

THE "SUN" CIRCULAR KNITTING MACHINE

INSTRUCTION
BOOK

ESTAB.
1865

THE HARRISON KNITTING &
TEXTILE MACHINERY CO. LTD.

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Rudolph Mosse, A.B.C. 6th Edition

THIS book has been written in simple Language so that any person without knowledge of hand knitting or knitting machinery may fully understand how to knit socks and stockings, etc., after a few hours spent on the machine.

REFERENCE to the index on the next page makes it easy to find the answer to any particular difficulty.

Make sure that you understand the machine before commencing to make articles.

DO NOT make any adjustments until you know if these are necessary.

INSTRUCTIONS

FOR THE

Harrison (Sun) Ribber

TO UNPACK THE MACHINES.

The Sun Knitting Machines are sent from here carefully packed and generally arrive safely at their destination. Should it occur that any part is found broken upon arrival, the course to pursue is to advise the Railway Company who delivered the machine, of the breakage, and inform them that you must hold them responsible for the damage.

After carefully taking the machine out of its box, fasten it to a firm table, bench, or stand, by means of the two clamps. If the machine is not made with clamps, it will be necessary to either bolt or screw it to the table or bench.

If the machine has to be fixed to an iron stand, it will be necessary to first remove the back plate from the base of the machine—then bolt the machine to the stand.

Next take out the Ribbing Attachment, No. 57 (Fig 2), place it in the socket 58 (Fig. 2), then take out the remaining parts of the machine and accessories. Screw the pillar 17 of Yarn Cross 15 into the hole 18, in base of machine (Fig. 2), then fix the Yarn-Cross to the top of the pillar fastening it with screw 16.

Next screw the Yarn Carrier No. 21 on to the machine by the two screws which have been left in the screw holes. The Yarn-Carrier is taken off the machine, and packed separately to ensure it arriving in perfect condition, as it is very necessary that every part should be accurate. The Yarn-Carrier includes the Wire Hook 20, Yarn-Guide No. 21, and Yarn-Guide Bracket No. 23.

Do not interfere with any screws or nuts unless you are told to do so in the Instruction Book.

WITH A SOFT CLOTH clean the machine, removing all the vaseline which is put on to prevent rust during transit.

To oil the machine, use good sperm oil to which a little paraffin has been added. We sell a specially prepared linseed oil in bottles or per gallon can. Unsuitable oils, such as Linseed, Castor, Colza, Olive, etc., should never be used. Paraffin will help to remove the grease, but should not be used in its pure state on the needles.

The parts requiring oil, are the heels of the cylinder and dial needles, also the Dial Spindle, for which purpose there is a hole at the top of the Adjusting Cap 59. There is also a hole in the Wheel Bracket F, through which the oil penetrates to the Crank Shaft and Counter.

The only other place which requires oil is the Revolving Cog Ring at the base of the machine, which is held in position by three washers and screws No. 45. It is of great importance, and an absolute necessity that beginners should become thoroughly acquainted with the names of the parts of the machine before commencing to knit.

DESCRIPTION OF THE (SUN) RIBBER.

Figs. 1 and 2 give a general view of the machine.

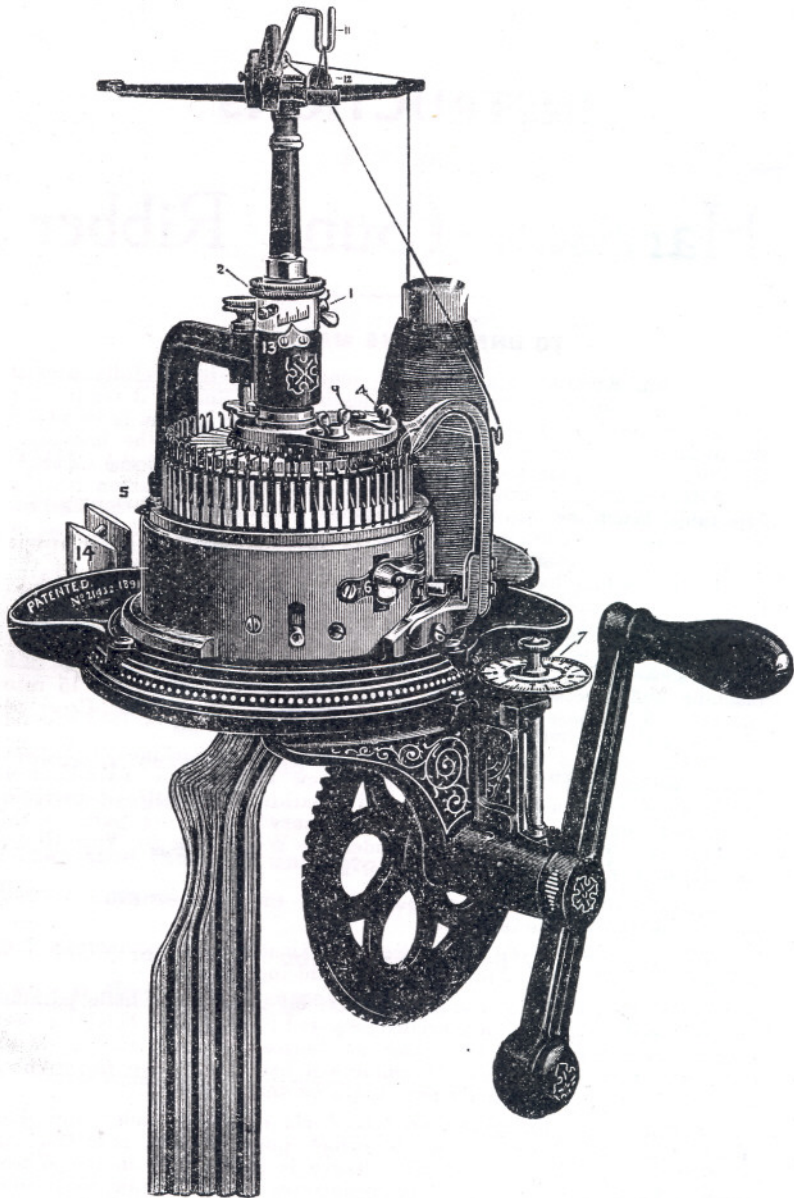


Fig. 1.

when some other figure is specially mentioned.

No. 1 is the Work Hook which is used for picking up dropped stitches.

No. 3 is the bobbin on which to wind the yarn.

No. 4 is the yarn from the bobbin which passes up through hole 5 in Yarn-cross, through eyelet 7 under yarn-lock 9, down through

hole 10, through eyelet 20 of Yarn-Guide, and finally down the slot of the Yarn-Guide 21. This is the correct way to thread the machine. If preferred the bobbins can be placed at the left side of the table under hole 6. The yarn would then be passed up through hole 6, through eyelet 7, etc.

No. 9 is the Yarn-Lock which grips the yarn as the Take-up wire rises, and prevents more than is necessary being drawn from the bobbin.

No. 11 is the Take-up wire for taking up the loose yarn at each end when knitting heels and toes or flat plain web. Its object is to prevent loops. Its power can be regulated by moving the weight along the straight wire A.B. To make it more powerful for coarse yarns it must be moved nearer to B, and less powerful for fine yarns nearer to A. Before moving the weight, the screw 14 must be loosened, and when the weight is in the desired position the screw must be tightened.

No. 15 is the Yarn-Cross, which conducts the yarn from the bobbin to the machine. The Yarn-Cross also includes Nos. 5, 6, 7, 8, and 10.

No. 17 is the Pillar, for the Yarn-Cross, and is screwed to the base of the machine.

No. 20 is the Eyelet, through which the yarn passes, and which prevents the yarn from rising out of the slot of the Yarn-Guide.

No. 21 is the Yarn Guide, which feeds the yarn into the hooks of the needles.

No. 23 is the Yarn Guide Bracket, which is fixed to the lug of the Cog Ring, and is held in position by two screws.

No. 33 is the Needle Cylinder, which is secured to the base of the machine underneath by two large screws.

No. 34 shows the Cylinder Needles. On their front sides they have hooks and latches at the upper ends, and butts and tails at the lower ends. The needles fit into the grooves of the Cylinder with the butts extending towards the inner side of the Cam Shell. After taking off the clasp ring, needles can be placed into, or taken out of, all the Cylinder grooves, excepting those grooves which are opposite the cams. To place the needles into those grooves, or take them out, the handle must be turned forward until the Cams are opposite another part of the Cylinder.

No. 35 is the Clasp Ring, which can be removed (see Fig. 7) to take needles out or put needles in the Cylinder.

No. 36 is the Cam Cylinder or Shell, which contains the cams which cause the Cylinder Needles to operate. To examine the cams it will be necessary to take out the Needle Cylinder. The centre cam, viz., the Stitch Cam, regulates the length of stitch formed on the Cylinder Needles by drawing the needles down a certain distance according to the height of the cam. To alter the position of the cam, loosen the wing nut and move the tension pointer No. 6 (Fig. 1) up to make a shorter or tighter stitch, and down to make a longer or looser stitch. The wing nut must be tightened before commencing to work.

No. 48 is the Counter to indicate the number of rounds which have been knitted. To set the counter, with the right hand take hold of the Wheel No. 49 (Fig. 2) to which the counter is attached, and slightly draw it towards you, then turn it round until the

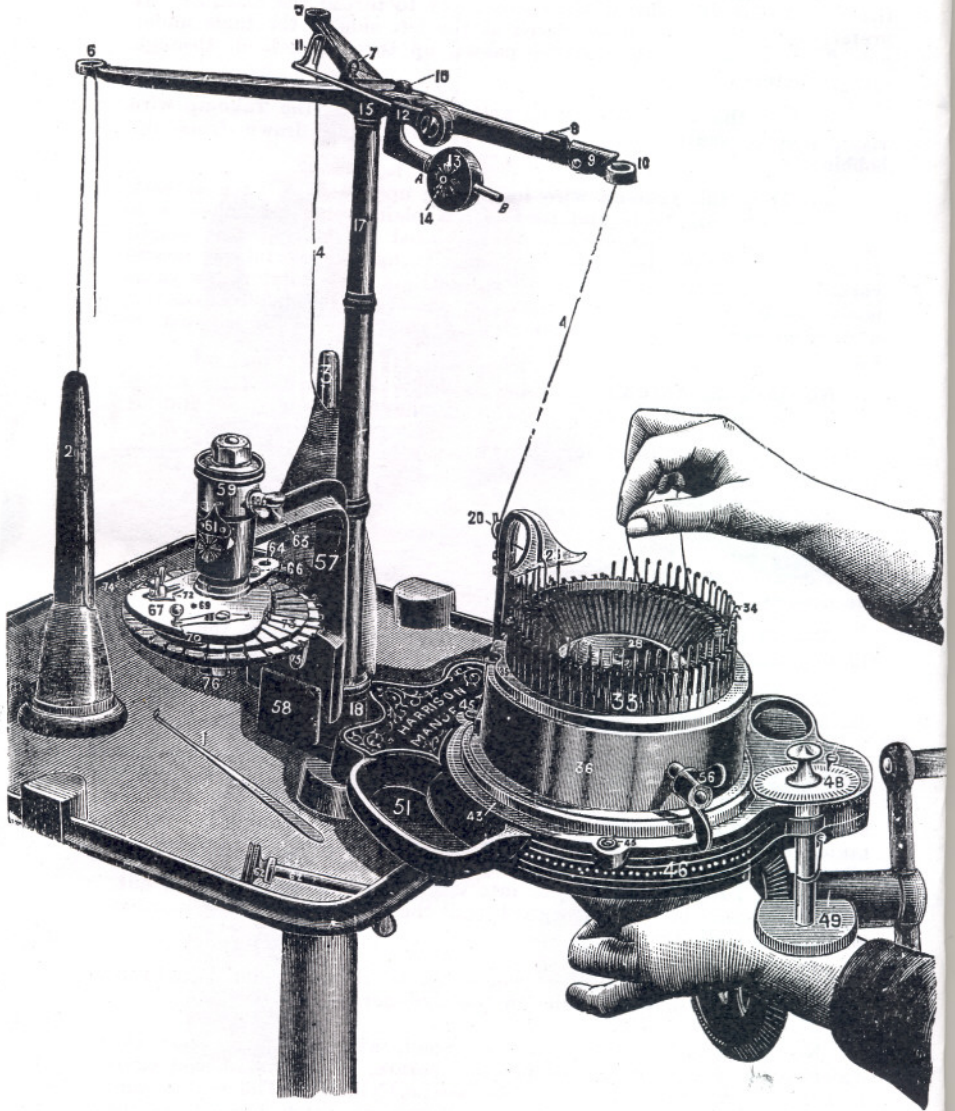


Fig. 2.

No. 50 is the Crank to which is attached the wooden handle, by which the machine is worked.

No. 51 is a Needle Pocket. There is one on each side of the machine, one to be used for the dial needles and the other for the cylinder needles.

No. 54 (Fig 5) is the Dial Post, and is adjusted by means of the Regulating Screw No. 55. Its object is to keep the Dial rigid, and also to adjust the Dial Needles so that they work in the exact centre between the Cylinder Needles.

No. 55 (Fig. 5) is the regulating Screw which moves the Dial Post.

No. 56 is the wing nut for fixing the Ribber Arm to the Cam Shell.

No. 57 is the Ribber Arm.

No. 58 is the Socket into which the Ribbing Attachment is placed when not in use.

No. 59 is the Adjusting Cap which regulates the height of the Dial.

No. 61 is the Pointer which indicates the height of the Dial.

It is advisable to make a note of the position of the Tension Pointers, also of the Pointer 61 on Adjusting Cap when knitting different thicknesses of yarn, so that at any future time the machine can be set to those numbers without experimenting, thus saving time.

No. 62 (Fig. 7) is the Driving Pin which connects the Ribber Arm and Tappet Plate. It is taken out when making heels and toes.

No. 63 is the Hole in Ribber Arm, into which Driving Pin fits.

No. 64 (Fig. 8) is the Hole in the Adjustable Timing Plate, into which the Driving Pin fits.

No. 65 (Fig. 8) is the point of the Adjustable Timing Plate or Driving Lug, to indicate the timing of the dial needles.

No. 66 (Fig. 8) is the Adjustable Timing Plate or Driving Lug, which is fixed to the Cam Plate by two screws.

No. 67 is the Cam Plate, or Tappet, to which the cams are attached, which cause the Dial Needles to operate.

No. 68 is the Out-throw or Welting Cam Lever, by means of which the Dial Needles are put in and out of action.

No. 72 is the Tension Pointer which indicates the position of the dial tension.

No. 73 (Fig. 2) is the Dial which holds the Ribbing Needles.

No. 74 shows the Dial or Ribbing Needles.

No. 75 is the Lug underneath the Dial which fits behind the Dial Post when the Ribbing Attachment is in action, and keeps the Dial rigid.

No. 76 is the Nut which secures the Dial.

It is of great importance, and an absolute necessity that beginners should become thoroughly acquainted with the names of the parts of the machine before commencing to knit.

ACCESSORIES AND TOOLS.

The following accessories are supplied with each Sun machine:—

- 1 Instruction Book.
- 1 Work Hook.
- 1 Set-up Basket.
- 1 Buckle.
- 1 Heel Wire.
- 1 Swift.
- 1 Winder.
- 2 Wooden Bobbins.

- 1 Oil Can.
- 1 Screw Driver.
- 1 Screw Key.
- 6 Dial Needles and 6 Cylinder Needles.
- 2 Weight Stands.
- 4 Weights.

TO REMOVE THE RIBBING ATTACHMENT FROM THE MACHINE.

Take all the ribber needles out of the dial or put the dial needles out of action by moving the Out-throw or Welting Cam Lever No. 68 to the extreme right. Loosen the wing nut, which fixes the ribbing attachment to the cam shell. Then with the right hand, lift the ribbing attachment up until it is clear of the machine, and place it in the Socket No. 58 until again required for use.

If there is knitted fabric in the machine, the stitches must be transferred from the dial needles to the cylinder needles before the ribbing attachment can be removed.

TO REPLACE THE RIBBING ATTACHMENT.

Take all the needles out of the dial or put the dial needles out of action by moving the Out-throw or Welting Cam Lever No. 68 to the extreme right. With the right hand lift the ribbing attachment out of the socket, holding the dial in position with the left hand, so that when placng it on the machine the lug 75 underneath the dial will fit exactly behind the dial post 54 (Fig. 5), the forked end of the ribber arm must fit over the screwed stud, to which is attached the wing nut No. 56. Tighten the wing nut to keep the ribbing attachment perfectly steady.

HOW TO RAISE OR LOWER THE DIAL.

The height of the dial is regulated by means of the adjusting cap No. 59 (Fig. 2) at the top of the ribber arm. With the right hand loosen the wing nut, and with the left hand turn the cap round to the right or left until the dial is the desired height, then tighten the wing nut firmly to secure it in this position. When the height of the dial is altered, the height of the yarn guide must be altered also. When knitting fine wool the edge of the dial should be just above the top of the cylinder, the pointer which indicates the height of the dial pointing to number 10 or 12 on the adjusting cap, No. 59, but for coarser wool it is necessary to have it higher. To ensure the same size of stitch when knitting from any special wool, before changing the machine to suit another quality of wool, make a note of the position of tension pointer on the adjusting cap, also tension pointers on cam shell, and cam plate. If these precautions are taken, the same size, weight, and texture of sock or stocking can be made at any future time.

HOW TO ADJUST THE YARN GUIDE.

A mark will be found on the Yarn Guide, and a corresponding mark on the Bracket. When these two marks are level, the Yarn Guide will be at the correct height for the cylinder and dial which was supplied in the machine. To raise or lower the Yarn Guide, loosen the two screws which secure the Yarn Guide to the Bracket. After adjusting the guide, tighten the two screws firmly. Care must be taken not to have the Yarn Guide too high, as this will cause the stitches to drop. If the Yarn Guide is too low, it will rub on the dial needles.

THE PARTS WHICH REQUIRE OILING ON THE MACHINE.

It is necessary to oil the heels of the cylinder and dial needles occasionally; also the dial spindle, for which purpose there is a small hole at the top of the adjusting cap 59. There is also a hole in the wheel bracket 49, through which the oil penetrates to the crank shaft and to the counter. When the cylinder is being changed, put a little oil on the ring where the cam shell fits. If the grease causes the upthrow cam to stick, a little paraffin in the slots will make them move easily. The only other place which requires oil is the revolving cog ring at the base of the machine, which is held in position by three washers and screws.

TO REGULATE THE LENGTH OF THE STITCH.

The size of the stitch formed on the cylinder needle is regulated by raising or lowering the Tension Pointer on the cam shell. Loosen the wing nut and lower the pointer to make a longer or looser stitch, or raise the pointer to make a shorter or tighter stitch. Care must be

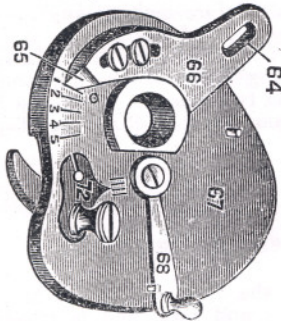


Fig. 8.

be taken not to have the Tension Pointer too high, or too low, before commencing to knit. Tighten the Wing Nut before commencing to knit.

The dial or rib stitch is made longer or looser, by loosening the wing nut of pointer, No. 72 (Fig. 8) on the cam plate, and moving the Tension Pointer No. 72 (Fig. 8) towards the centre of the dial; to make a shorter or tighter stitch, move the Tension Pointer nearer the edge of the dial. Tighten the screw firmly before commencing to knit. For coarse wool, a looser stitch is required than for fine wool.

HOW TO WIND YARN ON A BOBBIN.

The swift is adjustable to any sized hank of yarn and is extended by means of centre screw being loosened, the arms pulled out to required distance and the nut tightened. The swift is then placed on the spindle of clip which in turn is slipped on edge of table.

Fix parts of hand-winder together as follows.—

Screw handle into wheel, screw wheel into upright part and pass leather strap round wheel and bobbin spindle, then clamp winder on to table at a little distance from swift.

Place bobbin securely on spindle and a hank of yarn on swift, taking care that yarn is not entangled, wrap end of yarn a few times round bobbin and proceed to wind, turning handle with right hand and guiding yarn on to bobbin with left hand.

The bobbin must be filled firmly and shaped conically and care must be taken that the yarn is not guided past the highest filled part of bobbin or the yarn will not draw off easily when knitting. If a knot is made in the wool when winding, it should be covered up immediately and also made as small as possible, but the ends of wool should not be cut very short.

Yarn can be guided through a small piece of calico or knitted fabric and when yarn is of a harsh nature a little oil can be used. This lubricates the yarn causing it to pass the needles easier. Light coloured yarn can be lubricated by letting it run over a piece of paraffin wax.

Sometimes bobbins are a little rough but these should be made perfectly smooth by rubbing them with sand paper. Any roughness on the bobbin would put a drag on the yarn and cause bad work.

TO TIME THE RIBBER CAMS.

The machines are sent out with the position of the Ribbing Cams set to work best with the Cylinder Cams for general ranges of work and changes of cylinders, yet if coarse work is mostly required a better web (fabric) might be obtained by timing the Ribbing Cams to draw the stitch earlier, and if using a fine gauge cylinder they might advantageously be timed later, i.e. the nearer the pointer No. 65 (Fig. 8) is to the degree (line) 1, the earlier the cams act, and the nearer the pointer is to 5, the later the cams act. Before making any alteration or trial, take care to note the exact position of the pointer 65, and a record should be kept of the degree (line) or number preferred for each cylinder. After altering the Timing Plate or Driving Lug (No. 66) it must be tightly re-fastened by the two screws. The plate No. 67 is sometimes called the "Ribber Cam Plate," "Ribber Tappet," "Welting Cam Plate."

TO PUT THE DIAL NEEDLES OUT OF ACTION.

There are two methods of putting the dial needles out of action. The first is adopted when making heels and toes, and is effected by simply taking out the Driving Pin, which connects the Ribber Arm to the Cam Plate; this will disconnect the Cam Plate, causing it to remain stationary, and consequently the dial needles will not work. When replacing the driving pin, care must be taken that it enters the hole in the timing plate.

The second method is adopted when making the welts of socks and stockings. To put the dial needles out of action push the Welting Cam Lever (No. 68) to the extreme right. To put the dial needles in action push the Welting Cam Lever to the extreme left.

TO ADJUST THE DIAL NEEDLES TO RIGHT OR LEFT.

Take all the needles out of the dial or put the dial needles out of action. Put the ribbing attachment on as previously explained. Place a dial needle with the latch turned back, in one of the grooves of the dial, leaving the hook projecting slightly between two cylinder needles. Knit once round, then place the remaining needles in the dial.

For 4 and 1 rib the dial needles should work over the groove divisions of the cylinder, and for 3 and 1 rib, or 1 and 1 rib, the dial needles should work over the empty cylinder grooves. If the dial needles are working too near the right, turn the regulating screw No. 55 from you, until they are working in the centre between the cylinder needles. If you are working too near the left, turn the regulating screw towards you, and turn the handle forward at the same time, until they are working in the centre between the cylinder needles. Before commencing to knit, set the dial post to stand straight. There should be an equal number of threads on the regulating screw, at each side of the dial post bracket, so that the dial may be adjusted in either direction when necessary.

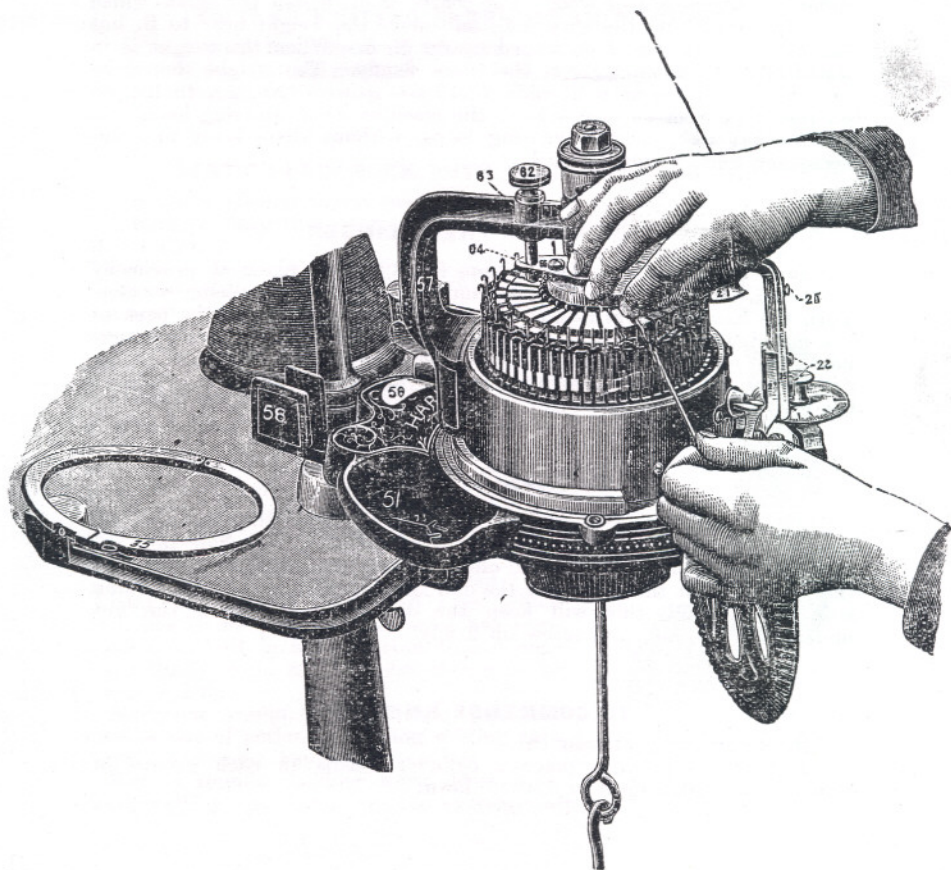
TRANSFERRING OF STITCHES.

To transfer a stitch from a cylinder needle to a dial needle, lift a cylinder needle out of the groove and leave it hanging loosely. Place a dial needle in the corresponding groove of dial, with latch open, holding it in position with forefinger and thumb. Hook cylinder needle into hook of dial needle and raise sufficiently to allow stitch to slip on to dial needle.

To transfer a stitch from a dial needle to a cylinder needle, place hook of empty cylinder needle into hook of dial needle.

Draw dial needle gently downwards until stitch has slipped beyond latch, then take butt of dial needle between thumb and forefinger and draw it upward until the stitch has passed on to cylinder needle.

Insert cylinder needle into empty groove of cylinder.

**Fig. 7.**