May 11, 1954 A. M. EVANS 2,677,828

UNDERGARMENT AND WAISTBAND THEREFOR

Filed Sept. 10, 1952

2 Sheets-Sheet 1

FIG. 1

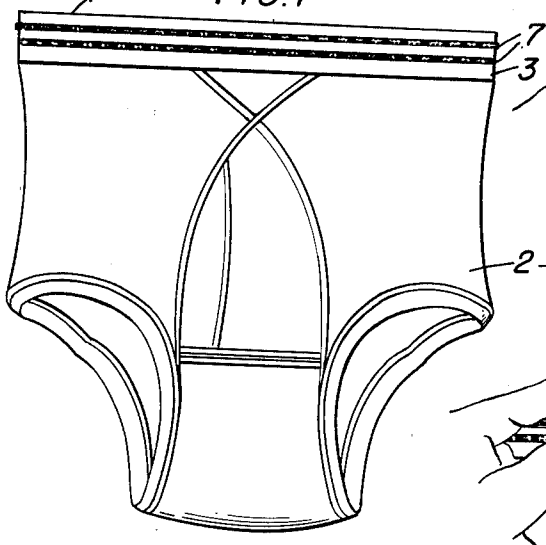


FIG. 3

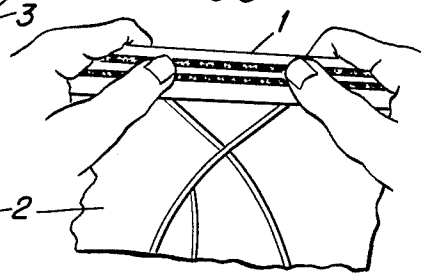


FIG. 4

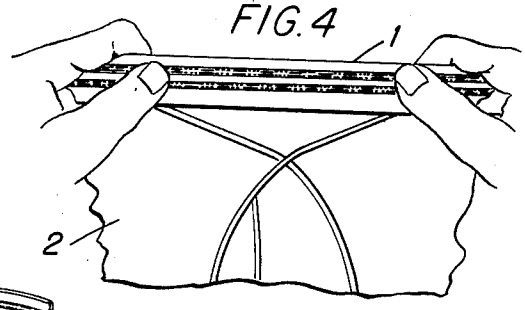


FIG. 2

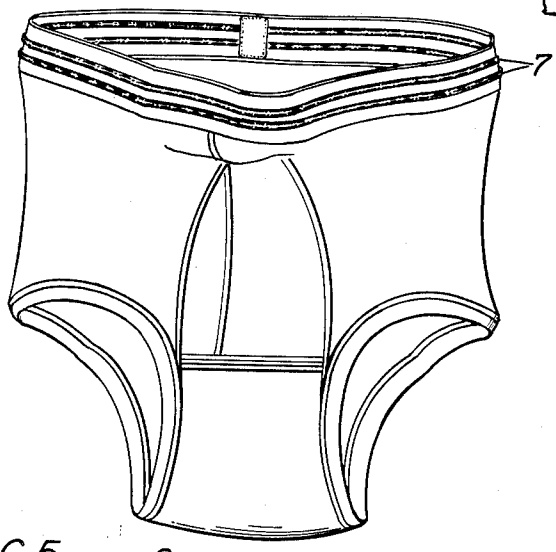
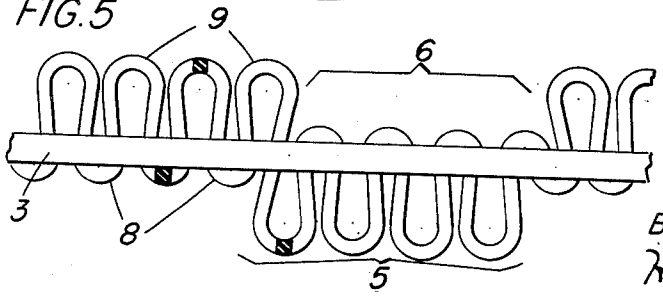


FIG. 5



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FIG. 6

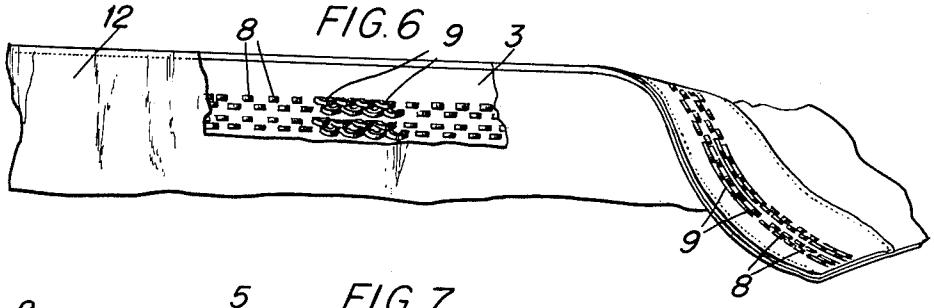


FIG. 7

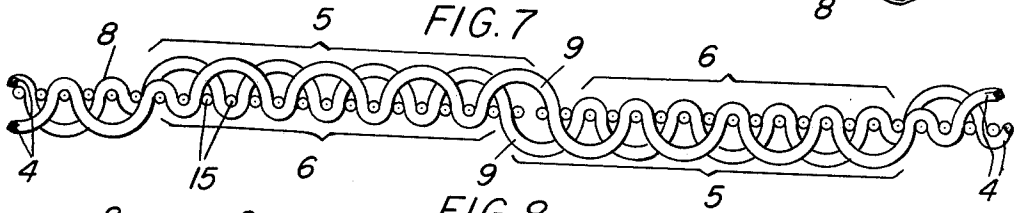


FIG. 8

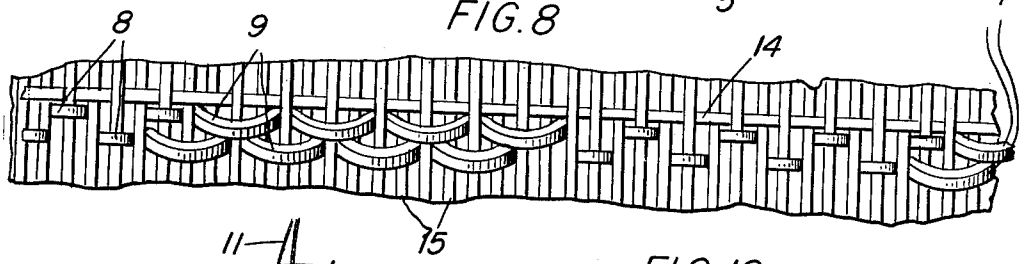


FIG. 9

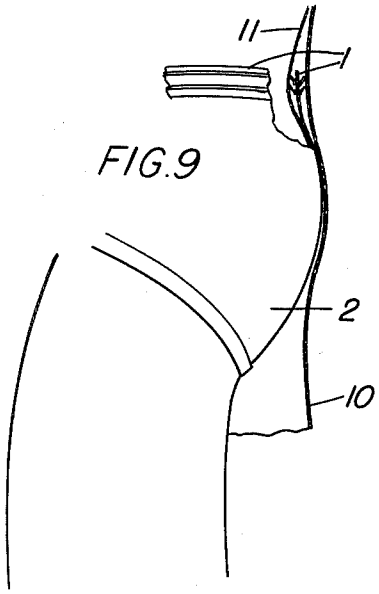
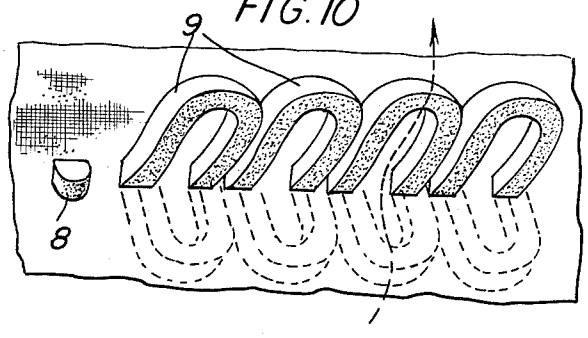


FIG. 10



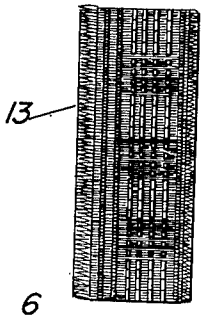
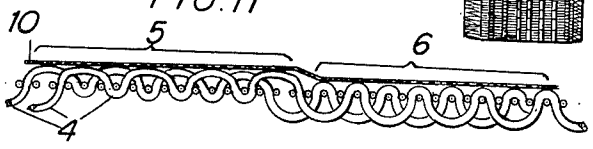


FIG. 12

FIG. 11



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UNDERGARMENT AND WAISTBAND THEREFOR

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Application September 10, 1952, Serial No. 308,829

9 Claims. (Cl. 2—224)

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This invention relates to undergarments and waistbands therefor and more particularly to undergarments having elastic waistbands. It has heretofore been known to so construct the waistbands of men's shorts or the like as to exercise a hold-down influence on shirts which overlap the waistband of the shorts. The waistbands of such garments heretofore known have been thick and complicated structures. Furthermore, they have not been adapted to hold down both an undershirt and an outer or dress shirt. I have invented a simple form of elastic waistband which not only exercises an improved hold-down influence on a shirt, but one which, despite its simplicity, is able to hold down an undershirt and at the same time an outer or dress shirt. I will describe and illustrate my invention in connection with men's shorts, but it should be understood that the invention is equally applicable to any type of undergarment requiring an elastic waistband, such, for instance, as night garments or ladies' underwear.

In the drawings:

Fig. 1 is a front elevation of a pair of men's shorts having one embodiment of my novel waistband.

Fig. 2 is a view of the garment of Fig. 1 with part of the waistband moved to make evident the fact that the waistband is built to exercise its hold-down influence on both the inside and outside of the shorts.

Figs. 3 and 4 are detail views on a somewhat larger scale of a portion of the front of the waistband of the shorts of Figs. 1 and 2; Fig. 3 showing the waistband in its contracted or relaxed condition, and Fig. 4 showing the elastic waistband stretched.

Fig. 5 is a view in horizontal section through part of the elastic waistband of Figs. 3 and 4, showing the alternate arrangement of the bare rubber thread on the two sides of the band.

Fig. 6 is a view of a section of waistband of a modified form of garment embodying my invention in which one side of the band is covered with cotton or other ordinary textile fabric so that the shirt hold-down effect is available on only one side of the waistband, the cotton covering cloth being broken away at one point to show the underlying structure.

Fig. 7 is a view in longitudinal section through the waistband of Figs. 1 to 5, taken on a line where bare rubber is present, a second thread of rubber being shown behind the first thread.

Fig. 8 is a view in side elevation of the face of a piece of elastic waistband in accordance with Figs. 1 to 5, showing only the small and large bare rubber loops and the weft threads.

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Fig. 9 is a view, partially broken away, of the shorts of Figs. 1 to 5 when being worn with two shirts.

Fig. 10 is a diagrammatic view, partly in perspective, of a face of the waistband of the shorts of Fig. 9, the large bare rubber loops being shown dotted in their position before the shirt has exercised an upward pull, and the solid line position of the large rubber loops showing their position and shape after the shirt has pulled on the loops.

Fig. 11 is a view in horizontal section through the waistband of Figs. 9 and 10, showing the manner in which one of the shirts follows the contours of the waistband fabric.

Fig. 12 is a diagrammatic view of the face of an embodiment of my novel waistband with a different arrangement of the lines of bare rubber threads.

In the drawings I have shown a typical form of men's shorts where a light garment is desired. With such a garment it is highly desirable that the waistband be as thin as possible and that at the same time it be elastic. Heretofore it has been suggested that waistbands could be built which would have a hold-down influence on a shirt to prevent its riding up as the wearer bends and moves about. The usual method of producing such a structure is to have one or more portions in the waistband which are inelastic and of special construction. These special portions have not only been without stretch but also of more complicated and thicker construction than the rest of the waistband. These features of such constructions are highly objectionable. Furthermore, any hold-down influence which such portions have been able to exert has been of what I term the non-recovery type. In other words, while such portions may present a frictional effect which helps to hold the shirt from riding up, once the shirt has moved, the waistband can have no influence in pulling it back. Again, these inelastic hold-down sections have heretofore been one-sided in that they can hold down a shirt only on one side of the undergarment. It is characteristic of my invention that I have a hold-down construction which is as elastic as the rest of the waistband and which may be incorporated in the base fabric all around the waistband. Because my waistband has substantially the same effective thickness as an ordinary elastic waistband which has no hold-down effect, I prefer to make the waistband with the hold-down effect incorporated in it throughout its entire length. This facilitates the holding of the shirt because a grip is exerted at a large number of closely spaced points. As will be pointed out hereinafter, this, taken in connection

with the particular structure, provides a much better hold-down for the shirt than has heretofore been obtainable.

The shorts shown in the drawings are of the general type covered by the C. R. Coppel et al. U. S. Patent No. 2,176,790, but it should be understood that the invention is not limited to this particular form of shorts or of undergarment.

In the drawings the waistband 1 is sewn to the inelastic body fabric 2 forming a complete circle, as can be seen in Fig. 2 of the drawings. Referring now to the detailed construction of the waistband, I have illustrated my invention embodied in a woven band 3 having longitudinal stretch or elasticity in its base fabric. This base fabric 3 may contain elastic warp threads which have been covered by a wound cotton cover to provide the longitudinal stretch referred to. If desired, inelastic threads can be intermixed in the warp, although I have omitted them from the drawings. By covering the elastic threads 14 of the base fabric, the stretch of the base fabric can be availed of without any undesirable friction when putting on the garment. In any case, I prefer to use textile yarns for the base fabric, i. e., cotton or wool, or cotton-covered yarn, etc., instead of bare rubber. The garment is shown in Figs. 1 and 2 in its relaxed or contracted position of waistband. Except where otherwise noted in the drawings, the waistband is shown in its relaxed condition.

To provide the hold-down effect in the waistband, I prefer to use bare elastic threads. For example, in the drawings I have used bare rubber threads 4 which are square in cross-section, as shown in Figs. 5 and 10. I intercalate lines or individual threads of bare rubber or other elastic longitudinally in the base fabric 3 in a particular manner to give my desired effects. The intercalation which I use comprises, for one thing, the interweaving of the bare rubber threads 4 from face to face of the waistband around the inelastic base weft threads 15, i. e., those running across the waistband. My novel interrelation has two important aspects. I vary the amount of rubber in the loop on each face of the fabric preferably after a series of loops, and I also provide a specific relation in tension and length of the bare rubber yarn with relation to the base fabric. Speaking first of the variation in the amount of rubber between one kind of loop and the other on either side of the garment, in effect I provide raised sections 5 of bare rubber alternated with sections 6 where the raising is skipped and the rubber is buried practically flush with the base fabric 3. These alternate raised and recessed sections not only function in a useful manner in holding the shirt against both vertical and horizontal movement, as will be hereinafter explained, but they enable me, in connection with the other conditions mentioned above and hereinafter described, to produce from a very simple structure a double-sided construction in which I have hold-down sections of live raised rubber on both outer surfaces of the base fabric.

As will be seen in Figs. 5, 7 and 8, I so place such intercalated threads or lines of bare rubber in the base fabric as to produce a flush section or recess on one face of the waistband with a raised rubber section opposite it on the other face, and to alternate sides for the recessed and raised sections, doing all this with a single thread. As hereinafter described, I can and frequently do find it desirable to repeat this construction in pairs or multiples of pairs of lines 7, but the principle of operation is the same whether a single thread, a pair of threads or multiplicities of pairs of threads are used. It will be seen that where a recessed section is produced on a given face of the fabric, the bare rubber is drawn down tightly in small loops 8 so that there is no space between the rubber and the inelastic cross or weft thread and the base fabric.

In the example shown in Figs. 1 to 11, the bare rubber thread comes to the surface in the recessed section over a single weft thread and then returns to the opposite side of the fabric to form long loops 9 over three weft threads. In this way the short loops 8 of the rubber in the recessed section are spaced apart and form only a minor part of the recess in a linear direction. The large rubber loops 9 appear in the raised section each time over three of the inelastic weft threads 15 of the base fabric and then each goes through to the recessed face and returns around a single weft thread so that the loops afford a substantially continuous surface of rubber on the raised section side. This arrangement, together with the transitions in any given line or thread from a raised section on one face to the adjacent recessed section on the same face, can be seen in Fig. 7. In this same figure I have shown a second bare rubber thread forming an adjacent line but staggered longitudinally of the fabric.

I desire to point out that my bare rubber thread is interwoven under such conditions that the long loops 9 in the raised sections have more slack in them than can possibly be taken up by the base fabric when stretched to its maximum. In fact, it is characteristic of waistbands made in accordance with my invention that what I term the large or long loops of the bare rubber in the raised sections which play the major part in holding down shirts are so slack under normal stretch of the waistband that the loops are pendant, i. e., they tend to hang down under the force of gravity. Even if the rubber is sufficiently stiff to cause them to project from the face of the fabric, they will have space inside the loop which is not in contact with the base fabric. This is true even if the base fabric is stretched out of ordinary limits. This surplus length in the large loops of bare rubber thread performs a valuable function not heretofore known, as will now be explained. When the shorts are being worn and shirts have been drawn down past the waistband on both sides, as shown in Fig. 9, these large loops are in prominent contact with the inner and outer shirts 11 and 10, respectively, as indicated at one side of Fig. 11. This is due in part, of course, to the thickness of the rubber lying above the surface of the base fabric. When, owing to movement of the wearer, a shirt tends to pull upwardly, the friction of the bare rubber will cause these loops to turn upwardly, as shown in Fig. 9. There will be a jamming effect of the rubber against the fabric as the loops are forced up, but the most interesting aspect of my construction at this point is that the long loops gripping the fabric of the shirt will tend to stretch and create tension in themselves as the shirt pulls. Thus in Fig. 10, for example, the loops are shown turned upwardly and stretched slightly in length as a result of the upward position of the shirt. When the shirt stops pulling, the loops tend to pull the shirt down again until the loops are relaxed. In this way it will be seen that my waistband not only provides an effective resistance to the crawling up of the shirt, but tends to pull the shirt down again when the pull of

the upward crawl ceases, a feature which I believe to be wholly novel in structures of this kind.

As shown in Fig. 11, the shirt 10 is also in contact with the recessed portions 6 of the waistband. Since the small loops of the rubber threads 4 do not have the ability to turn and stretch like the large loops of the raised sections, the small loops grip the shirt tightly before it rides up at all. However, these small loops being spaced apart do permit a shirt to adjust and stretch between the small loops where the shirt has any stretch in it. Similarly the alternation of recessed and raised portions creates an interaction in holding down which is believed valuable.

In Fig. 6 I have shown one way of producing a waistband in which the rubber loops project from only one side of the fabric. In this example I merely cover one side of the waistband with textile fabric 12. It is also possible, by using a more complex weave of base fabric, to so intercalate the rubber threads that they do not show on one side. However, the preferred form of my invention is with loops exposed on both faces.

In Fig. 12 is shown a slightly different elastic thread pattern waistband 13. Here I show four single bare rubber threads forming lines of loops spaced from each other. The other parts of the drawing are not bare rubber.

In Figure 12 and also in Figure 3, the alternating series of longer loops and shorter loops are aligned widthwise of the base fabric.

What I claim is:

1. An undergarment having a waistband comprising a base fabric having longitudinal stretch, in combination with a bare elastic thread interwoven longitudinally into the base fabric so as to form loops exposed on at least one face of the fabric, of such length that their thread is slack when the base fabric is stretched, whereby when the garment is being worn, limited up-and-down movement of the loops is permitted and a quality of holding down other garments is created even when the base fabric is stretched.

2. In an undergarment, an elastic waistband comprising a woven base fabric having longitudinal stretch, in combination with rows of bare rubber loops, some of said loops projecting from one or both faces of the base fabric having more slack than can be taken up by the stretch of the base fabric; whereby the bare rubber creates a garment hold-down quality in the waistband.

3. In an undergarment a waistband according to claim 2, in which there are series of long loops and series of short loops in alternation, the long loops of a series forming a substantially continuous line but the short loops forming only a minor part of the recess in a linear direction.

4. In an undergarment a waistband according to claim 2, in which the loops are arranged in series of long loops and series of short loops in alternation on the two faces of the waistband the long loops being of sufficient length to hang pendant when the base fabric is not stretched and not to lose all their slack when the fabric is stretched to its maximum.

5. An undergarment having a waistband comprising a base fabric having longitudinal stretch, in combination with a bare elastic thread interwoven longitudinally into the base fabric so as to form loops exposed on both faces of the fabric, of such length that their thread is slack when the base fabric is stretched to its maximum, whereby when the garment is being worn, limited up-and-down movement of the loops is permitted and a quality of holding down other garments is created even when the base fabric is stretched.

6. An undergarment having a waistband comprising a woven base fabric having longitudinal stretch, in combination with a bare rubber thread having a rectangular cross section interwoven longitudinally into the base fabric so as to form loops exposed on at least one face of the fabric, of such length that their thread is slack when the base fabric is stretched to its maximum, whereby when the garment is being worn, limited up-and-down movement of the loops is permitted and a quality of holding down other garments is created even when the base fabric is stretched.

7. An undergarment having a waistband comprising a woven base fabric with longitudinal stretch in combination with a bare rubber thread interwoven longitudinally into the base fabric so as to form loops exposed on both faces of the fabric, a succession of said loops having such length that their elastic is slack when the base fabric is stretched to its maximum, intercalated on the same face with loops tight on the fabric, whereby limited up-and-down movement of the loops is permitted and a hold-down quality is created in the waistband regardless of the position of the waistband of the garment on the wearer and regardless of the amount of tension on the waistband.

8. An undergarment having a waistband comprising a base fabric with longitudinal stretch in combination with a plurality of bare elastic threads interwoven longitudinally into the base fabric so as to form loops exposed on at least one face of the fabric, there being series of loops of such length that their elastic thread is slack when the base fabric is stretched to its maximum, alternating on the same face with loops tight on the fabric, forming alternating raised and recessed sections on the same side of the base fabric, whereby when the garment is being worn, limited up-and-down movement of the loops is permitted and a quality of holding down other garments is created even when the base fabric is stretched.

9. An undergarment having a waistband comprising a base fabric with longitudinal stretch in combination with a plurality of bare elastic threads having a square cross section with sharp corners, interwoven longitudinally into the base fabric so as to form loops exposed on both faces of the fabric, there being series of loops of such length that their elastic thread is slack when the base fabric is stretched to its maximum, alternating on the same face with loops tight on the fabric, forming alternating raised and recessed sections on the same side of the base fabric, whereby when the garment is being worn, limited up-and-down movement of the loops is permitted and a quality of holding-down other garments is created even when the base fabric is stretched.

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