Feb. 28, 1939. J. E. QUINN 2,148,836

WELT CONSTRUCTION FOR FULL-FASHIONED HOSIERY

Filed Sept. 22, 1938

Fig. 1.

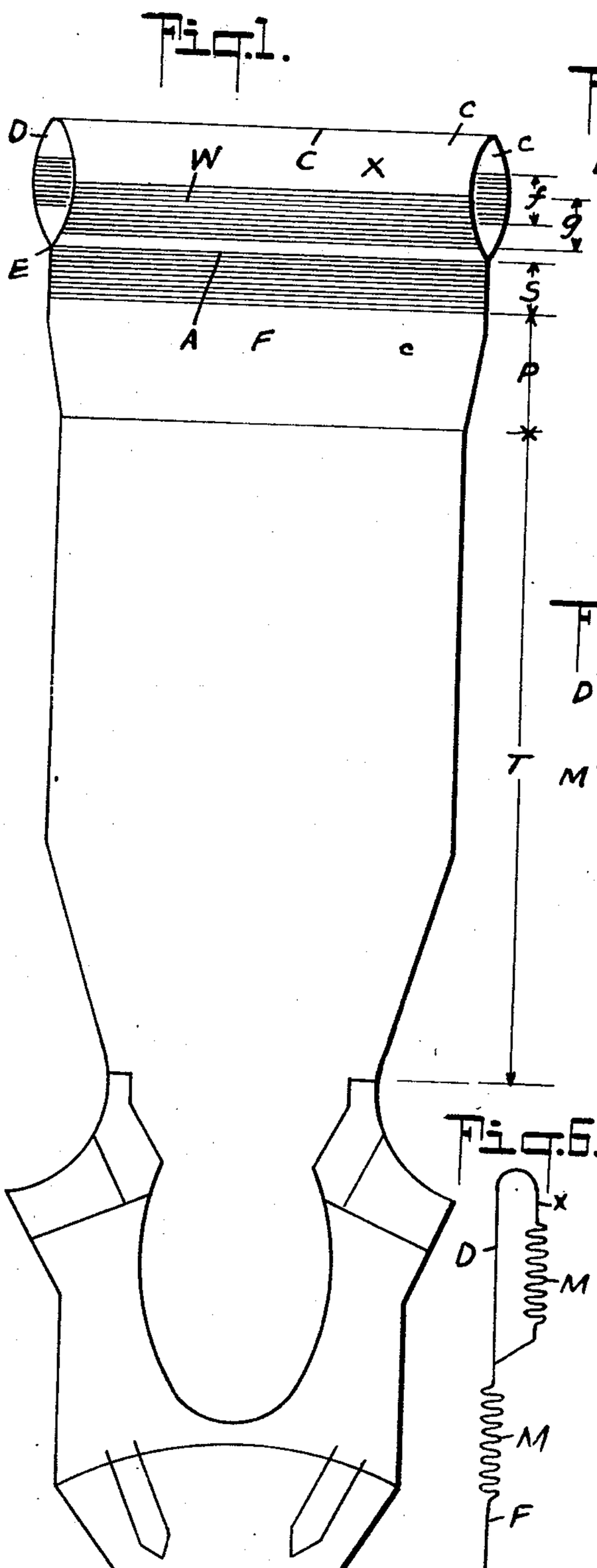

Fig. 2.

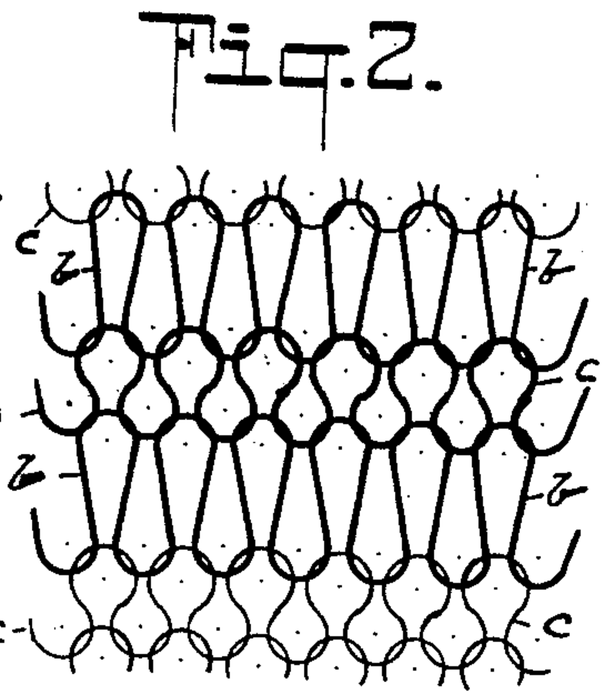

Fig. 4.

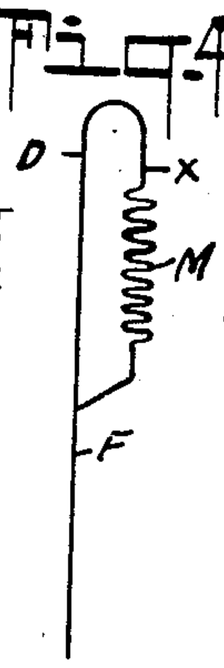

Fig. 3.

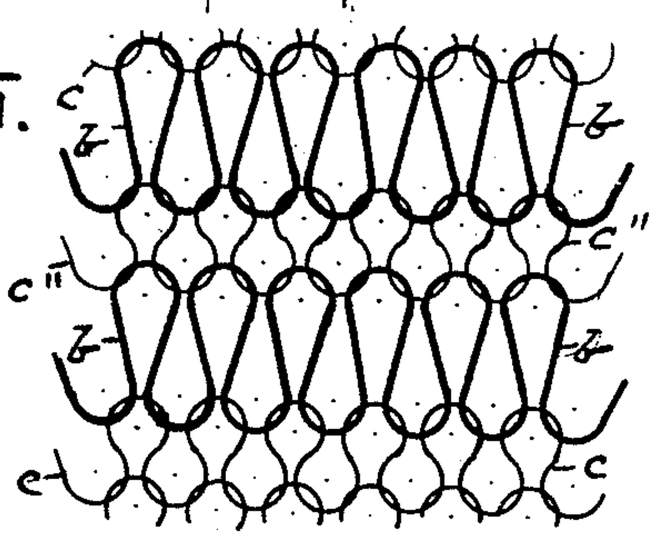

Fig. 5.

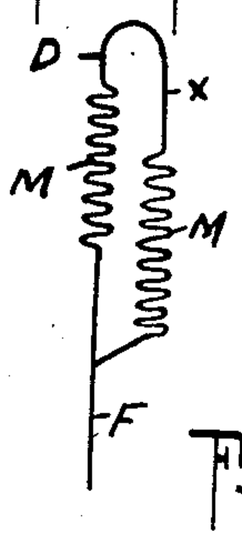

Fig. 8. Fig. 9. Fig. 10.

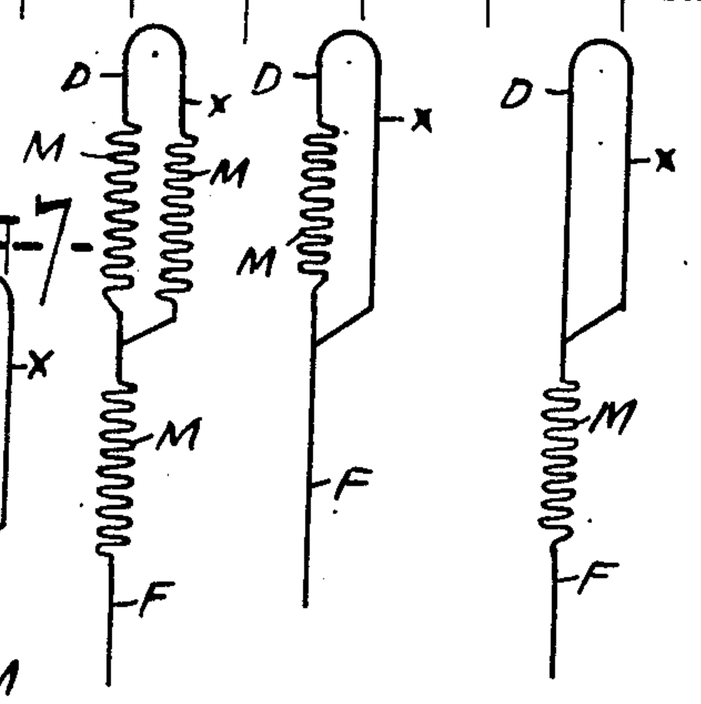

Fig. 6. Fig. 7.

INVENTOR
JOHN E. QUINN.
BY
J. B. Hume Lewis.
ATTORNEY

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WELT CONSTRUCTION FOR FULL-FASHIONED HOSIERY

John E. Quinn, Philadelphia, Pa.

Application September 22, 1938, Serial No. 231,202

8 Claims. (Cl. 66—173)

This invention relates to hosiery, and has particular reference to full-fashioned hosiery which is knit flat and the edges thereof sewed together to form a garment.

This is a continuation in part of my co-pending application Serial No. 93,799, filed August 1, 1936, which said application was a continuation in part of my then co-pending application Serial No. 698,555, filed November 18, 1933.

The object of the invention is to provide a stocking so constructed that the welt portion thereof and the upper part of the leg adjacent the welt will adapt themselves to the wearer's limb regardless of the size thereof.

Another object of the invention is to provide a stocking with a leg portion having the greater part thereof knit with ordinary tight loops, the upper part including the welt of such construction that the garment will snugly fit the part of the leg above the knee regardless of its dimensions with respect to the calf.

A further object of the invention is to provide the stocking with additional reinforcing means to prevent the accidental breaking of the threads when the upper part of the stocking is stretched abnormally.

A still further object of the invention is to provide the welt, and if desired, the after welt, with means to prevent the spiralling of such parts of the stocking when made according to the present invention.

It will be understood that even with limbs that have the same calf and ankle measurement, wide variations will be found in the girth of that portion of the limb to which the welt fits, and no efforts have been made to produce standard calf sizes with variable welt sizes, so that in many instances, the welts are either too large, in which case they do not closely fit the limb, or they are too small, in which case they are quite likely to be stretched beyond their elastic limit, thereby fracturing the threads which form the knitted loops, and thus causing runs of holes in the welt, particularly where those welts are contacted by the garter fasteners.

According to the invention, the improved stocking has a reinforced welt consisting of inner and outer walls, in which at least one annular area is provided with combinations of ordinary tight and loose courses, which said combinations cause the welt to snugly fit the upper limbs of smaller girth, and to readily stretch so as to adapt themselves to upper limbs of larger girth, regardless of the standard girth of the leg, calf and ankle. The reinforcing may continue below the welt to form what is commonly known as an "after welt." This after welt may also be provided with a tight and loose course area. The tight and loose course area wherever used may be provided with an additional splice or reinforcing thread knit into every course thereof, or the additional splice or reinforcing thread may be knit into the loose courses only of said area. The additional splice or reinforcing thread may be twisted in a direction opposite to the direction of twist of the other threads in said area.

The drawing illustrates embodiments of the invention, and the views therein are as follows:—

Figure 1 is a blank illustrating the surface knitting required to form a full-fashioned stocking,

Figure 2 illustrates the nature of the knitting designated as "I and I", and which is one form of knitting employed in the welt or after welt of the stocking,

Figure 3 is another type of knitting designated as "I and I", and which is similarly employed,

Figures 4 to 10 inclusive are diagrammatic views showing areas of tight and loose courses in various combinations in the walls of the welt and the after welt of a stocking.

It will be understood that the employment of tight and loose courses in certain portions of the stocking produce artistic features while at the same time increase the elasticity and also cause a saving in yarn. The employment of normal courses or tight courses insures strength in the parts associated with the loose courses, and my invention contemplates the use of tight and loose courses in combinations, such as "one and one", "two and one", "two and two", "three and one", "three and two", "four and one", etc. The walls of the welt and the after welt in the upper leg portion of the stocking or in one of them are knit with bands of uniform or different combinations of tight and loose loop course structures or any number of loose courses with any number of tight courses.

The yieldingness of a knitted fabric may be adapted to secure any desired elasticity both circumferentially and vertically when in use.

In the formation of the welt of the stocking, it will be understood that the types of yarn employed therein will be the same as in the conventional stockings, that is to say, that these welts are usually reinforced to provide strength for resisting the forces caused by the attaching of garters, etc., and it is intended that the welt shall not be weakened in any respect, but may have the advantage of the original strength plus the elasticity provided by this invention.

While this invention primarily contemplates the use of the regular yarns for the formation of the welt, it is my intention that all areas comprising any of the combinations of tight and loose courses and particularly those which are formed on the front wall of the welt and at the top of the leg shall be reinforced by the introduction of an additional splice thread or threads, so as to give still greater strength combined with greater elasticity.

The stocking is knitted as follows: Beginning with the course A, and continuing for a number of courses until the course C is reached, the stocking may be knitted so that the inner wall X thereof may be provided with tight and loose courses W in any arrangement shown in Figures 4, 5, 6 and 8. It is also part of this invention that this tight and loose course knitting W may be in any of the combinations heretofore mentioned, and what is heretofore referred to as "one and one", "two and one", "two and two", "three and one", etc. This particular designation means that in the "one and one" type, there will be one tight knit regular course, and then one loose knit course, then a repetition of these courses throughout the area designated as W. With the "two and one" type, there will be two tight regular courses, one loose course, then two tight regular courses, then one loose course in regular order through the area indicated as W. The "two and two", "three and one", etc. means that there are combinations of two regular tight courses and two loose courses; three regular tight courses and one loose course, etc.

When the stocking to be knitted has reached the point E (see Figure 1) the welt is formed by folding the web so far knit upon itself and the loops A onto the machine needles on which are the loops forming the course E, whereupon these loops are caught in with the course of loops at the point E and firmly secured therewith, after which the knitting continues downward to knit the area F. Now all this area so far referred to, that is the area X, the area D and the area F are reinforced in the conventional manner. The outer wall D may be of regular tight knit courses *c*, as indicated in Figures 2 and 3, or both walls of the welt may be partly of tight knit courses *c* and with areas *f* and *g* comprising tight and loose courses. The after welt may also be provided with an area S of tight and loose courses.

The dimension P indicates the distance between the bottom of the tight and loose course area in the after welt, and the bottom of the after welt, while the dimension T indicates what is commonly known as the leg of the stocking, and this leg is entirely of regular tight knit courses.

In Figure 2, there is indicated a small diagrammatic section of knitting, the loose loops *b* and tight loops *c'* being indicated in heavy lines, and intended to represent that there is in these courses an additional splice or reinforcing thread. The courses *c* represent the regular tight knit structure above and below the tight and loose course area.

In Figure 3, there are shown loose courses *b* with a tight course *c''*. It will be noted that the loose courses in this figure are of heavy lines, and the intermediate tight course of light lines indicating that the additional splice or reinforcing thread extends through the loose courses only of said area.

In Figure 4, there is shown diagrammatically, the upper part of a stocking in which the inner wall of the welt X is provided with a tight and loose course area M. In this instance, no tight and loose course area has been placed in either the front wall of the welt or in the after welt. The tight and loose course area in the inner wall of the welt may be of any of the combinations herebefore referred to, that is "one and one", "two and one", etc., and the additional splice or reinforcing thread may extend entirely through the tight and loose course area, or through the loose courses only. In addition thereto, the additional splice or reinforcing thread may be twisted opposite to the direction of the twist of the other threads composing said area.

In Figure 5, there is illustrated diagrammatically the upper part of the stocking showing tight and loose course areas in the inner wall X of the welt and the outer wall D of the welt, and no such area in the after welt.

In Figure 6, there are tight and loose course areas in the inner wall of the welt and in the after welt.

In Figure 7, there are tight and loose course areas in the outer wall of the welt and in the after welt, but no tight and loose course area in the inner wall of the welt.

In Figure 8, there are shown tight and loose course areas in the inner wall X of the welt, the outer wall D of the welt and in the after welt F.

In Figure 9, there is shown a tight and loose course area in the outer wall D of the welt only.

In Figure 10, there is shown a tight and loose course area in the after welt F only.

In some instances, it has been deemed advisable to omit the additional reinforcing thread from the tight and loose course area on the inner wall of the welt, as the inner wall of the welt is supported and prevented from excessive stretching by the outer wall of the welt.

In each of the areas of the combinations shown, the tight and loose course area may be of any of the combinations suggested, "one and one", "two and one", etc., and the additional splice or reinforcing thread may extend through each course of the area, or it may extend through the loose courses only. The additional splice or reinforcing thread may also, if desired be twisted in a direction opposite to the twist of the other threads composing said area.

It will, of course, be understood that when I have referred to the use of an additional splice or reinforcing thread, that I do not limit myself to the use of a single thread, but a plurality of threads may be employed, if desired.

The location or locations of the tight and loose course areas in the several parts of the stocking mentioned, that is the inner wall of the welt, the outer wall of the welt, and the after welt, may be located as desired, that is to say, this area may be nearer the top, nearer the bottom, or central in these parts, and no limitation on location shall be ascribed by reason of the diagrammatic views shown in the drawing.

It will, of course, be understood that the same purpose may be accomplished if a heavier yarn is used at the places where I have called for an additional reinforcing thread, that is to say, if the regular reinforcing has been with a seven strand thread, the tight and loose course area may be knit with a ten strand thread, which provides additional strands rather than additional threads. This is within the contemplation of this invention, and when I refer to the use of an additional thread, my meaning shall be construed as broad enough to include a thread of a greater number of strands.

It will also be understood that the height of the annular band or area is variable.

Of course, the stocking illustrated may be modified in various ways without departing from the invention herein set forth and hereafter claimed.

The invention is hereby claimed as follows:—

1. A full-fashioned stocking having a reinforced welt consisting of inner and outer walls, an area in at least one wall consisting of combinations of tight and loose courses, and an additional reinforcing thread knitted into said tight and loose course area only.

2. A full-fashioned stocking having a reinforced welt consisting of inner and outer walls, an area in at least one wall consisting of combinations of tight and loose courses, and an additional reinforcing thread knitted into said loose courses only.

3. A full-fashioned stocking having a reinforced welt consisting of inner and outer walls and a reinforced after welt, an area in at least one of said parts consisting of combinations of tight and loose courses, and an additional reinforcing thread knitted into said tight and loose course area only.

4. A full-fashioned stocking having a reinforced welt consisting of inner and outer walls and a reinforced after welt, an area in at least one of said parts consisting of combinations of tight and loose courses, and an additional reinforcing thread knitted into said loose courses only.

5. A full-fashioned stocking having a reinforced welt consisting of inner and outer walls, an area in at least one wall consisting of combinations of tight and loose courses, and an additional reinforcing thread knitted into said tight and loose course area only, said additional reinforcing thread being twisted opposite to the twist of other threads of said parts.

6. A full-fashioned stocking having a reinforced welt consisting of inner and outer walls, an area in at least one wall consisting of combinations of tight and loose courses, and an additional reinforcing thread knitted into said loose courses only, said additional reinforcing thread being twisted opposite to the twist of other threads of said parts.

7. A full-fashioned stocking having a reinforced welt consisting of inner and outer walls and a reinforced after welt, an area in at least one of said parts consisting of combinations of tight and loose courses, and an additional reinforcing thread knitted into said tight and loose course area only, said additional reinforcing thread being twisted opposite to the twist of other threads of said parts.

8. A full-fashioned stocking having a reinforced welt consisting of inner and outer walls and a reinforced after welt, an area in at least one of said parts consisting of combinations of tight and loose courses, and an additional reinforcing thread knitted into said loose courses only, said additional reinforcing thread being twisted opposite to the twist of other threads of said parts.

JOHN E. QUINN.