May 26, 1964 T. B. TERRY ETAL 3,134,108

SHORTS AND METHOD OF MAKING

Filed Dec. 1, 1961

4 Sheets-Sheet 1

Fig. 1.

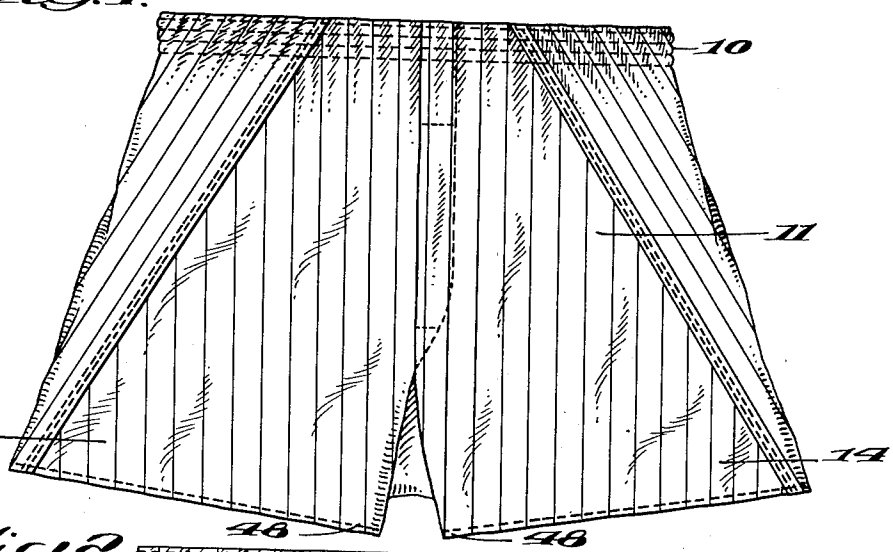


Fig. 2.

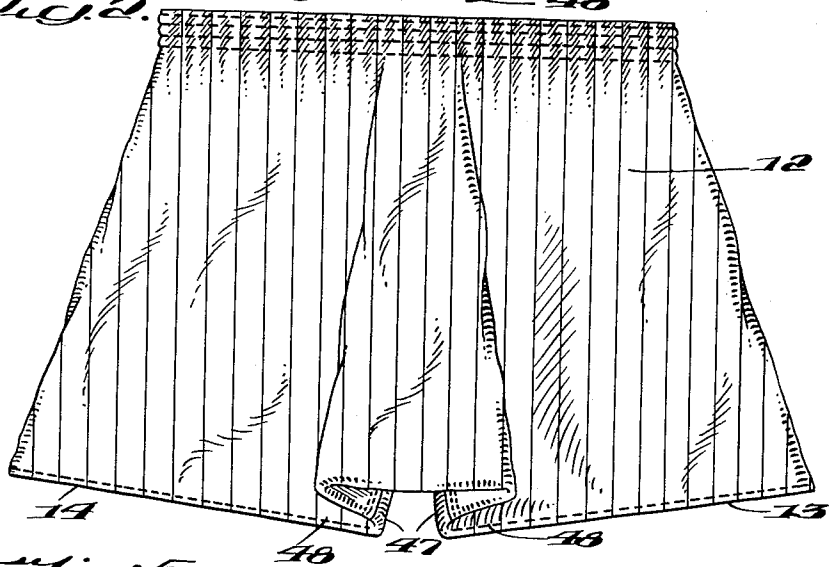


Fig. 5.

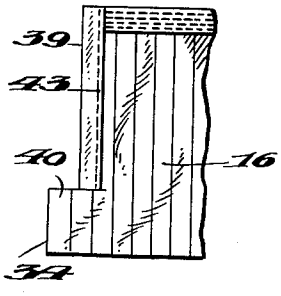
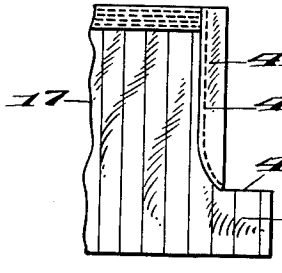


Fig. 6.



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Fig. 3.

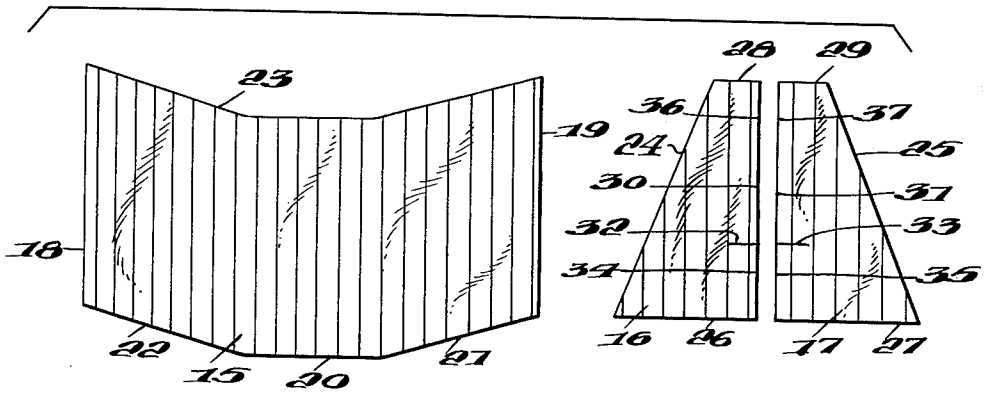
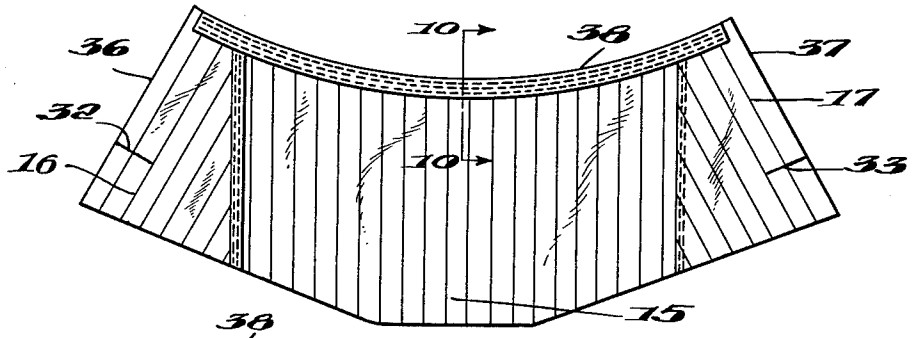


Fig. 4.



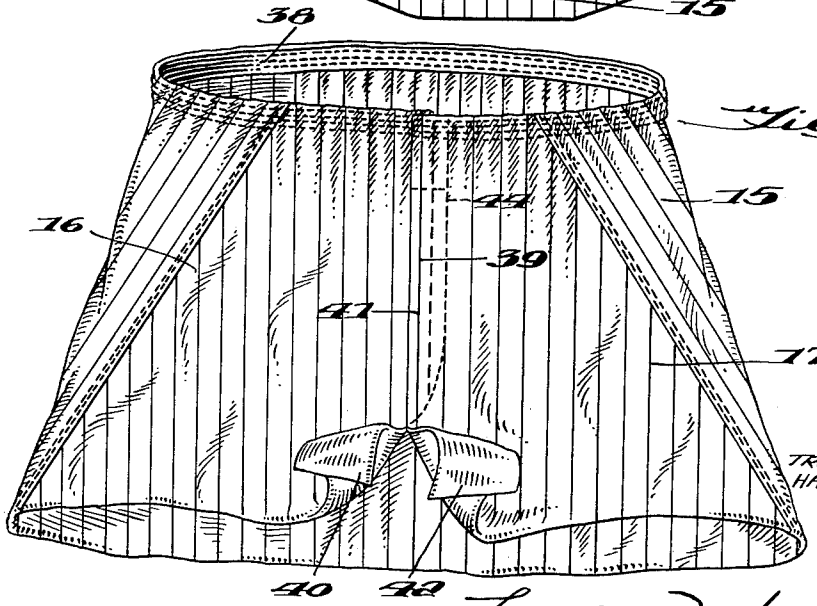


Fig. 7.

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Fig. 8.

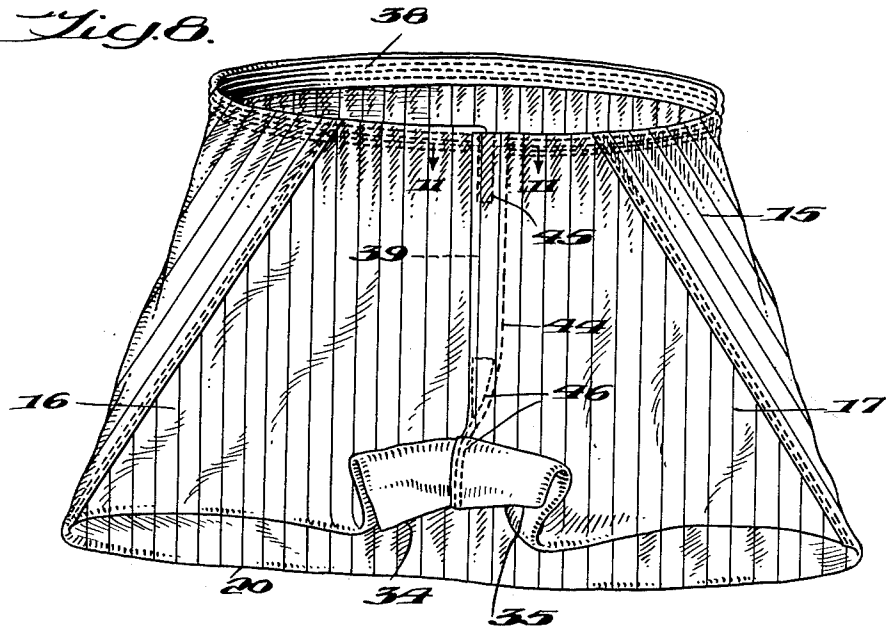


Fig. 9.

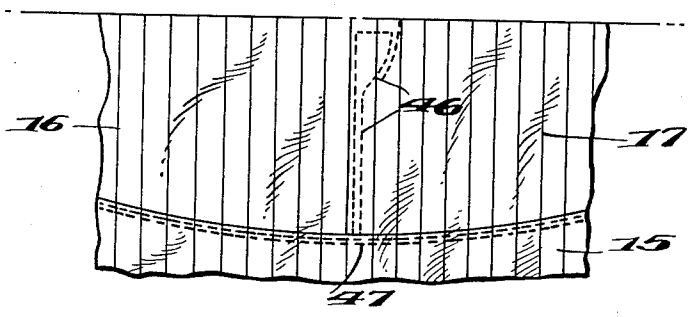


Fig. 10.

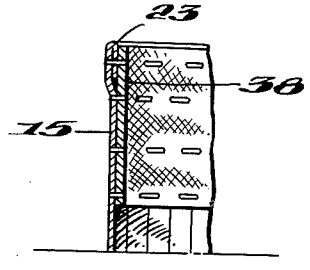
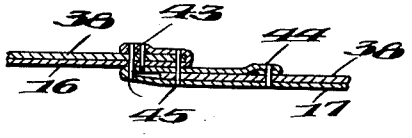


Fig. 11.



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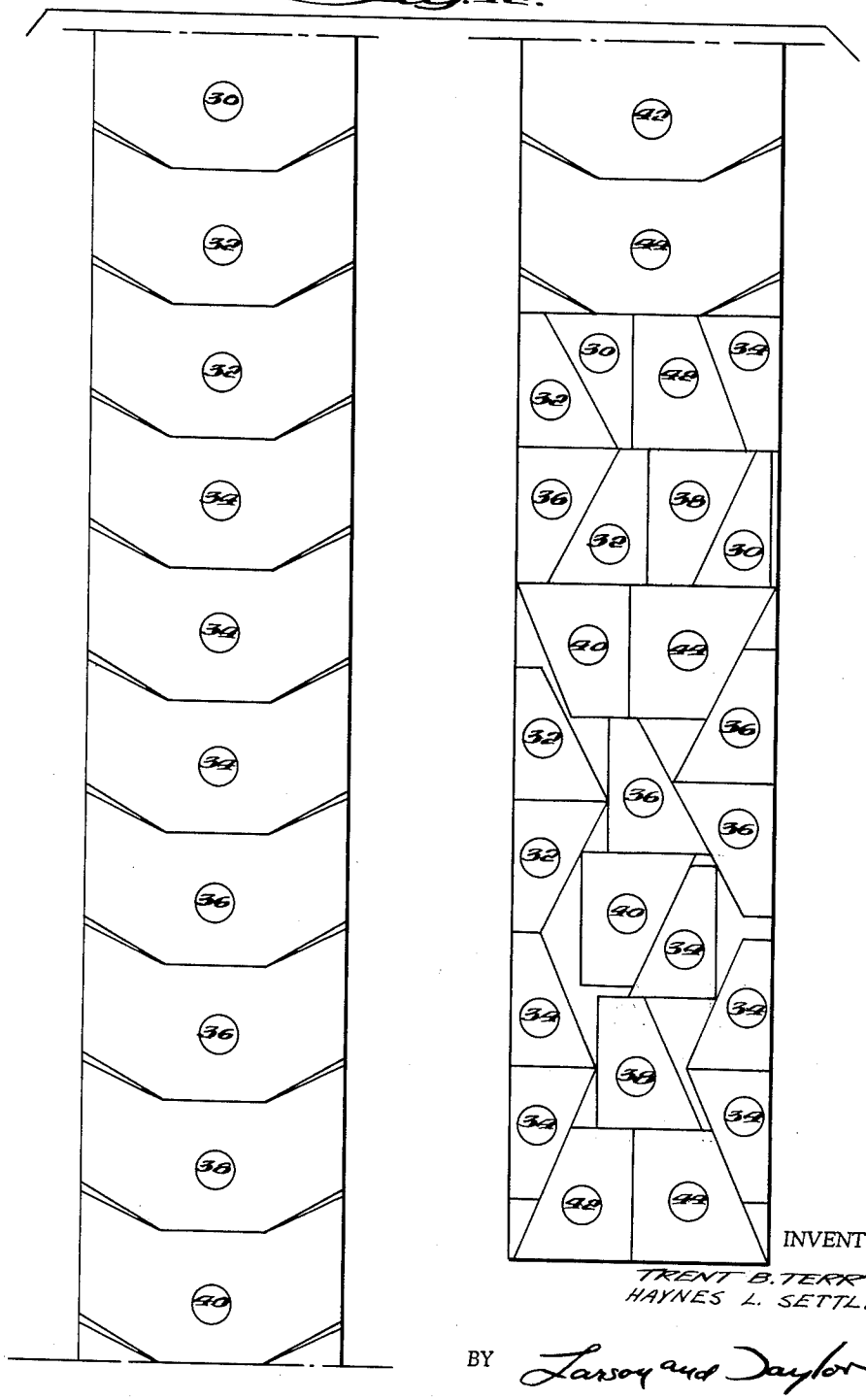
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Fig. 12.



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United States Patent Office 3,134,108 Patented May 26, 1964

3,134,108

SHORTS AND METHOD OF MAKING

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Filed Dec. 1, 1961, Ser. No. 156,217
2 Claims. (Cl. 2—224)

This invention relates to the type of garment commonly known as shorts. It is particularly useful for men and boys, but it is also adaptable for use by women. It is further useful as underwear or outerwear and may be modified to fit the requirements of either.

Manufacturers, particularly in the clothing industry, have for some time been anxious to find ways of reducing costs of production. However, when concerned with clothing, cost of production does not take priority over comfort, attractiveness, quality and the many other rigid requirements.

Yet our invention not only meets these rigid requirements, but it also has a great influence in reducing this cost of production. It relates both to an article of manufacture, commonly referred to as shorts and covering many analogous items such as pajamas, and the method for manufacture. With our invention, the number of operations are reduced greatly, and marking, cutting and sewing time is much shorter.

Whereas, normally it requires at least four to six hours to train a marker for a particular pattern and cutting, our invention not only reduces the training time to less than an hour but also eliminates almost all of the possible marking errors.

Equally as important is the saving of material. For example, it has been discovered that twelve pairs of men's shorts may be produced from 36" goods with at least a yard and one-half less material than is required for other known types. This alone is a savings of fifteen percent or more.

Furthermore, our invention results in a garment that is quite attractive and comfortable. The few seams present create a slim-line effect, and material of any oriented design naturally blends to this form of construction. We have also discovered that the bias and other such material properties are in their most advantageous relationships, thereby creating the most comfort possible for any type of activity and avoiding the disadvantages of "creeping" and "riding."

A primary object of the invention is, therefore, the provision of a pair of shorts or analogous garment of improved construction.

Another object is the provision of a garment that is conforming to standards and readily adaptable to various sizes and forms.

A further object is to produce a short or similar garment adaptable for use by men, women or children.

Still another object is to produce the garment for use as outerwear or underwear.

Yet another object is to provide a garment that is pleasing in appearance and comfortable to wear.

And another important object is the provision of a method of manufacture that is simple and time-saving.

And still another object is a method of manufacture that reduces both the number of steps and the amount of skill required.

And yet another object is a garment and a method for manufacturing it which provides for a minimm number of pieces and a radical savings in yardage.

These and other objects of this invention will become more apparent from the following description and claims.

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

FIG. 1 is a front view of a preferred embodiment of our invention showing a completed pair of mens' and boys' shorts,

FIG. 2 is a rear view of the shorts,

FIG. 3 is a plan of the blanks required to make the shorts,

FIG. 4 is a plan view of the reverse of the material, showing the initial joining of the blanks and the waist band,

FIG. 5 is a detail of the initial forming of the inner fly end on the reverse of the material,

FIG. 6 is a detail of the initial forming of the outer fly end on the reverse of the material,

FIG. 7 is a view showing the overlay of the inner and outer fly ends and crotch in preparation to sewing,

FIG. 8 is a view indicating the sewing for joining the fly ends and forming the crotch,

FIG. 9 is a detail of the inseam after sewing,

FIG. 10 is a section of **10—10** on FIG. 4 showing a detail of the belt,

FIG. 11 is a section **11—11** on FIG. 8 showing the construction of the waist portion at the front, and

FIG. 12 is a pattern showing an example layout and markings for twelve pairs of shorts embodying the invention.

In a preferred embodiment as shown in the drawings, the invention may comprise mens' or boys' shorts of the boxer type. Such a short is normally constructed of woven or unribbed knitted material and comprises, as shown in FIGS. 1 and 2, a waist portion **10**, a front portion **11**, a seat or back portion **12**, and leg portions **13** and **14**. A particularly attractive design is created by using cloth with design lines on the straight of the material, and for purposes of this description, such a design is employed to more dramatically show the invention. It should be borne in mind that the bias of the woven cloth or unribbed knit will therefore be at 45 degrees to the design line and in either direction.

FIG. 3 shows all of the blanks necessary to construct the shorts. They include a main blank **15** and front blank **16** and **17**. Opposite vertical sides **18** and **19** of the main blank **15** are parallel to each other. For mens' shorts the main blank **15** is preferably about 35 and one-half inches wide and of the same size for a given range of waste sizes. At the bottom the center edge portion **20** is substantially straight and is about one-third of the entire width. Edge portions **21** and **22** curve upwardly therefrom to substantially form a truncated convex outline at the bottom. As described later, portion **20** will become a part of the inseam and portions **21** and **22** a part of the leg portions **13** and **14**, respectively. The top edge **23** of the main blank **15** forms a concave outline somewhat shallower than the bottom convex outline.

Front blanks **16** and **17** are equal in size but inverted to each other. Edges **24** and **25** are equal in length to edges **18** and **19**. Top edges **28** and **29** are parallel to bottom edges **26** and **27**. Edges **30** and **31** are perpendicular to the respective top and bottom edges.

It will be seen that the difference in size will, for a given range of sizes, be determined by the size of front blanks **16** and **17**. Thus, for the same range of sizes, every main blank **15** will be the same size. In this manner the size can be varied by changing the lengths of edges **28**, **29** and edges **26**, **27**. However, for a change in length of edge **28**, for example, there will be an equal change in length for the opposite edge **26**. Therefore, for the particular range of sizes chosen, the difference in length between the top edge and the bottom edge, for any given front blank, will always be the same.

It can therefore be seen that the angle generated between edges **24** and **26** and edges **25** and **27** will be

constant. For example, for the range of sizes of waist 30 to 44, this angle is about 65°.

About one-third of the distance up the edges **30** and **31** of front blanks **15** and **17**, perpendicular slits **32** and **33** are made. These slits separate fly edge portions **36**, **37** from the inseam edge portions **34**, **35**. The result should be that the sum of the lengths of inseam edge portions **34** and **35** is slightly larger than the length of bottom edge **20** of the main blank **15**.

After the blanks have been cut and the slits made, the convenient first step of fabrication is to stitch together edge **19** of main blank **15** and edge **24** of front blank **16**. Correspondingly, edge **18** is then stitched to edge **25** of front blank **17**. The preferred seam is made by a double needle machine which assures proper covering of extreme edges to prevent unraveling.

At this point, an elastic waist band **38** may be applied. The waste band **38** is stitched to the material in a known manner with four lines of stitching, as shown in FIG. 10. It is of course stretched to a certain extent while applying, so that, on completion the material at the waist portion **10** will gather, due to the contraction of the band **38**. For reasons hereinafter discussed, the waist band **38** is started at about a distance in from edge **37** of blank **17** which is equal to the depth of the slit **33**. The stopping point of the band **38** near the edges **36** on blank **16** should be equal to about one-half the depth of the slit **32**.

Thus, it should be observed that the band **38** requires only a single unhampered operation. Furthermore, the 16 sewing threads required for the band will not need to be trimmed and reinforced at the respective waist band ends. This will be apparent when next the fly construction is commenced.

FIG. 5 shows a detail of the inner fly and construction on blank **16**. This is prepared by folding over edge **36** at a point about one-half the depth of the slit **32**. This is also about at the end of the waist band **38**. The extreme edge **36** is then slightly hemmed, and the resulting fold is sewn with a single line stitching **43** the entire length of the edge.

For the outer fly end **41**, the edge **37** is folded the entire depth of the slit **33**. This again will also result in a fold at about the band end. The end is appropriately hemmed and tucked at the lower end such that the stitching **44** of the entire length may result in the curved line as shown. Crotch edges **40** and **42** now become obvious.

It should of course be noted that the waist band **38** ends need not be exactly positioned. It is sufficient that these ends are covered by the respective fly end folds.

When the fly end portions **39** and **41** have been completed, the front blanks **16** and **17** are then brought together in a manner as shown in FIG. 7. The inner end points of the slits **32** and **33** are placed in contiguous relation to each other, with a corresponding overlap of the outer fly end **41** and the inner fly end **39**.

FIG. 8 shows the method of stitching upon completion of the overlap operation. At the top, a single needle stitch **45** is performed with a resultant rectangular pattern. The crotch and bottom fly portion are joined by the following operation.

The crotch edge portions **40** and **42** are appropriately hemmed as for a usual narrow width double needle operation. The lower edge of the inner fly portion **39** is tucked in between the inner fly end **39** and outer fly end **41**, and the tucking is a corresponding amount to the previous tucking of the outer fly end **41**. Then by means of a single needle operation, the parts are stitched together by starting at the crotch end, sewing up the crotch and a short distance along the fly, turning and sewing across the fly, and then sewing back down to the crotch end. The result **46**, as shown in FIG. 8, is an apparent double stitch of the crotch and a triangular stitch pattern at the lower fly end.

The next step in the manufacture of the garment may then be the formation of the legs by sewing of the inseam **47**. This is accomplished by stitching the front blank inseam edges **34** and **35**, now in contiguous relation, to the bottom edge **20** of the main blank **15**. This is done in one continuous double needle operation as shown partially in FIG. 9 and partially in FIG. 2.

The garment may then be completed by hemming the leg openings with stitching **48** to form the finished leg portions **13** and **14**.

The savings of material is quite obvious from FIG. 12. This is an example layout on a 36" bolt. It is for twelve men's shorts of the size range of 30–44 and entirely made with less than eleven yards of cloth. The numbers in the circles correspond to the garment size for which each of the blanks are used. As can be seen, the twelve main blocks of equal size are marked in a contiguous relation, with a very minimum of material waste. They are laid out whereby the parallel edges nearly coincide with the bolt selvage edges.

The remainder of the cloth is then used for marking the front blanks. Because of the constant angle aspect, it is quite clear that contiguous laying and marking is readily accomplished.

There can be even more savings if the pattern layout were limited to a lesser size range. For example, the first two transverse rows of material show the minimum waste, and if repeated with reversal would result in eight pairs of shorts with only the slight edge waste.

The unusually large number of possibilities and advantages of our invention is now readily apparent. There are no small parts to lose or rematch. For any given range of sizes, the dimensions of the main blank are unvaried, and since the front blank for any given size has the same dimension, only a single reversible pattern for marking need be used.

For use as outer wear, a fastening means may quite readily be applied to the fly, or alternatively if no fly were desired, the fly edges earlier mentioned could be sewn together contiguously by folding the inner fly edge **36** the same way as the outer fly edge **37**.

As for comfort, it is to be noted that there is a horizontal bias at the upper hip portions where many persons have need for further "stretch," particularly when bending. At the crotch, the bias is at all points, 45 degrees to both the crotch seam and the inseam, thereby creating substantial comfort when walking or running. Additional comfort is available because the seat biases in the direction of either leg when that leg is moved forward.

As for design and appearance, a slim line effect is created when using a longitudinally oriented design as that shown. The result is an appearance of a smaller waist with no consequent appearance of larger hips. Alternatively, a wider appearance may be effected by using a laterally oriented design.

It is therefore to be understood that the form of our invention, herewith shown and described, is to be taken as a preferred example of the same, and that various changes in the shape, size and arrangement of parts, or of the order of manufacture, may be resorted to without departing from the spirit of our invention, or the scope of the subjoined claims.

We claim:

1. A pair of shorts comprising a main blank of textile material having a continuous concave recessed top edge, a convex bottom edge, and two straight lateral edges of equal length and parallel to each other; a first front blank of textile material having straight top and bottom edges parallel to each other, a straight lateral edge at an acuate angle of about 65° to the first front blank bottom edge and equal in length to the main blank lateral edges, and an additional straight lateral edge perpendicular to the respective top and bottom edges; and a second front blank of textile material having like dimensions and reversed to the first front blank, the main blank lateral edges and

the additional lateral edges of both front blanks being cut along the straight of a bolt of material and the lateral edge of each front blank being sewn along its length to a respective one of the parallel lateral edges of the main blank, the top edges and bottom edges of all of the blanks forming respective continuous concave and convex lines, the length of the top edge of the main blank being greater than the sum of the length of both front blank top edges, each front blank at its respective additional lateral edge having a cut transverse thereto to define a fly edge portion on the additional lateral edge above said cut sewn to the fly edge portion of the other front blank and an inseam edge portion below said cut sewn to a part of the bottom edge of the main blank, and the transverse edge formed by the cut and joining the inseam edge portion comprising a crotch edge portion sewn to the crotch edge portion of the other front blank, the top edges defining the waist portion, and the upper portions of the main blank at the lateral edges thereof defining the upper hip portions and extending around to the front of the shorts such that the textile material at the said upper portions defines a horizontal bias parallel to the waist portion.

2. A method of forming a plurality of shorts of varying size comprising laying a bolt of material at a given width with longitudinal edges parallel; contiguously marking and cutting a series of main blanks of equal width having parallel straight lateral edges separated by a distance substantially equal to the said given width, said lateral edges being marked along the straight of the material, the main blanks further having a continuous concave recessed top edge and a convex bottom edge; contiguously marking and cutting a series of front blanks having parallel straight top and longer bottom edges, a straight lateral edge perpendicular to the top and bottom edges and an additional lateral edge equal in length to

respective parallel edges of a main blank and at an acute angle of about 65° with the bottom edge of the respective front blank, the number in the series of front blanks being twice the number in the series of main blanks for joining two front blanks with each of said main blanks, the acute angle for all of the front blanks being constant and the length of said top and bottom edges being varied to determine the respective size of each shorts, and the length of each main blank top edge being greater than the sum of the length of both front blank top edges joined therewith; cutting a transverse cut in each of the front blanks at the respective first lateral edge about one third the length thereof up from the bottom edge; sewing the additional lateral edge of each of two equal sized front blanks to each one of the main blanks to form continuous top and bottoms; joining the lower edges formed by the transverse cuts together to form a crotch portion, sewing the lower one third of the first lateral edges of both main blanks to the center of the bottom edge of the main blank to form an inseam portion, and sewing the remainder of the first lateral edges together to form a fly portion, the upper portions of the main blank at the lateral edges thereof thereby defining the upper hip portions and extending around to the front of each of the shorts such that the material at said upper portions of each main blank define a horizontal bias parallel to the respective waists.

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