Dec. 14, 1937. E. J. MARTEL 2,102,368

ARCH SUPPORTING STOCKING

Filed Sept. 26, 1935

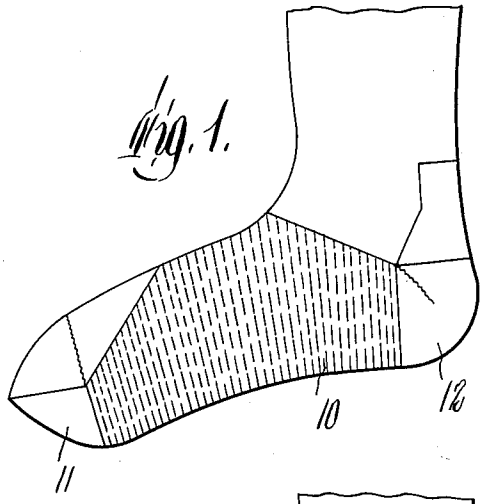


Fig. 1.

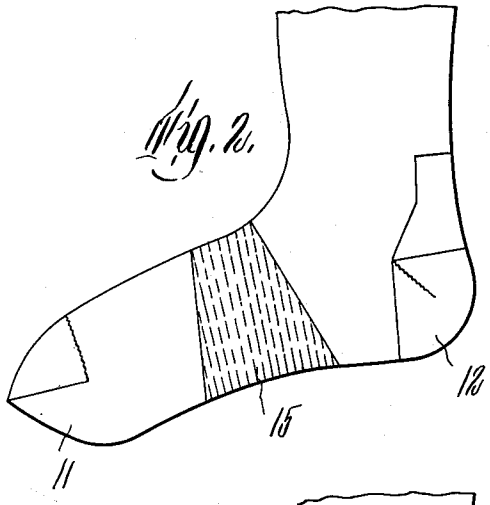


Fig. 2.

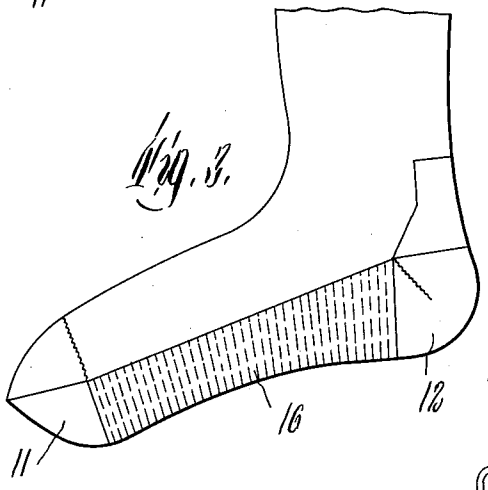


Fig. 3.

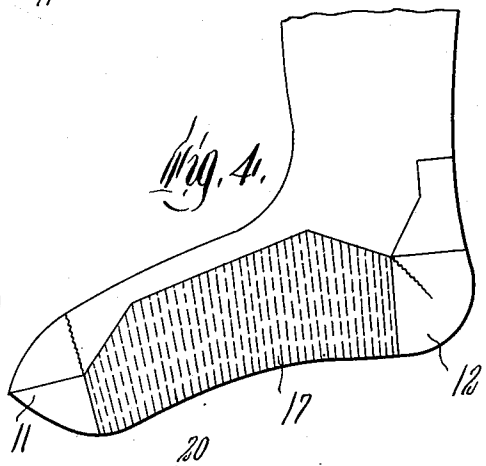


Fig. 4.

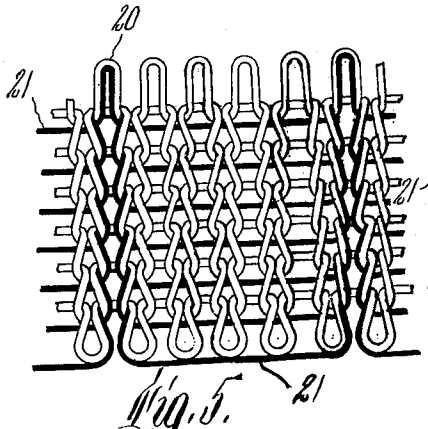


Fig. 5.

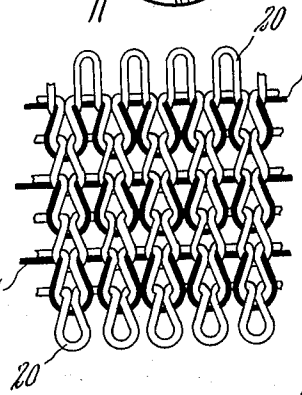


Fig. 6.

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2,102,368

ARCH-SUPPORTING STOCKING

Edgar J. Martel, Laconia, N. H.

Application September 26, 1935, Serial No. 42,251

5 Claims. (Cl. 66—182)

This application is a continuation in part of my copending application Serial No. 753,811, filed November 20, 1934. The invention relates to a sock or stocking which is preferably of knitted construction and which has embodied therein a supporting element for the arch of the foot of the wearer.

It is well known that a great many people are subject to troubles with their feet which cause pains in their feet and elsewhere in their bodies. These troubles are frequently due to a tendency on the part of the cuneiform bones of the foot to be depressed by the weight of the person to positions below the positions they normally occupy. As these bones are the keystones of the arch formed by the bones structure of the foot, undue depression of these bones results in what is commonly known as "fallen arches." While considerable restoring force is required to push the cuneiform bones back into place when once the arches have fallen, yet a comparatively small sustaining or supporting force under the arch portions of the feet is often sufficient to prevent the falling of the arches. The present invention relates to a sock or stocking having means acting to prevent fallen arches rather than to restore the arches after they have fallen.

According to the invention, I provide socks or stockings, the leg portions of which are knitted with inelastic yarn only, so that the pressure against the leg of the wearer is slight, being due only to the tension of the knitted loops in the fabric, whereas the foot of the sock or stocking is made with a substantial area of knitted elastic thread in the sole portion, which may, if desired, extend all of the way around the instep portion of the stocking. By using for such areas a fine elastic thread to be knitted with the inelastic yarn, a stocking is thus provided with a yielding instep portion having a substantial supporting tension on the arch of the wearer's foot. Furthermore, the knitted elastic yarn on the sole of the foot forms a resilient cushion between a portion of the wearer's foot and the insole of the shoe.

Since in some cases the straight addition of an elastic yarn to the inelastic yarn may result in a more bulky fabric than is desired, I may reduce the bulk either by knitting the elastic yarn into courses alternating with one or more courses without the elastic yarn, or by knitting the elastic yarn in each course by needles which are spaced by needles which do not take the elastic yarn so that the elastic yarn floats between successive stitches.

For a more complete understanding of the invention, reference may be had to the disclosure thereof in the description which follows and on the drawing of which

Figures 1, 2, 3 and 4 are elevational views of the foot portions of stockings showing reinforced areas of different shapes.

Figures 5 and 6 are diagrams of alternative forms of fabric which may be employed.

The stocking illustrated in Figure 1 is provided with an elastic area 10 which extends entirely around the instep portion of the stocking and extends on the sole of the stocking from the toe part 11 to the heel pocket 12.

Figure 2 shows a stocking with an elastic area 15 extending around the foot of the stocking at the instep portion thereof, this area being more nearly in the shape of an encircling band for the instep of the foot.

Figure 3 shows a stocking having an elastic area 16 limited to the sole portion of the stocking but extending from the toe cap to the heel cap.

Figure 4 shows an elastic area 17 similar to the area 16 in Figure 3 extending higher on the sides of the foot.

In carrying out the invention, socks or stockings are preferably made with the leg portions consisting solely of an inelastic yarn of such material as cotton, rayon or silk. In the foot of the sock or stocking, an elastic thread is fed to the needles to be stitched with an inelastic thread, the feed being controlled so that the added elastic thread is limited to predetermined areas.

It is evident that elastic areas may be made in various other designs or patterns, having, in common with the designs shown, the function of providing a substantial, resilient, supporting force for the arch of the foot, and a cushion for a portion of the sole of the foot. These areas may be built into the stocking in any desired manner, and the elastic thread may be employed in the elastic areas instead of the inelastic yarn used for the other portions of the stocking, or with such yarn as a reinforcing thread. In order not to render the stocking objectionably bulky, a very fine elastic thread may be used, such thread consisting preferably of a fine strand of soft rubber having a double covering of cotton or other fine yarn wound thereon. These elastic threads can be made small enough to be knitted successfully into loops by the needles of conventional knitting machines so that such elastic thread can be fed to the machine like ordinary yarn. The resulting area thus is elastic not only by reason of the

formation of loops (which gives a small degree of elasticity), but also by reason of the stretching power of the elastic thread. Although each individual thread exerts a small tension, the elastic area contains a large number of courses of such thread, the combined tension of which is sufficient to exert a substantial supporting force on the arch of the foot.

If it is desired to reduce the bulkiness still further, the elastic yarn may be knitted in with the inelastic yarn in consecutive courses in the manner shown in Figure 5 or as shown in Figure 6. The fabric shown in Figure 5 may be knitted by feeding the inelastic yarn **20** to all the needles, but elevating every other needle to take the elastic yarn **21**. The elastic yarn is thus stitched by these needles and floats past the other needles. It is evident that instead of alternate needles, every third, fourth or fifth needle may be raised to take the elastic thread prior to stitching. When the elastic yarn is knitted on a machine into spaced wales of the fabric, the action of the needles and sinkers inevitably produces more or less tension on the elastic yarn as it is being knitted. As a necessary result, the floated portions of the elastic yarn draw together the wales into which the elastic yarn is knitted, thus gathering the fabric and causing it to have a rib-like structure when unstressed. Furthermore, the stitches in the several courses which include the elastic yarn need not be in the same wales as shown, but may be staggered.

As indicated in Figure 6, the elastic yarn may be knitted into alternate courses, this being done by control of the feeding finger through which the elastic yarn is supplied. It is evident that the courses containing the elastic yarn may be spaced by more than one course of inelastic yarn if desired.

Stockings embodying the invention may be knit on circular machines or on flat machines, since in both types of stockings it is common practice to insert substitute or reinforcing yarns in the sole portions of the stockings and extra reinforcing yarns in the heel and toe portions.

It is evident that various modifications and changes may be made in the particular embodiments of the invention herein shown and described without departing from the spirit or scope of the invention as defined in the following claims.

I claim:—

1. A knitted sock or stocking having its leg portion made of an inelastic yarn and having an elastic yarn knitted into the sole portion thereof together with an inelastic yarn continuously from the heel pocket to the toe pocket thereof, whereby the arch of the foot is given support and a substantial cushion is provided for the ball of the foot.

2. A knitted sock or stocking having the foot knitted of inelastic yarn and an elastic yarn knitted in with said inelastic yarn after the manner of a reinforcing yarn over a substantial area of the sole portion sufficient to provide an elastic support for the arch and a resilient cushion for the ball of the wearer's foot.

3. A knitted sock or stocking having the foot knitted of inelastic yarn and an elastic yarn knitted in with said inelastic yarn in courses spaced by courses which do not contain elastic yarn over a substantial area of the sole portion sufficient to provide an elastic support for the arch and a resilient cushion for the ball of the wearer's foot.

4. A knitted sock or stocking having the foot knitted of inelastic yarn and an elastic yarn knitted in with said inelastic yarn over a substantial area of the sole portion and in a sufficient number of courses to provide an elastic support for the arch and a resilient cushion for the ball of the wearer's foot.

5. A knitted sock or stocking having the foot knitted of inelastic yarn and an elastic yarn knitted in with the inelastic yarn in successive courses over a substantial area of the sole portion, the elastic yarn in each course being knitted with the inelastic yarn in stitches which are spaced by groups of at least three stitches past which the elastic yarn is floated.

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