

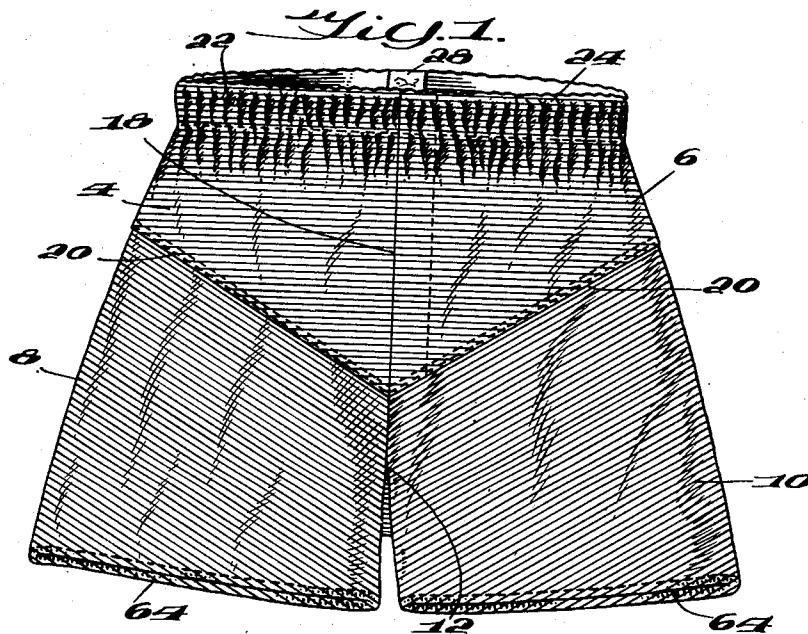
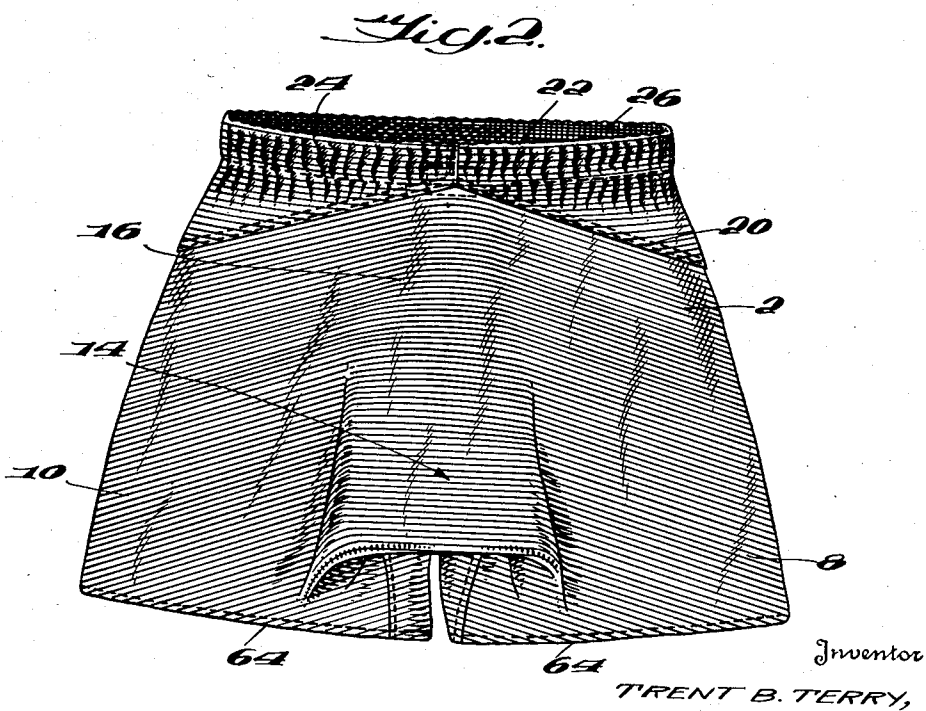
April 27, 1954

T. B. TERRY  
BIFURCATED GARMENT

2,676,327

Filed Dec. 29, 1949

5 Sheets-Sheet 1



Inventor  
TRENT B. TERRY,

By *Robert B. Larson*  
Attorney

April 27, 1954

T. B. TERRY  
BIFURCATED GARMENT

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*Fig. 4.*

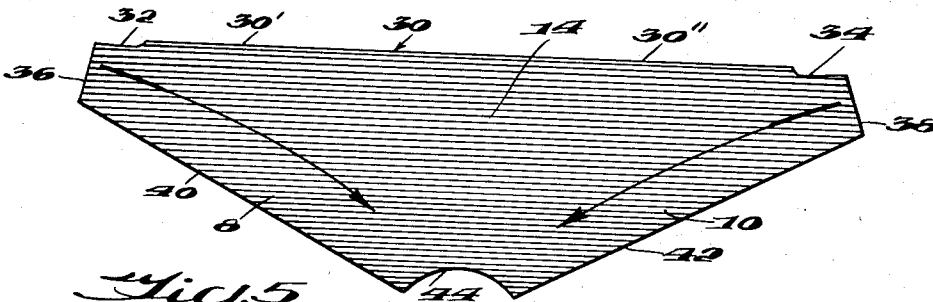


*Fig. 5.*

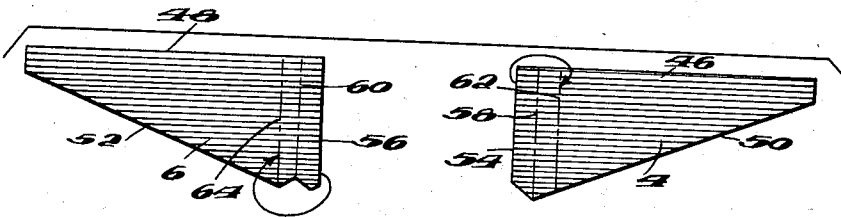


*Fig. 3.*

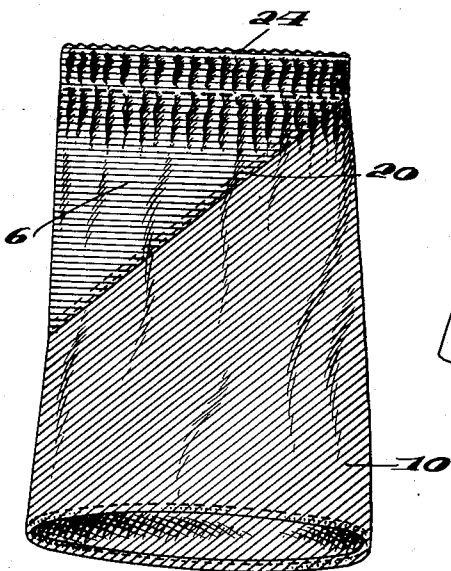
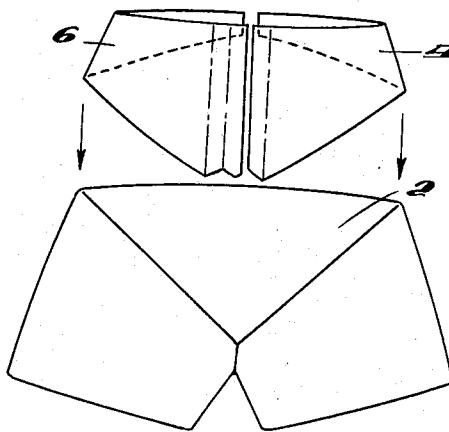


*Fig. 6.*



Inventor  
TRENT B. TERRY,

By *Robert B. Hanson*  
Attorney

April 27, 1954

T. B. TERRY  
BIFURCATED GARMENT

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*Fig. 7.*

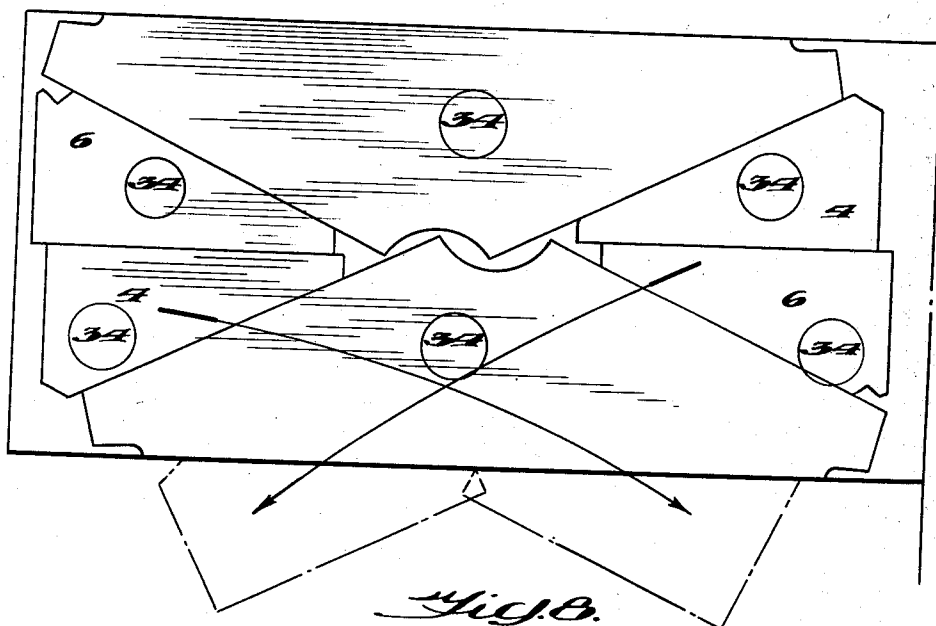
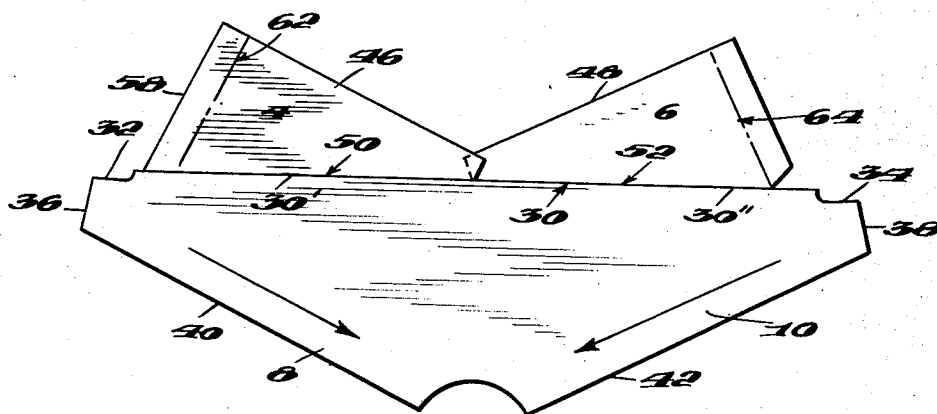


*Fig. 8.*



INVENTOR.  
TRENT B. TERRY,

BY  
*Robert B. Laramie*  
ATTORNEY

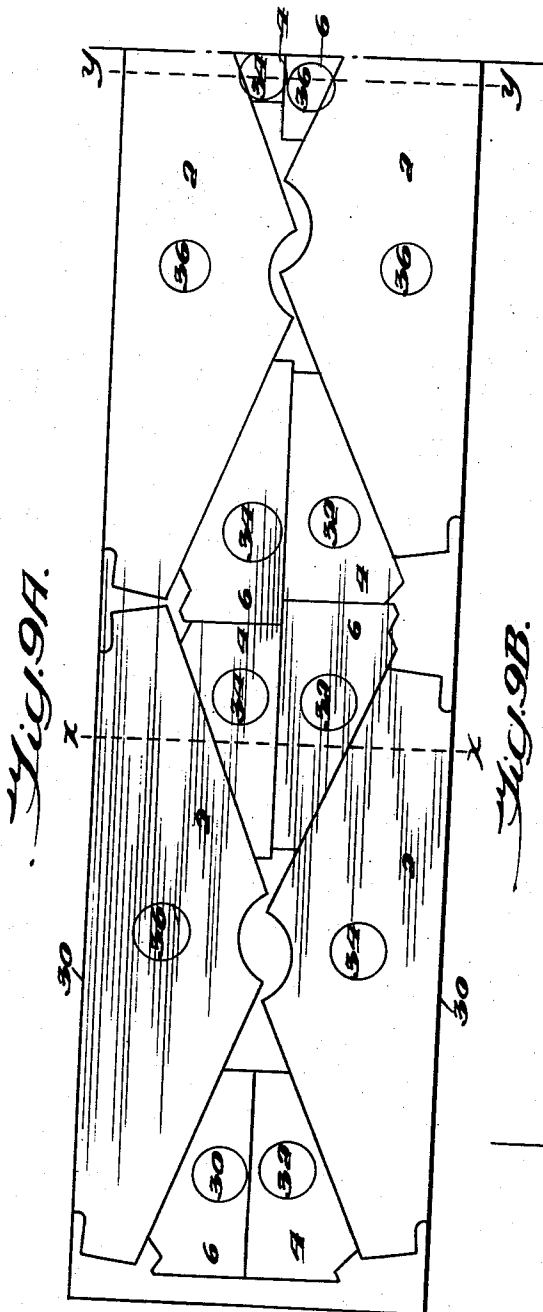
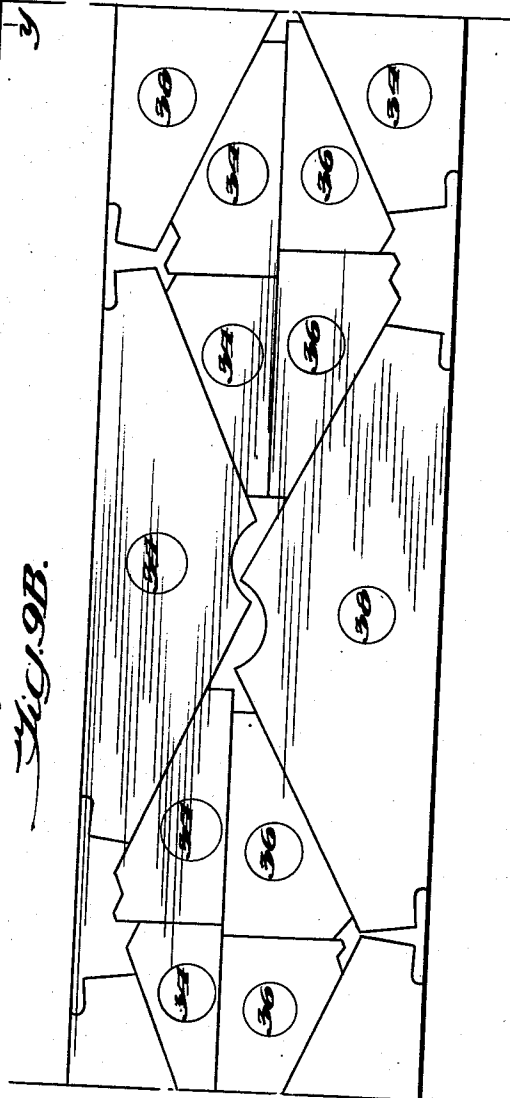
April 27, 1954

T. B. TERRY  
BIFURCATED GARMENT

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5 Sheets-Sheet 4



INVENTOR.  
TRENT B. TERRY  
BY  
*Robert B. Carson*  
ATTORNEY

April 27, 1954

T. B. TERRY  
BIFURCATED GARMENT

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Fig. 9D.

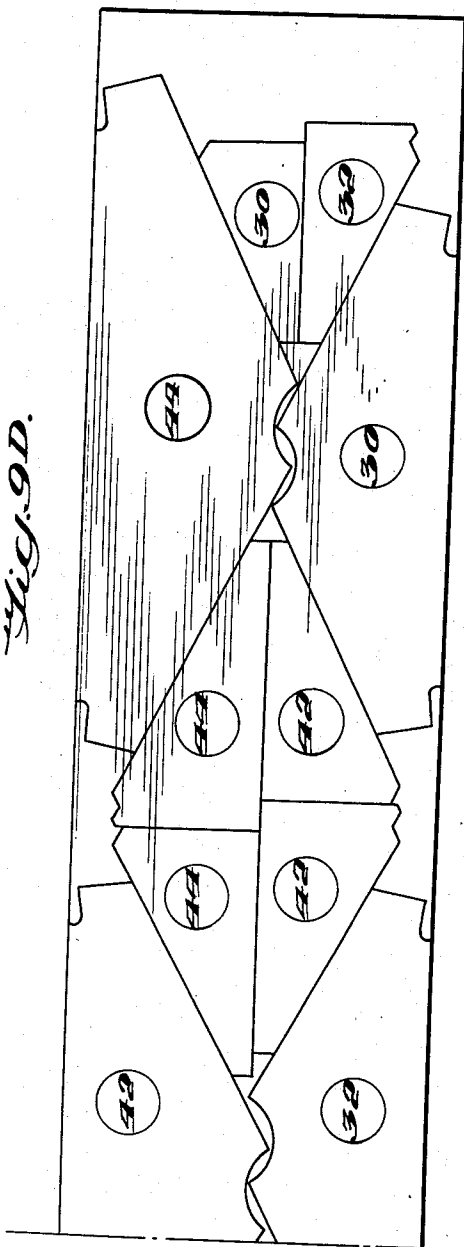
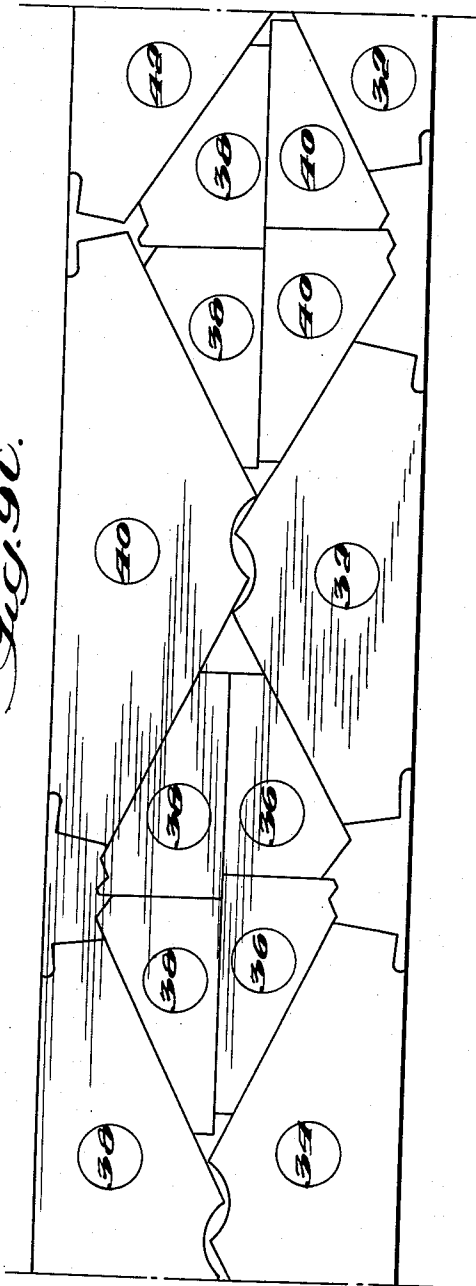


Fig. 9C.



INVENTOR.  
TRENT B. TERRY

BY  
Robert B. Pearson  
ATTORNEY

## UNITED STATES PATENT OFFICE

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## BIFURCATED GARMENT

Trent B. Terry, Charlottesville, Va.

Application December 29, 1949, Serial No. 135,694

4 Claims. (Cl. 2-224)

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This invention relates to an underwear garment known as a short, and to a method of making the same. More particularly, my invention relates to a short made of woven cloth material and which is a free wearing, free fitting garment. Shorts made in accordance with this invention are preferably of the "boxer" type having an elastic waist band which causes the material of the short to be gathered all around the waist portion. The short, however, may have either a closed front, or an open front adapted to be secured in closed position by means of "grip-pers," buttons, or other means.

In its broader aspects this invention may be said to be an improvement on my invention disclosed in my United States Patent No. 2,325,924, granted August 3, 1943, which, however, relates primarily to pajamas rather than shorts. Specifically, however, as will soon be apparent as the disclosure of the present invention proceeds, most of the features of the present invention comprise quite radical departures from what is disclosed in that patent.

One object of the present invention is to provide a short which can be made of but three pieces of cloth of woven material, and a waist band of elastic material, and which pieces are so shaped and arranged as to effect great savings in the manufacture of the garment.

Another object of the invention is the provision of such a short which may be manufactured in accordance with assembly line methods which can be carried out with very good results even with inexperienced operators.

A still further object of the invention relates to a special manner of marking the outlines of the pieces making up a set of sizes of the shorts on a bolt of cloth, which effects a saving of from two and one-half to three yards of cloth for a set of sizes as compared to any conventional short, and a saving in cutting time also because of the absence (with one exception) of any curved lines.

The manufacture of shorts according to my invention effects a reduction in the number and complexity of the operation necessary to assemble and stitch the pieces of which the garment is made, and thus speeds up production as well as making it possible to employ standard machines and operators who have had little or no training in this work. Thus with the same number of operators it is possible in a given period to produce a considerably higher number of these shorts than of a conventional short. It is a further object of the invention to provide such a garment.

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Among other objects of this invention are the provision of a short which is stronger than the conventional short and thus a short which can withstand strains, stress, wear and laundering over a greater length of time than now possible with conventional garments. This is partly because of the paucity of stitch lines, which incidentally also effects considerable savings in thread costs.

These, and manifold other objects and advantages of the invention will become more apparent from the following description and claims when considered in conjunction with the accompanying drawings in which:

Fig. 1 is a front elevation of a short made in accordance with the invention;

Fig. 2 is a rear view of the same;

Fig. 3 is a side view;

Fig. 4 is a plan view of the body piece which is used in forming the garment;

Fig. 5 is a plan view of the two triangular pieces which form the abdominal region of the garment;

Fig. 6 is a diagrammatic perspective view illustrating generally the relation of the various pieces;

Fig. 7 is a plan view of a piece of cloth with the outlines of pieces marked thereon;

Fig. 8 is a plan view of the body piece with the two triangular pieces forming the abdominal region stitched thereto, during one stage of the manufacture, and

Figs. 9A, 9B, 9C, and 9D, collectively illustrate the markings of a bolt of standard width material with the necessary pieces for sets of sizes of shorts from size 30 to size 42 marked thereon.

These drawing figures illustrate a preferred form of the garment and a preferred layout for the marking of the cloth. Moreover, several of these drawing figures diagrammatically illustrate preferred steps in the preferred method of manufacture.

An underwear garment known as a short and embodying the invention is shown in Figs. 1 and 2. While many of the attributes of this invention are applicable to other types of shorts, as well as to pajamas and other types of garments, the manifold benefits of the invention are particularly appreciated in connection with the boxer type shorts here illustrated.

Referring to the first two drawing figures, the boxer short shown therein comprised of but three pieces of cloth of woven material, the straight of the material running in the direction of the myriad parallel lines shown. These three pieces of cloth of woven material are, a body

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piece 2, and two triangular shaped pieces 4 and 6.

The body piece 2 is cut and formed to include leg portions 8 and 10, a crotch 12, a full seat portion 14, and an upper back portion 16.

The two triangular shaped pieces 4 and 6 are cut, folded, and stitched to form an overlapped fly 18 and are stitched to the body piece 2 along the stitch line 20 so as to form an abdominal region support in the front of the completed garment. The straight of the material of these triangular shaped pieces is disposed horizontally in the finished garment.

Extending around the upper edge portions 22 and 24 of the triangular shaped pieces 4 and 6, respectively, is a waist band 26 of elastic webbing or the like, which is stitched to the pieces 4 and 6 when the elastic webbing is stretched, so that the cloth is gathered when the elastic is not under tension, as shown. At the median line in back where the two ends of the elastic webbing meet, a label 28 is stitched to the elastic to cover the juncture.

In Fig. 4 there is shown a blank which is cut to form the body piece 2. The blank, as indicated, is preferably of woven material with the straight of the material running in the direction of the horizontal parallel lines shown. The upper edge 30 of the body piece 2 extends parallel to these parallel lines and at the lateral ends there are cut-outs or notches 32 and 34.

The body piece 2 has side edges 36 and 38 which diverge downwardly and which join, respectively, with inwardly converging bottom edges 40 and 42, which latter are separated by an arcuate central edge 44.

In Fig. 5 the blanks from which the triangular shaped pieces 4 and 6 are made, are shown. From this figure it will be seen that one edge of each piece is parallel to the horizontal parallel lines representing the straight of the material. These edges are indicated, respectively, by the reference numerals 46 and 48. These triangular shaped pieces 4 and 6 have sloping bottom edges 50 and 52, respectively, and edges 54 and 56 which are folded back over the fold lines 58, 60 and stitched along the lines 62, 64, to form fly portions of the fly 18 (Fig. 1).

The method of forming the boxer short from the blanks of material shown in Figs. 4 and 5 will now be described.

In Fig. 7 there is shown a piece of standard width woven material, on which has been marked, in accordance with one feature of the invention, the necessary pieces for two pairs of shorts. It will be evident from such figure that there are two body pieces 2 marked thereon and that for each body piece there is set of triangular shaped pieces 4 and 6.

Advantageously, the first step in the assembling process, after the various pieces described have been cut and are ready for assembly, is to form the fly portions on the triangular shaped pieces 4 and 6. As mentioned the edge 54 of piece 4 is folded back over the fold line 58 and is stitched along line 62. Likewise, edge 56 of piece 6 is folded back over fold line 60 and is stitched along line 64.

Next, the triangular shaped pieces 4 and 6 are placed in position as shown in Fig. 8. Because there is a "right" and a "wrong" surface to all woven cloth, it is essential to employ pieces so cut that the "right" for the triangular pieces 4 and 6 will be faced in the same direction as the "right" of the body piece 2. With reference again to Fig. 7, this can be effected by moving

the pieces as directed by the arrows to the positions shown in dotted lines. These positions are such that (as will be seen clearly from Fig. 8) the edge 50 of piece 4 is disposed along the edge portion 30' of edge 30 of the body piece 2 and the edge 52 of piece 6 is positioned along the edge portion 30'' of edge 30. The pieces 4 and 6 are then stitched to the body piece 2. This stitching is effected in a single operation and preferably with a double needle machine, going all across the top edge of the body piece 2.

The next operation may advantageously be the sewing up of the crotch (12 in Fig. 1). With reference to Fig. 8, this is accomplished by bringing each lateral end of the blank 2 (with pieces 4 and 6 sewed thereto) forwardly around and downwardly as indicated by the long arrows, so that the lines of the material form a V in the front, and then by stitching the edge 34 to the edge 32, the edge 38 to a portion of the arcuate edge 44 and the edge 36 to another portion of said arcuate edge 44. This operation, as will be appreciated, forms the legs 8 and 10 (Figs. 1 and 2) except for the finishing of the legs with bottom edge hems 64 which may, if desired, then be effected. This operation also eliminates the need of a bar tacking machine, and thus avoids one operation usually required in the manufacture of shorts.

The garment may then be finished by putting on the elastic waist band 26. This is placed on the triangular pieces 4 and 6 adjacent to the edges 50 and 52 (Fig. 8) with one end edge of the elastic webbing placed at the juncture line of the two pieces 4 and 6. The webbing is then stitched all around to the pieces 4 and 6 while the webbing is stretched so that when the webbing is permitted to return to normal the waist band portion of the completed garment will be gathered as illustrated in Figs. 1 and 2. This can be done on a special type machine at the rate of one pair of shorts every thirty seconds. To complete the stitching of the webbing to the garment, the junctures of the two triangular pieces 4 and 6 and of the ends of the elastic webbing are stitched and then covered with a cloth label 28 which is stitched both through the webbing and cloth of the garment.

One of the advantages of this garment is that the order of several of the steps may be varied which, in an assembly line arrangement, permits the pieces to be shifted to various operators if any one part of the assembly line is slowed up for any reason. Thus, the operation of placing the elastic webbing on the garment, which has just been described, may, if desired, be accomplished just after the triangular shaped pieces 4 and 6 have been stitched to the body piece 2. Moreover, the hemming of the bottom edge of the legs may be effected before or after the operation of securing the elastic webbing to the garment.

With the exception of the stitching of the triangular shaped pieces 4 and 6 to the body piece 2, which, as stated, is done with a double needle machine, all stitching on this garment is accomplished with a single needle sewing machine. This is a considerable advantage, for not only is a great saving effected in thread because of this and the relatively few stitch lines in this garment, but the garment is (also because of this) very much stronger. It has been demonstrated at the Institute of Textile Technology at Charlottesville, Virginia, that wherever material is

punctured by needles to make seams, the mate-

rial is about 20% weaker than the same cloth which has not been sewn. With no seat seams, and with but the one double needle seam (20) which is at a place where little or no strain is placed on the garment, it should be evident that the garment described should be, and is, much stronger than a conventional short.

It has been stated above that one of the objects of this invention is to provide a short garment, a whole series of standard sizes of which can be made with considerably less material than hitherto accomplished. How the invention accomplishes this object will now be described.

In men's size shorts, the usual standard sizes run from size 30, through 32, 34, 36, 38, 40 and 42 to size 44. While smaller and larger sizes than these are of course known, garments in such sizes are usually made up specially. Of the standard sizes 30 to 44 mentioned, it will be found that if we use the number one as a base for those standard sizes purchased the least, sizes 30, 40, 42 and 44 will each have one; that there will be two of size 32 and 38; and three for sizes 34 and 36. Thus the most prevalent sizes of men's shorts sold are in sizes 34 and 36.

Using this as a basis, I have, in accordance with the invention, provided a special layout of these sizes on a bolt of cloth and this layout is so designed as to effect a saving of from  $2\frac{1}{2}$  to 3 yards of cloth for each set of these sizes, when compared to other conventional shorts. Such a set of sizes as marked on a standard bolt of material is illustrated in Figs. 9A, 9B, 9C, and 9D. It should perhaps be made clear here again that these drawing figures, 9A, 9B, 9C and 9D, collectively, illustrate a complete set of size markings on a bolt of cloth, and that four drawing figures have been used solely because of the space required to show the layout adequately. In these figures the numerals indicating the sizes have been encircled so that they will not be confused with reference numerals.

A careful analysis of these figures will reveal a general pattern which is made up by disposing the body pieces 2 with their edges 30 along and parallel to the outer edges of the material, and so that a bottom edge of one, adjacent the arcuate edge 44, is disposed within the arc formed by the arcuate edge 44 of the opposite one. It will be found that the width of a standard cloth bolt is just sufficient to permit this to be effected if the particular arrangement disclosed in Figs. 9A, 9B, 9C, and 9D is followed.

It will further be noted that in such an arrangement, the body pieces will, on the material, run along on one side in the order sizes 36, 36, 34, 38, 40, 42 and 40; while opposite to these, respectively, will be the body pieces 2 for sizes 34, 36, 38, 34, 32, 32, and 30.

Careful study of these figures, 9A, 9B, 9C, and 9D will further reveal that the general pattern is completed by disposing between opposed pairs of body pieces 2, a number of the triangular pieces 4 and 6. These are (except at each end of the markings on the bolt), positioned in groups of four and each group is arranged in diamond shape.

Specifically, it will be noted that of each group of four, those triangular shaped pieces on one side will comprise a pair for one size garment, while those opposite, in the same group, will comprise a pair of a different size. Thus, for example, in Fig. 9A it will be noted that there are triangular pieces 4 and 6 for size 34 on one side, and triangular pieces 4 and 6 for size 32

on the other, and that all four of such pieces together form, generally speaking, a diamond. Moreover, it will be seen that pieces 4 of sizes 32 and 34 are disposed diagonally, with respect to each other and that pieces 6 of these sizes are disposed also diagonally with respect to each other. Still further, if the complete layout of sizes is viewed, it will also be noted, that in every case, at least one of a pair of pieces 4 and 6 for a given size in each diamond shaped arrangement, will be positioned so that a transverse line normal to the edge of the material and passing through said piece will also pass through a body piece 2 for the same size thus, for example, in Fig. 9A the transverse dotted line X which passes through piece 4 of size 34, also passes through body piece 2 for size 34, and transverse dotted line Y which passes through piece 6 of size 36 also passes through a body piece 2 for a size 36.

Because of the particular shapes of the body pieces 2 and the triangular shaped pieces 4 and 6, and because of the unique arrangement shown and just described, it has been found that a remarkable saving in cloth can be effected, which for the set of sizes listed, will be from  $2\frac{1}{2}$  to 3 yards, as compared with any conventional short. In such calculations the comparisons are made in accordance with United States Government standards for such sized garments.

In fact, with the savings thus accomplished by the invention, the extra cloth saved can be employed to make up special sizes, or additional pairs of any of the sizes mentioned.

Moreover, the general pattern which has been described makes it possible to use up small pieces of material, which otherwise could not be economically used for making shorts. This is perhaps best illustrated by Fig. 8 which can be considered as disclosing a relatively small piece of a bolt of cloth, but which nonetheless can be used to make two pairs of shorts according to my invention.

It should now be appreciated that among the many benefits of this invention, is that it simplifies greatly the task of the cutter. With the exception of the arcuate edge 44 of the body piece blank, all cutting lines are straight, and not only does this fact make the cutting easier to accomplish, but also, for this reason, permits the cutting to be done by less skilled cutters than those usually required.

While the advantages of the invention could be elaborated on at some length, they will, without further explanation, now be apparent to those skilled in the art.

It should be kept in mind that the embodiments described and illustrated are examples of preferred forms of the invention and that, obviously, some changes can be effected both in the article and its mode of manufacture, without departing from the invention. I claim:

1. A pants garment of woven fabric, comprising a lower portion including the seat, crotch and leg regions of the garment and formed from single blank means having a substantially straight top edge extending along the straight of the fabric and terminated by the lateral ends of said blank means, short downwardly converging sides at said lateral ends, inwardly converging bottom leg edges, and a central concave arcuate edge portion, the upper front abdominal portion, the side portions and upper back portion being formed of two triangular-shaped blanks, the upper edge of each of which is straight and extends along the straight of the fabric, a second

edge of each being folded back to form when the garment is completed a fly portion and which second edge is normal to the straight of the fabric, and the remaining edge of each of which is straight and is stitched to the substantially straight top edge of said single blank means with the fly portion of each triangular shaped blank being positioned adjacent to a lateral end respectively of said top edge of said single blank means, said triangular-shaped blanks being joined together at the upper rear median line of the finished garment, and said short diverging side edges being stitched to said arcuate edge portion to form leg openings.

2. A pants garment as defined in claim 1, an elastic waist band disposed along the upper edges of said triangular shaped blanks, and stitched thereto in stretched condition and so as to join said triangular shaped blanks together to form in the completed garment a continuously joined waist band portion.

3. A pants garment as defined in claim 1, the stitching of said remaining edges of said triangular shaped blanks to the top edge of said single blank means being comprised of two spaced parallel stitch lines, all remaining cloth junctures being of single line stitching.

4. A pants garment of woven fabric, comprising a lower portion including the seat, crotch and leg regions of the garment and formed from single blank means having a substantially straight top edge extending along the straight of the fabric, and terminated by the lateral ends of said blank

means, short downwardly diverging side edges at said lateral ends, inwardly converging bottom leg edges, and a central concave arcuate edge portion between said bottom edges, the upper front abdominal portion and the side portions being formed of two triangularly shaped blanks, the upper edge of each of which is straight and extends along the straight of the fabric, a second edge of each extending vertically when the garment is completed at the abdominal covering portion and which second edge is normal to the straight of the fabric, and the remaining edge of each of which is straight and is stitched to the substantially straight top edge of said single blank means with said second edge of each triangularly shaped blank being positioned adjacent to a lateral end respectively of said top edge of said single blank means, means connecting said triangularly shaped blanks at the rear of the garment, and said short diverging side edges being stitched to said arcuate edge portion to form leg openings.

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