

Oct. 11, 1960

A. R. PARTHUM

2,955,445

FULL FASHIONED STOCKINGS WITH ANTI-RUN DEVICES

Filed May 24, 1955

5 Sheets-Sheet 1

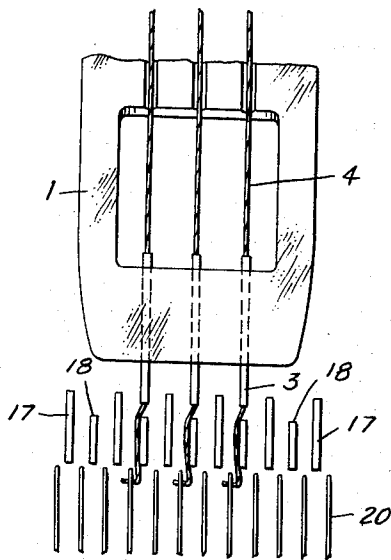


Fig. 1

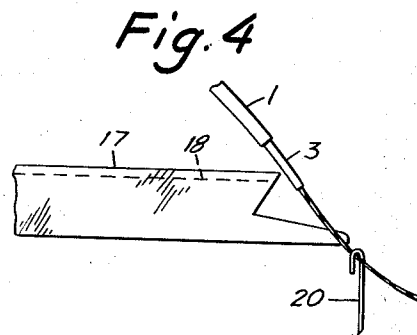


Fig. 4

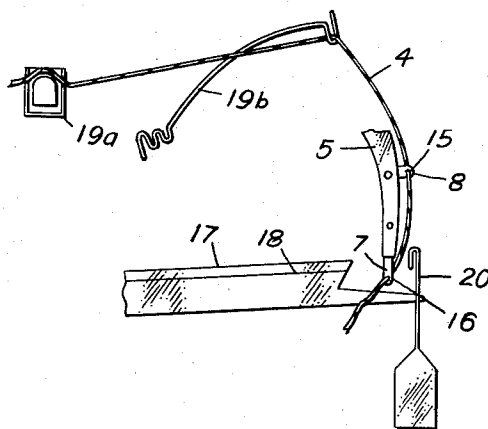


Fig. 6

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Fig. 2

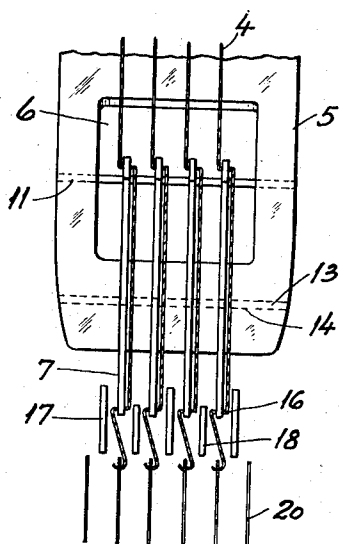


Fig. 3

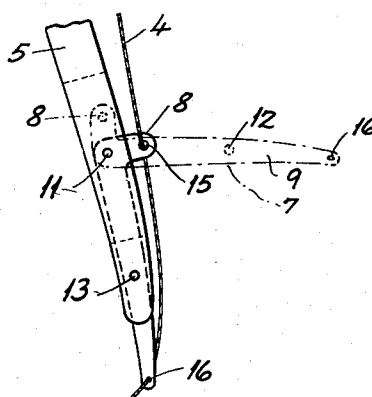
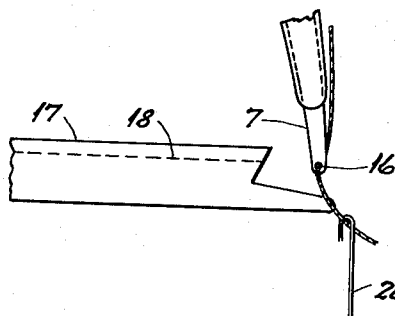


Fig. 5



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Fig. 7

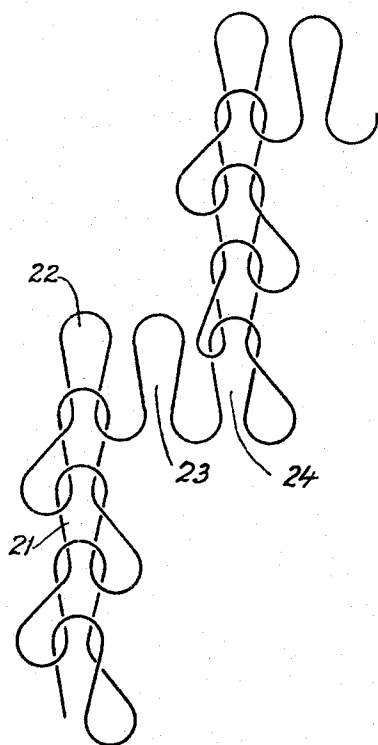
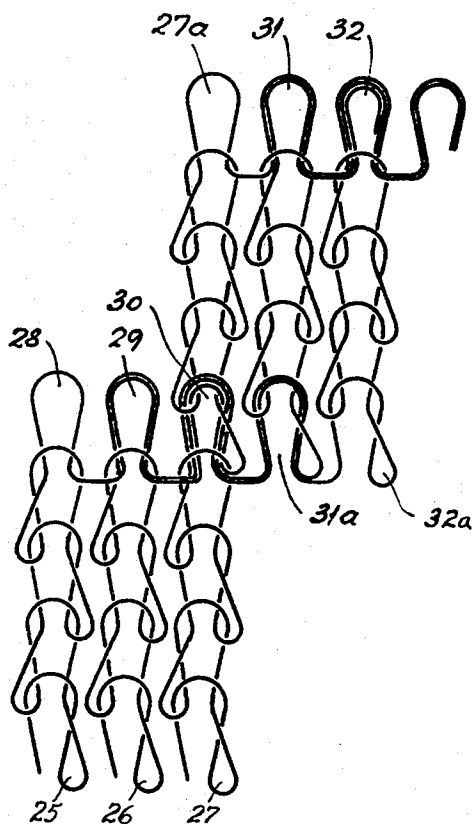


Fig. 8



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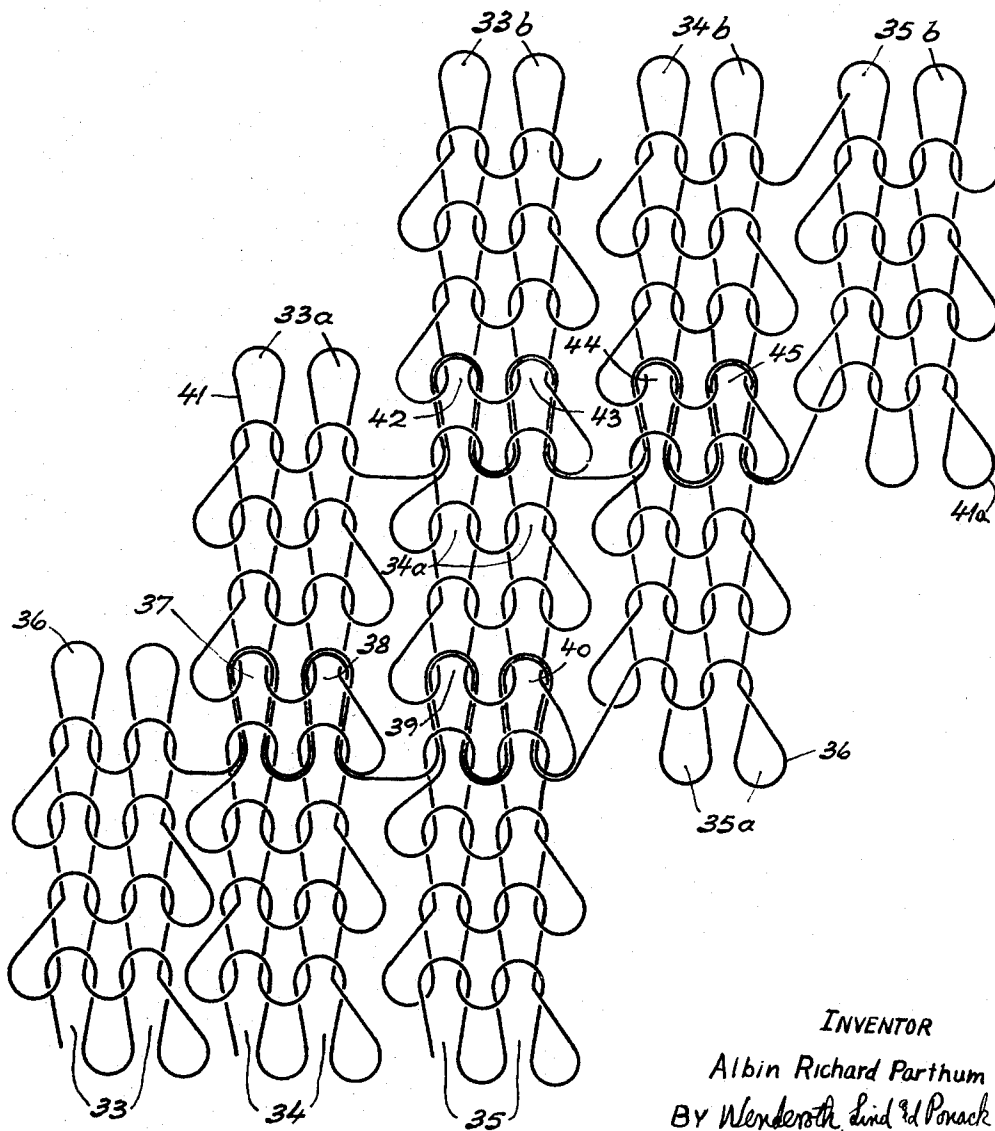
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Fig. 9



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FIG II

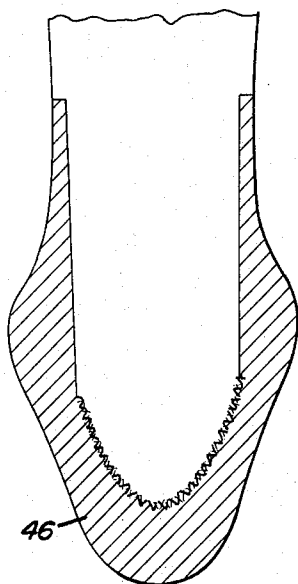


FIG I2

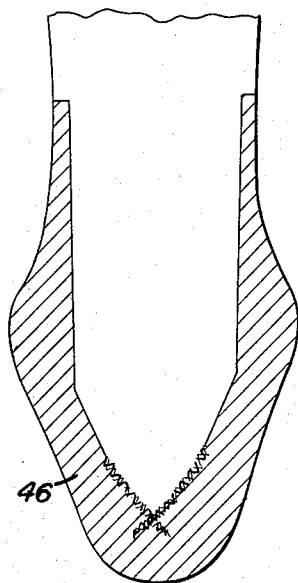


FIG IO

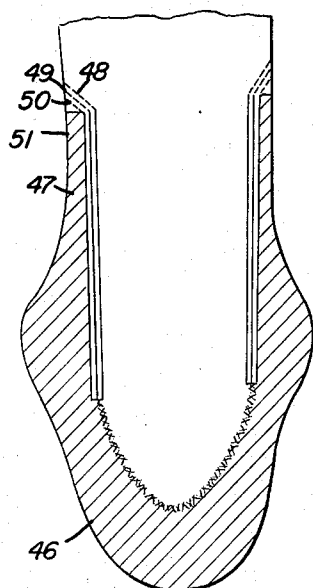
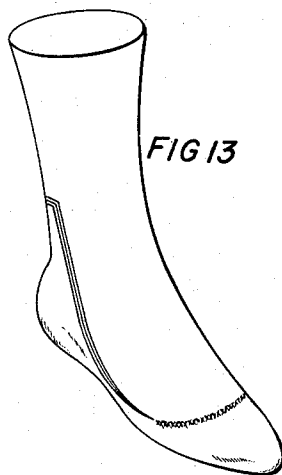


FIG I3



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FULL FASHIONED STOCKINGS WITH ANTI-RUN DEVICES

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Claims priority, application Denmark June 1, 1954

5 Claims. (Cl. 66—182)

The present invention concerns a method of procedure and an apparatus for the production on a modified conventional full fashioned knitting machine (cotton machine) of stockings with anti-run devices, and stockings produced in accordance with this method of procedure. The stockings made in accordance with this method of procedure have reinforced feet.

A feature of a stocking in accordance with the invention is that during its knitting on the full fashioned knitting machine there are knitted special anti-run threads along the whole of the edge of the foot reinforcement or solely along the edge of the toe reinforcement, which anti-run threads by being transferred from one or more wales to other wales form cross-binding stitches at the points of crossing. The stocking's ordinary meshes hereby become filled with more than two threads, by which means there is formed a kind of stopper, which prevents running upwards or downwards. The prevention of running upwards is of the greatest importance. The stopper effect of these anti-run threads can be increased by making these especially thick and one can contingently use threads of a different kind from that used for the remainder of the stocking, for instance heavier threads of crepe nylon, artificial silk, cotton or wool.

The transfer of the anti-run threads from one needle wale to another is carried out by the lateral displacement in the frame of the thread guides for these threads.

The anti-run threads form lines walewise in the longitudinal length of the stocking, or if they are displaced these lines form rows oblique to the direction of the wales. The wales are offset from each other at certain intervals, the amount of which can vary from a single course to several courses.

Such a stocking will retain its elasticity in all directions.

The method of procedure according to the present invention is a simple, rapid and advantageous method of producing stockings, that are secured against running by means of anti-run devices, whose meshes in the main lie on top of the body meshes of the stocking with which they are knitted together mesh by mesh.

For the production of the lines of the anti-run devices it is advantageous in accordance with the invention that the knitting machine shall have a double set of thread guides, working one above the other, and each having more than one tube or more than one thread guide with an eye, and which can be moved in opposite directions to each other for forming anti-run stitches in individual courses.

The drawing shows diagrammatically some embodiments of parts of a knitting machine in accordance with the invention and various embodiments of stockings produced in accordance with the invention.

Fig. 1 shows a thread guide holder with three thread guiding tubes,

Fig. 2 a thread guide holder with four thread guides,

Fig. 3 a side elevation view of Fig. 2,

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Fig. 4 a thread guiding tube and sinker and divider,

Fig. 5 a thread guide and sinker and divider,

Fig. 6 a spring wire bracket with accessories,

Figs. 7-9 show anti-run threads forming various types of meshes,

Figs. 10, 11 and 12 various stockings laid out flat, and

Fig. 13 a stocking sewed together and pulled over a model foot.

In Fig. 1 a thread guide holder for adding the anti-run threads is represented by 1, and this has an opening 2 and below carries three ordinary thread guides 3, through which threads 4 are led. The thread guide holders are attached to a thread guide steel rod or a rail, which can be moved laterally along the needle frame in both directions. In its position of rest the thread guide holder is held outside the needle frame, but during operation it is held in the requisite place in the needle frame, where it can be moved in the requisite manner.

Figs. 2 and 3 show an alternate means for adding the anti-run thread. In this means, which is also mounted on a thread guide rail, a thread guide holder is designated by 5, and this has an opening 6 and below carries four so-called thread guides. A thread guide 7 has the form of an angle with a short leg 8 and a longer leg 9. At the angle is located an eye by means of which the thread guide can be located on and turnably held by a shaft 11, which in any suitable manner is attached to the thread guide holder laterally of the opening 6. An eye 12 is located on the long leg 9 by means of which the thread guide can be fastened to a pin 13 which can be slid in through holes 14 bored in the thread guide holder 5, and from which holes it is easily retractable as required. In the operative position of the guide a thread can easily be threaded through an eye 15 on the short leg 8, but it is first after the pin 13 has been retracted that the guide can be swung out to the position shown in Fig. 3 exposing an eye 16 on the long leg, so that a thread 4 may easily be threaded.

In Fig. 4 are shown the positions of the first form of thread guide tube, a high sinker 17 and a low divider 18. The thread guide extends down to a point just above a divider 18, although the thread 4 can be caught by the sinker and by the divider.

As is seen in Fig. 5 the second form of thread guide 7 extends down below the top of the sinker 18 and its thread corresponding to thread 4 in Fig. 3, can be caught by both the sinker and the divider. A steel needle is designated by 20.

In Fig. 6 is shown a tension device for a thread 4. The thread is led from a spool over a braking device 19a of any suitable type, and further over a bendable spring wire bracket 19b to a thread guide 7. By this means it is possible to maintain a suitable tension on the thread during the whole of the knitting.

In Figs. 7, 8 and 9 are shown various mesh systems for the anti-run courses.

Fig. 7 shows for the sake of clarity only a single wale containing the meshes 21 and 22 produced by only one thread guide 7 similar to those shown in Figs. 2 and 3, the wale containing five meshes. In the production of the fifth mesh the thread guide is displaced a distance of two wales to the right so that a course is formed consisting of the last mesh 22 in the wale, an intermediate mesh 23 and the first mesh 24 in a new wale. The body meshes of the stocking itself are not shown.

Fig. 8 shows a mesh system consisting of three wales 25-28, 26-29 and 27-30, of the type shown in Fig. 7. The system is knitted by means of a thread guide means with three guides therein, which each deliver thread to their own wale. The three wales 25, 26 and 27 are first knitted. To form course 28, 29, 30, 31a, 32a the thread guide is displaced to the right a distance of two

wales. This causes the formation of cross-binding meshes 29, 30 and 31a, and the ordinary mesh 32a in that the anti-run thread from mesh 28 crosses the threads from meshes 29 and 30 and therefore forms the wale 30—27a. The thread from mesh 29 crosses the threads from wale 27, 30, 27a and forms mesh 31a. The thread from wale 30 forms mesh 32a. Hereafter the wales 31a, 31 and 32a, 32 are formed. The cross-binding meshes 31 and 32 are formed in similar way as set forth above.

In Fig. 9 is shown a system of meshes knitted by a thread guide with three thread guiding tubes, each of which delivers a thread to two steel needles. After knitting the double wales 33, 34 and 35 the thread guide is displaced the width of two wales to the right. In the course 36, 37, 38, 39, 40, there are formed cross-binding meshes at the wales 34, 33a and 35, 33b and the double wales part 37, 38, 33a and 39, 40, 42, 43 as well as the new double wale 35a, 44, 45 are knitted with the threads from wales 33, 34 and 35 respectively. When course 41, 41a is knitted, the thread guide is again moved two wales to the right, after which wales 42, 43, 33b and 44, 45, 34b as well as the new double wale 41a, 35b are knitted with the use of threads from wales 33, 34 and 35 respectively.

In Figs. 10, 11 and 12 are shown stockings laid out flat, as they are delivered from the knitting machine and before they are stitched together along the seam and under the foot. A re-inforced portion 46 of the stocking at the heel and the foot is shown hatched. In Fig. 10 there are shown just over the re-inforced heel portion 47 three lines of anti-run threads 48, 49, 50 which from the edge 51 of the stocking are led diagonally for a suitable distance and then stepwise down towards the centre of the stocking, so that they prevent running from the heel portion 47. The anti-run line 50 follows the inner edge of the heel re-inforcement forming a wale. It can however also be located both within the reinforcement, or as with the lines or wales 49 and 50, formed by means of anti-run threads lie a suitable distance outside the reinforcement, for instance parallel with the inner edge and closer in to the center of the stocking, by which means a special pattern effect is obtained. Towards the toe portion of the stocking the reinforcement 46 approaches the center line of the stocking in steps and the lines of anti-run threads 48, 49, 50 follow the edge of the reinforced portion, so that these lines meet and may cross each other.

In Fig. 11 is shown a stocking with a heel portion of ordinary kind, and where only the angle-shaped part of the anti-run course or courses at the toe portion is shown knitted.

Similarly in Fig. 12 is shown a stocking with an ordinary heel portion, where only the inner part of the angle-shaped part of the lines of the anti-run device is shown knitted. To obtain a special reinforcement of the toe portion, especially as regards the big toe, the anti-run lines are continued past their point of intersection, so that a cross is formed, the arms of which may have any chosen suitable length.

Fig. 13 shows a stocking in accordance with Fig. 10 assembled and mounted on a model foot.

What I claim is:

1. A full fashioned stocking having a foot reinforcement and having rows of courses of anti-run threads knitted into the meshes of the body of the said stocking which rows commence at the beginning of the heel reinforcement and extend diagonally inwardly a predetermined distance on the stocking and then continue down in the direction of the wales of the body of the stocking and along to the edge of the foot portion of the reinforcement to the toe portion along the edge of which they continue to the middle of the foot of the stocking.

2. A full fashioned stocking having a foot reinforcement and having rows of courses knitted of anti-run threads knitted into the meshes of the body of the said stocking on the right and left hand side of the foot portion of the said stocking in which the said rows cross each other on the middle line of the foot adjacent the toe thereof and extend a little distance into the said reinforcement.

3. A full fashioned stocking having a toe and foot reinforcement knitted into the meshes of the body of the stocking by means of anti-run threads forming rows of courses, said anti-run threads being positioned along each leg of said meshes, said rows extending from the middle part of the inner edge of the toe reinforcement and following said inner edge and the edge of the foot reinforcement adjoining the toe reinforcement along at least part of its length.

4. A full fashioned stocking having a toe, foot and heel reinforcement knitted into the meshes of the body of the stocking by means of anti-run threads and forming rows of courses, the anti-run threads extending along the legs of said meshes, said rows commencing above the top of the heel reinforcement on the back portion of the stocking and extending obliquely to the front edge of said heel reinforcement and downwardly to the edge of the foot reinforcement, along the foot reinforcement to the edge of the toe reinforcement and then to the middle part of the foot of the stocking along the edge of the toe reinforcement.

5. A full fashioned stocking as claimed in claim 1 in which the anti-run threads are artificial crepe threads of a polyamide.

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