

Aug. 3, 1943.

R. PICKLES ET AL

2,325,977

MANUFACTURE OF ELASTIC TUBULAR GARMENTS

Filed April 10, 1943

2 Sheets-Sheet 1

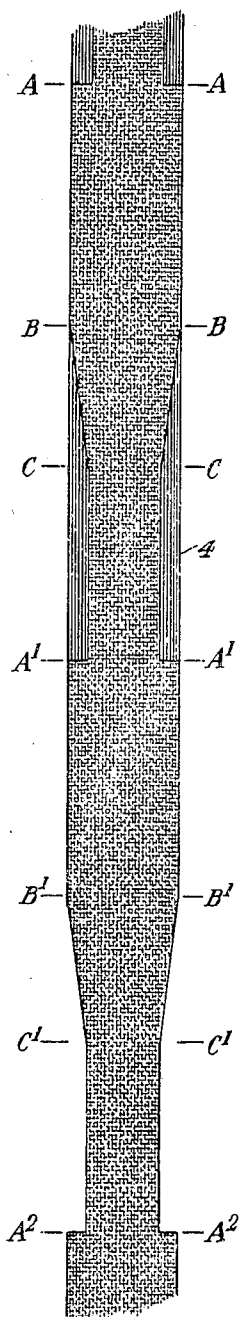


Fig. 1.

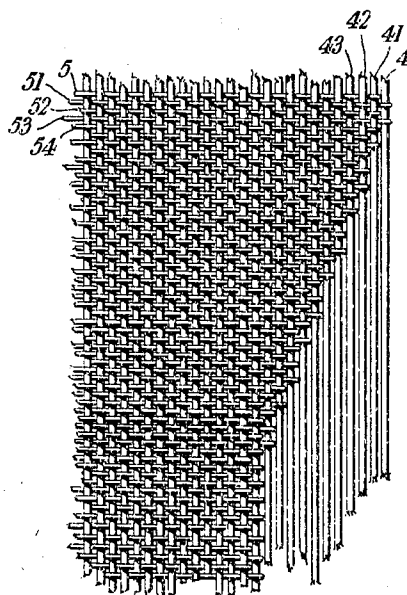


Fig. 2.

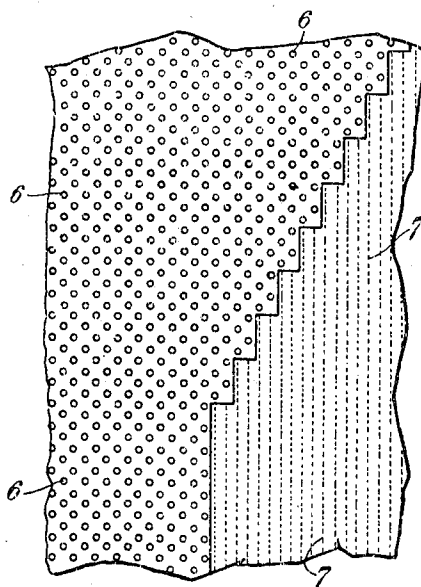


Fig. 3.

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2 Sheets-Sheet 2

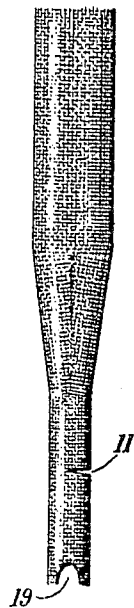


Fig. 5.

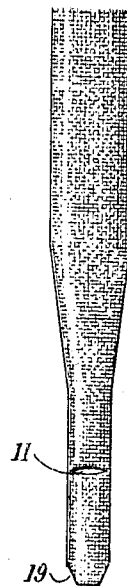


Fig. 4.

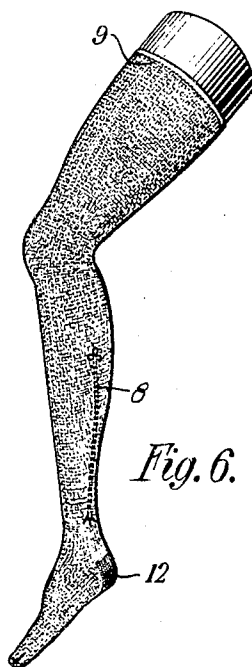


Fig. 6.

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UNITED STATES PATENT OFFICE

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MANUFACTURE OF ELASTIC TUBULAR GARMENTS

Robert Pickles and John Pickles,
Burnley, EnglandApplication April 10, 1943, Serial No. 482,598
In Great Britain February 24, 1941

4 Claims. (Cl. 2—239)

The object of the invention is the provision of a new or improved method of manufacturing elastic hosiery, and other shaped tubular garments such as roll-on corsets and vests, such method being capable of achieving cheaper production than has hitherto been possible by the knitting processes hitherto commonly employed for the purpose, whilst the liability to "laddering" inherent in knitted articles is avoided.

The method according to the invention consists in weaving the garment in tubular form, using elastic weft threads, the number of warp ends lifted being progressively modified at predetermined intervals so as to effect such variations in width as are requisite to produce the desired shape of the article, e. g. at the calf or ankle of a stocking, and the exposed unwoven portions of the warp threads being subsequently severed. Garments may be manufactured in accordance with the invention by weaving a continuous tubular fabric and subsequently dividing the same transversely into individual lengths each including a full repeat of the pattern, such lengths each constituting an independent stocking or the like. During the weaving operation a pattern repeat is produced by weaving in all the warp ends for a predetermined number of picks, then decreasing the number of the warp ends lifted progressively until the desired minimum width is attained; weaving at minimum width is continued for a predetermined number of picks, whereafter the number of warp ends lifted is increased to the full number so as to resume weaving at maximum width, whereupon the next repeat commences.

The manner in which the invention may be carried into effect in the manufacture of elastic stockings is hereinafter described with reference to the accompanying drawings, of which Fig. 1 is a representation of a length of hose fabric as woven in accordance with the invention, including a number of "repeats"; Fig. 2 is a fragmentary view of a portion of the fabric drawn to a larger scale, showing the manner in which the warp ends are progressively decreased to produce the desired variation in shape; and Fig. 3 a fragmentary view of a portion of the pattern used for punching the warp-selecting cards of a jacquard as employed in the production of the effect illustrated in Fig. 2. Figs. 4 and 5 are rear and side views of a severed stocking length shown separately, and Fig. 6 depicts the completed stocking stretched over a dummy leg.

For the purpose of weaving a stocking in accordance with the invention it is convenient to employ a loom of the jacquard type, the warp-

selecting cards whereof are punched in accordance with the pattern shown in Fig. 3. After weaving a sufficient length of hose at extreme width, say from A to B in Fig. 1, the warp ends lifted by the jacquard mechanism are progressively decreased, preferably working from both sides of the fabric, until the hose gradually attains its minimum width at C. Weaving proceeds at the decreased width from C to A' for a length sufficient for the ankle and foot portions of the stocking, whereafter a fresh "repeat" is commenced, the full number of warp ends in the shed being lifted. Further cycles of operation are repeated according to the number of stockings to be woven.

In Fig. 2 warp ends are denoted by the reference numerals 4, 41, 42 etc., and weft picks by reference numerals 5, 51, 52 etc. In Fig. 3 the pattern shows at 6, 6 where the warp ends are to be lifted and at 7 where they are allowed to remain unwoven.

After each repeat has reached the cloth-roller of the loom, it may be severed transversely from the remaining piece along the lines AA, A'A', etc., and the exposed unwoven portions of the warp, indicated generally by the reference 4 in Fig. 1, may then be clipped off by hand. The seam-like formation along the line at which the warp ends are clipped off may be concealed by embroidering a "clock" or fancy pattern 8 over the same.

Each "repeat" cut off between successive lines AA, A'A', etc. constitutes a single stocking length as shown in Fig. 4, and the raw edge at the upper or wider end is subsequently hemmed as at 9 (Fig. 6) to prevent unravelling of the terminal wefts. The narrow end of the stocking length is cut to a shape substantially as indicated at 19, and the edges are then secured together to close the toe.

According to the jacquard warp-selecting card pattern illustrated in Fig. 3, the warp ends are arranged to be decreased in groups of two after each fourth pick. It will however be understood that any other suitable arrangement may be employed to effect a gradual decrease and increase in width such as will enable the stocking to fit neatly upon the wearer's calf and ankle. It is of course unnecessary that the shaping of the fabric should take place simultaneously or symmetrically on both sides.

The warp threads may be of cotton, rayon or fine wool and the elastic weft is conveniently composed of textile (e. g. cotton or rayon) and india-rubber latex filaments combined by the method described in our British Patent Specifica-

tion No. 443,188. The weft threads may be adapted for weaving by preliminary subjection to a fixation treatment similar to that described in British Patent Specification No. 497,518, the fixing agent being subsequently discharged from the woven article by immersion in a suitable solvent, to restore the full elasticity of the rubber component of the material.

The heel may be made by slitting across the back of the fabric, as at 11 (Figs. 4 and 5) and inserting between the separated edges of the slit a separate previously woven piece 12 of elastic fabric of single-ply, said inserted portion 12 being shaped so as to constitute a seat to enclose the wearer's heel, and its edges being seamed to the divided edges of the fabric along the slit 11. Whereas the stocking fabric is made elastic in a transverse or weftwise direction, the material forming the heel-portion 12 is preferably arranged so as to be elastic in a direction lengthwise of the stocking.

All the severed edges of the fabric are preferably bound to prevent fraying. Elastic thread should be used for this purpose, unless the fabric is held under tension along the length of the edge during the binding operation, in which case inelastic binding material may be used.

Garments manufactured by this method are not liable to the defect of laddering which is characteristic of knitted fabrics. Further, it is not essential to provide strengthened fabric tops in the case of stockings, since the use of suspenders (garters) is unnecessary.

What we claim as our invention and desire to secure by Letters Patent is:

1. A tubular woven elastic garment comprising warp and elastic weft threads, and having a top portion of uniform diameter and a lower adjacent portion, wherein the number of the warp threads interwoven with the weft threads is progressively decreased throughout a portion of

the length of the garment, the unwoven portions of the warp threads being severed and detached.

2. A woven elastic stocking as claimed in claim 1, having inelastic textile warp threads and rubber-textile weft threads, the number of the warps interwoven with the wefts being progressively decreased throughout the calf-portion of the stocking and the ankle and foot portions being woven at minimum width, said stocking having a heel-portion inserted in and seamed to the edges of a transverse slit in the back of the stocking and having the lower end seamed across to close the toe.

3. A woven elastic stocking as claimed in claim 1, having inelastic textile warp threads and rubber-textile weft threads, the number of the warps interwoven with the wefts being progressively decreased throughout the calf-portion of the stocking and the ankle and foot portions being woven at minimum width, said stocking having a heel-portion inserted in and seamed to the edges of a transverse slit in the back of the stocking and having the lower end seamed across to close the toe and wherein fancy clock patterns are embroidered over those parts of the stocking at which the unwoven portions of the warp are clipped off.

4. An elastic stocking as claimed in claim 1, having inelastic textile warp threads and elastic weft threads woven to form a tubular fabric decreased in width throughout the calf, ankle and foot portions of the stocking, a heel portion inserted in a transverse slit in the back of the fabric and seamed at its edges to the edges of said slit, said heel-portion being elastic in the direction lengthwise of the stocking, and a closed toe formed by seaming across the lower end of the fabric.

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