9 years	13"	12"	8 ¹ / ₄ "	112 stitches
10 years	13 ¹ / ₂ "	12 ¹ / ₂ "	8 ³ / ₄ "	116 stitches
11 years	14"	13"	9"	120 stitches
12 years	14"	13 ¹ / ₂ "	9 ¹ / ₂ "	124 stitches

The measurements apply to length of

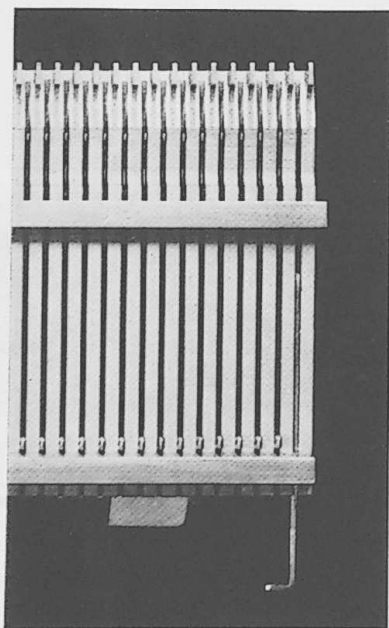
trousers down to leg

leg down to heel (without heel)

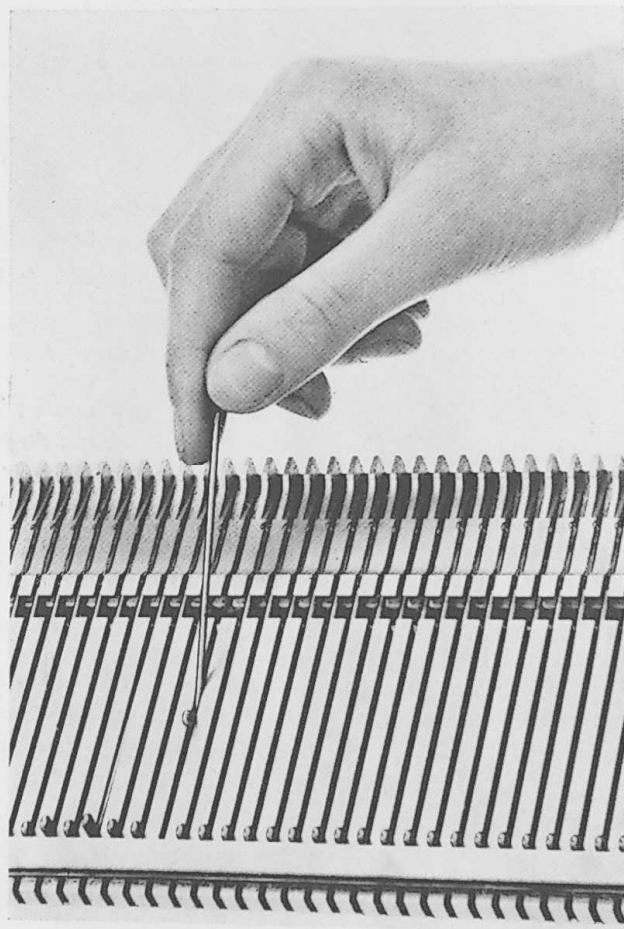
foot including heel and toe

Changing needles

Needles with bent latches: Carefully try to reform needles with bent latches by using thumb and forefinger until they regain their original shape. If this does not work, the needle is best replaced.



III. 27



III. 28

Changing of bent or broken needles: On the needle-bed on which the damaged needle is positioned, pull out cam-box rail fastener to unfasten the blocked rail (Ill. 27). Push rail to the right until damaged needle is free. Insert new needle (Ill. 28). Bring back cam-box rail and secure with rail fastener.

Please note: In case the cam-box rail is removed altogether, i.e. for thorough cleaning of latch needles and cam-box channels, always replace rail from the right.

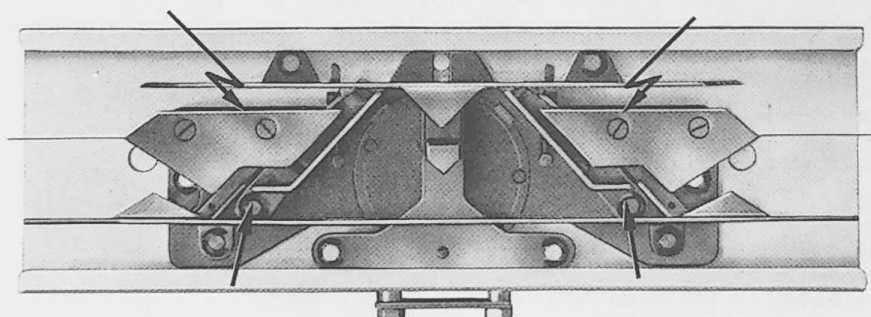
Maintenance of the knitting machine

The life of the hand knitter—as with every other machine—depends on good maintenance. Necessary repairs are usually the result of careless use and neglect.

Always cover the machine with a clean cloth when it is not in use. Before using it again, remove all particles of wool and dust from the needle grooves and the cam-box channels with a soft brush and, when necessary, oil very lightly.

Oil sparingly, but regularly, with sewing machine oil (not salad oil or glycerine). Oil needle butts and cam-box rails lightly. The parts which should be oiled very lightly are shown in Ill. 29. After applying oil, wipe clean with a soft cloth to remove all surplus oil.

After a period of either excessive use or no use at all, it is sometimes necessary to clean all needles and needle grooves and cam-box channels very thoroughly. To do this, remove both cam-box rails, pulling to the right, take out all needles, wash needles in benzine and shake in a few drops of oil. Dust needle grooves and cam-box channels with a hard brush or wash in benzine a brush pencil. Replace the needles and insert cam-box rails from the right.



Ill. 29

Fault finding

Cam-box movement heavy

Wool tension too tight. Loosen the tension screw a little and ensure that the tension wire bends sufficiently.

Stitch size is either too large or too small.

Needles and cam-box rails are too dry (see maintenance).

The wool is twisted too roughly or too loose. Pass rough wool over a piece of paraffin wax or candle before winding on the ball.

When using very thick wool and the largest stitch size setting is not sufficient any more for single-bed knitting, knit with every other needle.

Cam-box jammed

Jamming is caused by:

- a) A needle being in the wrong position. Note: Needles in H.P. or R.P. were not hard against the cam-box rail causing one needle to be drawn into W.P. To ensure against this, see that butts of needles in R.P. are right down on the lower cam-box rail and that butts of needles in H.P. are always touching upper cam-box rail.

The stitch size control or stitch type control are not properly engaged in position chosen.

The empty needles are not all in parallel direction or cam-box is passed too fast through empty needles.

- b) Careless handling or forcing of racking wheel (needles get mixed up).

Handling of jammed cam-box

Never force cam-box, try to remove jammed cam-box with utmost care, as follows:

- a) Put stitch type control on 0 (needles are out of action) and carefully move cam-box. Turn stitch size control anticlockwise and engage a number smaller. If cam-box still cannot be moved, turn stitch size control anticlockwise over 1 until the small arrow points straight downwards. Try to move cam-box again. This should rectify the jamming. If this does not show the desired result (extreme case), remove cam-box rail as described on page 26 and take off cam-box.
- b) Turn racking wheel lightly to find out on which side the needles are jamming, then turn wheel to the opposite side. If this does not produce a result, proceed as described under a).

End stitches may drop if:

The weighted comb does not pull evenly and weighs only on one side.

The comb is not re-hung often enough.

Not enough weight on.

The comb rests on the table top.

The side weights are not used or re-hung often enough.

Edge needle is out of formation (i.e. see rule for casting on page 11), when racking, possibly add 1 needle.

The bristles of the brushes are broken or bent (cut if necessary).

The stitch size is incorrect for the type of wool used (too loose or tight).

The cam-box has been moved too far away from the end needle, causing wool to become slack. You can restore adequate tension by pulling the wool behind the tension screw.

The wool brake is not adjusted tight enough.

Tension wire is incorrect (when free it should point vertically).

Other stitches may drop if:

Needle latches are bent or broken (see needle changing on page 26).

Irregular knitting can be caused:

When the stitch control is not properly engaged in its chosen position.

By incorrect use of the racking wheel or

By wrong positioning of the racking wheel.

The wool thread breaks if:

The stitch size control is put more than two numbers higher at a time.

For circular knitting it should only be one number higher at a time.

The racking wheel is turned for more than two numbers. Usually, the racking wheel is turned by only one number. When changing two positions at a time, change tension accordingly (looser).

Knitting Patterns

Lace Patterns

Lace patterns are knitted on single-bed. With single transfer tool, transfer stitches onto the adjacent needle to the side. The empty needles with open latches are left in W.P. When pushing cam-box over next row, the empty needle is automatically threaded and produces a normal stitch in the second row.

To create lace patterns, always transfer stitches after every second row.

When working on the double-bed knitting lace patterns, the edge stitches may be transferred from front to rear bed and vice versa.

Crossed stitch patterns (cable)

To create these patterns, transfer stitches from the front or the rear needle-bed onto the transfer tools, cross and hang exchanged stitches back onto needles.

For crossed stitch patterns, set stitch size control one number higher than for plain knitting.

For crossed stitch patterns in purl knitting (crossed stitches on the front needle-bed), the tension is set equal to the one for racking patterns (see racking patterns).

Lace patterns with needles in H.P. are only knitted on single-bed: For lace patterns (for instance pattern No. 42 to 46) needles are pushed into H.P. with the needle selectors (39) at certain intervals, then knit one or several rows and push back needles into W.P. Whilst taking back needles in H.P. to W.P., push them into U.W., i.e. $\frac{3}{8}$ " back with open latches and knit one row.

In case you put every second needle into H.P., you can knit 1—2 rows after. If there is every 4th—6th needle in H.P., you can knit 3—4 rows only according to ply-wool.

Use side weights with these patterns and re-hang as required.

Imitation Fair-Isle Patterns

The imitation fair-isle knitting allows you to knit in a simple and fast manner using two colours (sample pattern No. 48 and 49). The two colours are knitted both one after another and simultaneously. Therefore, it is advisable to use every other needle for the second colour. This has to be taken into consideration for the calculation of the garment, because the row counter only counts one row at a time.

Mode of operation: Thread basic colour through wool feed and wool guide. Set needles which are meant to be knitted in second colour into U.W. (Page 7). Note: last row of knitting passes behind latch). Lay wool into these needles from the side of the cam-box which is very important. Push back needles until needle latches close over threaded wool. Push cam-box over the knitting and hold second colour loose in hand.

Original Fair-Isle Patterns

To create original fair-isle (see patterns No. 50 to 52). **Knit all the different shades in the same row one after another.**

Mode of operation: Stitch type control on cam-box is put to 0. Disconnect basic colour from wool feed and wool guide. Along the whole pattern, knit **with your needles in U.W. and feed wool by hand.**

According to pattern, set the group of needles used for the first colour (also basic colour) on U.W., thread wool into these needles and push back needles until latches close on this wool. Then push cam-box over the knitting. Return cam-box to the other side (empty). Put needles used for second shade into U.W., thread desired shade, push back needles until the latches close on this wool and push cam-box over knitting. Repeat same operation for all other shades used in the same row.

Please note:

It is important that the wool is fed always from the side of the cam-box, for instance if cam-box is positioned to the right, feed wool right to left. Make sure needles in U.W. have their latches open. When counting rows for original fair-isle patterns, please note that the cam-box is pushed several times to knit one row, all rows being counted by the row counter, therefore, giving a false reading.

Racking pattern

The racking wheel may be put on 7 different positions, thus moving front needle-bed from one needle position to the right or to the left with every number.

Racking is possible with basic ribbing patterns, with fishermans rib and single fishermans rib. Needles may be selected according to your taste.

If needles are in the same proportion on both needle-beds, stitch size control is the same as for ribbing, fishermans rib or single fishermans rib.

Should the design used require more needles in W.P. on one of the needle-beds, they should always be on the rear needle-bed, with stitch size control 1—2 numbers higher.

Should all or almost all of the needles on front and rear bed be in W.P., both stitch size controls have to be put 2—3 numbers higher.

When knitting an indicated pattern, please follow the instructions very closely. Observe correct needle setting and racking sequence. Without any particular instructions, cam-box is always positioned to the right.

Please note:

Only operate racking wheel when the cam-box is free from needles.

The racking wheel has to engage properly into the desired position.

Do not change racking wheel to over more than two numbers at a time and preferably turn stitch size control looser.

Use side weights and re-hang frequently. This is especially necessary for patterns which are racked over several needles.

Please observe position of needles that face each other at the edges of the knitting to avoid stitches dropping. Should you, after finishing rib, select extra needles for pattern, the machine may not automatically put stitches onto these needles. Therefore, pick up loop of previous row and hang on empty needle.

Weaving patterns

This pattern is produced by laying across the needles a thread of thick wool which is not actually knitted. The result resembles a weaved fabric of great firmness. Weaving patterns are used for jackets, coats, covers, cushion covers, skirts, shawls, waistcoats, etc.

Any type of wool can be used for the weaving rows as long as it is slightly thicker than the basic material for which 2 or 3-ply wool is best used. For weaving, wick wool, nap wool or home spun wool may be used. Even carpet wool can be used and carpeting can be produced if the basic knitting texture is strong and tight. It is best to use a good 2-ply machine yarn for this.

Weaving is quite simple and does not take much time. When a row of knitting is completed, lay your weaving thread across between the needle heads and run cam-box over. The thread is now closed in by two rows of knitting. When using very thick or fibrous wool, it is best to press down thread onto the texture with your finger or the flat side of working tool before pushing cam-box over slowly.

Please note: The wool may stay on one side.

When feeding wool to the other side, disconnect front cam-box, thread wool in front of cam-box and lay across needles on the other cam-box with little tension. Close cam-box and knit.

Elastic band

An elastic band can be included in the same way to produce an elastic edge. It can be adjusted according to the degree of elasticity required.

Lacy ribbed patterns on double-bed—position of stitch type on F = **Lacy ribbed pattern**.

The stitch type position F (for lacy ribbed patterns) can only be used when knitting on both beds. Lacy ribbed pattern knitting on the single-bed, with the needles in H.P. is quite different.

The F-position (lacy ribbed patterns) can only be used together with the position N (normal knitting), e.g. 2 rows F, one row N and so on changing continuously.

It is easier to keep control if you always use the front needle-bed for the position F. At the same time, the stitch type indicator of the rear needle-bed should be on **position N = normal**.

The stitch size should be quite loose on both cam-boxes.

The patterns No. 30—38 are examples for typical lacy ribbed patterns:

The F patterns may also be racked.

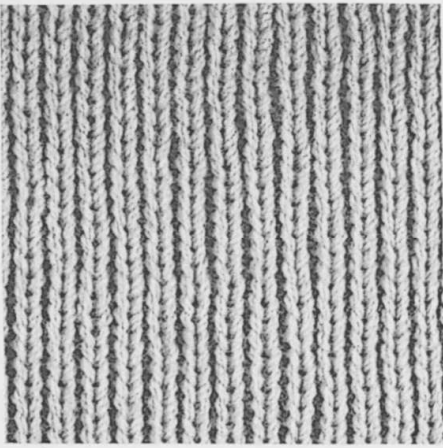
Explanation of abbreviations for descriptions of patterns

R.B.	=	Rear needle-bed
F.B.	=	Front needle-bed
*N	=	Normal knitting—stocking stitch for single-bed —ribbing for double-bed
*P	=	Patent (Fishermans rib)
*O	=	Free wheeling of cam-box
*F	=	Lacy ribbed patterns
Ne	=	Needles
R	=	Row
	=	Needle in working position
.	=	Needle in rest position
0	=	Empty needle in working position
V	=	Racking
—	=	Knit one row
=	=	Knit two rows
*		Stitch type positions

When knitting two-coloured rows, it is of an advantage not to lay thread into automatic wool feed but into wool guide only and to bring wool end from the left side by hand. When starting to knit a row, put little tension on thread, but leave loose in the knitting row.

This mode of operation facilitates the quick change of colours.

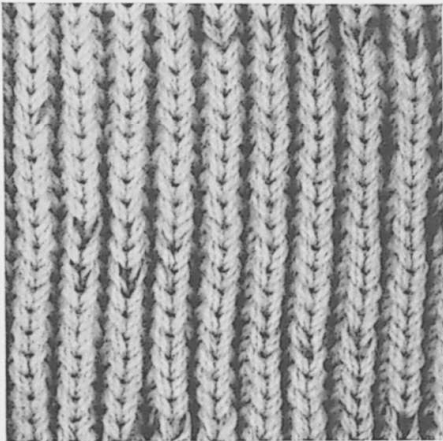
It also saves time to choose an even number of rows for the change of colours, so that colours may be changed on the same side always.



Design 1

R.B. $\frac{N}{N}$ 1.1.1.1.1.1.1.1
 F.B. $\frac{N}{N}$ 1.1.1.1.1.1.1.1

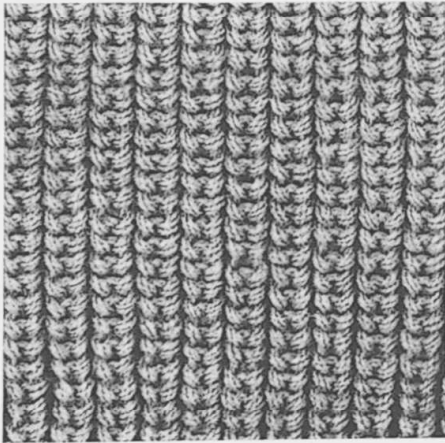
Knit 1 purl 1 rib.
 Racking wheel on $\frac{1}{2}$.



Design 2

R.B. $\frac{P}{P}$ 1.1.1.1.1.1.1.1
 F.B. $\frac{P}{P}$ 1.1.1.1.1.1.1.1

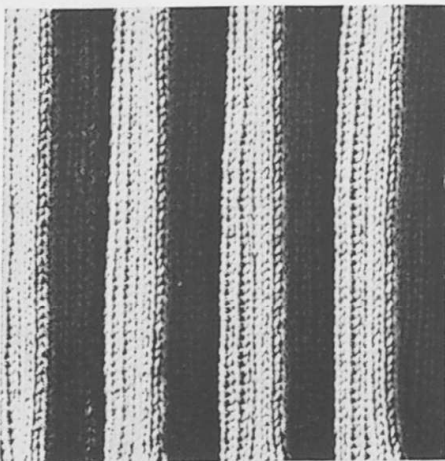
Full pattern fishermans rib.
 Racking wheel on $\frac{1}{2}$.



Design 3

R.B. $\frac{N6}{P5}$.1.1.1.1.1.1.1.1
 F.B. $\frac{N6}{P5}$.1.1.1.1.1.1.1.1

Half-pattern fishermans rib.
 Racking wheel on $\frac{1}{2}$.



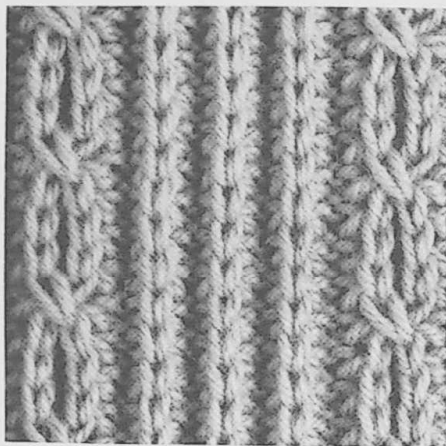
Design 4

Pleats. Ribbing with all needles. It is best to use thin 2-ply machine wool. The distance between the two empty needle groups can be adjusted to determine the distance between the pleats.

Racking wheel on 1.

R.B. $\frac{N}{N}$ | | | | . . | | | | | | | | | | . . | | | | | | | | | |
 F.B. $\frac{N}{N}$ | | | | | | | | | | . . | | | | | | | | | | | | | |

and so on.



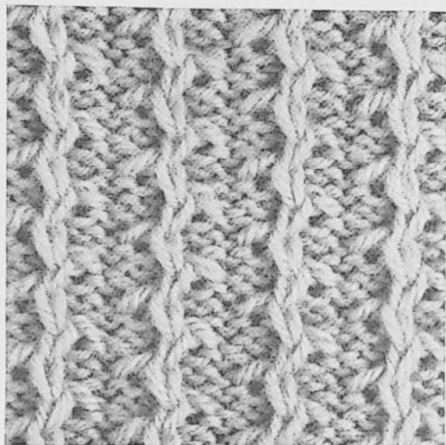
Design 9

Cast-on and knit hem (every other needle). Racking wheel on $\frac{1}{2}$. Then put racking wheel on 1 and transfer stitches as follows:

R.B. $\frac{N}{P}$ | | | | | | | | | | | | | | | | | | | |
 F.B. $\frac{P}{N}$ | . . . | . . . | . . . | . . . | . . . |
 a b a b

Stitch size: R.B. 2 numbers higher than for normal rib
 F.B. 1 number higher than for normal rib

Cam-box on left.
 Cross stitches a and b after each 8th row.



Design 10

Cast-on and knit hem (every other needle). Racking wheel on $\frac{1}{2}$. Then put racking wheel on 1 and transfer stitches as follows:

R.B. $\frac{N}{P}$ | | | | | | | | | | | | | | | | | | | |
 F.B. $\frac{P}{N}$ | . . . | . . . | . . . | . . . | . . . |

Stitch size: R.B. 2 numbers higher than for normal rib
 F.B. 1 number higher than for normal rib

Cam-box on left.
 V: = 3 = 1 = 3 = 1 etc.



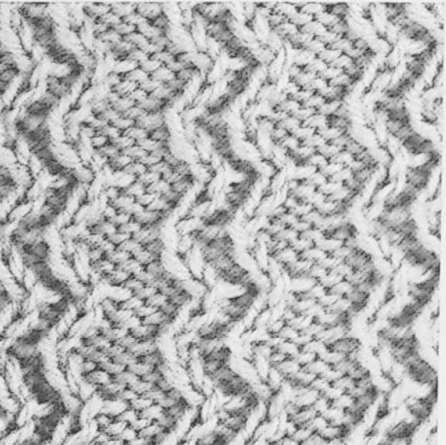
Design 11

Cast-on and knit hem (every other needle). Racking wheel on $\frac{1}{2}$. Then put racking wheel on 1 and transfer stitches as follows:

R.B. $\frac{N}{P}$ | | | | | | | | | | | | | | | | | | | |
 F.B. $\frac{P}{N}$ | . . . | . . . | . . . | . . . | . . . |

Stitch size: R.B. 2 numbers higher than for normal rib
 F.B. 1 number higher than for normal rib

Cam-box on left.
 V: = 2 = 1 = 2 = 1 etc.



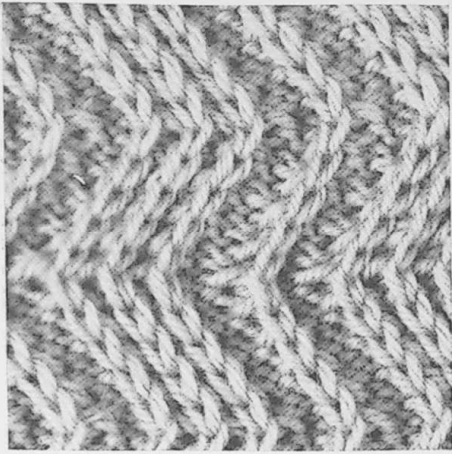
Design 12

Cast-on and knit hem (every other needle). Racking wheel on $\frac{1}{2}$. Then put racking wheel on 1 and transfer stitches as follows:

R.B. $\frac{N}{P}$ | | | | | | | | | | | | | | | | | | | |
 F.B. $\frac{N}{P}$ | . . . | . . . | . . . | . . . | . . . |

Stitch size: R.B. 2 numbers higher than for normal rib
 F.B. same as for normal rib

V: * - 2 - 3 - 4 - 3 - 2 - 1 and repeat from *.



Design 13

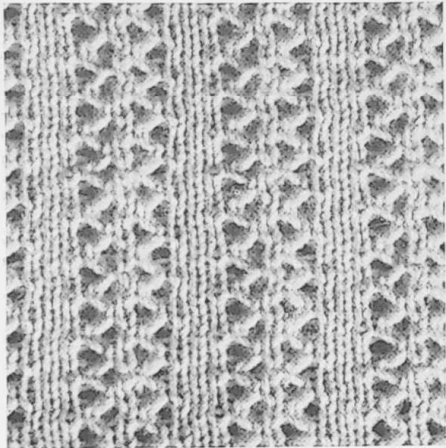
Cast-on and knit hem (with all needles). Racking wheel on 1.
Then transfer stitches as follows:

R.B. $\frac{N}{P}$ | | | | | | | | | | | | | | | | | | | |
F.B. $\frac{P}{N}$ | . . | | | | . . | | | | . . |

Stitch size: R.B. 2 numbers higher than for normal rib
F.B. 1 number higher than for normal rib

Cam-box to left.

V: * = 2 = 3 = 4 = 5 = 6 = 5 = 4 = 3 = 2 = 1 from * repeat.



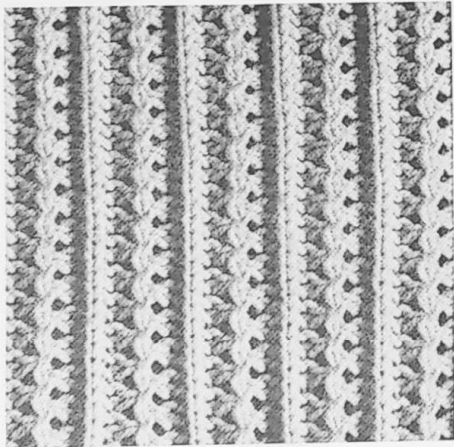
Design 14

For cast-on and hem (every other needle) racking wheel on $\frac{1}{2}$.
Then transfer stitches as follows:

R.B. $\frac{N}{P}$ | | | | | | | | | | | | | | | | | | | |
F.B. $\frac{P}{N}$ | . . . | | | . . . | | |

Stitch size: R.B. 2 numbers higher than for normal rib
F.B. 1 number higher than for normal rib

V: = 2 = 1 = 2 = 1 etc.



Design 15

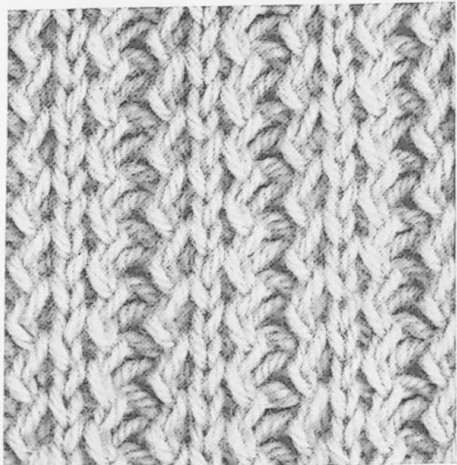
For cast-on and hem (every other needle) racking wheel on $\frac{1}{2}$.
Then put racking wheel on 1 and transfer stitches as follows:

R.B. $\frac{P}{N}$ | . | . | . | . | . | . | . | . | . | . |
F.B. $\frac{N}{P}$ | . . | . . | . . | . . | . . | . . | . . |

Stitch size: as for normal rib

Cam-box to left.

V: = 2 = 1 = 2 = 1 etc.



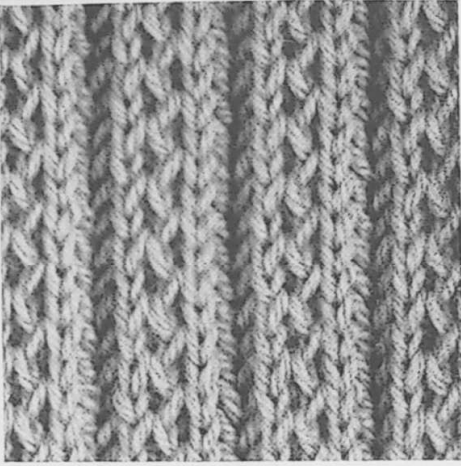
Design 16

For cast-on and hem (every other needle) racking wheel on $\frac{1}{2}$.
Then put racking wheel on 1 and transfer stitches as follows:

R.B. $\frac{P}{N}$ | | | | . | | | | . | | | | . | | | | .
F.B. $\frac{N}{P}$ | . | . | . | . | . | . | . | . | . | . | . |

Stitch size: on both beds one number higher than for normal rib

V: = 2 = 1 = 2 = 1 etc.



Design 17

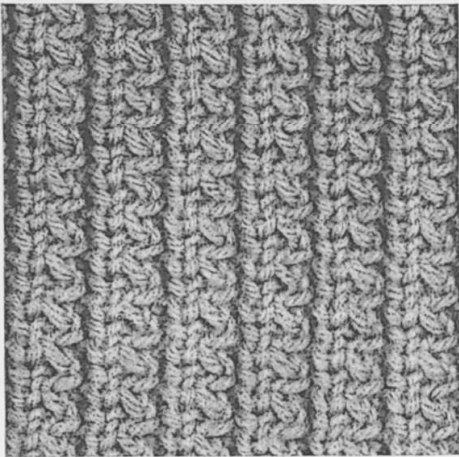
For cast-on and hem (every other needle) racking wheel on $\frac{1}{2}$.
Then put racking wheel on 1 and transfer stitches as follows:

R.B. $\frac{P}{\bar{P}}$ | | | . | | | . | | | . | | |
F.B. $\frac{P}{\bar{P}}$ | . | . | . | . | . | . | . | . | . | . | .

Stitch size: on both beds one number higher than for normal rib

V: = 2 = 1 = 2 = 1 etc.

This pattern can also be done with both controls on N and with only one row knitted between racking.

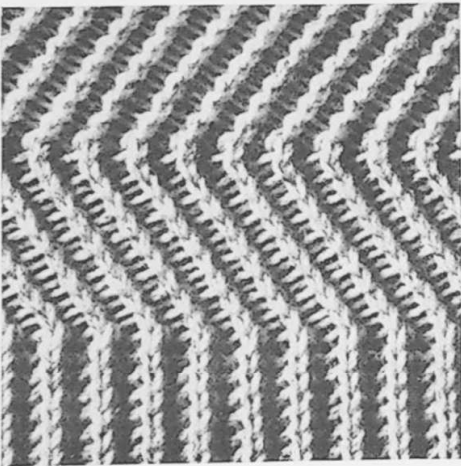


Design 18

For cast-on racking wheel on 2. Then for hem and pattern, racking wheel on 1.

R.B. $\frac{N6}{\bar{P5}}$ | | . | | . | | . | | . | | . | | . | | . |
F.B. $\frac{N6}{\bar{P5}}$ | . | . | . | . | . | . | . | . | . | . | . | .

V: = 2 = 1 = 2 = 1 etc.



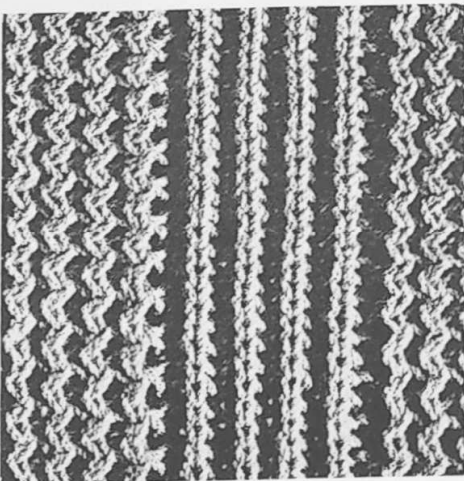
Design 19

For cast-on and hem (every other needle) racking wheel on $\frac{1}{2}$.
Thereafter racking wheel on 1.

R.B. $\frac{P}{\bar{P}}$ | . | . | . | . | . | . | . | . | . | . | . | . | .
F.B. $\frac{P}{\bar{P}}$ | . | . | . | . | . | . | . | . | . | . | . | . | .

Stitch size: both beds equal to normal rib

V: * - 2 - 1 - 2 - 1 etc. and continue for 19 rows. Knit 20th row without racking and repeat from *.



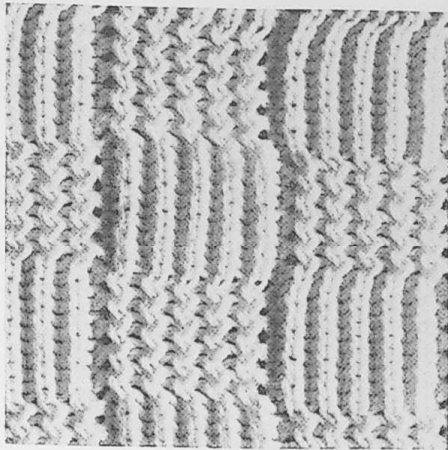
Design 20

For cast-on and hem (every other needle) racking wheel on $\frac{1}{2}$.
Then put racking wheel on 1 and transfer stitches as follows:

R.B. $\frac{P}{\bar{P}}$ | . | . | . | . | . | . | . | . | . | . | . | . | . | .
F.B. $\frac{P}{\bar{P}}$ | . | . | . | . | . | . | . | . | . | . | . | . | . | .

Stitch size: both beds as for normal rib

V: = 2 = 1 = 2 = 1 etc.



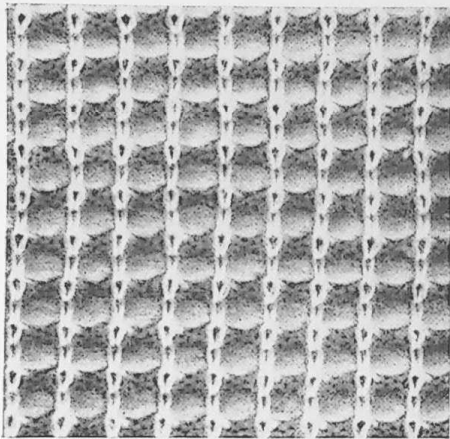
Design 21

For cast-on and hem (every other needle) racking wheel on 1/2. Then put racking wheel on 2 and transfer stitches as follows:

R.B. \overline{P} 1.1.1.1.1.1.1.1.1.1.1.1.1.1
 F.B. \overline{P} 1.1.1.1.1.1.1.1.1.1.1.1.1.1

Stitch size: both beds as for normal rib

V: * = 1 = 2 = 1 = 2 = 1 = 2 = 1 = 2 = 1 = 2 = 3 = 2
 = 3 = 2 = 3 = 2 = 3 = 2 = 3 = 2 repeat from *.



Design 22

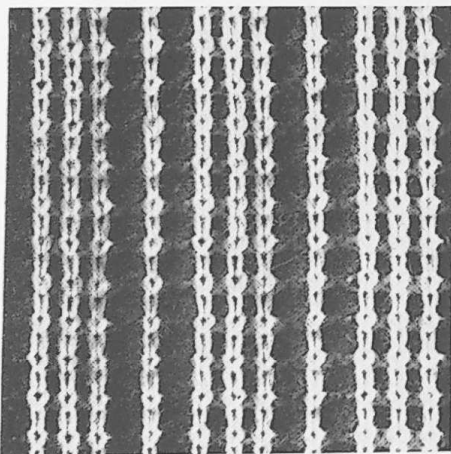
R.B. \overline{N} 1.1.1.1.1.1.1.1.1.1.1.1.1
 F.B. \overline{N} 1.1.1.1.1.1.1.1.1.1.1.1.1

Racking wheel on 1/2.

Stitch size: both beds as for normal rib

Lay across second colour after each 4th row.

Second colour may also be knitted after each 2nd row.



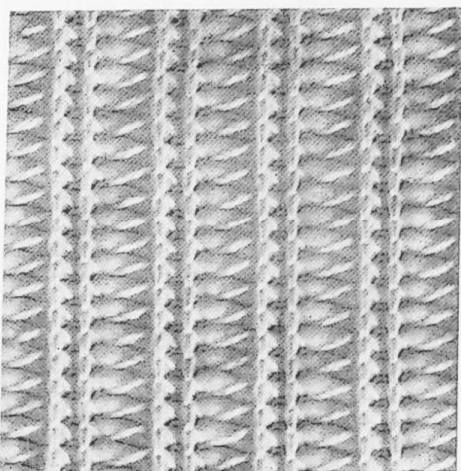
Design 23

For cast-on (every other needle) racking wheel on 1/2. Then transfer stitches as follows:

R.B. \overline{N} 1.1.1.1.1.1.1.1.1.1.1.1.1.
 F.B. \overline{N} 1.1.1.1.1.1.1.1.1.1.1.1.1.

Stitch size: both beds as for normal rib

Lay across second colour after each 2nd row.



Design 24

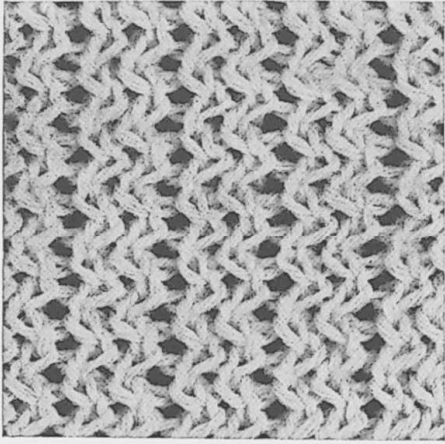
For cast-on (every other needle) racking wheel on 1/2. Then transfer stitches as follows:

R.B. \overline{P} 1.1.1.1.1.1.1.1.1.1.1.1.1.
 F.B. \overline{P} 1.1.1.1.1.1.1.1.1.1.1.1.1.

Stitch size: R.B. as for normal rib

F.B. 1 number higher than for normal rib

Lay across second colour after each 2nd row.



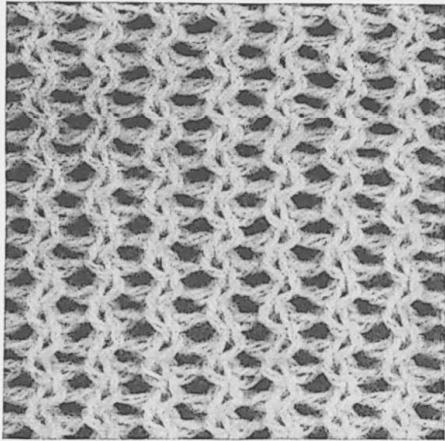
Design 25

For cast-on and hem (every other needle) racking wheel on $\frac{1}{2}$.
Then put racking wheel on 1 and transfer stitches as follows:

R.B. $\frac{N6}{P5}$ 1 . . . 1 . . . 1 . . . 1 . . . 1 . . . 1
F.B. $\frac{P5}{N6}$ 1 . . . 1 . . . 1 . . . 1 . . . 1

V: = 2 = 1 = 2 = 1 = 2 etc.

Pattern for soft wool.



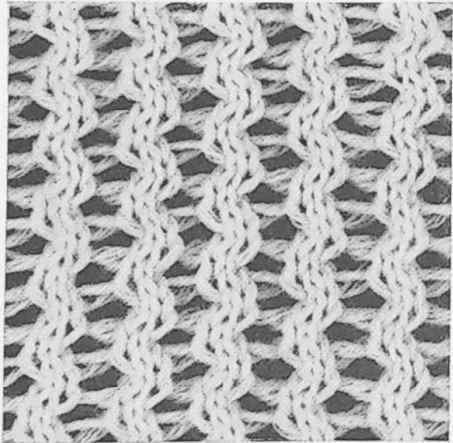
Design 26

For cast-on and hem (every other needle) racking wheel on $\frac{1}{2}$.
Then put racking wheel on 1 and transfer stitches as follows:

R.B. $\frac{N5}{P5}$ 1 . . . 1 . . . 1 . . . 1 . . . 1
F.B. $\frac{P5}{N5}$ 1 . . . 1 . . . 1 . . . 1 . . . 1

V: = 2 = 1 = 2 = 1 = 2 etc.

Pattern suitable for thick and soft wool.



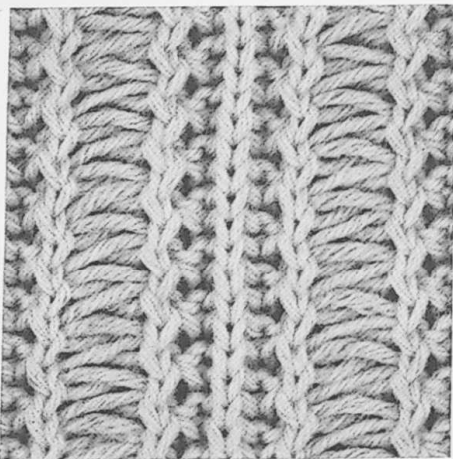
Design 27

For cast-on and hem (every other needle) racking wheel on $\frac{1}{2}$.
Then put racking wheel on 1 and transfer stitches as follows:

R.B. $\frac{N8}{P8}$ 1 1 . . . 1 1 . . . 1 1 . . . 1 1 . . . 1 1 . . . 1 1
F.B. $\frac{P8}{N8}$ 1 . . . 1 . . . 1 . . . 1 . . . 1 . . . 1 . . . 1 . . . 1

V: = 3 = 1 = 3 = 1 etc.

Pattern for soft wool, tension loose.



Design 28

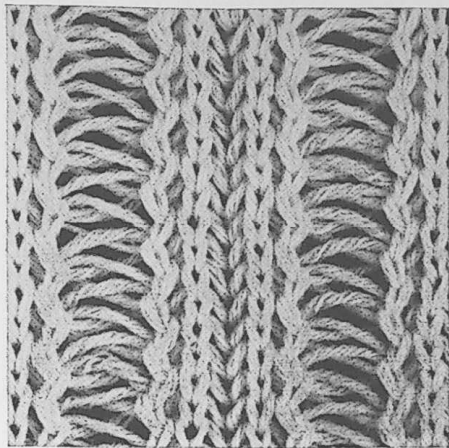
For cast-on and hem (every other needle) racking wheel on $\frac{1}{2}$.
Then put racking wheel on 1 and transfer stitches as follows:

R.B. $\frac{P6}{P6}$ 1 . . . 1 . . . 1 . . . 1 . . . 1 . . . 1
F.B. $\frac{P6}{P6}$ 1 . . . 1 . . . 1 . . . 1 . . . 1 . . . 1

Cam-box to the left.

V: = 2 = 1 = 2 = 1 = 2 etc.

Pattern for soft wool.



Design 29

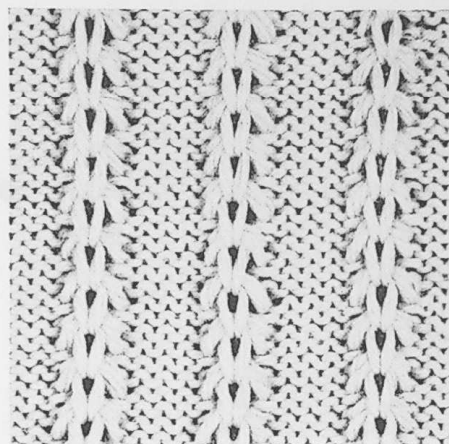
For cast-on and hem (every other needle) racking wheel on $\frac{1}{2}$.

Then put racking wheel on 1 and transfer stitches as follows:

R.B. $\frac{P6}{P6}$ 1.1.1.1.1...1.1.1.1
F.B. $\frac{P6}{P6}$ 1...1...1...1...1...1

V: = 2 = 1 = 2 = 1 etc.

Pattern suitable for soft wool.



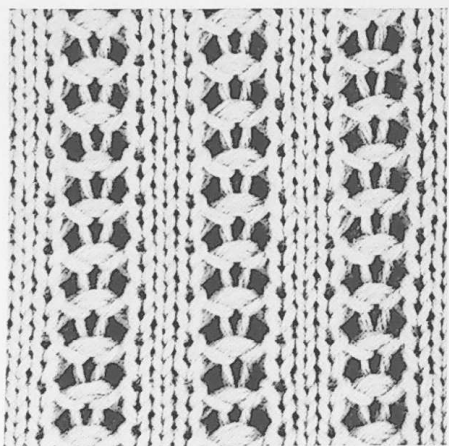
Design 30

For cast-on and hem (every other needle) racking wheel on $\frac{1}{2}$.

Then transfer stitches as follows:

R.B. $\frac{N7}{N7}$ 11.11111.11111.11
F.B. $\frac{N+F7}{N+F7}$...1...1...1...1...

Setting F.B.: 1 row normal
* 2 rows lace (F)
1 row normal. Repeat from *



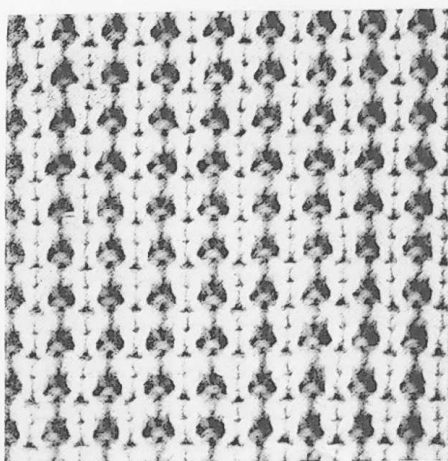
Design 31

For cast-on and hem (every other needle) racking wheel on $\frac{1}{2}$.

Then transfer stitches as follows:

R.B. $\frac{N7}{N7}$ 11...111...111
F.B. $\frac{N+F7}{N+F7}$...1...1...1...

Setting F.B.: 1 row normal
* 2 rows lace
1 row normal. Repeat from *

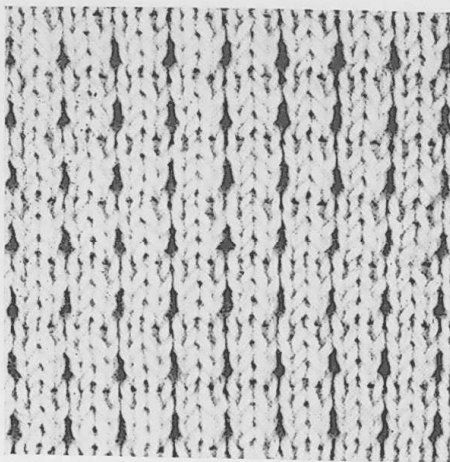


Design 32

Cast-on and hem according to needle setting. Racking wheel on $\frac{1}{2}$.

R.B. $\frac{N5}{N5}$ 1.1.1.1.1.1.1.1
F.B. $\frac{N+F5}{N+F5}$ 1.1.1.1.1.1.1.1

Setting F.B.: 1 row normal
* 2 rows lace
1 row normal. Repeat from *

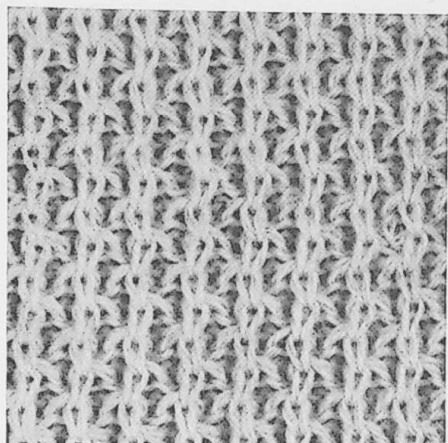


Design 33

For cast-on and hem (every other needle) racking wheel on $\frac{1}{2}$.
Then put racking wheel on 1 and transfer stitches as follows:

R.B. $\frac{N7}{N+F7}$ 1111111111
F.B. $\frac{N7}{N+F7}$. 1 . 1 . 1 . 1 . 1 . 1 .

Setting F.B.: 1 row normal
* 2 rows lace
2 rows normal. Repeat from *



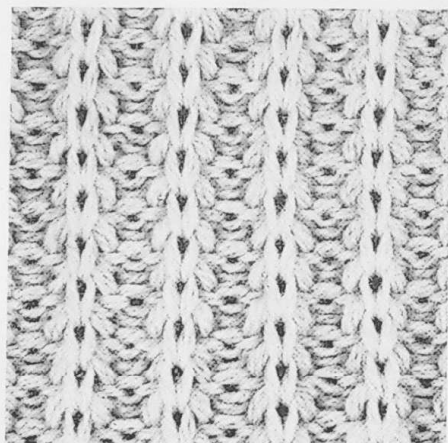
Design 34

For cast-on and hem (every other needle) racking wheel on $\frac{1}{2}$.
Then put racking wheel on 1 and transfer stitches as follows:

R.B. $\frac{N5}{N+F5}$ 1111111111
F.B. $\frac{N5}{N+F5}$ 1 . 1 . 1 . 1 . 1 . 1 .

Setting F.B.: 1 row normal
* 2 rows lace
1 row normal. Repeat from *

V: After every lacy ribbed pattern from * $\cong 2 \cong 1 \cong 2 \cong 1$ etc.
(for thick 2-ply wool)

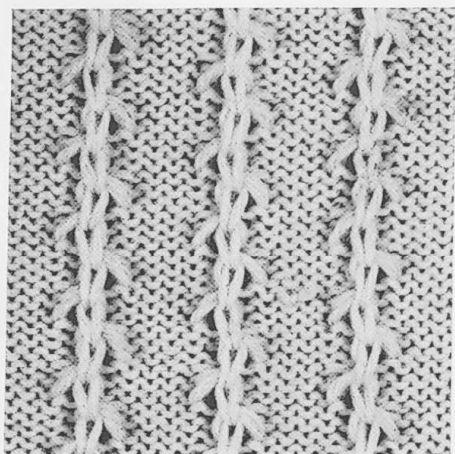


Design 35

For cast-on and hem (every other needle) racking wheel on $\frac{1}{2}$.
Then transfer stitches as follows:

R.B. $\frac{N7}{N+F7}$ 1 . 1 . 1 . 1 . 1 . 1 . 1 . 1 . 1 . 1 .
F.B. $\frac{N7}{N+F7}$. 1 . . . 1 . . . 1 . . . 1 . . .

Setting F.B.: 1 row normal
* 2 rows lace
1 row normal. Repeat from *



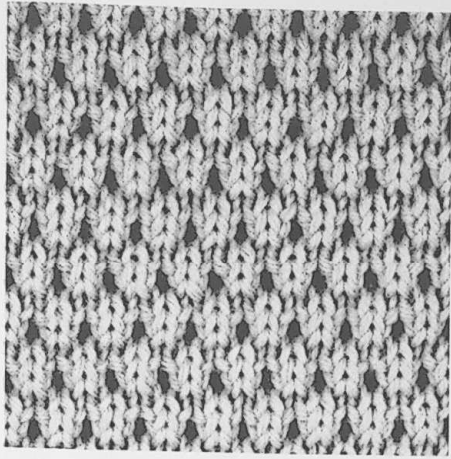
Design 36

For cast-on and hem (every other needle) racking wheel on $\frac{1}{2}$.
Then put racking wheel on 1 and transfer stitches as follows:

R.B. $\frac{N6}{N+F6}$ 11111111111111
F.B. $\frac{N6}{N+F6}$. 1 1 1

Setting F.B.: 1 row normal
* 2 rows lace
1 row normal. Repeat from *

V: After every lacy ribbed pattern from * $\cong 2 \cong 1 \cong 2$ etc.



Design 37

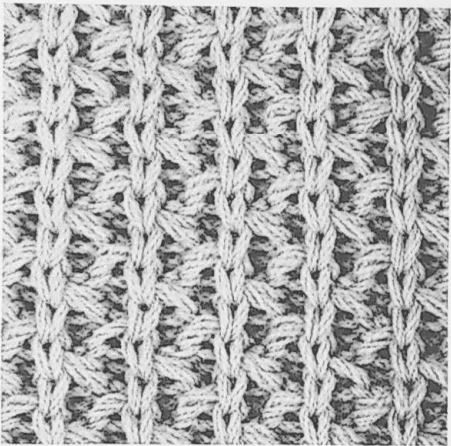
For cast-on and hem (every other needle) racking wheel on $\frac{1}{2}$.

Then put racking wheel on 1 and transfer stitches as follows:

R.B.	$\frac{N7}{N7}$	11111111111111
F.B.	$\frac{N+F7}{N+F7}$	1.1.1.1.1.1.1.1.

Setting F.B.: 1 row normal
* 2 rows lace
2 rows normal. Repeat from *

V: from * $\equiv 2 \equiv 1 \equiv 2 \equiv 1$ etc.



Design 38

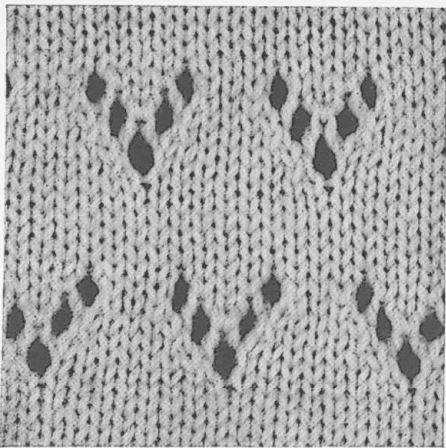
For cast-on and hem (every other needle) racking wheel on $\frac{1}{2}$.

Thereafter racking wheel on 1.

R.B.	$\frac{N6}{N6}$	1.1.1.1.1.1.1.1.1.1.
F.B.	$\frac{N+F6}{N+F6}$.1.1.1.1.1.1.1.1.1.1.

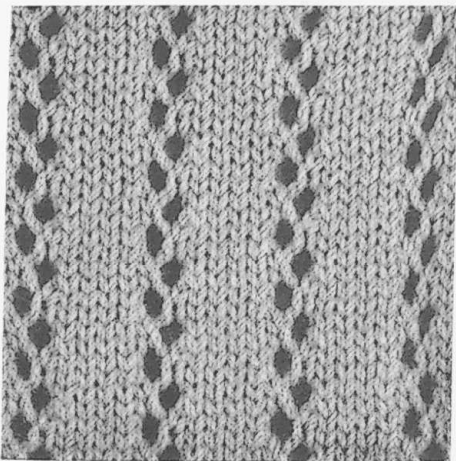
Setting F.B.: 1 row normal
* 2 rows lace
1 row normal. Repeat from *

V: from * $\equiv 2 \equiv 1 \equiv 2 \equiv 1$ etc.



Design 39

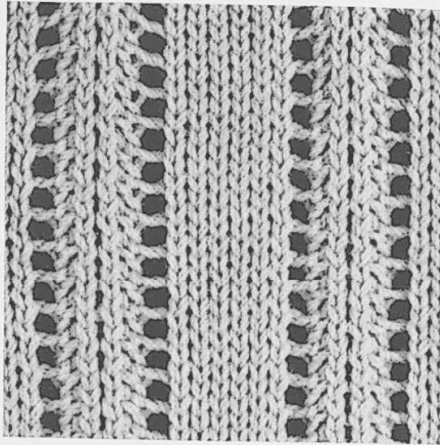
Transfer each 8th stitch with single transfer tool onto neighbouring needle. Always keep emptied needles with open latches in W.P. Knit two rows, then transfer 7th stitch onto left neighbouring needle and 9th stitch onto right needle at the side. Knit 2 rows, then transfer 6th stitch to the left and 10th stitch to the right neighbouring needle. Knit 6 rows and repeat whole pattern vice versa.



Design 40

Transfer every 6th stitch to the right onto neighbouring needle using single transfer tool. Always keep emptied needles with open latches in W.P. Knit 2 rows.

Then transfer left neighbouring stitch to first lace pattern stitch (being each 6th stitch) onto the left side. Knit two rows. Again transfer the first stitches (each 6th stitch) to the right side. Knit two rows and continue repeating.



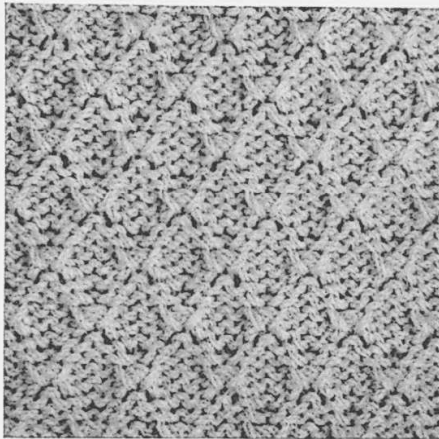
Design 41

This pattern needs 6 needles within the knitting. * Take off 1st and 2nd stitch (13th and 14th stitch) with double transfer tool and transfer onto 2nd and 3rd needle (14th and 15th needle).

Take off 5th and 6th stitch (17th and 18th stitch) and transfer onto 5th and 4th needle (17th and 16th needle).

Always leave emptied needles with open latches in W.P.

Knit 2 rows and repeat from * continuously.



Design 42

R.B. N I
 a b a b a

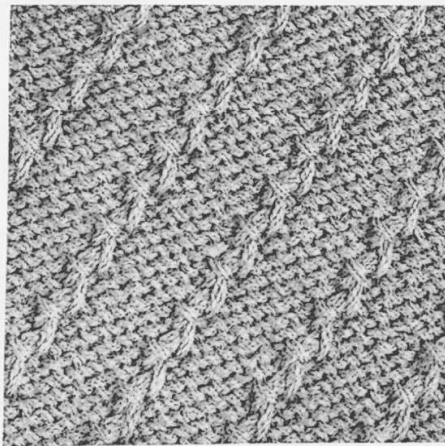
Knit two rows.

* Push needles a into H.P. Knit 3 rows.

Transfer needles from H.P. to U.W. and knit 2 rows.

Push needles b into H.P. Knit three rows.

Needles in H.P. into U.W., then knit two rows and repeat from * continuously.



Design 43

R.B. N I
 a b c a b c

Knit 2 rows, transfer needles a (each 4th needle) into H.P.

Knit 2 rows, transfer needles in H.P. to U.W.

Needles b (each 4th needle by 1 needle to the right) into H.P.

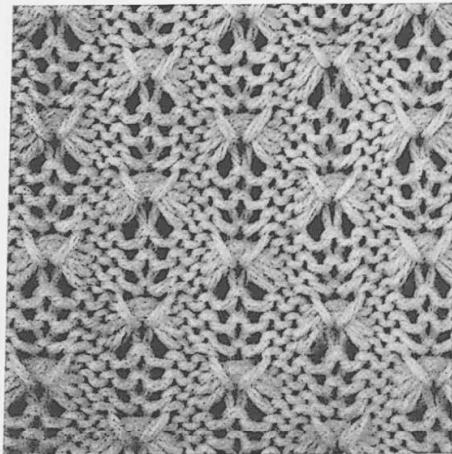
Knit 2 rows. Transfer needles in H.P. into U.W.

Transfer needles c (every 4th needle) to H.P.

Knit 2 rows etc.

Repeat pattern moving 1 needle to the right and continue to put each 4th needle into H.P.

Always re-start pattern from the left edge.



Design 44

R.B. N I I . I . I I . I . I I . I . I I . I . I I . I . I I . I I
 a b a b

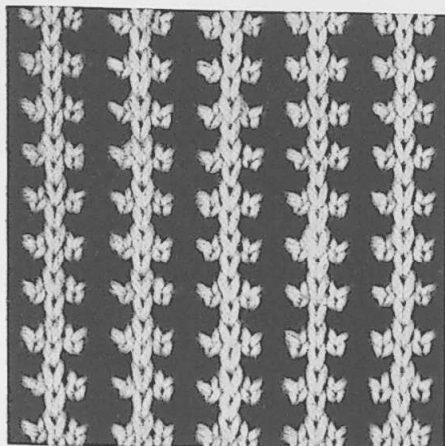
Knit 4 rows.

* Transfer needles a into H.P.

Knit 4 rows. Transfer needles in H.P. into U.W.

Transfer needles b into H.P.

Knit 4 rows. Push needles in H.P. into U.W. and repeat continuously from *.



Design 45

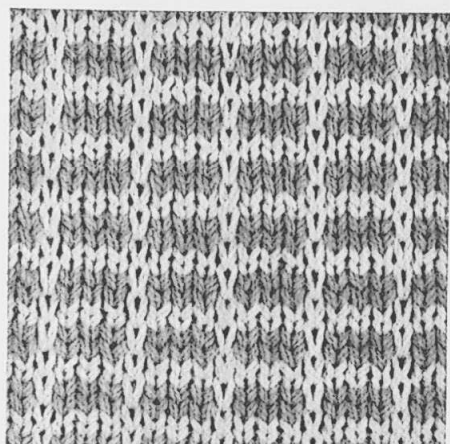
R.B. N | | | | | | | | | |
 a b a b

2 rows with basic colour.

* Push needles a in H.P. 2 rows contrasting shade.

Push needles in H.P. into U.W. and put needles b into H.P.

2 rows basic colour. Push needles in H.P. into U.W. and repeat from * continuously.



Design 46

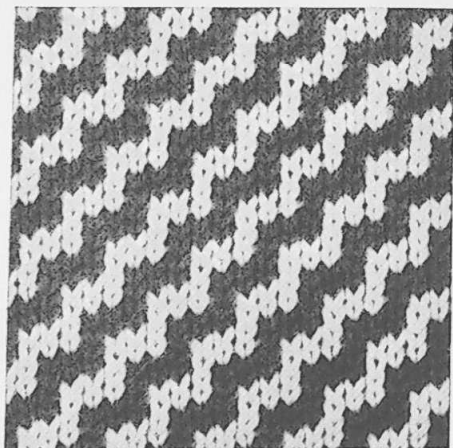
R.B. N | | | | | | | | | | | | | | | | | | | | | |
 a a a a

2 rows first shade. Put needles a in H.P.

2 rows contrasting shade. Transfer H.P. needles to U.W.

2 rows first shade. Put needles a in H.P.

2 rows contrasting shade. H.P. needles into U.W., etc.



Design 47

R.B. N | | | | | | | | | | | | | | | | | | | | | |
 a b c a b c a b c

2 rows basic colour. Push needles a (each 4th needle) into H.P.

2 rows contrasting shade. Change H.P. needles to U.W.

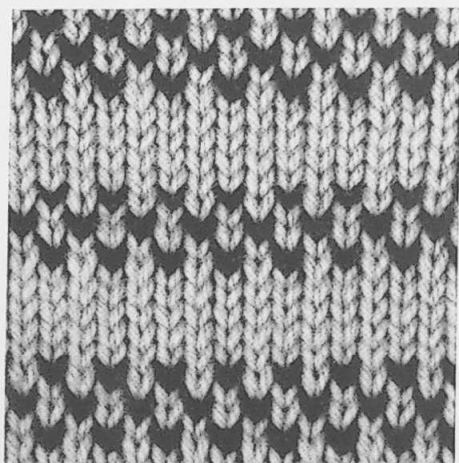
Transfer needles b (every 4th needle by 1 needle more to the right) to H.P.

2 rows basic colour. Transfer H.P. needles to U.W.

Needles c (each 4th needle) into H.P.

2 rows contrasting shade. Needles in H.P. into U.W.

Moving 1 needle to the right continue to put each 4th needle into H.P.



Design 48

For detailed information on Fair-isle knitting (imitation) see page 29

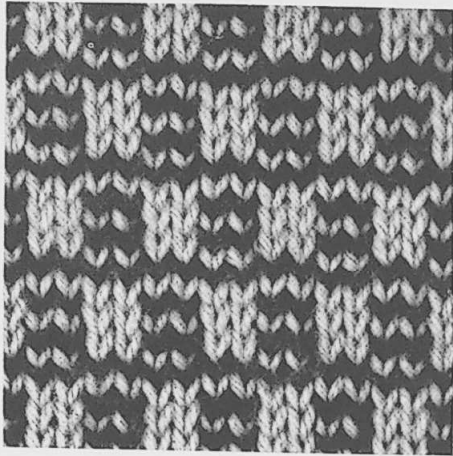
* — knit 4 rows.

— 5th row: Push each 2nd needle with open latch into U.W. (green working tool). Insert contrasting shade. Push back needles. Knit 1 row.

— 6th row same as 5th row with the pattern crossed.

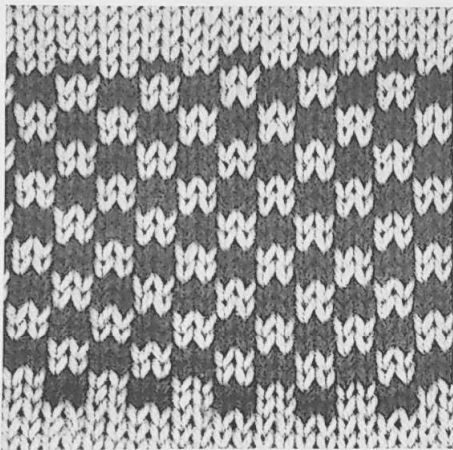
— 7th row same as 5th row.

— repeat from *.



Design 49

- * — 1st row: All needles with open latches into U.W. (green working tool, reverse side. Lay across contrasting shade, push back needles and knit 1 row.
- 2nd row: Put 1st, 2nd, 5th, 6th, 9th, 10th needle etc. with open latches in U.W. (yellow working tool). Insert contrasting shade and knit 1 row.
- 3rd row same as 2nd.
- from * repeat crossed pattern.



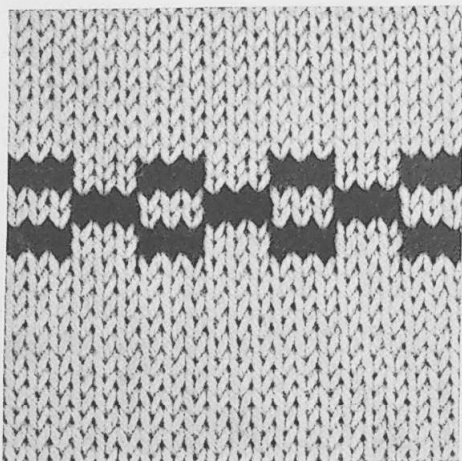
Original Fair-isle patterns

For detailed information on original Fair-isle knitting, see page 29

Design 50

Stitch type control for whole pattern on 0.

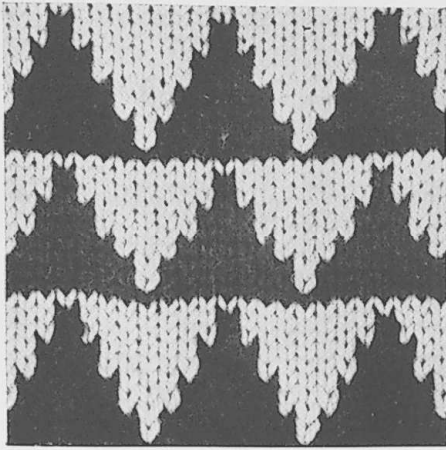
- * — 1st row: Put 1st, 2nd, 5th and 6th, 9th and 10th needle etc. in U.W. (yellow tool). Lay across basic colour, push back needles and push cam-box over the knitting and return it (empty) to the other side. Put 3rd, 4th, 7th, 8th, 11th and 12th needle etc. in U.W. Lay across contrasting shade, push back needles and push cam-box over knitting.
- 2nd row same as 1st.
- from * repeat pattern (crossed).



Design 51

Knit with basic colour. Disconnect thread from wool guide.

- 1st row of pattern: Push 1st—3rd, 7th—9th, 13th—15th needle etc. into U.W. Insert basic colour. Push back needles and push cam-box over knitting. Return cam-box to other side (empty). Transfer 4th—6th, 10th—12th, 16th to 18th needle into U.W. Lay across one contrasting shade, push back needles and push cam-box over knitting.
- 2nd row of pattern same as 1st.
- 3rd row of pattern: knit 1st—3rd, 7th—9th, 13th—15th needle with second contrasting shade as described above.
- 4th row: same as 3rd.
- 5th row: same as 1st and 2nd row of pattern.



Design 52

Knit with basic colour. Disconnect thread from wool guide. Knit pattern same as Original Fair-isle.

Sample of colours: basic colour: silver grey, 1 contrasting shade: red, 2nd contrasting shade: green.

- 1st row: red.
- 2nd row: 1st—7th needle, 9th—15th, 17th—23rd needle red, 8th, 16th, 24th needle etc. basic colour grey.
- 3rd row: same as 2nd row.
- 4th row: 2nd—6th, 10th—14th, 18th—22nd needle etc. red, 1st, 7th—9th, 15th—17th, 23rd—25th needle etc. grey.
- 5th row: same as 4th row.
- 6th row: 3rd—5th, 11th—13th, 19th—21st needle etc. red, 1st and 2nd, 6th—10th, 14th—18th, 22nd—26th needle etc. grey.
- 7th row: same as 6th row.
- 8th row: 4th, 12th, 20th needle etc. red, 1st—3rd, 5th—11th, 13th—20th needle etc. grey.
- 9th row: same as 8th row.
- 10th row: grey.

Repeat this pattern from 11th—20th row with the colours green and grey. From 21st row onwards, repeat from 1st to 10th row.

Before commencing to knit any garment, it is advisable to make a sample square of knitting as set out hereunder:

If really good results are to be obtained, this test square must not be too small. (The wool can, of course, be unravelled later on.) It is best to cast on **50 stitches** and knit **50 rows** in the selected stitch size and the desired knitting pattern. Then remove the piece from the knitter, pull it lengthways several times and afterwards let it lie for some time. It will thus assume the same stitch pattern as the finished work. Pin the «rested» test square to a base board, avoiding distortion. Next cut out a square of soft cardboard 4" high by 4" wide. Place the cardboard on the test square and count the number of stitches fitting the 4" width and the number of rows fitting the 4" height. From this information it is possible to calculate the number of stitches for the width and the number of rows for the height on the model sketch.

Example: Supposing that in the test square 30 stitches have been found for a width of 4" and that 16" is entered on the sketch for the lower edge of a sweater (casting on edge), then we have the following calculation:

$$\begin{aligned}
 4'' &= 30 \text{ stitches} \\
 1'' &= 30 \div 4 = 7\frac{1}{2} \text{ stitches} \\
 16'' &= 16 \times 7\frac{1}{2} = \mathbf{120 \text{ stitches.}}
 \end{aligned}$$

Or supposing that in the stitch sample 45 rows have been counted for a height of 4" and according to the sketch 20" are required for the overall height of the sweater, the following calculation is obtained:

$$\begin{aligned}
 4'' &= 45 \text{ rows} \\
 1'' &= 45 \div 4 = 11\frac{1}{4} \text{ rows} \\
 20'' &= 20 \times 11\frac{1}{4} = \mathbf{225 \text{ rows.}}
 \end{aligned}$$

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