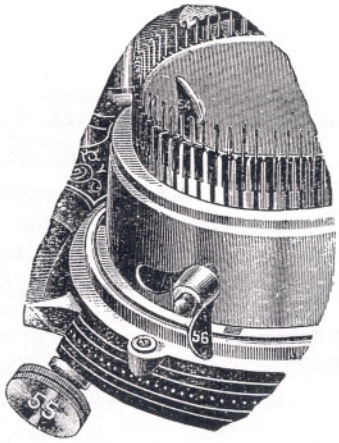


Fig. 5.

THE USE OF THE ADJUSTABLE TAKE-UP WEIGHT 13.

The weight can be moved along the straight wire A.B. to suit different thicknesses of wool. For coarse wool, loosen the screw which fixes the weight on the wire A.B. and move the weight near to B, but for fine wool, it should be moved nearer to A. When the weight is in the desired position, tighten the screw firmly. The weight should be in such a position as will cause the Take-up wire, No. 11, to lift up all the loose wool at each side of the machine when knitting heels and toes or flat web, thus preventing loops, without there being any unnecessary tension on the wool.

TO CHANGE THE CYLINDER.

Remove the ribbing attachment from the machine, as previously explained. Remove the clasp ring and take out all the cylinder needles. Turn the handle forward and stop with the Yarn Guide at the back of the machine, take out the two large screws which will be found underneath the cylinder. The cylinder can now be lifted out. Put another cylinder in and replace the two iarge cylinder screws, screwing them firmly.

TO CHANGE THE DIAL.

After removing the ribbing attachment from the machine, as previously explained, unscrew the nut underneath the dial, take off the dial and replace it with the one required for use. Take care that the steady pin at the bottom of the dial spindle enters the corresponding hole in the dial—this will keep the dial rigid. Replace the nut underneath the dial, and screw up firmly.

TO COMMENCE KNITTING.

Remove ribbing attachment.

Remove clasp ring, place a cylinder needle in each groove of cylinder with latch open or turned down.

Replace clasp ring.

Set cylinder tension pointer at 5 or 6.

Turn handle forward and stop with yarn guide at right-hand side of machine.

Place bobbin of waste wool exactly under hole 5 in Yarn Cross, pass wool up through hole, through eyelet 7, under yarn lock 9, down through hole 10, through hook 20 in yarn guide, and finally down slot of yarn guide then draw through approximately 1½ (one-and-a-half) yards of wool.

With right hand place set-up basket down inside cylinder, hold it underneath in left hand keeping hooks of set-up basket slightly down below top of cylinder No. 33 (Fig.2). Hold wool at the nearest part to the yarn guide in right hand and pass it under a hook of set-up basket and over highest cylinder needle. Repeat passing wool under a hook of set-up basket and round every alternate cylinder needle proceeding to left or anti-clockwise. Continue to where needles are depressed. Still holding set-up basket turn handle forward and stop with yarn guide at back of machine. The needles which were depressed will now be in action, continue the set-up, securing the loop on last needle by twisting wool twice round.

Attach weight stand with two weights to bottom of set-up basket. Turn handle forward and knit number of rounds required.

TO TAKE KNITTED FABRIC FROM MACHINE.

Break wool near hook 20 of yarn guide. Remove weights, hold work underneath the machine with left hand and turn handle very slowly forward until work leaves machine.

GENT'S PLAIN SOCK WITH 1 AND 1 RIBBED TOP

Remove ribbing attachment.

Remove clasp ring, place a cylinder needle in every alternate groove of cylinder.

Replace clasp ring, set up as previously explained with spare wool, this time taking the wool round every needle and not every alternate one.

Knit 20 rounds.

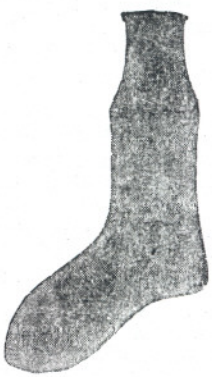
Replace ribbing attachment as previously explained making sure that lug on dial fits exactly behind dial post. Place a dial needle with latch open in one of the grooves of dial, leaving it projecting slightly between two cylinder needles and over empty cylinder groove. Knit one round then place a needle with its latch open in each groove of dial. Knit a few rounds.

Break wool and join cotton thread.

Knit two rounds, join wool from which sock has to be made. After wool has commenced to knit in break cotton thread near Yarn Guide, wind back surplus cotton on to cotton bobbin.

Knit one complete round and put dial needles out of action by moving welting cam lever to extreme right.

Knit 3 rounds, holding work down well, move welting cam lever back to extreme left.



Knit number of rounds required for top, approximately 60, and stop with yarn guide in front of machine.

Change for plain knitting as follows:—

Remove clasp ring.

Transfer stitches from all dial needles to cylinder needles and remove ribbing attachment. Knit number of rounds required for leg, approximately 70/85, and stop with yarn guide in front of machine.

For the Heel.

Place bobbin of splicing under the hole 6 in yarn cross. Thread splicing through hole and attach to wool. Knit 1 round and stop with yarn guide in front of machine.

Take wool and splicing—now knitting together—from between Yarn Lock 9 and hole 10 and place in hook of take-up wire No. 11.

Put all needles behind marked grooves of cylinder out of action by raising them as high as they will go.

While first half of heel is being knitted front part of work must be held down firmly by hand.

Knit forward and stop with Yarn Guide at back of machine. Raise last needle in action at right.

Knit backward and stop with Yarn Guide at back of machine. Raise last needle in action at left.

Repeat last two rows of knitting until 14 stitches remain in action. The last needle should be raised at left.

This completes first half of heel.

Hook heel wire into work about 2 rows below the third needle in action at each side. Attach weight stand with one weight on end of heel wire.

Knit forward and stop with Yarn Guide at back of machine. Depress a needle at right making sure that latch is open.

Knit backward and stop with Yarn Guide at back of machine. Depress a needle at left.*

Repeat last two rows until there is only one needle up in action in front of marked groove at each side of cylinder. The last needle should be depressed at left.

Break splicing near Yarn Guide and wind surplus splicing back on to splicing bobbin.

Knit forward and stop with Yarn Guide in front of machine. Depress all needles at back of machine. Unhook wool from take-up wire. Knit number of rounds required for foot, approximately 65/80, and stop with Yarn Guide in front of machine.

For the Toe.

Follow instructions given for heel up to mark*.

Repeat last two rows of knitting until all needles have been depressed in front of marked grooves.

Break splicing and draw surplus splicing back on to splicing bobbin.

Knit forward and stop with Yarn Guide at front of machine. Depress all needles at back of machine.

Knit 2 rounds.

This completes sock. To finish stitches of toe see Lesson 23.

The number of rounds given is only a guide as wool varies according to different manufacturers.

GENT'S 3 AND 1 RIBBED SOCK WITH 1 AND 1 RIBBED TOP.

Set up and knit approximately 60 rounds of 1 and 1 ribbed top as explained in previous pattern.

Stop with Yarn Guide at right-hand side of machine.

Change for 3 and 1 rib:—

Remove clasp ring.

Transfer stitches on every alternate dial needle to a cylinder needle commencing with the first dial needle in front of marked groove at left-hand side of machine and proceeding left or anti-clockwise.

Replace clasp ring.

Knit approximately 70/85 rounds for leg and stop with Yarn Guide at front of machine.

For the Heel.

Remove clasp ring.

Commencing at left-hand side of cylinder, transfer stitches from all dial needles in front of marked cylinder grooves on to cylinder needles.

Replace clasp ring. Knit 5 rounds and stop with Yarn Guide at front of machine.

*Place bobbin of splicing under hole 6 in yarn cross, passing splicing up through hole, attach it to wool and knit 1 round.

Take out driving pin No. 62.

Take wool and splicing now knitting together from between yarn lock No. 9 and hole No. 10 and place in hook of take-up wire No. 11.

Raise all needles behind marked grooves of cylinder as high as they will go.

While first half of heel is being knitted front part of work must be held down by hand.

Knit forward and stop with Yarn Guide at back of machine. Raise last needle in action at right.

Knit backward and stop with Yarn Guide at back of machine. Raise last needle in action at left.

Repeat last 2 rows of knitting until 14 stitches remain in action. The last needle should be raised at left.

This completes first half of heel.

Hook heel wire into work about 2 rows below the third needle in action at each end. Attach weight stand with one weight on end of heel wire.

Knit forward and stop with Yarn Guide at back of machine. Depress a needle at right (making sure latch is open).

Knit backward and stop with Yarn Guide at back of machine. Depress a needle at left.*

Repeat last two rows until there is only one needle up in action in front of marked groove at each side of cylinder. The last needle should be depressed at left.

Break splicing near Yarn Guide and draw all surplus splicing back on to splicing bobbin.

Knit forward and stop with Yarn Guide at front of machine.

Depress all needles at back of machine. Put in driving pin taking care that it enters the hole in the timing plate. Unhook wool from take-up wire. Knit approximately 65/80 rounds for foot and stop with Yarn Guide in front of machine.

For the Toe.

Follow instructions for heel from * to *.

Repeat last two rows until all needles in front of marked grooves have been depressed. The last needle should be depressed at left.

Break splicing near Yarn Guide and draw surplus splicing back on to splicing bobbin.

Knit forward and stop with Yarn Guide at front of machine.

Depress all needles at back of machine. Put in driving pin and unhook wool from take-up wire.

Knit 2 rounds.

This will complete sock. To finish stitches of toe see Lesson 23 .

The number of rounds given is only a guide as wool varies according to different manufacturers.

TO KNIT SOCKS CONTINUOUSLY.

Having finished one sock continue as follows:—

Remove clasp ring.

Place a dial needle in every empty groove of dial and transfer stitches from corresponding cylinder needles on to dial needles.

Turn handle forward and stop with Yarn Guide in front of machine.

Break the wool, join on cotton thread.

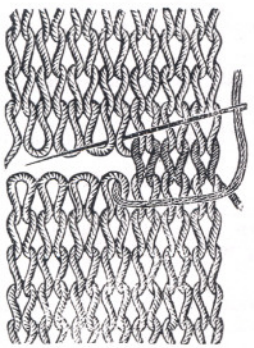
Another sock can now be commenced.

In the knitting of plain socks continuously care must be taken in the replacing of the ribbing attachment that the lug under dial fits exactly behind dial post.

NOTE.—When weights near the floor remove the set-up basket and pass the work through the buckle No. 53. Attach weight stand with weights to bottom of buckle. The buckle must always be moved up the work when the weights near the floor.

TO FINISH THE STITCHES OF THE TOE.

Leave the sock or stocking the right side out. Press the toe with a hot iron, first laying a damp cloth over the stitches. Unravel the two rounds which were knitted after the toe was completed, and break off the wool except about ¾ of a yard. Thread the end of the wool through a short darning needle, pass the needle down through the first stitch and up through the second on that side of the toe which is nearest to you, draw the wool carefully through so as not to unravel the next stitches. Now pass the needle through the corresponding stitches on the opposite side of the toe, again drawing the wool carefully through. Pass the needle down through the second and up through the third stitch on the side nearest to you, and repeat on the opposite side, and so on, passing the needle down through the last stitch through which the needle has passed, then up through a new stitch alternately on each side of toe. If care is taken not to split or unravel the



stitches, and the wool used in sewing is drawn just tight enough to make the same size of stitch as that formed by the machine, the seam will be almost invisible.

TO SEPARATE STOCKINGS OR SOCKS.

Cut the cotton thread in four places at opposite sides of the stocking or sock. Then take hold of each end separately and draw it firmly but carefully out, and a perfect selvedge will remain.

TO MAKE A SELVEDGE IN PLAIN KNITTING (I.E., WITHOUT RIBBING ATTACHMENT).

Set tension to a suitable number.

Set up as previously explained with all needles in cylinder.

Break off wool, attach cotton thread.

Knit 2 rounds and stop with Yarn Guide at right-hand side of machine.

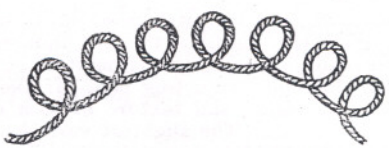
Raise all needles as high as they will go, commencing on centre needle at back of machine and proceeding towards left until you reach needles in action near Yarn Guide. Turn handle forward until these needles are clear of Yarn Guide and continue to raise all needles out of action. The handle can now be moved backward or forward when necessary.

Break cotton, withdraw it from Yarn Guide and leave end hanging inside cylinder.

Thread machine with wool for garment, draw approximately 1½ yards from bobbin.

Make loop about 1 inch from end of wool and place it on centre needle at back of machine.

Continue making a loop on each needle by twisting the wool round next needle nearer left, placing forefinger of left hand on loop thus formed until a similar loop has been made on next needle nearer left. The wool must be wrapped round the needles fairly loosely and so that it crosses on the inside of the cylinders. See diagram.



When selvedge is completed bring Yarn Guide back to right-hand side of cylinder. Depress needles—making sure latches are open—commencing on centre needle at back of cylinder and proceeding left. Draw slack wool back from machine on to bobbin. Turn handle forward until Yarn Guide is at left-hand side of machine holding wool above yarn until it commences to knit in. Depress remainder of needles and proceed to knit number of rounds required.

GENERAL INFORMATION.

SOME CAUSES OF DROPPED STITCHES.

There are several causes of dropped stitches. The chief cause is a wrongly adjusted Yarn Guide. If the cylinder needles drop stitches, the Yarn Guide must be too far away from the cylinder needles, or

too high up. If the former, the guide may be pressed in towards the centre of the cylinder (whilst there are no needles in the cylinder), or the Yarn Guide could be packed on the bracket, to throw it nearer to the needles. If it is too high up, follow the instructions on page 9 under "How to adjust the Yarn Guide." Another cause of plain stitches dropping is the accumulation of yarn which felts between the cog ring lug and the lug of the cam shell. This should be carefully cleaned away. When dial needles drop stitches, it is generally because the Yarn Guide is too high up, or because the timing plate No. 66 has moved out of position. When that is the case, loosen the two screws and place the pointer on the centre mark. Then screw up tightly. See note on "How to Time the Ribber Cams."

All the screws should be firmly screwed up, also the wing nut, which secures the ribber arm to the cam shell, and the nut underneath the dial, which secures the dial. If the yarn in use is quite unsuitable for the cylinder in the machine, dropped stitches would be the result. Then dropped stitches are often caused by bad winding. When stitches drop in heels and toes only, it is often through the wool looping. This can be remedied by sliding the adjustable weight on the take-up wire nearer to B, Fig. 2. The weight should be in such a position as will cause the take-up wire to lift up all the loose wool at each side, thus preventing loops. If the wool breaks when knitting flat web, or heels and toes, his can be remedied by sliding the weight on the take-up wire nearer to A, Fig. 2. The clasp ring should always be round the cylinder when knitting.

Tensions.—After changing the positions of the tension pointers, care must be taken to tighten the screws firmly, otherwise when the machine is in motion it may suddenly stick or become immovable. When using coarse, heavy wool, such as wheeling yarn, put the cylinder tension pointer at the loosest position, also the dial tension pointer, and the dial as high as it will go.

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 the tension pointers on the cam shell, and on the ribber cam plate and adjusting cap. If those precautions are taken, the same size, weight, and texture of sock or stocking can be obtained at any future time. The slightest variation in the tension, or in the amount of weight attached to the work, will affect the size of the article being knitted, making it larger or smaller, according to a looser or tighter tension, or more or less weight being used.

To prevent odd work, a system of measurement is recommended, in addition to counting the rounds. The following is considered a good plan to adopt:—Nail a tape measure to the edge of the bench or table on the left hand side, close to the machine. When the required number of rounds have been knitted for the calf of the leg, draw the tape measure to the bottom of the work. Place a pin or a mark of some kind in the tape measure to indicate the length. Proceed to knit the required number of rounds for the ankle. Again draw the tape measure to the bottom of the work and place a pin or mark to indicate the length of the ankle. All subsequent stockings should be measured in the same way. Yarns vary in thickness, softness, and body, each of which causes difference in length, width, and tension, therefore it is impossible to give fixed sizes and tensions which will be accurate for all yarns, and it is advisable to keep a memorandum of all articles made, giving yarn used, tensions, rounds knitted, fashionings, etc., making alterations which would be improvements in the proportions. Badly wound bobbins interfere with the regular working of the

machine. The operator should always watch the bobbin in order to detect large knots before they reach the machine, to prevent breakages.

Broken Needles.—When the cylinder needles are being raised up out of action, care must be taken to raise them as high as they will go (with the clasp ring on), otherwise the needles will come into contact with the cams and so cause the butt of the needle to break, and damage the cams and cylinders. When depressing the needles, push them down as far as possible, taking care not to close the latches. If the bottom portion of a cylinder needle has broken in the machine, it is not safe to force the machine round in any way. Remove the top portion of the broken needle. It is sometimes possible to remove the bottom pieces as well. If, however, the broken pieces cannot be found, it will be necessary to take the cylinder out and carefully remove **all** the broken pieces. If the needle is broken in such a way that the machine will not turn at all, proceed as follows: Take the driving pin out. Turn the ribber cam plate round (with the welting cam in action), until the stitches are off all the dial needles. Put the welting cam out of action, and turn it round once, slowly. Next take the ribbing attachment off. Now take out all the cylinder needles except those held by the cams. Place the needles in the pocket. Take out both the cylinder screws and lift the shell and cylinder off both together. Now turn the shell round the cylinder in the hands until you can take the needles out. Bent latches are caused by the Yarn Guide striking them, which most frequently happens if the handle is turned quickly when there are no stitches on the needles.

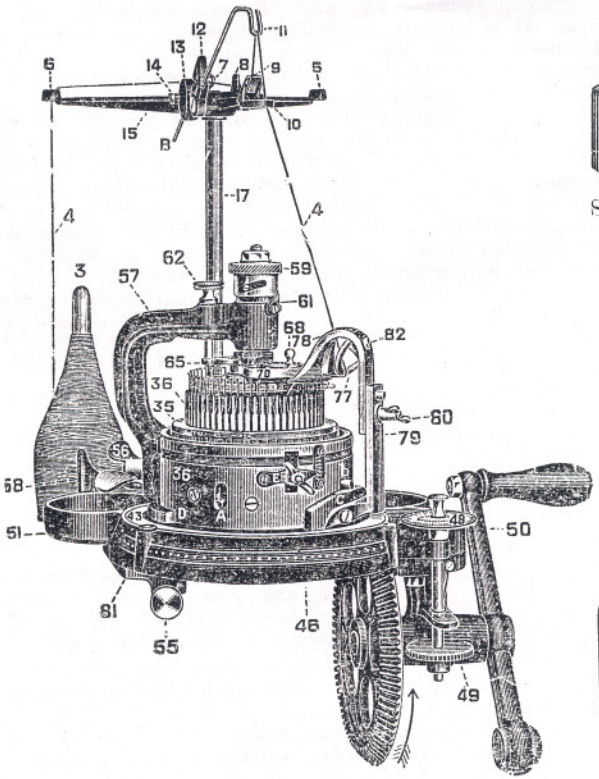
Bent or stiff latches would make imperfect stitches, also they would cut the yarn and cause holes in the fabric. They can be easily straightened or loosened by manipulating them between the forefinger and thumb or with a pair of pincers.

Needle latches should open and close freely.

Splicing.—Splicing is one or twofold yarn, and is used along with other yarns for thickening the heels and toes. It is also used for thickening the knees. Double knees, heels, and toes are understood to be made when splicing is used in this way. Splicing is made 1 and 2 ply, in colours to suit all yarns.

Dividing Cotton.—Cotton, setting-up cotton, dividing cotton, separating cotton, all mean the same thing. It is cotton used for setting-up or commencing the knitting, so that a perfect selvedge may be obtained. It is also used for dividing one sock or stocking from another when knitting them continuously. We supply a cheap cotton suitable for this purpose.

THE DULEX MACHINE.



511

Small "Dulex" Cylinder and Dial

Ordinary Cylinder and Dial

This illustrates the Dulex Machine fitted with the smaller cylinder and dial, and also shows the smaller and larger cylinder and dial at the side.

INSTRUCTIONS FOR CHANGING DULEX MACHINE CYLINDERS.

Intructions for changing from the 4¼ in. to the 3½ in. diameter machine.

The Dulex Machine is contructed so as to take more than one diameter of cylinder, the adventage being that any size, from the smallest to the largest sock or stocking can be made on the one machine.

The usual and most useful sizes for general purposes are—

Cylinder	Dial	Diameter
84 needles	42 needles	4¼ in.
60 needles	30 needles	3½ in.

Or, for finer purposes—

Cylinder	Dial	Diameter
108 needles	54 needles	4¼ in.
84 needles	42 needles	3½ in.

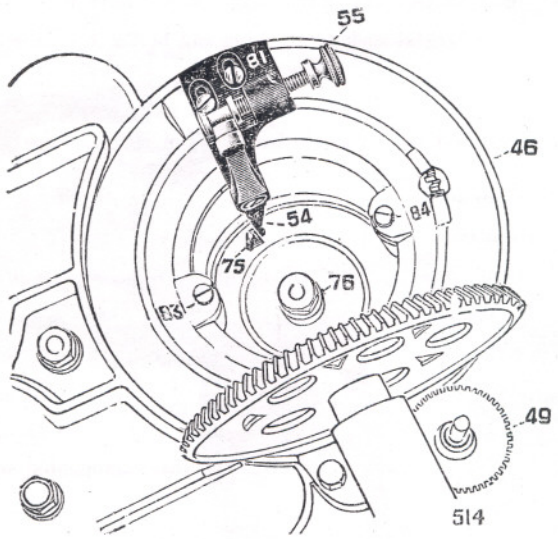
Any guage of cylinder and dial are interchangeable with above.

All that is required to be understood, beyond the working of the 4¼ in. machine, as described in the Sun machine instruction book, is the changing of the parts to those which form the Dulex or 3½ in. machine. The extra parts consist of a 3½ in. or Dulex cylinder, 3½ in. dial, tappet or ribber cam plate, and clasp ring, set of cylinder needles, and set of dial needles. The cylinder needles have longer butts (heel), the dial needles are less in length than those used in the ordinary Sun machine.

How to change from $4\frac{1}{4}$ in. to $3\frac{1}{2}$ in. diameter cylinder and dial.

Remove all the cylinder needles, take out the two screws, Nos. 83 and 84, lift the cylinder out of the cam shell, No. 36.

Before the $3\frac{1}{2}$ in. cylinder can be put in, the dial post No. 54 must be brought nearer to the centre of the machine, thus:—Loosen the two screws, No. 81, which hold the dial post in position, and slide the dial post inwards to extreme end of the slot, this will bring it to the same relative position when the $3\frac{1}{2}$ in. cylinder is in as it was to the $4\frac{1}{4}$ in. cylinder, viz.:—Close to the inside of the cylinder. Put in the $3\frac{1}{2}$ in. cylinder, and screws Nos. 83 and 84 for same. The lug on the inside of the cylinder must not be placed near the dial post. Tighten up screws Nos. 81, 83 and 84. Put in the long butted (heeled) needles, and put on the $3\frac{1}{2}$ in. clasp ring. It will be seen that the Yarn Guide No. 78 is too far away from the cylinder needles for them to take their stitches.



To bring the Yarn Guide No. 78 closer to the needles.

Remove the wing nut No. 80, and the washer, take the Yarn Guide No. 78 away from the bracket, remove the screw, and place the Yarn Guide No. 78 on the inside of the bracket; replace the screw, washer and wing nut, and screw up very tightly. The mark on the Yarn Guide should be placed level with the top of the bracket.

When the dial is raised or lowered, the Yarn Guide must also be raised or lowered to correspond. The hooks of the dial needles must pass under the Yarn Guide without touching the guide.

To change the dial and ribber cam plate

on Dulex Machines.

With the spanner take off the nut No. 76, remove the 4¼ in. dial and tappet, and replace same by the 3½ in. tappet and dial; take care that the steady pin in dial spindle enters the corresponding hole in the dial. Put on the nut No. 76 and screw tightly with the spanner.

When the 4¼ in. cylinder and dial are again required, the Yarn Guide must be replaced on the outside of the bracket. Place the cylinder in, and slide the post up to touch it. The lug on the inside of the cylinder should be placed opposite the post, otherwise it may prevent the post going close to the cylinder. The 4¼ in. tappet and dial must be put on in place of the 3½ in. tappet and dial.

BABY'S SOCKS.

On 60 x 30 x 3½ inch cylinder and dial. Tight Tension, 3 ply soft wool.

Set up for 1 and 1 rib. After knitting three rounds with the welting cam out of action for the welt, knit 70 rounds for leg, change front half of ribbing needles to plain; make heel as usual. After the heel put in three extra ribbing needles each side, next those already in; transfer stitches on to them; knit 25 rounds for foot; transfer the extra ribbing stitches back to plain needles; make toe in ordinary way, on half the needles.

The above sock may be made on a larger cylinder. The tension must be set to knit as tightly as possible.

Use our wools which are specially spun to suit our machines.

Specially Prepared Knitting Machine Oil,

(also adapted for other machinery),

TWO GALLON DRUM: ONE GALLON CAN: IN BOTTLES 4 ozs.

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LIMITED SETS—9 BOARDS, OR FULL SET—19 BOARDS,

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