

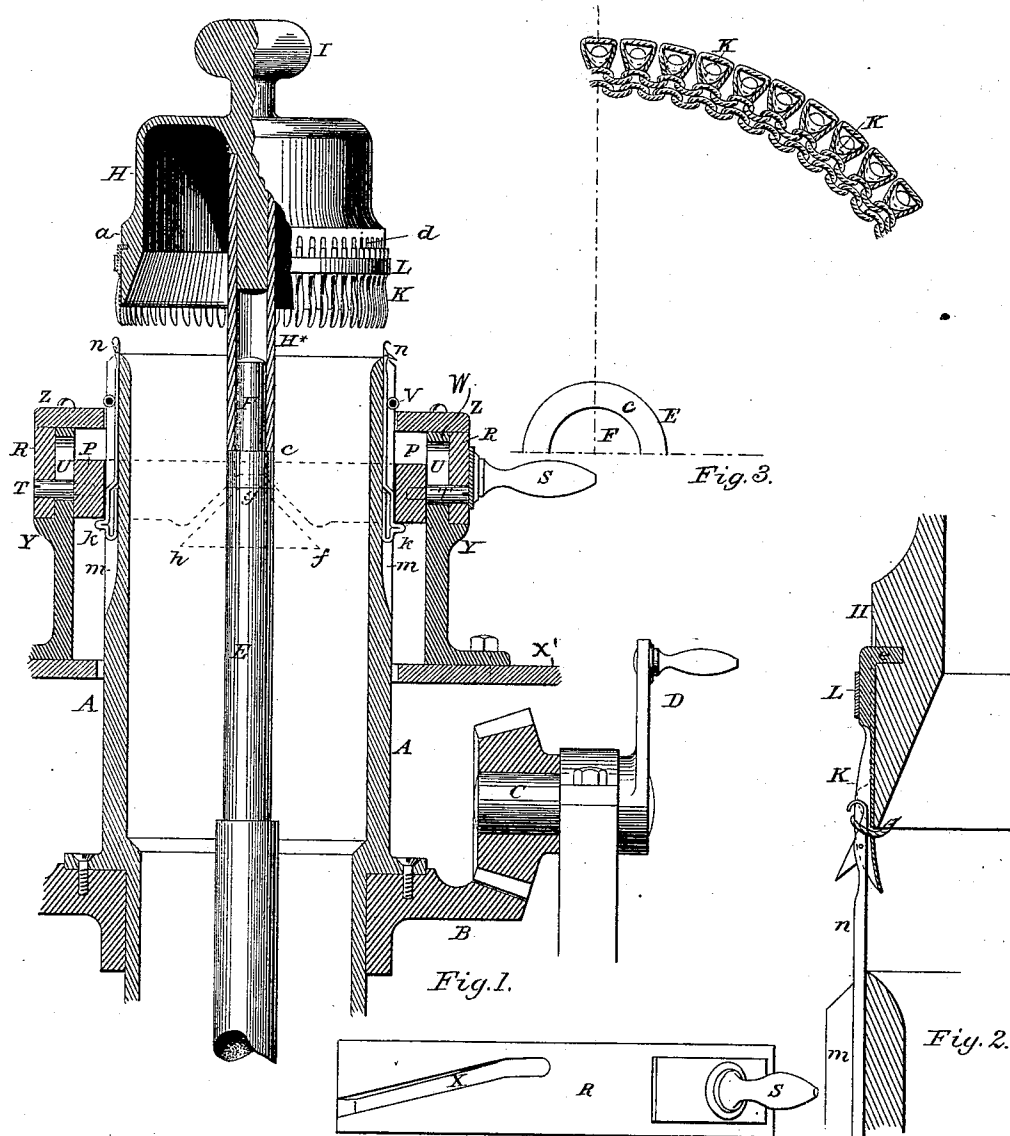
(No Model.)

F. LASHER.

DEVICE FOR TRANSFERRING STOCKING RIBS.

No. 478,613.

Patented July 12, 1892.



WITNESSES.

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FRANK LASHER, OF BENNINGTON, VERMONT, ASSIGNOR TO THE LASHER STOCKING COMPANY, OF SAME PLACE.

DEVICE FOR TRANSFERRING STOCKING-RIBS.

SPECIFICATION forming part of Letters Patent No. 478,613, dated July 12, 1892.

Application filed April 8, 1889. Renewed December 30, 1891. Serial No. 416,566. (No model.)

To all whom it may concern:

Be it known that I, FRANK LASHER, of the town of Bennington, in the county of Bennington and State of Vermont, have invented certain Improvements in Devices for Transferring Stocking-Ribs, of which the following description, in connection with the accompanying sheet of drawings, constitutes a specification.

10 This invention is designed to transfer tubular-knit stocking-ribs to the needles on the cylinder of a tubular-knitting machine.

In the present practice of making stockings by tubular knitting it is customary to provide the stocking with a ribbed top, which, as is well understood, is knit on a rib-machine employing two sets of needles, while the body of the stocking is knit on a different machine employing but one set of needles. As the top is previously knit, in order to complete the stocking it is necessary to transfer the ribbed top to the needles of the machine which knits the leg and foot.

25 The object of this invention is to facilitate such transfer.

One method of knitting stockings has consisted in providing the machine which knits the body and foot of the stocking with a series of detachable cylinders, each fitted with needles, so that while the knitting was progressing on one cylinder a ribbed top could be run onto the needles of another cylinder by an operator by hand, and when the knitting on the former was finished the latter could be substituted in the machine.

30 Another method has consisted in arranging a series of semi-tubular quills or points upon or around a hoop of the same size and having the same number of quills as the cylinder has needles, upon which the stitches of the rib are looped. All the needles of the cylinder are then elevated and the hoop is inverted over them, so that each of the needles will enter a quill. After being so entered the stitches are next pressed by hand down off the quills onto the needles, when the transfer piece or hoop is removed.

My invention is shown in the drawings, in which—

50 Figure 1 shows a vertical section taken through the axis of a needle-cylinder with the

transfer device in position. Fig. 2 is an enlarged similar section of the upper part of the cylinder and of the lower part of the transfer device, showing an entered needle in position 55 to take the stitch from the quill. Fig. 3 is a magnified view of a section of the ends of the quills of the transfer as they appear with the stitches of a rib attached and the points presented toward the observer. Fig. 4 is a side 60 view of the cam-slot ring detached.

The needle-cylinder is shown at A and is driven by means of a gear B attached thereto, which is propelled by pinion-gear C and crank D or by other suitable means. The cylinder 65 is grooved, as at *m m*, to receive the needles *n n*, which move vertically therein as their driving-shanks *k k* pass through the cam-grooves or over the cam-faces provided to control and regulate their action. They are held in position in the grooves by the retaining spring-band V and the draw-down ring P. This ring P has two guide-pins T T screwed into it, which extend through vertical slots U U in a surrounding stationary concentric ring W 75 W, which rests on the table X' of the machine or is otherwise suitably supported.

Outside of the ring W an elevating-ring R is adjusted, which has two inclined slots X X, through which pins T T protrude. This ring 80 is confined between ledge Y and cap Z and may be turned by means of handle S back and forth around the ring W to the extent of the length of slots X X. By means of the ring R and its movement the draw-down ring P 85 may be elevated to the extent of the vertical rise in their length of slots X X. When ring P is forced up, it permits every needle which has been elevated by passing over the cam-face *h g f* at the point where the feed-thread 90 is introduced to remain so elevated until said ring has been forced down by a reverse movement of ring R. In the center of the cylinder A stands the transfer-post E, which is a permanent attachment of the needle-cylinder, 95 which is reduced at the top F, so as to leave a shoulder *c*, upon which the centering-socket H* of the transfer rests when the transfer is in position for use.

The transferring device proper consists of 100 a closed cylinder H, provided with the knob I for convenience in handling. Its bottom

edge is left of sufficient thickness at *a* to allow for holes in which the quill-shanks *e* are inserted. Its surface is also fluted, as at *d*, to form seats for the stems of the quills, as seen in Fig. 1. The quills are fixed in position by entering the shanks in the holes in the rim of the cylinder H, the stems lying in the flutes *d*. Over the whole the retaining-band L is tightly fitted, so that each quill is firmly held in an accurate fixed position to coincide exactly with that of a needle in the cylinder when adjusted in position over the same to effect a transfer. In the center of the cylinder H is the tubular socket H*, which is of sufficient length to extend below the bottom edge of the cylinder H and rest on the shoulder *c*, as seen in Fig. 1. When so adjusted, the quills stand exactly over the needles and at such an elevation that when the needle-cylinder is rotated and the shanks *k k* pass up over the cam *f g* or *h g* the head of the needle will enter the quill under the stitch, as shown in Fig. 2, the latch in the process being thrown open, as shown, by the conjoint influence of the centrifugal force generated by the rapid revolution of the cylinder and by encountering the stitch on the quill under which the needle passes.

One of the leading features of this invention relates to the axial socket H* of the transfer device and the axial stud F and shoulder *c* of the needle-cylinder. These features of the stud and socket by co-operation secure absolutely concentric adjustment of the quills to the needles, while the slight rotary adjustment of the transfer device about the stud F, so as to bring a single quill of the series in exact position to receive a single elevated needle at the point where the feed is taken in, is sufficient to and does put the whole series of quills in like accurate position over the needles to enable them to be forced up under the stitches on the transfer-quills, all of which may be done without manual manipulation simply by rotation of the needle-cylinder after the parts have been properly placed in position.

In practice the invention is used as follows: The rib is first run onto the quills of the transfer device, the rib itself being tucked or folded over into the interior of the same. It is then inverted over the stud F and the socket slipped down to the shoulder *c*. This leaves the stitches on the quills at the right elevation for the needles to take them on when raised by the elevating-cam. Then the elevating-ring R is turned to the left, so that the cam-slots shall cause the pins T T to be raised, thus carrying up the draw-down ring P with it. The needle-cylinder A is then revolved rapidly a turn or two. This last movement is designed to throw the latches all out and to force all the needles up under

the loops on the quills. Then the handle S is slightly turned back, so as to draw the stitches down a short distance on the quills to where they are of slightly smaller diameter. This movement is to make sure that the latches of all the needles have been opened and that all the stitches have been properly transferred to the needles. Then the handle S is returned to its original raised position, after which the cylinder is again given another rapid turn or two, when the handle is turned to the right, so as to draw down the ring P, which also carries with it all the needles and leaves them in position to begin the knitting. After this the transfer is removed and the feed-thread entered, when the machine can be started and the knitting may proceed in the usual way.

One marked feature which distinguishes this method of transferring from others in use is that by means of the stud and socket herein described accurate concentric adjustment is obtained, so that it is sufficient if only a single needle is brought into apposition with a quill to effect the transfer of the whole rib without further attention to the other needles, the work being all done by the machine without the aid of the hands or fingers.

I therefore claim as my invention—

1. The combination of the needle-cylinder provided with needles and with an axial supporting-stud, as shown, with the cylindrical transferring device provided with transfer-quills corresponding in number with the needles of the cylinder arranged concentrically around a central socket, which is adapted to slip onto said axial stud, substantially as described, and for the purposes set forth.

2. The combination, with the needle-cylinder provided with needles and an axial stud and the cylindrical transfer device provided with quills and central socket, substantially as shown, of the draw-down ring and means, substantially as shown, for imparting to it a vertical movement, substantially as described, and for the purposes set forth.

3. The combination, with the needle-cylinder and needles, of the draw-down ring provided with guide-pins, the concentric stationary stand with vertical slots in which said pins move, and the surrounding-ring having cam-slots which coact with said pins and having a limited rotary movement, substantially as described, and for the purposes set forth.

In testimony whereof I have hereto set my hand, at Bennington, Vermont, this 6th day of April, A. D. 1889.

FRANK LASHER.

In presence of—

FRANKLIN SCOTT,
E. H. WORTHINGTON.