Jan. 26, 1960 C. J. PEACHEY 2,922,166

ELASTIC WAISTBAND

Filed Dec. 19, 1957 3 Sheets-Sheet 1

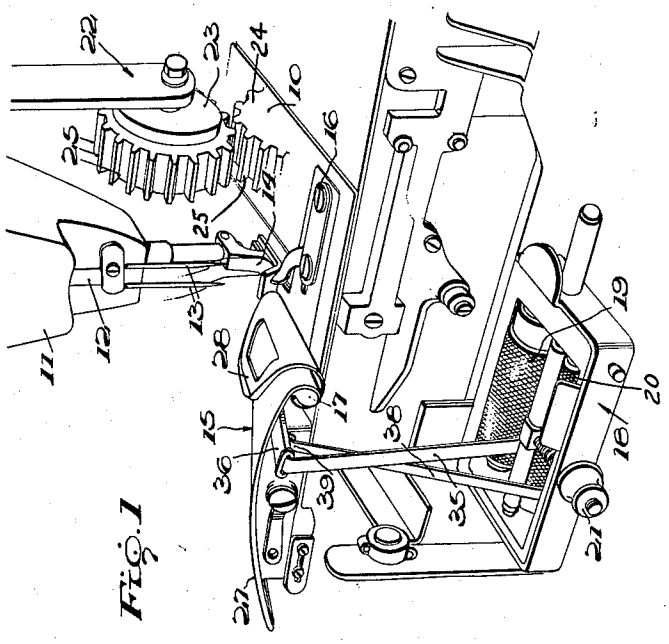

Fig. 1

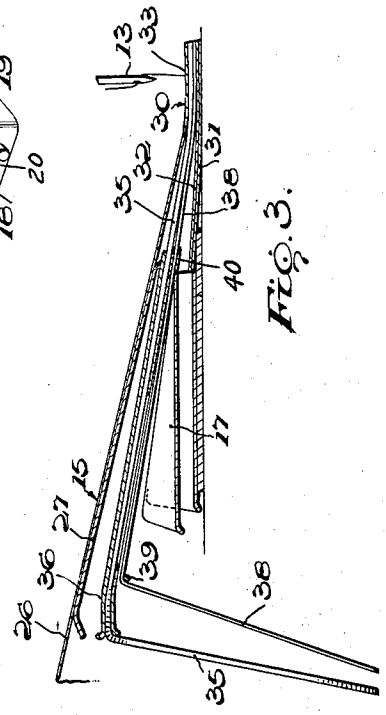

Fig. 3.

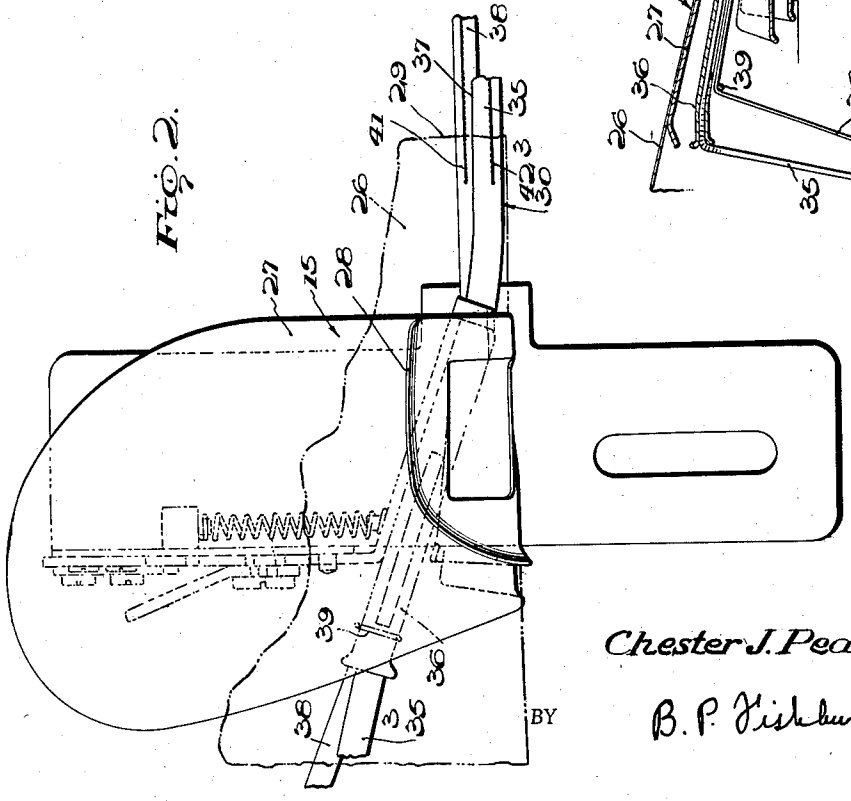

Fig. 2.

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Jan. 26, 1960 C. J. PEACHEY 2,922,166

ELASTIC WAISTBAND

Filed Dec. 19, 1957 3 Sheets-Sheet 2

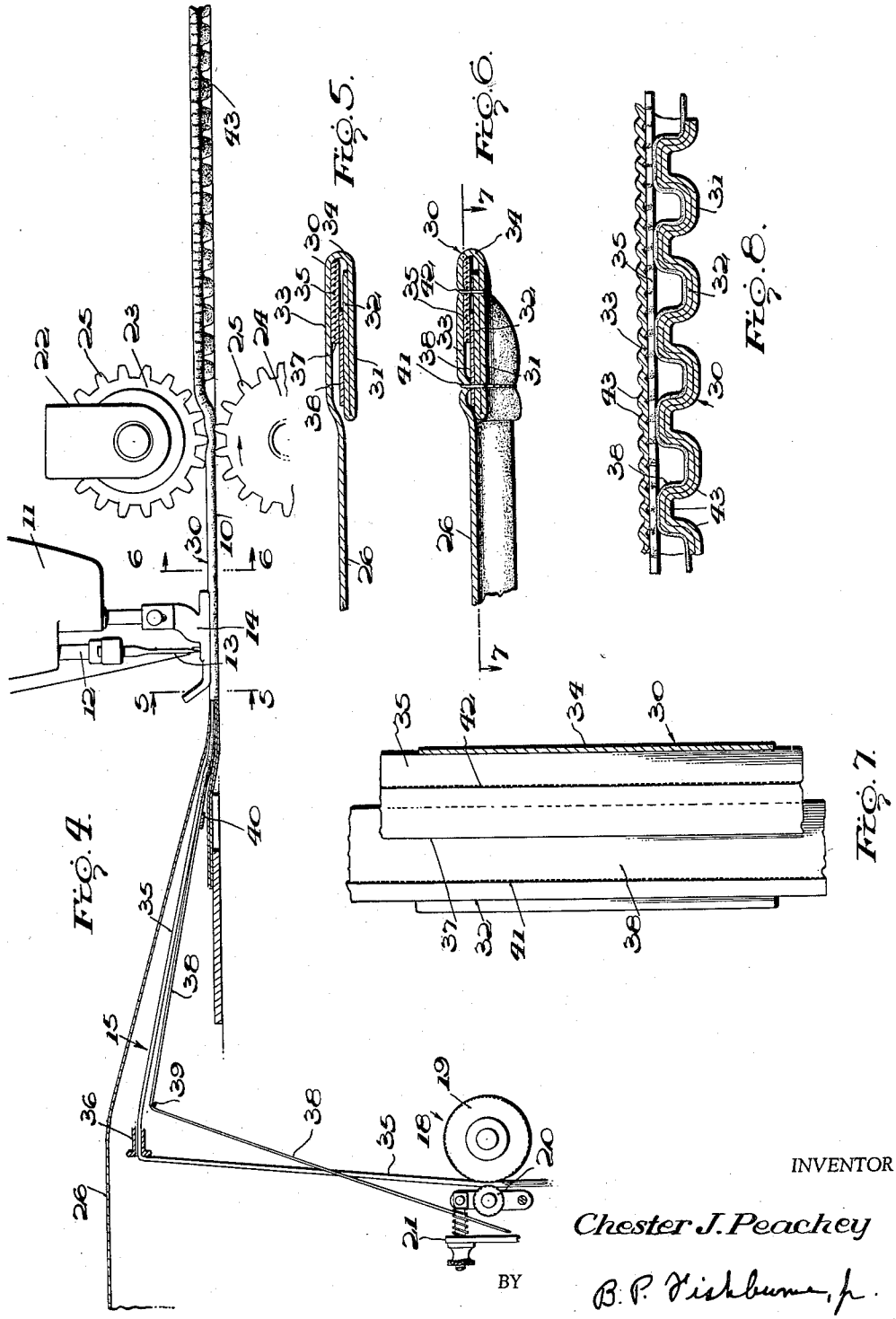

Fig. 4.

Fig. 5.

Fig. 6.

Fig. 8.

Fig. 7.

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ELASTIC WAISTBAND

Filed Dec. 19, 1957 3 Sheets-Sheet 3

Fig. 9

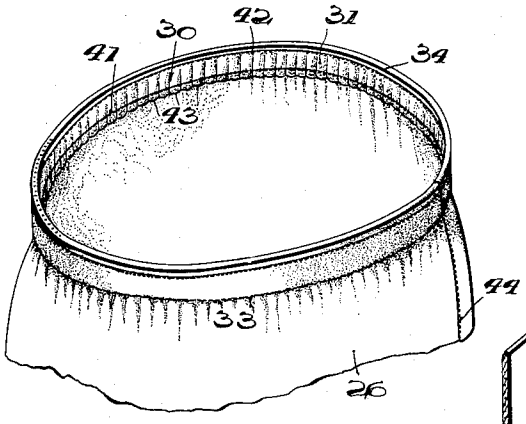


Fig. 10

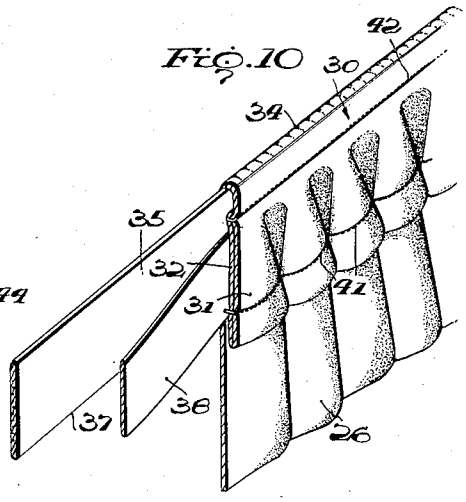


Fig. 11.

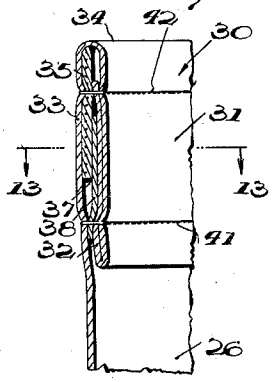


Fig. 12.

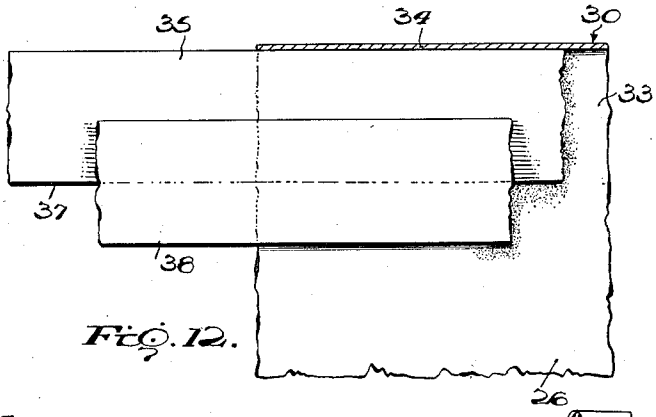


Fig. 14.

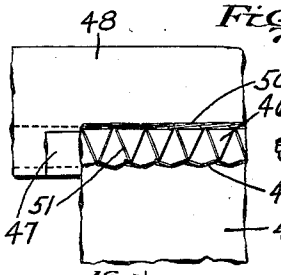


Fig. 16.

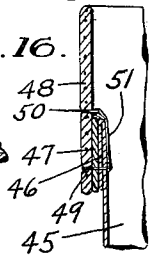


Fig. 13

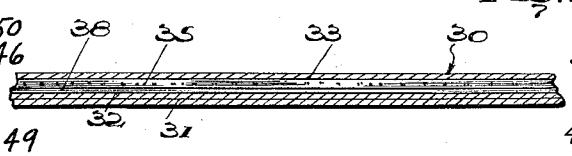
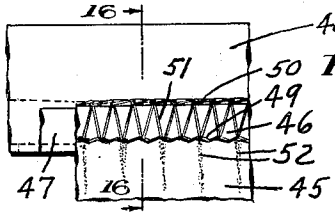


Fig. 15.



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2,922,166

ELASTIC WAISTBAND

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Application December 19, 1957, Serial No. 703,857

3 Claims. (Cl. 2—237)

The present invention relates to wearing apparel and more particularly to an elastic band construction, such as a waistband, and to a method of making the same.

A primary object of the invention is to provide an improved waistband for various articles of apparel, such as panties, pajama pants, skirts and the like, the present waistband being greatly superior in strength and durability to conventional or existing waistbands.

A further and more specific object is to provide an elastic waistband including novel means for greatly strengthening the same against damage or failure when the waistband is stretched during usage.

A further important object is to provide a simplified method for rapidly and efficiently manufacturing the waistband in a uniform manner and continuously for producing a band of desired length.

Still another object is to provide a novel waistband for garments which includes an elastic member and an inelastic strengthening or reinforcing member connected in the waistband in a novel manner.

Other objects and advantages of the invention will become apparent during the course of the following description.

In the accompanying drawings forming a part of this application and in which like numerals are employed to designate like parts throughout the same,

Figure 1 is a perspective view of apparatus used in the practice of the method.

Figure 2 is a plan view of a cloth folder and associated elements.

Figure 3 is a fragmentary vertical section taken on line 3—3 of Figure 2.

Figure 4 is a fragmentary longitudinal vertical section, partly diagrammatic, through the apparatus shown in Figure 1 and through the article being produced by the apparatus, parts omitted.

Figure 5 is an enlarged transverse vertical section through the article prior to stitching and taken approximately on line 5—5 of Figure 4, parts omitted.

Figure 6 is a similar section through the article after stitching and taken approximately on line 6—6 of Figure 4.

Figure 7 is an enlarged fragmentary horizontal section through the article taken on line 7—7 of Figure 6.

Figure 8 is an enlarged fragmentary longitudinal section through the article or waistband illustrating the shirring of the same in the completed state.

Figure 9 is a perspective view of the finished waistband upon an article of apparel.

Figure 10 is an enlarged fragmentary perspective view of the waistband and showing free portions of the elastic and inelastic tapes.

Figure 11 is an enlarged fragmentary transverse vertical section through the finished waistband.

Figure 12 is a fragmentary plan view of the article similar to Figure 7, partly in section, prior to stitching the same.

Figure 13 is a fragmentary horizontal section taken on line 13—13 of Figure 11.

Figure 14 is a fragmentary side elevation of a waistband in accordance with a modification of the invention and with the waistband in a stretched condition.

Figure 15 is a further side elecation of the waistband shown in Figure 14 but in a contracted condition to show the shirring.

Figure 16 is a vertical section taken on line 16—16 of Figure 15.

In the drawings, wherein for the purpose of illustration is shown a preferred embodiment of the invention, attention is directed first to Figures 1 through 8, wherein the numeral 10 designates the bed of a conventional two needle sewing machine, including a sewing machine head 11. The sewing machine head carries a vertical reciprocatory needle bar 12, upon which are mounted in side-by-side spaced relation a pair of needles 13. Also carried by the head 11 is the usual adjustable presser foot 14, and the sewing machine includes the usual feed dog mechanism, not shown, and other conventional elements, not necessary to show or describe in connection with the present invention.

In advance of the needles 13 and presser foot 14, a conventional cloth folder 15 is rigdly mounted at 16 upon the sewing machine bed 10. The folder 15 has its spiral portion 17, adapted to form a tubular hem on the cloth in longitudinal alignment with the pair of needles 13, as shown in Figure 1. The folder 15 is generally of the type manufactured by Union Special Machine Company of Chicago, Illinois, for use upon a two needle sewing machine of the same manufacturer, designated Style 51400 BE.

Mounted directly below the folder 15 is an adjustable elastic tape tensioning or brake device 18, likewise of conventional design, and preferably of the type manufactured by Union Special Machine Company of Chicago, Illinois. The tensioning device 18 embodies a first tensioning roller 19, mounted upon a fixed axis of rotation, and a laterally adjustable companion roller 20, shiftable toward and from the roller 19 by adjusting means 21. Since the construction of the device 18 is conventional and well known, it is unnecessary to further describe the same in detail in the present application.

Rearwardly of the reciprocatory needles 13, a conventional cloth feeding or pulling unit 22 is mounted in fixed relation to the sewing machine, and this unit is also preferably of a type presently manufactured by Union Special Machine Company, Chicago, Illinois. All of the mentioned parts manufactured by Union Special Machine Company are shown in Catalog No. 102L of that manufacturer, second edition, 1956. The feed unit 22 embodies upper and lower cooperating feed rollers 23 and 24, at least one of which is power-driven to turn in the direction of the arrows in Figure 4. The feed rollers are formed of Bakelite, or the like, and have teeth 25 which mesh in the manner of gears and engage the cloth to feed the same to the right, Figure 4, during the operation of the apparatus. Since the feed unit 22 is conventional, it is believed unnecessary to describe it or its operation in further detail herein.

In the practice of the method, an operator manually feeds cloth blanks 26 into the folder 15 from the left hand side of the apparatus, as illustrated in Figure 1. The leading edge of each cloth blank 26 is passed over the apron 27 of the folder and beneath a guide tongue 28, leading into the spiral cloth folding horn 17, in a well-known manner. When the leading side 29 of the cloth blank 26 emerges from the outlet side of the folder 15, which is its right hand side, Figure 2, the longitudinal edge portion of the cloth blank will be folded as illustrated in Figure 5 to form a substantially tubular hem

30, including an inner side formed of two thicknesses of the cloth, as shown at 31 and 32, and an outer side 33 of one thickness, integrally connected with the fabric blank or body portion 26. The two sides of the tubular hem 30 are integrally joined by a U-shaped portion 34 of one cloth thickness, as shown in Figure 5. The side of the hem constituting the two cloth thicknesses 31 and 32 is arranged next to the body of the wearer of the finished garment equipped with the waistband of the present invention. As each fabric blank 26 is fed through the folder 15 from left to right, Figures 2 and 3, the edge portion of the blank is folded continuously and automatically to produce the folded hem 30 shown in Figure 5.

A continuous section of elastic tape 35 from a supply roll, not shown, extends upwardly from below the tensioning unit 18 and engages between the tensioning rollers 19 and 20, as shown in the drawings. The elastic tape 35 is passed into a generally longitudinal tubular guide 36 of the folder 15, at the inlet side of the folder. The elastic tape after passing through the guide 36 emerges from the discharge side of the folder in underlying relationship to the side 33 of the tubular hem 30, Figure 5, and the elastic tape 35 has one longitudinal edge arranged close to the U-shaped portion 34 of the tubular hem and its other longitudinal edge 37 is arranged substantially at the transverse center of the hem 30. During the operation of the apparatus, the elastic tape 35 is fed through the folder 15 simultaneously with the feeding of each cloth blank 26 therethrough.

A continuous length of inelastic tape 38 from a spool or source, not shown, is also fed upwardly adjacent the inlet side of the folder 15 and passes through a guide element 39 on the folder, near and below the guide 36 for the elastic tape. The inelastic tape 38 extends through the folder 15 in substantially parallel relation to the elastic tape 35 and engages through an additional guide element 40 near the discharge side of the folder. The inelastic tape 38 emerges from the discharge side of the folder in underlying relation to the elastic tape 35 and the side 33 of the tubular hem 30, Figures 2 and 5. The guide element 40 is positioned relative to the tubular guide 36 so as to cause the pair of tapes 35 and 38 to emerge from the folder 15 inside of the hem 30 in partially overlapping parallel relation, Figures 2 and 5. The inelastic tape 38 is arranged next to the portion or side 32 of the hem 30, and the combined widths of the partially overlapping tapes 35 and 38 are substantially equal to the width of the hem 30, as shown. The guide means 39 and 40 for the inelastic tape 38 constitute an important part of the present invention and have been added to the otherwise conventional folder 15, and the guide means for the inelastic tape are not conventional.

After emerging from the folder 15, the entire partially formed waistband shown in Figure 5, including the substantially tubular hem 30 and the partially overlapping tapes 35 and 38 pass beneath the presser foot 14 of the sewing machine and into position to be stitched by the needles 13 of the sewing machine in a generally conventional manner. The feed dog mechanism of the sewing machine, not shown, advances the work past the needles in the usual step-by-step manner while the needles sew spaced parallel lines of stitching 41 and 42 through the work to form the waistband. The spacing of the needles 13 with respect to the hem 30 and the tapes 35 and 38 is such that the line of stitching 41 secures together the two sides 33 and 31—32 of the hem together with the inelastic tape 38, near and inwardly of the outer longitudinal edge of the inelastic tape, Figure 6. The line of stitching 41 does not pass through the elastic tape 35. The other line of stitching 42 passes through and connects the two sides of the hem 30 with the elastic tape 35, near and inwardly of the outer longitudinal edge of the elastic tape, and the line of stitching 42 does not pass through the inelastic tape 38, see Figure 6.

During the time that the lines of stitching 41 and 42 are being formed in the waistband, the entire waistband including the hem 30 and the tapes 35 and 38 is engaged and pulled by the rollers 23 and 24 of the feed unit 22, in timed relation with the operation of the sewing machine feed mechanism. Simultaneously, the brake or tensioning unit 18 exerts a desired degree of holding force or stretching on the elastic tape 35, which degree of stretching may be adjusted at the unit 18 in a well-known manner, for determining the ultimate amount of stretch imparted to the finished waistband. With this arrangement, the elastic tape is flat and at least partially taut at the time it passes beneath the needles 13, and the cloth in the tubular hem 30 is likewise flat adjacent to the needles, as is the inelastic tape 38, although the inelastic tape and tubular hem are not held under tension. The entire waistband construction, Figure 5, is therefore flat or unshirred between the discharge side of the folder 15 and the feed or pulling unit 22, Figure 4. The waistband construction is therefore flat while the lines of stitching 41 and 42 are being formed, and the elastic tape 35 is under constant and even tension at this time.

The above mode of operation is continuous for making a waistband of any desired length on the cloth blank 26. When the waistband passes from or beyond the pulling unit 22, Figure 4, the tension on the elastic tape 35 is immediately relaxed, and the elastic tape automatically retracts to the unstretched condition and automatically produces the desired amount of shirring in the finished waistband, as indicated at 43. The degree of shirring and accordingly the degree of stretchability of the finished waistband is regulated by adjusting the tensioning unit 18, as stated.

When the work or waistband emerges from between the feed rollers 23 and 24, the waistband is finished and will appear as illustrated in Figures 8 and 10. The fabric layers on both sides of the tubular hem 30 will be shirred, as shown, and the inelastic tape 38 will be shirred, but the elastic tape 35 is still flat, although free of tension. The cloth blank with the now finished waistband thereon is taken from the apparatus and formed into the desired garment, such as the garment shown in Figure 9, by merely stitching together the ends of the fabric blank and waistband or by stitching together the ends of a pair of blanks as indicated at 44, Figure 9.

In the finished waistband, the elastic tape 35 functions in exactly the same manner as in any conventional waistband having an elastic tape stitched therein, and the inelastic tape 38 does not interfere in the slightest with the normal operation of the waistband. When the waistband is stretched during use, however, the inelastic tape 38 will be tensioned before the elastic tape is stretchced beyond its elastic limit and before the lines of stitching 41 and 42 can be caused to break or fail under tension. The strength of the inelastic tape thus adds greatly to the overall strength of the waistband and increases its durability greatly, which is the principal object of the invention.

In Figures 14 to 16 inclusive, there is shown a modified form of waistband, wherein a fabric garment body portion 45 is provided, and one marginal edge portion of the body portion 45 is folded to produce a relatively narrow hem 46, Figure 16. A section of inelastic tape 47 is arranged upon the outer face of the hem 46 and extends lengthwise thereof and is coextensive therewith. A section 48 of elastic tape is arranged outwardly of the inelastic tape 47 and the elastic tape overlaps the tape 47 and hem 46, as shown, and the tape 48 is preferably considerably wider than the inelastic tape 47 so as to project beyond the inelastic tape and hem 46.

The elastic tape 48 is held stretched or taut, Figure 14, and the inelastic tape 47 is in a flat or extended condition, as is the hem 46. While this condition prevails, a line of stitching 49 is formed through the hem 46, inelastic tape 47 and the elastic tape 48 for permanently secur-

ing these elements together near the inner longitudinal edge of the hem as shown in Figures 14 and 16. Simultaneously with the formation of the line of stitching **49**, a parallel line of stitching **50** is formed through the elastic tape **48** just beyond the outer edge of the hem **46** and inelastic tape **47**, and the two lines of stitching **49** and **50** are linked together by a zig-zag interconnecting thread **51**, as shown. The line of stitching **50** preferably does not pass through the hem **46** and inelastic tape **47**. After the stitching is thus formed, the tension on the elastic tape **48** is relieved and the elastic tape contracts and shirring **52** will be formed in the hem **46** and inelastic tape **47**, as shown in Figure 15.

The waistband construction is now finished, and the same possesses generally the same advantages as the waistband shown and described previously in the first form of the invention. The inelastic tape **47** greatly strengthens the waistband when the same is subsequently stretched during the use of the garment, and failure of the lines of stitching **49** and **50** is substantially eliminated, as is the overstretching or damaging of the elastic tape and garment body portion. Additionally, the presence of the inelastic tape **47** in the waistband eliminates to a great extent the formation of loose or improper stitches in the line of stitching **49**.

The principal difference in the waistband shown in Figures 14 to 16 over the waistband of the prior form of the invention is that the tubular hem **30** is eliminated, and the inelastic and elastic tapes are applied directly to the outer side of the garment body portion and the elastic tape **48** is exposed or uncovered in the finished garment, as shown. Other than this, the waistband of Figures 14 to 16 functions in the same manner and possesses the same advantages as the waistband of the preferred form of the invention, Figure 9.

It is to be understood that the forms of the invention herewith shown and described are to be taken as preferred examples of the same, and that various changes in the shape, size and arrangement of parts may be resorted to, without departing from the spirit of the invention or the scope of the subjoined claims.

Having thus described my invention, I claim:

1. A waistband for a garment, said waistband including a substantially tubular hem formed of delicate stretchable fabric, a longitudinally elastic tape arranged within the hem and held longitudinally stretched while the substantially tubular hem is longitudinally distended, a longitudinal line of stitching connecting the stretched elastic tape and distended substantially tubular hem, said line of stitching and elastic tape causing the tubular hem to be shirred when the elastic tape is released and contracts, a longitudinally inelastic tape arranged within the tubular hem and held in the longitudinally distended condition when the hem is longitudinally distended, a longitudinal line of stitching connecting the hem and the inelastic tape when the hem and inelastic tape are both longitudinally distended, the inelastic tape and the elastic tape having their free edges free from connection with each other, the inelastic tape serving to limit the longitudinal distention of the tubular hem and the stretching of the elastic tape thereby protecting the line or lines of stitching.

2. A waistband for a garment, said waistband including a delicate stretchable fabric portion, a longitudinally elastic tape arranged in contact with the fabric portion and held longitudinally stretched while the fabric portion is held longitudinally distended, a longitudinally inelastic tape arranged adjacent to the elastic tape and contacting with said fabric portion and held longitudinally distended when the fabric portion is longitudinally distended, longitudinal stitching means connecting the longitudinally stretched elastic tape and the longitudinally distended fabric portion, said longitudinal stitching means also connecting the longitudinally distended inelastic tape and the longitudinally distended fabric portion, the longitudinally elastic tape and the longitudinal stitching means causing the fabric portion and the inelastic tape to be shirred when the elastic tape is released from the stretched condition and allowed to contract, the inelastic tape serving to limit the stretching action of the elastic tape and thereby protecting the stitching means.

3. A waistband for a garment, said waistband including a delicate stretchable fabric portion, a longitudinally inelastic tape contacting with said fabric portion and held longitudinally distended when the fabric portion is longitudinally distended, a longitudinally elastic tape contacting with the inelastic tape and extending longitudinally of the inelastic tape, the elastic tape being wider than the inelastic tape and extending from the lower edge of the inelastic tape beyond the opposite upper edge of the inelastic tape, said elastic tape being held longitudinally stretched while the fabric portion is longitudinally distended, a longitudinal line of stitching passing through the elastic tape and the inelastic tape and said fabric portion when the elastic tape is longitudinally stretched and the inelastic tape and fabric portion is distended, a second longitudinal line of stitching passing through the elastic tape when the elastic tape is longitudinally stretched, said second line of stitching being arranged adjacent to the transverse center of the elastic tape and being arranged above and exteriorly of the inelastic tape and said fabric portion, and a zigzag line of stitching connecting the second line of stitching with the first-named line of stitching, the arrangement being such that the fabric portion and inelastic tape are shirred when the stretched elastic tape is released so that it can contract, the inelastic tape serving to limit the stretching of the elastic tape and thereby protecting the line or lines of stitching.

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