

Feb. 10, 1948.

H. L. REDMOND

2,435,945

PANT TYPE GARMENT

2 Sheets-Sheet 1

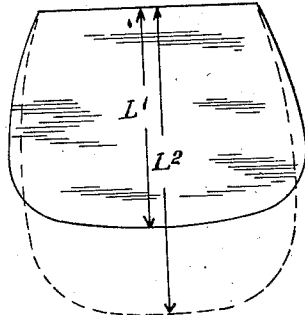
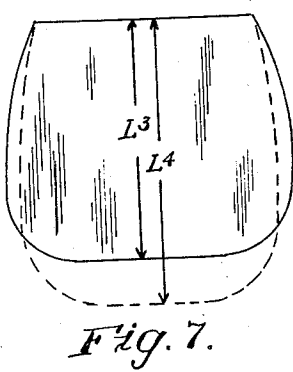
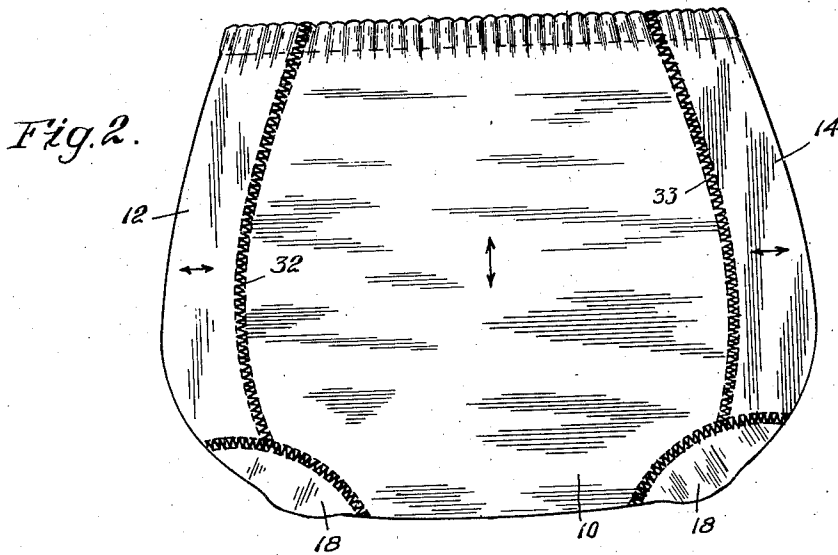
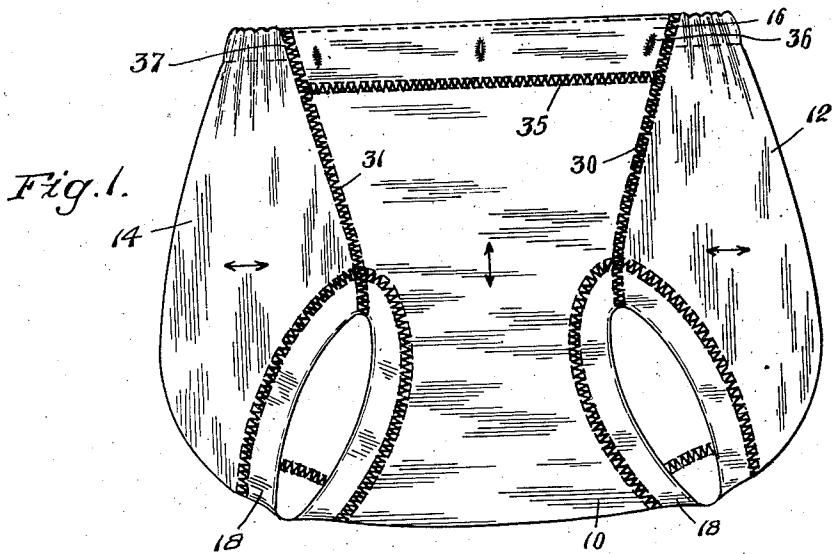


Fig. 6.

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PANT TYPE GARMENT

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2 Sheets-Sheet 2

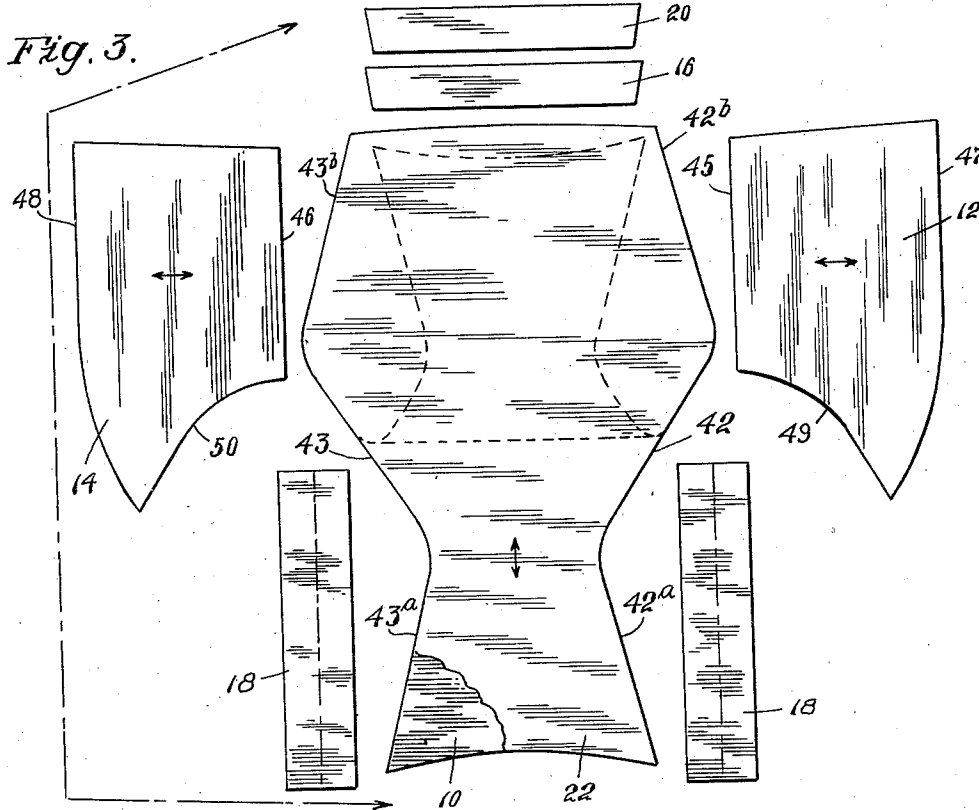


Fig. 4.

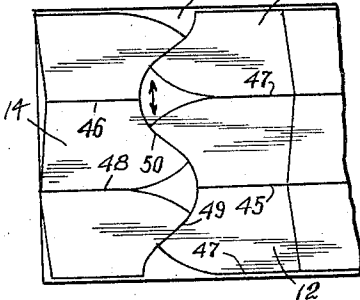
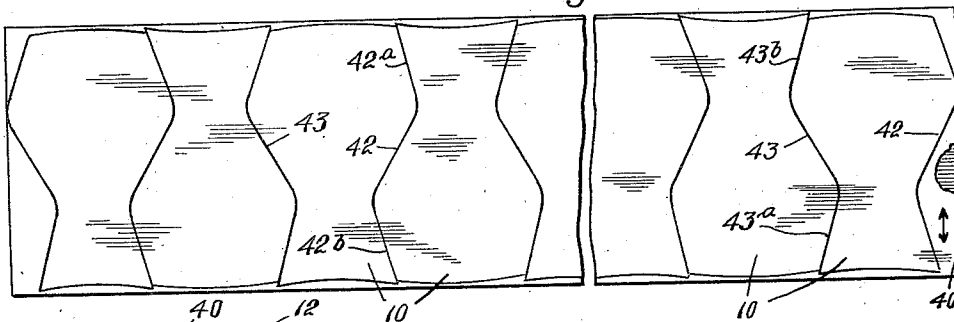


Fig. 5.

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UNITED STATES PATENT OFFICE

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PANT TYPE GARMENT

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2 Claims. (Cl. 2-224)

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This invention relates to garments and particularly to pant type garments such as infants' and children's garments of the training pantie type.

The invention is concerned with the construction of such garments and provides a better fitting garment procured, surprisingly, by a construction which entails a substantial saving in material without sacrifice in commercially essential features of comfort and freedom from undue restraint during activity of the wearer. The saving of material has two aspects. First, the actual square inch area or weight of material in the garment is substantially reduced for equivalent waistline size of garment; and second, in multiple production, the total yardage or weight of stock (including wastage) used per dozen garments in corresponding age size is substantially reduced. A labor cost saving is also obtained at least in multiple production, by reason of the method of cutting the novel garment of this invention from stock, such as tubular knit inelastic yarn material of the kind ordinarily used in the manufacture of training pantie type garments.

These and other advantages of the construction will be further described herein in connection with a description of the novel construction as exemplified by the garment shown in the accompanying drawings wherein

Fig. 1 is a front view of the garment;

Fig. 2 is a rear view of the garment;

Fig. 3 is a diagrammatic view of parts used to make up the garment, intended to show the relation of these parts and illustrating by a dotted line showing a fold in one part of the garment made during assembly of the garment;

Fig. 4 illustrates a pattern useful in cutting main sections of the garment, the pattern being laid out on suitable tubular fabric, and the whole being shown broken away centrally;

Fig. 5 is a similar view of a pattern for cutting side sections of the garment; and

Figs. 6 and 7 are diagrammatic showings of the relative dimensions of garments constructed with and without my invention, respectively.

The garment shown in Figs. 1 and 2 is of the legless type and comprises essentially a four-piece garment plus accessory parts including leg opening trim and waist fastening means. The four main parts consist of a central front-to-back panel 10, in single or multiple thickness, side panels 12 and 14 and a front waistband 16. The accessories include leg opening trim 18, and internal facing 20 for the waistband 16, and an

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elastic band extending around the waistline from one side of the front waistband 16 to the other side of the waistband 16. All these parts except the elastic band are illustrated in unassembled relation in Fig. 3, panel 10 being shown as internally faced with a co-extensive facing 22.

The panel 10 is stitched along the seams 30, 31 in front to side panels 12 and 14 respectively and is seamed at the rear along seams 32 and 33 to the rear edges of side panels 12 and 14 respectively. Leg opening trim 18 may then be stitched around the openings defined by the side panels 12 and 14 and the central panel 10. The front waistband is of the usual construction comprising an outer ply of knit material faced internally with a ply 20 of material, such as woven fabric, which is non-stretchable in both directions. The composite waistband is stitched to panel 10 along seam 35. An elastic band runs through the rear and side hems of the garment, being anchored in front usually at points 36 and 37 adjacent the side edges of the front panel 16. The waistline edges of side panels 12 and 14 and the rear waistline edge of central panel 10 are gathered to allow for suitable expansion of the fabric when the elastic band is stretched during donning and doffing of the garment.

The garment is made from knit material with the exception of the facing 20 and the fit and comfort of the garment are based upon a particular construction which relies upon the capacity of such knit material to stretch substantially more in a direction across the wales of the material than in a direction along the length of the wales.

I have found that if primary consideration be given, in garments of the type herein involved, to the minimum trunkwise dimension of the garment when tensioned vertically, comfort and freedom from crotch binding is assured. The minimum trunkwise dimension of the non-tensioned garment can then be made much less than that found in present-day garments with the result that the garment fits more snugly when the fabric is relaxed and avoids the unsightly "droopy drawers" effect encountered in the case of non-trouser wearing infants.

The garment of this invention illustrated in the drawings has, in combination with side panels 12 and 14 having wales running in a vertical trunkwise direction imparting lateral stretchability in the areas of these side panels, a continuous central panel or gore, in single or multiple thickness, extending from the front

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waistband, preferably in one-piece construction, through the crotch and to the waistline at the rear of the garment, the material of such panel having its wales extending in a lateral direction imparting vertical stretchability to the garment and the panel being preferably of such lateral width front and back that the garment has a trunkwise stretchability along its medial line limited substantially only by the coursewise stretchability of the fabric of the central panel. Thus, as shown in the drawings and as indicated by the lines and arrows, the central panel 10 has its wales running laterally of the garment so that the material has great stretchability along the direction of the arrows. The front and back lateral dimensions of panel 10 are also sufficient to permit medial trunkwise stretch substantially to the limit of the coursewise stretch of the material, unhampered by side panels 12 and 14 or seams 30 and 31.

Major advantages result. First, the trunkwise length of the garment may be restricted so that it has a snug fit at the crotch giving the wanted natty appearance in normal standing position of the wearer. This snug fit does not, however, cause binding at the crotch when the wearer moves to bending, sitting or other positions exerting a pull on the garment from waist to crotch; because such pull on the garment cannot be transmitted to the body until the central panel 10 has stretched to its full extent trunkwise front and rear. This conversion of trunkwise pull into fabric stretch rather than into pressure on the wearer permits the trunk dimension to be much less than in garments not provided with this capacity for trunkwise stretch.

Since knit material of the type used in these garments is cut while it is in relaxed position it will be seen that a further important advantage is that substantial saving of material is afforded, equivalent to the amount of material representing the reduction in trunk length in relaxed non-tensioned position of the garment. This difference has been found in sizes 1, 2, 3, 4, 6 and 8 to run from about $\frac{3}{4}$ inch to 1 inch which, doubled for front and rear amounts to $1\frac{1}{2}$ to 2 inches saving in length per each central panel. For materials of equivalent weight in the two forms of garment this saving amounts to as much as 15-20% by weight of material in the garment as a whole, when the central panel includes an internal co-extensive facing 22, making a double thickness central panel 10; and the width of the panel in front is as shown substantially that of the front waistband and taken with the width of the panel 10 in back makes up more than one-half the circumference of the garment near the waistline.

Furthermore, in multiple manufacture the central panels 10 and internal facings 22 may be cut from tubular knit material such as 40 on a pattern as illustrated at Fig. 4. Because of the cutting of the panels crosswise of the tubular material, the panels are not cut on the fold, and the step of unfolding of panels which have been cut on the fold, as was heretofore the custom when the panels were cut along the length of the tubular fabric, is eliminated. Thus, as shown in Fig. 4, a series of central panels 10 may be cut from tubular knit material such as 40 crosswise of the material by a series of spaced cuts across the wales of the fabric to provide transversely cut edges 42, 43, adjacent panels being formed in end-to-end fashion as shown, so that the portion of the panel which will form

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the front of the garment is cut alternately from adjacent one edge and from adjacent the other edge of tubular material 40. Side panels 12 and 14 are cut from tubular knit material 40 lengthwise thereof as shown in Fig. 5 to form vertical side panel edges 45 and 47 of panel 12, and 46 and 48 of panel 14 extending walewise of the fabric. In assembling the garment the transversely cut edges 42, 43 of panel 10, either in single or multiple thickness, are seamed at their lower ends 42a and 43a (Fig. 3), by lines of stitching 30 and 31, respectively, to walewise extending front edges 45 and 46 of side panels 12 and 14, respectively, to form the front of the garment. The other ends 42b and 43b of transversely cut edges 42 and 43 of panel 10 are then seamed by lines of stitching 32 and 33 to walewise extending rear edges 47 and 48, respectively, of side panels 12 and 14 to form the rear of the garment. The portions of transversely cut edges 42, 43 intermediate lines of stitching 30 and 32, and 31 and 33, respectively, then cooperate with lower edges 49 and 50, respectively, of side panels 12 and 14 to form leg openings for the garments to which leg trim 18, doubled along the dotted lines of Fig. 3, is attached.

As an illustration of the type of dimension relation that may be secured in garments manufactured in accordance with my invention, a garment of a type such as is shown in the Le Coney Patent No. 1,937,899 having no substantial stretchability along the trunkwise medial line of the garment might have, in an age 4 size, having a relaxed waistband circumference of about $18\frac{1}{2}$ inches, a non-tensioned trunkwise dimension L3 (Fig. 7) from the top of the waist to the bottom of the crotch of about 10-10 $\frac{1}{2}$ inches. The ratio of trunkwise length to one-half waistline circumference shown in the Le Coney drawing is as $2\frac{3}{4}$ inches is to $2\frac{1}{4}$ inches or 44 to 35. An $18\frac{1}{2}$ inch waist circumference of Le Coney would therefore have a trunkwise length of 11.6 inches. When such a garment is tensioned along its trunkwise medial line it will stretch under moderate tension, in the case of an ordinary knit material of the type heretofore used in such garments, to a dimension L4 which is less than 13 inches, as indicated by Fig. 7. On the other hand, in a garment constructed in accordance with my invention designed for age 4 size and having a waistband circumference of $18\frac{1}{2}$ inches and made from identical material, a smaller non-tensioned trunkwise dimension L1 (Fig. 6) of only 9 inches readily increases under moderate tension to a dimension L2 of something over 13 inches, as indicated in Fig. 6. Thus a prior art garment of this age size has a non-tensioned trunkwise dimension L3 more than about 80% (89% to be exact) of its tensioned dimension L4 whereas the garment of my invention has a trunk line non-tensioned dimension L1 far less than 80% (less than 70%) of its tensioned dimension L2.

While the illustrated example of the dimensions above given is for age 4 size, the difference between tensioned and non-tensioned length in garments of the other usual training pantie sizes is such that they will conform to the requirement of having a relaxed trunkwise length less than 80% of tensioned trunkwise length. Since stretchability is dependent upon the particular character of the fabric, it will be understood that this comparison involves garments made of the usual weights of knit cotton, cotton and wool, rayon or other fiber in conventional gauges.

The reduction of the non-tensioned trunkwise dimension L3 to the dimension L1 also changes the relation of the trunkwise length to the waistline circumference. In the garment illustrated in the Le Coney patent, as has been above recited, the ratio of trunkwise length to one-half waistline circumference is as 44 is to 35, i. e., the relaxed trunkwise length is greater than one half the waistline circumference. In garments manufactured in accordance with my invention, in a substantial range of sizes besides age 4 size, the non-tensioned trunkwise length L1 may be made less than one half the relaxed waistline circumference. Still the trunkwise stretchability imparts to the garment a trunkwise tensioned length substantially greater than one half the relaxed waistline circumference and equal to or greater than the tensioned length of prior art garments.

In accordance with usual practice, the plies of panel 10 may be made from the same or different weight knit material. Often the facing 22 is made of lighter weight, softer material cut from the same pattern.

The lateral stretchability and vertical non-stretchability retained in side panels 12 and 14 and secured by cutting the panels lengthwise of knit fabric 40 as shown in Fig. 4, insures a proper fit of the garment in normal standing position of the wearer.

While for convenience the above description of a garment constructed in accordance with this invention has been directed to a garment of the training pantie type, it will be understood that the novel features hereof may be incorporated in garments designed for adults. For example, the advantages of this invention have been found to apply to the construction of men's knit shorts. Again, while the invention is primarily concerned with garments of the legless type, it is contemplated that short leg portions may be added so long as they do not detract from the essential trunkwise stretchability of the garment construction as above described.

Similarly while a one-piece continuous central panel construction, whether of single or multiple thickness, is desirable, the essential functions of the garment are not necessarily departed from by the interposition of a seam in the central panel as for the purpose of changing thickness, i. e., the number of plies of material, as between front and back, for the purpose of forming a fly, or for other reason.

As will readily be understood from the description hereinbefore given, the waistband feature illustrated in the drawings and described in connection with the training pantie type of garment, may be modified in accordance with known variations of garment construction. For instance, instead of having the non-stretchable waistband 16 and elastic band confined to only a portion of the circumference of the waistline, the central panel 10 may be carried to the waistline. The elastic band may then, if desired, be carried throughout the circumference of the waistline. Or the waistline edge may be formed in whole or in part of a woven elastic tape.

I claim:

1. A legless pant type garment comprising side panels formed of knit material wherein the wales of the material run vertically of the garment to give lateral stretchability to the garment in said side panels, and a central panel of knit material extending from a point adjacent the waistline in front through the garment crotch to a point at least half way towards the waistline in the rear, said central panel being wider in front and in the rear than in the crotch, the wales of the material in said central panel extending laterally of the garment, lower edges of the side panels and sides of the crotch portion of the central panel co-operating to define leg openings for the garment with the central panel being seamed above said leg openings to said side panels along seams diverging upwardly from one another both in the front and in the rear along at least a substantial portion of their lengths, and the vertical medial length of the garment in relaxed condition being less than one-half the relaxed waistline length but in tensioned condition being materially greater than said one-half relaxed waistline length.

2. A legless pant type garment comprising side panels formed of knit material wherein the wales of the material run vertically of the garment to give lateral stretchability to the garment in said side panels, and a continuous single piece central panel of knit material extending from a point adjacent the waistline in front through the garment crotch to a point adjacent the waistline in the rear, said central panel being wider in front and in the rear than in the crotch, the central panel being wider along each of its upper front and rear edges than the waistline width of either side panel and the wales of the material in said central panel extending laterally of the garment to give substantial medial vertical stretchability to the garment, lower edges of the side panels and sides of the crotch portion of the central panel co-operating to define leg openings for the garment with the central panel being seamed above said leg openings to said side panels in the front and in the rear along seams extending upwardly towards the waistline, and the vertical medial length of the garment in relaxed condition being less than one-half the relaxed waistline length but in tensioned condition being materially greater than said one-half relaxed waistline length.

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