June 5, 1928. 1,672,021

I. COHEN.

MACHINE FOR ATTACHING REENFORCING STRIPS TO KNITTED FABRICS

Filed July 21, 1927 2 Sheets-Sheet 1

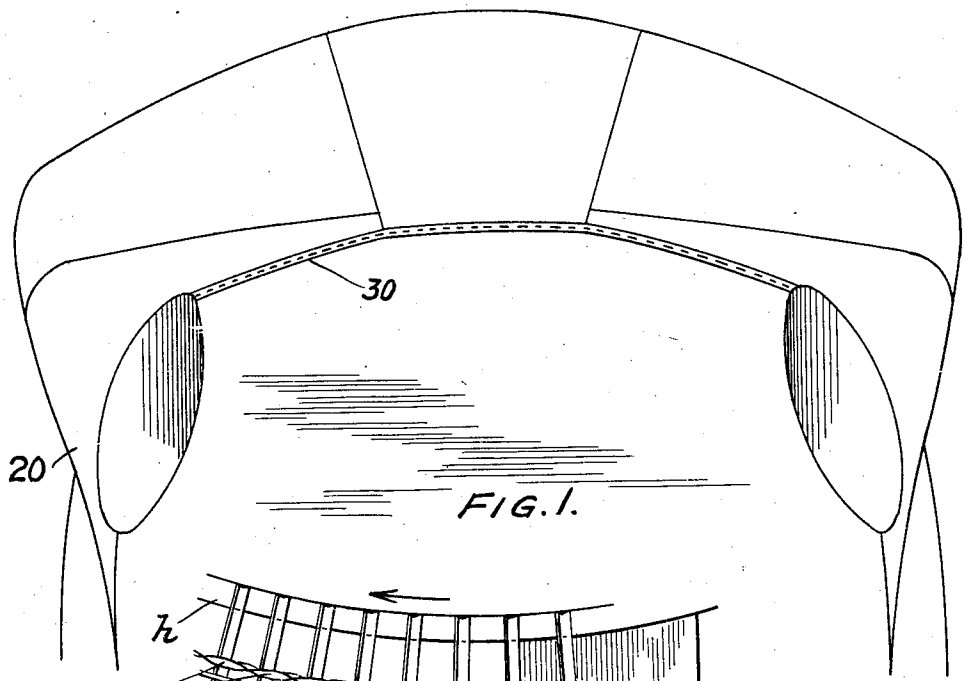


FIG. 1.

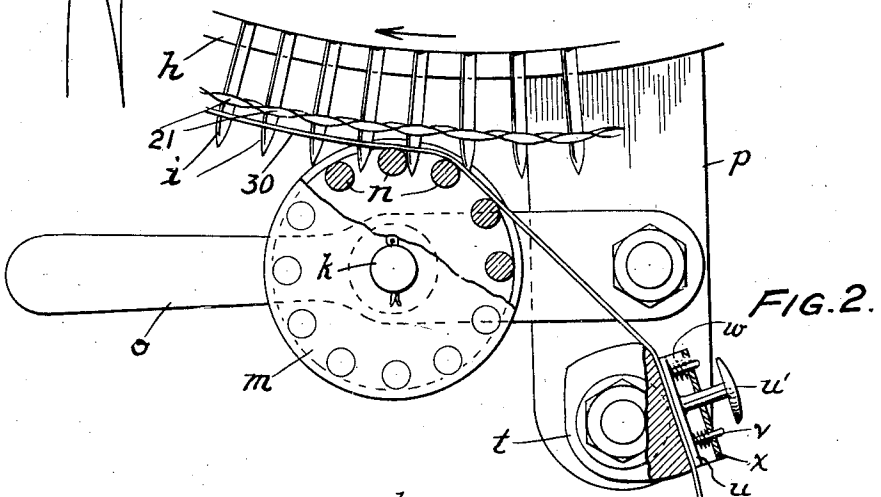


FIG. 2.

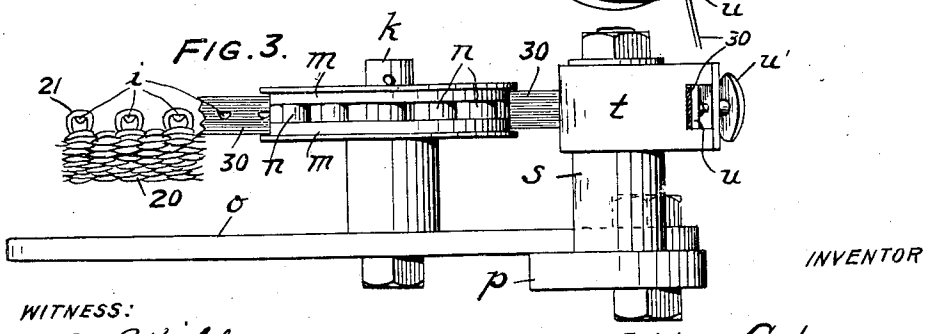


FIG. 3.

INVENTOR

WITNESS:

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FIG. 5.

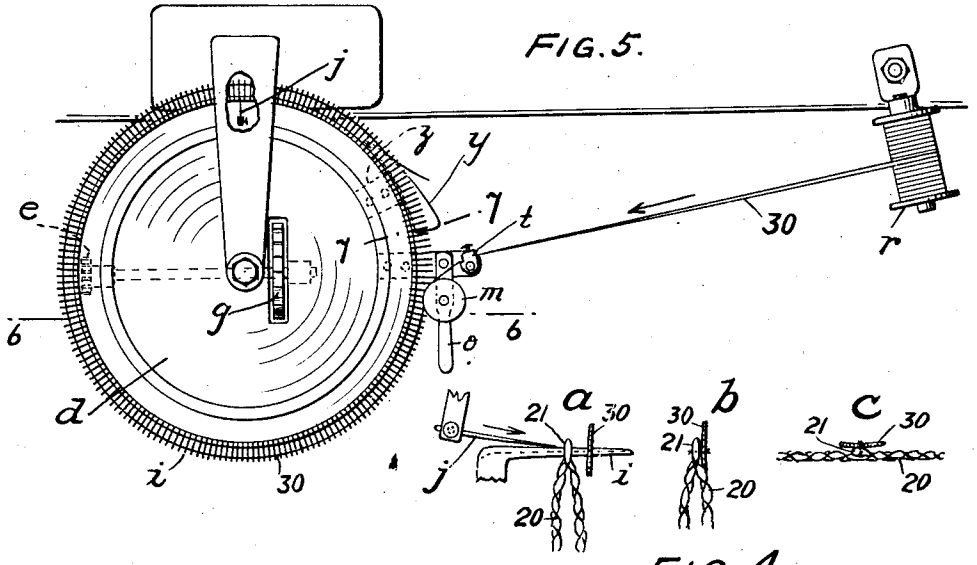


FIG. 4.

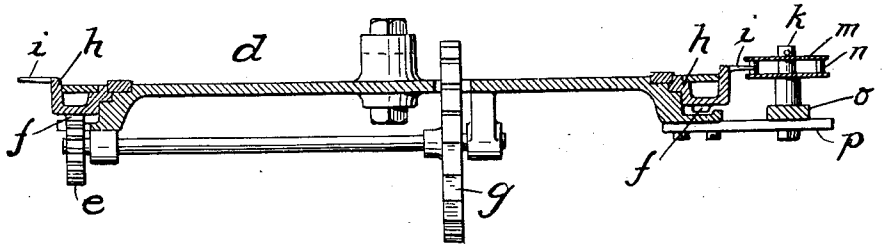


FIG. 6.

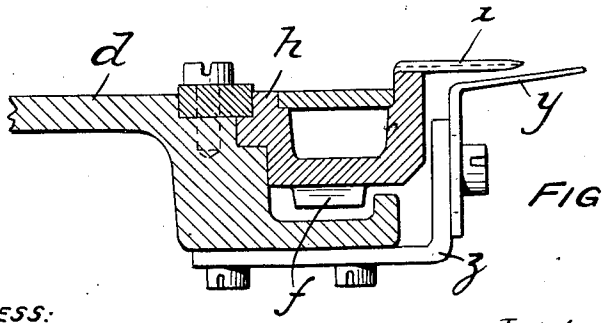


FIG. 7.

WITNESS:

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Patented June 5, 1928. 1,672,021

UNITED STATES PATENT OFFICE.

ISIDOR COHEN, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO ABRAHAM L. STOUMEN, LEO S. SACK, AND SAID COHEN, AS COPARTNERS DOING BUSINESS AS DURABLE KNITTING MILLS.

MACHINE FOR ATTACHING REENFORCING STRIPS TO KNITTED FABRICS.

Application filed July 21, 1927. Serial No. 207,424.

In the manufacture of sweaters and similar knitted garments, it is customary to reenforce the same transversely on a line extending between the arm-holes and along the neck in order to prevent excessive stretching of the fabric along this line with resultant permanent distortion and loss of shape of the shoulder portion of the garment.

The object of my invention is to provide means, almost wholly automatic, for securing a reenforcing strip across this part of the sweater. Another object of the invention is to so secure the reenforcing strip to the sweater that it will not impair the elasticity of the fabric along this line but will permit it to stretch along this line to the desired degree and no more.

A preferred embodiment of the invention is shown in the drawings, in which—

Fig. 1 is a front view of a sweater or other knitted garment with the front wings of the sweater opened out to allow a full view of the inside of the garment and of the reenforcing strip applied thereto.

Fig. 2 is a detail plan view, partly in section, of a small arc of the looper, the feed wheel cooperating therewith and the tension device that engages the reenforcing strip as it travels toward the feed wheel and looper.

Fig. 3 is a front elevation of Fig. 2.

Fig. 4 comprises diagrams illustrating the mode of attachment of the reenforcing strip to the knitted garment.

Fig. 5 is a general plan view of the looper, the mechanism for guiding the reenforcing strip thereto and the stripper for detaching the reenforced fabric from the looper.

Fig. 6 is an enlarged vertical section, on line 6—6 of Fig. 5, through the looper and the mechanism for guiding the reenforcing strip thereto.

Fig. 7 is a detail section on the line 7—7 of Fig. 5.

Ring h of the looper (Figs. 5 and 6), which may be of any known construction, is operated, as usual, by a pinion e driving a rack f on the looper; the pinion shaft carries a ratchet wheel g which is intermittently operable by means of a reciprocating pawl, not shown. The circular frame d of the looper provides a bearing for the ring h (Fig. 7), which carries the radially extending peripheral points i on which fabric is adapted to be looped. Ring h is removable and may be replaced by another ring carrying differently spaced points.

Arranged in operative relation to the looper, in a manner known in the art, is a sewing attachment, which, in the rotation of the looper, is adapted to secure any suitably positioned strip to the loops engaging the points i. This sewing contrivance, being known in the art, is not illustrated in detail, the needle, however, being shown and marked j in Fig. 4 (a).

Arranged adjacent to the periphery of the looper is a feed or guide wheel, shown in Figs. 2, 3, 5 and 6, for cooperating with the looper points to automatically engage the reenforcing tape 30 with the looper points and properly position it relative to the knitted fabric, as hereinafter described. This wheel, which comprises flanged discs m and a peripheral row of pins n between them, is turnable on a stud k carried by a lever o, which is pivotally mounted on a bracket p secured to the looper frame. The axis of rotation of the wheel and the direction of its pins n are parallel to the axis of rotation of the looper. The wheel is so positioned that the points i, in the rotation of the looper, successively project between adjacent pins n, and, by their gear-like engagement therewith, impart rotation to the wheel.

The reenforcing tape 30 is wound on a spool r and extends therefrom to the wheel m, as shown in Figs. 2 and 5. A post s, on the looper frame, carries a frame t having a flat face between which and a plate u the reenforcing tape travels on its way from spool r to wheel m and the looper. Plate u carries pins v which extend through holes in a fixed plate x carried by frame t, and springs w are coiled about pins v and are confined between plate u and plate x. Thereby the strip is pressed yieldingly between frame t and plate u, so that the strip is fed to the pins n and looper points i under tension. Secured to the plate u is a knob u', by means of which plate u may be retracted from frame t to allow tape 30 to be passed through the tension device preparatory to starting the machine.

The operation of the device, so far as described, is as follows: The knitted sweater

20, Fig. 1, is engaged with the looper points *i* by engaging successive loops 21 of the sweater fabric, along the desired line of reenforcement, with successive points of the looper (see Figs. 2 and 3). The end of the reenforcing tape 30, which has been drawn through the tension device *t*, *u*, is then engaged by hand with one or more of the looper points that engage the loops at one end of the row of sweater fabric loops that are hung from the looper points. The wheel *m* is then swung into the operative position shown in Fig. 2. Rotation of the looper is then started. Those looper points which have pierced the tape 30 operate to pull the tape through the tension device tangentially over the pins *n* of the wheel *m*. As the looper continues to rotate, successive looper fingers engage successive pins *n* and turn wheel *m* and at the same time successively pierce tape 30. It is also possible to arrange the mechanism so that the looper points do not directly engage the pins, but turn the wheel by the frictional engagement between the tape and the pins. The operation continues until there is impaled on the looper points a length of tape equal to the length of the row of loops that are engaged with the looper points; that is, until a strip of reenforcing tape extends across the sweater along the desired entire line of reenforcement. The wheel *m* is then swung out of operative relation with the looper.

As the suspended loops of the sweater and the reenforcing strip 30 pass the sewing device, the needle *j* thereof sews the renforcing tape 30 to successive loops, as shown in Fig. 4 (*a* and *b*).

Beyond the sewing device and between the same and the wheel *m*, a stripper cam *y* is secured to a bracket *z*. This cam acts to strip off the looper points successive sweater loops that have been suspended from such points, together with the parts of the reenforcing tape attached thereto, until the last loop of the row of loops and the rear end of the attached reenforcing tape are stripped off the looper, thereby entirely freeing the reenforced sweater.

Fig. 4 (*c*) illustrates a row of sweater loops extending at right angles to the plane of the reenforcing strip 30 and indicates the manner in which the reenforcing strip is permanently secured to the sweater.

The looper points are so spaced apart that when the sweater is looped thereon the fabric is stretched somewhat along the line of suspended loops. When, therefore, the sweater is removed from the looper and the fabric along the line of reenforcement contracts, the reenforcing strip 30 is shirred or gathered to just the degree desired to enable the fabric to stretch to the desired degree along the line of reenforcement.

Having now fully described my invention, what I claim and desire to protect by Letters Patent is:

1. In a machine for attaching reenforcing strips to knitted garments, the combination with a rotatable looper comprising peripheral points adapted to be engaged by a row of loops of the knitted fabric and a rotatable wheel adjacent to the periphery of the looper and comprising a circular row of pins adapted to be propelled by the traveling looper points and to be thereby rotated, whereby when a reenforcing fabric is fed tangentially to the wheel, it will be pierced by successive looper points as the looper points propel the wheel and will be carried along by the looper in fixed relation to said row of loops.

2. In a machine for attaching reenforcing strips to knitted garments, the combination with a rotatable looper comprising peripheral points adapted to be engaged by a row of loops of the knitted fabric, a rotatable wheel adjacent to the periphery of the looper and comprising a circular row of pins adapted to be propelled by the traveling looper points and to be thereby rotated, and a tension device through which a reenforcing tape is adapted to travel between the looper points and pins and to be pressed by the pins over the looper points as the looper points propel the wheel.

3. In a machine for attaching reenforcing strips to knitted garments, the combination with a rotatable looper comprising peripheral points adapted to be engaged by a row of loops of the knitted fabric, a rotatable wheel adjacent to the periphery of the looper and comprising a circular row of pins adapted to be propelled by the traveling looper points and to be thereby rotated, the points being adapted to successively engage and penetrate a reenforcing tape extending between the coacting points and pins, and means at another part of the periphery of the looper to secure the tape to the row of loops as the looper rotates.

4. In a machine for attaching reenforcing strips to knitted garments, the combination with a rotatable looper comprising peripheral points adapted to be engaged by a row of loops of the knitted fabric, a rotatable wheel adjacent to the periphery of the looper and comprising a circular row of pins adapted to be propelled by the traveling looper points and to be thereby rotated, the points being adapted to successively engage and penetrate a reenforcing tape extending between the coacting points and pins, means at another point in the line of travel of the looper points to secure the tape to the row of loops, and a stripper, extending along a part of the periphery of the looper beyond said securing means, adapted to strip the loops and attached reenforcing tape from the looper points.

5. In a machine for attaching reenforcing strips to knitted garments, the combination with a rotatable looper comprising peripheral points adapted to be engaged by a row of loops of the knitted fabric, a rotatable wheel adjacent to the periphery of the looper and comprising a circular row of pins adapted to be propelled by the traveling looper points and to be thereby rotated, and a lever carrying said wheel and adapted to be operated to move said wheel into and out of operative relation with the looper.

In testimony of which invention, I have hereunto set my hand at Philadelphia, Pennsylvania, on this 4th day of June, 1927.

ISIDOR COHEN.