May 3, 1955 W. W. ARTZT 2,707,284

METHOD OF MAKING GARMENTS

Filed Feb. 11, 1952 3 Sheets-Sheet 1

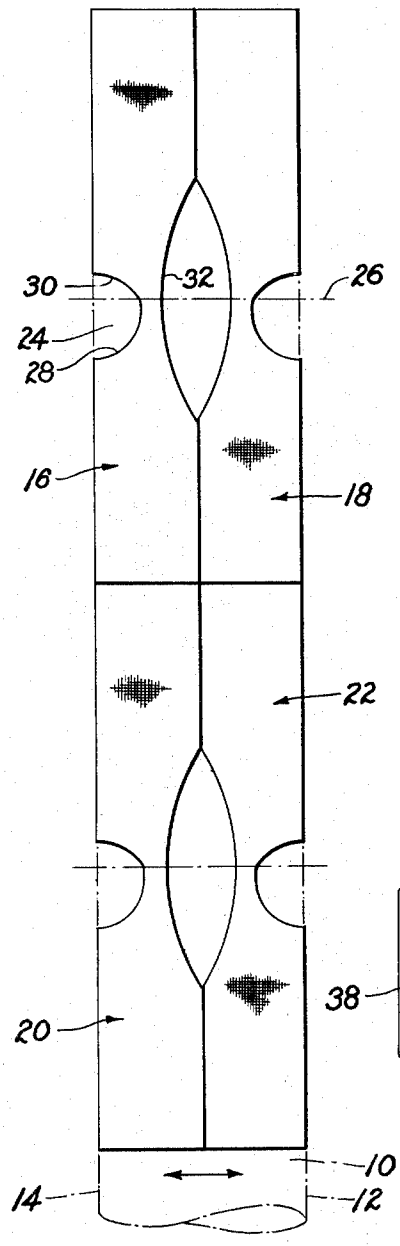


Fig. ~1~

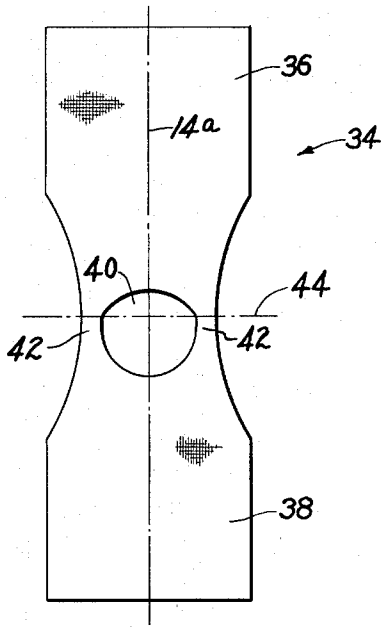


Fig. ~2~

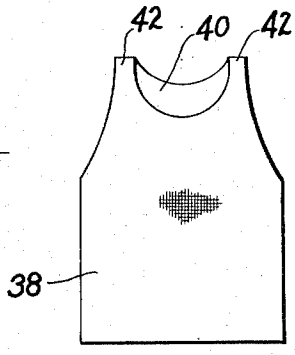


Fig. ~3~

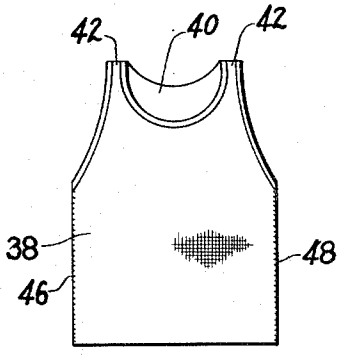


Fig. ~4~

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METHOD OF MAKING GARMENTS

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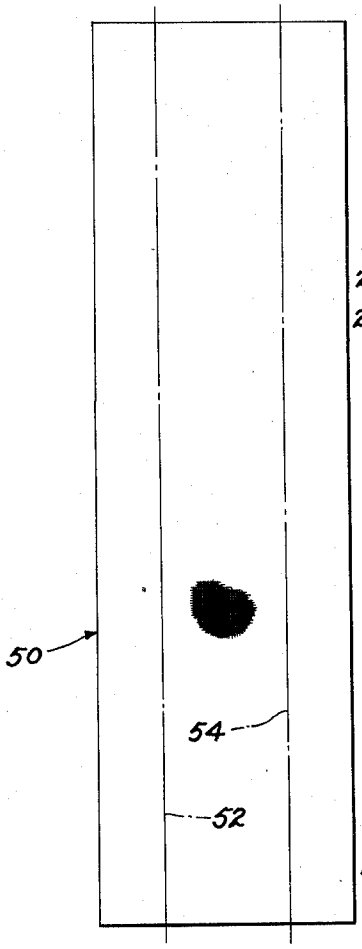


Fig.~5~

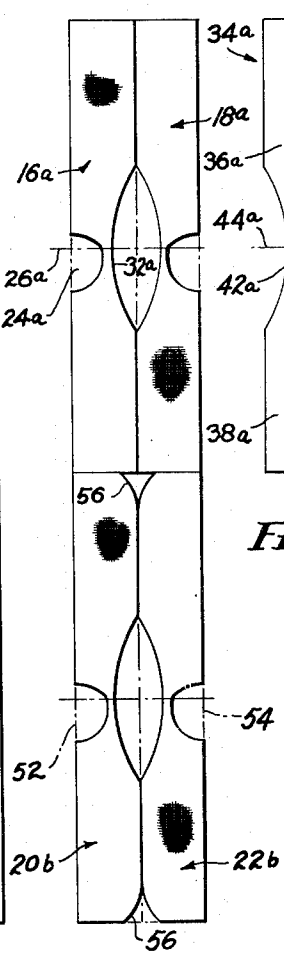


Fig.~6~

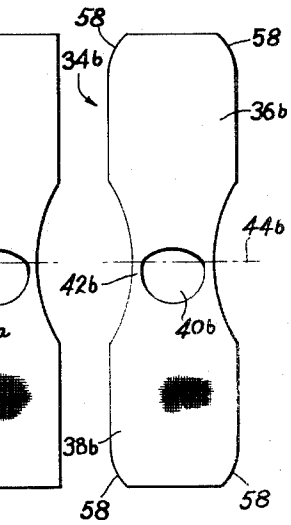


Fig.~7~

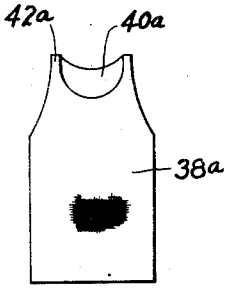


Fig.~8~

Fig.~10~

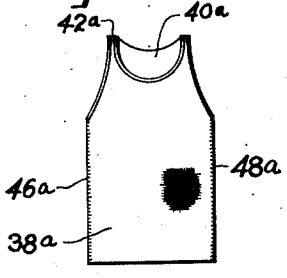


Fig.~9~

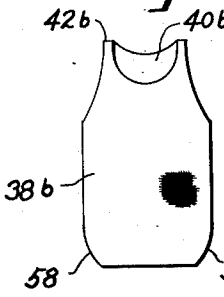


Fig.~11~

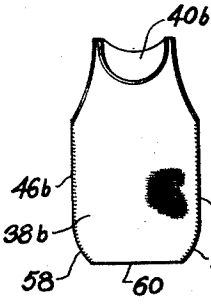


Fig.~12~

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METHOD OF MAKING GARMENTS

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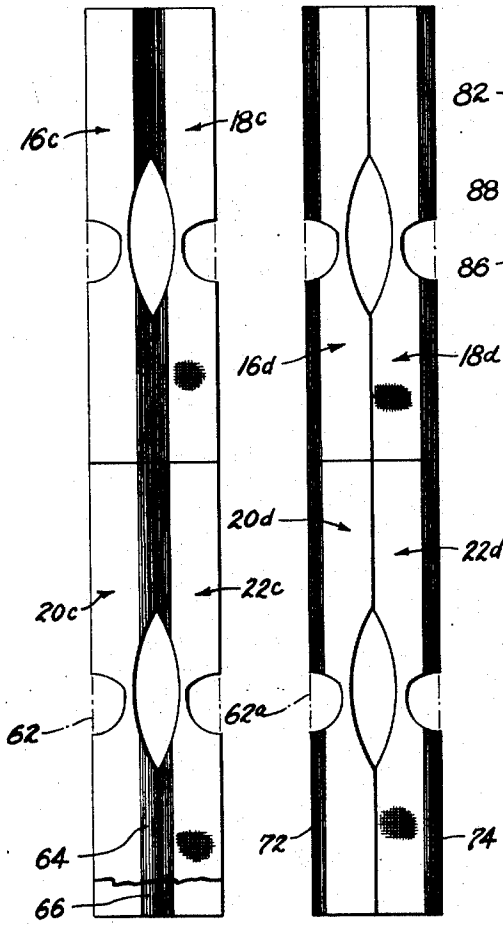


Fig. ~13~

Fig. ~15~

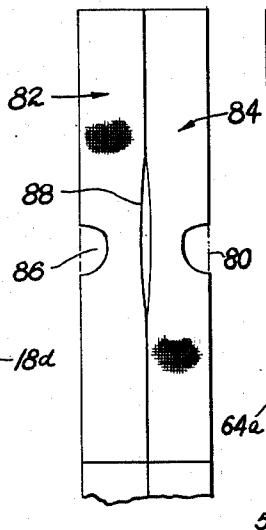


Fig. ~18~

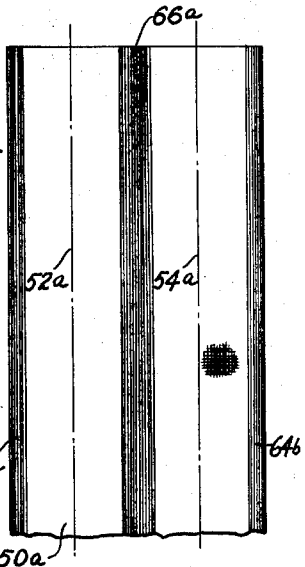


Fig. ~17~

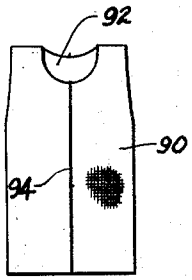


Fig. ~19~

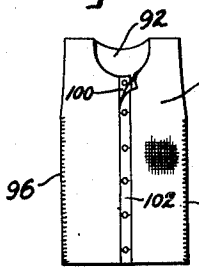


Fig. ~20~

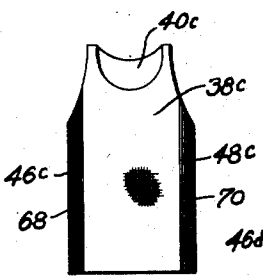


Fig. ~14~

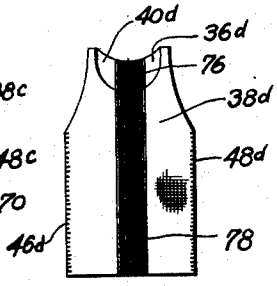


Fig. ~16~

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United States Patent Office 2,707,284 Patented May 3, 1955

2,707,284

METHOD OF MAKING GARMENTS

William W. Artzt, New York, N. Y.

Application February 11, 1952, Serial No. 271,042

8 Claims. (Cl. 2—243)

The present invention relates to garments and methods of making the same, and is particularly directed to improved garments such as undershirts, vests and other like garments of the sleeveless type, and to improved methods of producing such garments, and is further a continuation-in-part of my copending application for United States Letters Patent identified by Serial No. 202,752 and filed December 26, 1950, now Patent No. 2,588,606.

One of the objects of the present invention is to provide garments of the character indicated which are of one piece construction and devoid of seams in the shoulder areas to thereby increase the comfort to the wearers and also the useful life of the garments.

Another object is to provide a garment of the character indicated which is more yieldable laterally than longitudinally so that maximum comfort is afforded to the wearer, and so that the garment continues to comfortably fit the wearer even after lateral shrinkage has been caused by laundering thereof.

Another object is to provide a garment of the character indicated, formed so that a single size thereof will conform to and properly fit different size wearers.

Another object resides in the provision of garments of the character indicated which are formed at the lower end so that the garment when worn does not "creep-up" the torso of the wearer.

Another object resides in the provision of methods of forming garments of the character indicated which effect substantial savings in the labor required and reduce the waste of material to a minimum.

A further object is to provide methods of forming garments of the character indicated cut from the flattened walls of a continuous tube of material or from two superposed elongated layers of material joined together at the side edges thereof in accordance with patterns laid thereon, wherein the neck opening of each garment is cut through the flattened walls along an arcuate line intersecting the adjacent fold edge at points spaced unequally from the transverse center line of the pattern to thereby provide a neck opening deeper in the front than in the back of the garment.

A further object is to provide methods of forming garments of the character indicated cut from superposed layers of material joined at the side edges thereof, wherein the garment is completed by a single stitching operation forming a continuous seam along each side of the body portion.

A still further object is to provide methods of forming garments of the character indicated from superposed layers of material joined along the side edges thereof and more yieldable laterally than longitudinally, wherein the complete garments are cut from said layers so that the body portions of the completed garments are more yieldable laterally than longitudinally and a minimum of material is wasted in so cutting the garments.

A still further object is to provide improved methods of forming garments of the character indicated each having longitudinal zones in the body portion thereof

which are more yieldable laterally than the remainder thereof so that a single size of such garments will conform to and properly fit the torsos of different size wearers.

Still another object is to provide methods of forming garments of the character indicated from superposed layers of material joined at the side edges thereof, wherein the completed garments are cut from said layers in a manner to reduce to a minimum the extent of cutting required.

The above and other and further objects, features and advantages of the present invention will be manifest from the following description and the accompanying drawings.

In accordance with one embodiment of the invention, the foregoing objects are accomplished by providing two elongated layers of flexible material joined together at the opposite side edges thereof, in the form of a flattened continuous tube or otherwise, cutting the two layers to provide a longitudinally arranged series of side-by-side disposed folded garment forming blanks. The neck opening for each garment is formed by cutting a suitably shaped arcuate section out of the two layers at the folded edge of the related blank with the cutout section being disposed so that a major portion of the area thereof is disposed to one side of the transverse medial line. The widths of the shoulder strap forming portions of the blanks are controlled by cutting arcuate sections of greater or lesser curvature out of the central parts of the two layers. A completed garment is formed from each of the blanks by opening the latter then refolding the blank along its transverse medial line, and then stitching together, or otherwise joining, the adjacent side edges of the blank.

In accordance with another embodiment of the invention, the two layers of material are formed with longitudinally extending zones of a material more yieldable laterally than the remainder of the layers and located to provide laterally yieldable zones either at the front and back or at the sides of each finished garment, so that such garment, when worn, will readily and automatically conform to the shape of the wearer's torso to provide maximum comfort and to fit wearers of different sizes.

In accordance with still another embodiment of the present invention, each blank cut from two joined together layers as above and provided with relatively wide shoulder portions is further cut along a centrally located line extending down the front portion from the neck opening so that the resulting garment opens at the front to provide a vest or other sleeveless garment opening at the front.

In the accompanying drawings wherein I have illustrated preferred embodiments of my invention:

Fig. 1 is a plan view of a flattened tube of material having a series of side-by-side patterns thereon to define the lines along which said tube is cut to provide garment forming blanks according to one embodiment of this invention;

Fig. 2 is a plan view of a blank cut from the tube of Fig. 1 and then spread flat;

Fig. 3 is a front elevational view of a garment forming blank, of the kind shown in Fig. 2 after it has been refolded;

Fig. 4 is a front elevational view of a completed garment formed from the refolded blank of Fig. 3;

Fig. 5 is a plan view of a sheet of material employed in producing garment forming blanks according to another embodiment of this invention;

Fig. 6 is a plan view of the sheet of Fig. 5 folded to provide two elongated layers joined together at the side edges thereof and having patterns thereon to define the

lines along which the layers are cut to provide garment forming blanks of slightly varied configuration;

Fig. 7 is a plan view of a blank of one configuration cut from the layers of Fig. 6 and then spread flat;

Fig. 8 is a front elevational view of a garment forming blank, of the kind shown in Fig. 7, after it has been refolded;

Fig. 9 is a front elevational view of a completed garment formed from the refolded blank of Fig. 8;

Fig. 10 is a plan view similar to Fig. 7, but showing a blank of another configuration cut from the folded sheet of Fig. 6;

Fig. 11 is a front elevational view of the blank of Fig. 10 after it has been refolded;

Fig. 12 is a front elevational view of a completed garment formed from the refolded blank of Fig. 11;

Fig. 13 is a plan view of a flattened tube of material having laterally yieldable longitudinal zones and shown with patterns thereon to define the lines along which the tube is cut to provide garment forming blanks according to still another embodiment of the present invention;

Fig. 14 is a front elevational view of a completed garment produced from a blank cut from the tube of Fig. 13;

Fig. 15 is a plan view of a flattened tube of material similar to the tube of Fig. 13, but having differently located laterally yieldable zones, and shown with patterns thereon to define the lines along which the tube is cut to provide garment forming blanks according to still another embodiment of this invention;

Fig. 16 is a front elevational view of a completed garment produced from a blank cut from the tube of Fig. 15;

Fig. 17 is a fragmentary plan view of a sheet of material having longitudinally extending, laterally yieldable zones and adapted to be folded in the manner of the sheet of Fig. 5 to provide for the cutting of blanks therefrom to be used in producing garments of the kind shown in Fig. 14;

Fig. 18 is a fragmentary plan view of a flattened tube of material having patterns thereon to define the lines along which the tube is cut to provide garment forming blanks in accordance with a further embodiment of the present invention;

Fig. 19 is a front elevational view of a blank cut from the tube of Fig. 18 and then refolded and further cut to provide an opening down the front; and

Fig. 20 is a front elevational view of a completed garment formed from the refolded blank of Fig. 19.

Referring to the drawings in detail, and more particularly to Fig. 1 thereof, an elongated flattened tube **10** of flexible material is there shown. The tube **10** is preferably formed of a circularly knitted fabric which is yieldable in a lateral direction and substantially non-yielding in a longitudinal direction, however, the invention is not limited to that specific fabric, and tube of other materials, such as, for example, broadcloth, flexible sheet material, woven nylon or other synthetic yarns, and the like, may be utilized.

The preferred knitted tube **10**, which is stretchable in the direction of the double-headed arrow of Fig. 1, may be produced on conventional circular knitting machines, such as, for example, machines made by the Supreme Knitting Machine Co. Inc., of Brooklyn, N. Y.

After the tube **10** has been flattened to provide two superposed layers of material joined together along the opposite folded side edges **12** and **14**, a longitudinally arranged series of side-by-side disposed pairs of garment forming blanks are cut therefrom. In Fig. 1 a series of paired patterns, consisting of the patterns **16** and **18** and the patterns **20** and **22**, are shown disposed on the flattened tube **10** to define the lines along which the latter is cut to provide the garment forming blanks. It will be noted that each of the patterns is of substantially rectangular configuration and extends longitudinally of the tube **10**.

In describing the specific form of the patterns, particular reference will be made to pattern **16**, however, it is to be understood that all of the patterns are identical. Pattern **16** is formed with a length equal to twice the desired length of the completed garment and with a width, at its widest points, equal to one half the width of the flattened tube **10** so that the paired patterns may be arranged side-by-side to substantially cover the entire area of the flattened tube. The outer edge of the pattern **16** is formed with an arcuate cutout **24** to define the neck opening in the garment forming blank. In order to provide a neck opening which dips lower at the front than at the back of the garment, the cutout **24** is disposed to locate a major portion of the area thereof at one side of the transverse medial line **26** of the pattern. Such eccentricity of the cutout **24** is preferably provided by forming one side portion **28** of the cutout with a smaller radius than the radius of the other side portion **30** thereof. The width of the shoulder strap portions and the depth of the arm openings of the garment forming blank cut from the tube **10** is controlled by the depth of an arcuate recess **32** formed in the inner edge of the pattern symmetrically with respect to the transverse medial line **26**. Thus, by increasing the depth of the arcuate recess **32**, the width of the shoulder strap portion of the blank may be reduced, while increasing the length of the recess **32** results in increasing the depth of the arm opening.

Since the width of the pattern **16** is equal to one-half the width of the tube **10**, the patterns may be arranged side-by-side as shown to substantially cover all of the flattened tube with the exception of the spaces defined by the cutouts **24** and the recesses **32** of the several patterns, and the material wasted in cutting the several garment forming blanks from the tube is limited to these spaces of relatively small area. While only two pairs of patterns have been illustrated to be disposed on the tube **10**, it is to be understood that the length of the flattened tube, preferably formed in multiples of the length of a pattern, is the only actual limitation on the number of patterns that may be arranged in the manner shown, and that a tube of any desired length may be employed. It is further apparent that instead of the several patterns illustrated, a single pattern may be used and moved to each of the successive positions as the cutting operation proceeds.

The next step in producing garments of the character indicated is the cutting of the two superposed layers of the tube **10** along the lines defined by the end edges, inside edge, recess **32** and cutout **24** of each pattern. Since the patterns of each side-by-side pair confront at their inner edges and the several pairs confront at their end edges, the cutting along such edges serves to define two blanks simultaneously so that the extent of the required cutting is materially reduced. While patterns, such as the patterns **16**, **18**, **20** and **22**, are useful in defining the lines to be followed by a manually directed cutter, it should be understood that in mass production or commercial practice the entire cutting operation is preferably performed by stamping the blanks from the tube by means of suitably shaped blanking dies.

The garment forming blanks cut from the tube **10**, whether formed by patterns and a manually directed cutter or by blanking dies, will each have the form shown in Fig. 2 when unfolded and spread flat. The blank **34** of Fig. 2 includes a back forming portion **36** provided by the unfolded double thicknesses of material on which the upper end portion of the pattern **16** was disposed, a front forming portion **38** provided by the unfolded double thicknesses of material on which the lower end portion of the pattern was disposed, a neck opening **40** corresponding to the cutout **24** of the pattern, and arcuate recesses at the opposite side edges corresponding to the recess **32** of the pattern and defining relatively narrow shoulder strap forming portions **42** formed integral with and connecting the back and front forming portions at the opposite sides of the neck opening. Since the blank **34**, as seen in Fig. 2, has been unfolded about the

fold edge 14 of the flattened tube, such blank will be accurately symmetrical about its longitudinal medial line 14*a* which corresponds to said fold edge.

The blank 34 is formed into a garment by refolding it along the transverse medial line 44 thereof, so that the front forming portion 38 is superposed on the back forming portion 36 as shown in Fig. 3. It will be seen that the neck opening of the blank, when the latter is refolded as above, is deeper at the front than at the back. This difference is the result of the displacement of the cutout 24 to one side of the transverse medial line of the pattern. While I have illustrated the neck opening as cut along arcuate lines 28 and 30 (Fig. 1) of different radii to provide the necessary displacement of the cutout 24, it is to be understood that the cutout may be semi-circular, if desired, with the center of such semi-circular cutout being offset from the transverse medial line 26 of the pattern in the direction toward the part of the pattern defining the front forming portion of the blank. However, by cutting along the arcuate lines 28 and 30 of different radii, the radius of the line 28 can readily be varied to enlarge the depth of the front of the neck opening without necessarily increasing the width of the neck opening. Thus, the depth of the neck opening at the front may be enlarged without requiring the excessive outward disposition of the relatively narrow shoulder strap portions 42.

When garments of the character herein described are worn as undergarments, it is generally desired to have the front of the neck opening lower than the neck opening of an outer garment, such as a sport shirt, worn therewith so that the undergarment will not be seen, hence the provision of a deeper front at the neck opening as herein described has a considerable advantage over conventional garments when worn as undershirts.

The garment is finished by stitching together the adjacent edges at the sides of the back and front forming portions 36 and 38 to provide the side seams 46 and 48 (Fig. 4), and tape strips or other suitable reinforcement may be stitched or otherwise secured around the neck opening 40 and the arm openings as shown.

The completed garment, thus provided, is free of any seams in the shoulder area, and the absence of such seams not only increases the comfort to the wearer but also increases the useful life of the garment since seams in the shoulder areas are subjected to severe strain and tend to break open. Moreover, shoulder seams are uncomfortable when the wearer of the garment carries any weight on the shoulder, such as a strap supporting a bag, or a rifle or pack as carried by men in the armed forces. The advantages accruing from the elimination of the shoulder seams in garments made in accordance with the present invention will, therefore, be readily appreciated.

It will also be noted that the completed garment of Fig. 4 is laterally yieldable by reason of the lateral yieldability of the tube 10 from which it is formed, and this feature insures that garments constructed according to this invention, when fashioned from a tube of knitted material, will readily conform to the contours of the wearer's torso to provide freedom of movement and maximum comfort even after laundering of the garment has caused lateral shrinkage.

In addition, the method of producing the garments according to this invention reduces to a minimum the waste of material in cutting the blanks from the flattened tube, and also reduces the labor involved in cutting the blanks and in completing the garment from such a blank in that the seams 46 and 48 can be formed in one stitching operation.

Referring now to Figs. 5 to 9, inclusive, a garment similar to that already described is there shown in various stages of production. In Fig. 5 an elongated sheet 50 is shown spread flat and has two longitudinal fold lines indicated thereon by the broken lines 52 and 54. The fold lines 52 and 54 are disposed at distances from the respective side edges of the sheet 50 equal to substantially one-quarter of the width of the latter. In order to provide two superposed layers of material joined together along their side edges and from which garment forming blanks may be cut, the portions of the sheet 50 disposed outwardly of the fold lines 52 and 54 are folded inwardly along said fold lines to overlie the central portion of the sheet with the side edges of the sheet, when so folded, meeting along the longitudinal centerline of the sheet.

With the sheet 50 folded as above, patterns 16*a* and 18*a*, constituting a pair and corresponding to the patterns 16 and 18 described in detail in connection with the first embodiment of this invention, are placed upon the folded sheet and the respective blanks cut from the latter by cutting along the end edges, inside edges, cutouts 24*a* and recesses 32*a* of the patterns. As in the first described embodiment the neck opening defining cutout 24*a* is displaced relative to the transverse medial line 26*a* of the pattern and the recess 32*a* for defining the arm holes is symmetrical with respect to said line 26*a*.

The unfolded blank 34*a* (Fig. 7) provided by cutting the folded sheet 50 is similar to the blank 34 of Fig. 2 cut from the tube 10 and includes a back forming portion 36*a*, a front forming portion 38*a*, connecting shoulder strap portions 42*a*, and a laterally centralized neck opening 40*a*. As before, the blank 34*a* is refolded about its transverse medial line 44*a* so that the front forming portion overlies the back forming portion, with the neck opening 40*a* being deeper at the front than at the back (Fig. 8). The garment is then completed by stitching together the side edges of the back and front forming portions along the side seams 46*a* and 48*a* (Fig. 9) and if desired strengthening tapes may be provided around the neck and arm openings. The garment as thus completed is the same as that shown in Fig. 4, and its method of production differs from that first described only in the manner in which the two superposed layers of material joined together at the side edges are provided. It will be apparent that the advantages set forth in connection with the garment and method illustrated in Figs. 1 to 4 are shared by the garment and method of Figs. 5 to 9.

Referring to Fig. 6 and Figs. 10 to 12, inclusive, the various stages in the production of a slightly modified garment embodying the present invention are there illustrated. At the lower portion of Fig. 6, a pair of patterns 20*b* and 22*b* are positioned side-by-side on the two superposed layers of material provided by the folded sheet 50. Each of these last mentioned patterns is provided with rounded corners 56 at the opposite ends of the inside edge thereof, and corresponds in all other respects to the patterns 16*a* and 18*a* disposed thereabove. The blank 34*b* (Fig. 10) formed by cutting the two layers of the folded sheet along the lines defined by either pattern 20*b* or 22*b* includes, when spread flat, a back forming portion 36*b*, front forming portion 38*b*, connecting strap portions 42*b* and a neck opening 40*b* therebetween which is eccentrically located relative to the transverse medial line 44*b* of the blank.

The blank 34*b* differs from the previously described blanks in that the side edges of the back and front forming portions 36*b* and 38*b*, respectively, converge or curve towards each other adjacent their lower ends, as at 58. The garment is formed from the blank 34*b* by refolding the latter about its transverse medial line 44*b* so that the front forming portion overlies the back forming portion, as in Fig. 11, and then the side edges are stitched together along continuous means 46*b* and 48*b* (Fig. 12) which extend from the arm openings to the bottom of the curved corners 58 so that the opening 60 at the bottom of the garment will have a smaller circumference than the remainder of the garment. Thus, while the lower edge portion of the garment can be slid down over the wearer's buttocks, it will fit tightly over the buttocks of the wearer and resist "creeping-up" of the garment when worn.

Referring now to Figs. 13 and 14 of the drawings, a

garment of the character indicated constructed according to another embodiment of the invention is there shown in various stages of production. In Fig. 13 the outlines of an elongated, flattened tube **62** are represented by the broken lines and the tube **62** is provided with two longitudinally extending zones **64** and **66** which are circumferentially positioned on the tube so that, when the tube is flattened, the zone **64** of the upper layer may be made to overlie the zone **66** of the lower layer along the longitudinal medial line of the flattened tube.

Each zone is formed of a material that is more yieldable laterally than the remainder of the tube and in the preferred embodiment is formed integral with the less yieldable remainder of the latter. Such integral, laterally yieldable zones may be provided in a circularly knitted tube by forming the latter with suitably spaced sections of an accordion knit such as is illustrated and described in United States Letters Patent No. 2,201,980, wherein a self-pleating machine knitted, double-rib fabric has fewer wales on the inner surface at the fold lines than at the outer surface of the fold lines. For example, the knitted fabric, at the accordion knitted zones, may have one or more wales missing on one surface at every sixth, eighth or tenth wale position and leave two adjacent wales missing in the other surface at every fifth and sixth, seventh and eighth, or ninth and tenth position, respectively, with the missing wales on one surface being generally equi-distantly staggered in relation to the missing wales of the other surface. The thread forming each course of the fabric is sufficiently tensioned in relation to the gauge and thickness of the thread to cause the fabric to fold itself in accordion fashion along the lines of the missing wales.

In utilizing circular, double needle-row machines of the type heretofore indicated for producing the circularly knitted tube **62**, the self-pleating, double-rib zones **64** and **66** are produced by removing, or rendering ineffective and inoperative, one or two needles at regular intervals in each of the cylinder and dial rows or sets of needles in the corresponding zones of the machine, but with the spaces of the removed needles of one row being staggered in relation to the spaces of the removed needles of the other row, and then knitting each course of the thread overall of the remaining needles with sufficient tension so as to cause the fabric to fold by itself around the points where one or two needles are missing. A circularly knitted tube produced in this manner will be formed of a self-pleating or double-rib fabric in the zones **64** and **66**, and a plain jersey knit in the remainder thereof. While it has been found that forming the zones **64** and **66** to each include three pleats or folds is preferable, it is apparent that a greater or lesser number of pleats or folds may be provided in the same manner.

The cutting of the tube **62** proceeds in the manner previously described along the lines defined by patterns **16***c*, **18***c*, **20***c* and **22***c* which are the same as the similarly numbered patterns of Fig. 1, such cutting being achieved through the use of patterns and a manually directed or guided cutter or through the use of suitably shaped blanking dies in commercial practice. In any event, each blank cut from the tube **62**, when unfolded and spread flat will have the configuration of the blanks shown in Figs. 2 and 7, and will further be provided with zones of laterally yieldable material extending along the opposite side edges of the back and front forming portions thereof. When the blank is refolded abouts its transverse medial line so that the front forming portion **38***c* overlies the back forming portion (Fig. 14) and the adjacent side edges thereof are stitched together along continuous seams **46***c* and **48***c*, the zones extending along the side edges of the back and front forming portions are joined together to provide laterally yieldable zones **68** and **70** extending vertically along the opposite sides of the completed garment.

The laterally yieldable, self-pleated zones **68** and **70** of the garment of Fig. 14 permit a single size of the garment to comfortably fit and conform to the torsos of wearers of different sizes.

Referring now to Figs. 15 and 16 of the drawing, still another modification of the invention is there illustrated. The garment illustrated in Fig. 16 is formed by cutting a garment forming blank from the flattened tube **62***a* of Fig. 15. The tube **62***a* is similar in construction to the previously described tube **62** and includes longitudinally extending, diametrically opposed zones **72** and **74** which are more yieldable laterally than the remainder of the tube and may be of self-pleating or double-rib formation. In flattening the tube **62***a*, the fold edges thereof are arranged so that the zones **72** and **74** extend along the side folded edges as seen in Fig. 15.

When garment forming blanks are cut from the tube **62***a* in accordance with the patterns **16***d*, **18***d*, **20***d* and **22***d*, corresponding in configuration to the similarly numbered patterns of the previously described embodiments, the zones **72** and **74** will provide longitudinal zones of laterally yieldable material extending centrally along the back and front forming portions of each blank. The garment of Fig. 16 is provided by refolding the blank cut from the tube **62***a* so that the front forming portion **38***d* of the blank overlies the back forming portion **36***d* of the latter with laterally yieldable zones **76** and **78** extending centrally from the back and front, respectively, of the neck opening **40***d*, and then stitching together the side edges of the back and front forming portions along the side seams **46***d* and **48***d*. The garment thus formed includes self-pleated, double-ribbed sections at the back and front for lateral yielding so that a single size of the garment may comfortably fit and be worn by wearers of different sizes.

Referring now to Fig. 17, a portion of an elongated rectangular sheet **50***a*, similar in dimensions to the sheet **50** of Fig. 5, is there shown. The sheet **50***a* is provided with longitudinal zones **64***a* and **64***b* extending along its side edges, and a central longitudinal zone **66***a*. The zones **64***a* and **64***b* and the zone **66***a* are of laterally yieldable, self-pleated or double-rib fabric and are preferably formed integral with the remainder of the sheet in a manner similar to that set forth in connection with the yieldable zones of the tubes **62** and **62***a*.

The sheet **50***a*, when folded about the fold lines **52***a* and **54***a* in the manner described in connection with the folding of the sheet **50** of Fig. 5, will provide two superposed layers of material joined together along the outside fold edges with the zones **64***a* and **64***b* coming together to overlie the zone **66***a* at the center of the layers. The two superposed layers thus provided may be substituted for the tube **62** of Fig. 13 in providing a garment of the kind shown in Fig. 14 and having laterally yieldable zones extending along the sides thereof.

It is apparent that repositioning the laterally yieldable zones of the sheet of Fig. 17 so that a zone is centered at each of the fold lines thereof, will provide a sheet which, when folded in the manner indicated, may be substituted for the tube **62***a* of Fig. 15 in producing garments having laterally yieldable zones at the back and front, as in Fig. 16.

Referring now to Figs. 18 to 20, inclusive, still another embodiment of the present invention is there illustrated and relates to the production of vests or other similar sleeveless garments opening down the front. To produce such garments a flattened tube **80** (Fig. 18) is cut in accordance with the outlines of patterns placed thereon, for example, the patterns **82** and **84**. The patterns **82** and **84** are generally similar to the patterns heretofore described, each having a cutout **86** at the outside edge for defining the neck opening and displaced relative to the transverse medial line of the pattern so that the neck opening will be deeper at the front than at the back of the garment. The patterns **82** and **84** differ from those previously described in that the recess **88** of each cut into the inner edge to define the arm hole is relatively

shallow so that the distance measured laterally from the neck opening along the shoulder line to the edge of the arm hole is greater than in the previously described embodiments.

After the folded blanks have been cut from the tube **80** in the manner heretofore described and unfolded, each blank is refolded about its transverse medial line, as in Fig. 19, so that the front forming portion **90** overlies the back forming portion **92**, and the portion **90** is cut along the central line **94** extending down from the neck opening. While the cutting operation along the line **94** has been described as accomplished after the blank has been refolded, it is to be understood that this cut may be made simultaneously with the cutting of the blank from the tube **80** or thereafter when the blank is spread flat.

The vest-like garment is completed, as in Fig. 20, by stitching together the side edges of the back and front forming portions **92** and **90** along the seams **96** and **98** and then securing tapes or other flexible strips **100** and **102** along the edges of the front at the cut **94** to carry fastening means, such as, the illustrated buttons and buttonholes or the mating parts of a slide fastener. As thus provided, the vest-like garment opens down the front and has a neck opening which is deeper at the front than at the back of the garment.

From the foregoing description, it will be seen that the present invention provides improved methods of forming undershirts, vests and other like garments of the sleeveless type, wherein the garments are cut from superposed layers of material joined together along the outer edges thereof in a manner to reduce to a minimum the waste of material as well as the labor involved in completing the garments, and wherein the resulting garments have seamless shoulders and neck openings that are deeper at the front than at the back of the garment. Further, the invention provides such garments having restricted bottom openings to prevent "creeping-up" the torso of the wearer, and may be formed to incorporate laterally yieldable zones so that a single size of the garment may comfortably fit wearers of different sizes.

While I have illustrated and described preferred embodiments of my invention, it is to be understood that I do not wish to be limited to those precise embodiments, as obviously various modifications and changes may be made therein without departing from the spirit and scope of my invention.

What I claim is:

1. The method of making garments of the class described comprising providing two superposed elongated layers of flexible material joined together along folded outside edges thereof; cutting both of said layers along spaced transverse lines, along a substantially centrally disposed longitudinal line interrupted by two branched arcuate lines disposed centrally between successive transverse lines and concaved toward each other to provide folded garment forming blanks each extending along an adjacent folded outside edge, and along other arcuate lines each intersecting the adjacent folded edge at spaced points in the central portion of the related blank; opening each of said folded blanks; refolding each opened blank along its transverse medial line; and stitching together the side edges of each refolded blank from the bottom thereof to the curved sections of the side edges defined by said branched arcuate lines along which the layers are cut.

2. The method of making garmnts of the class described comprising providing two superposed elongated layers of flexible material joined together along folded outside edges thereof; cutting both of said layers along spaced transverse lines and a transversely centralized longitudinal line interrupted by two branched arcuate lines concaved towards each other and disposed midway between successive ones of said transverse lines to define a longitudinally arranged series of side-by-side paired and folded garment forming blanks each extending along a folded outside edge of said layers, and along other arcuate lines each intersecting the adjacent folded outside edge at spaced points in the central portion of the related blank; opening said folded blanks to each provide back and front forming portions defined by the unfolded opposite end portions of the blank and a neck opening therebetween defined by the related one of said other arcuate lines; refolding each opened blank along its transverse medial line so that the front forming portion overlies the back forming portion thereof; and stitching together and adjacent side edges of said back and front forming portions to provide continuous seams extending from the bottom of said side edges to the related branched arcuate lines along which said layers are cut and which define arm holes.

3. The method of making garments of the class described as set forth in claim 2; wherein said two superposed layers are provided by forming a continuous tube of flexible material having two diametrically opposed longitudinal zones which are more yieldable laterally than the remainder of the tube, and flattening said tube so that said zones are superposed along the center of the tube whereby each of the garments will have laterally yieldable zones extending along the opposite sides thereof.

4. The method of making garments of the class described as set forth in claim 2; wherein said two superposed layers are provided by forming a continuous tube of flexible material having two diametrically opposed longitudinal zones which are more yieldable laterally than the remainder of the tube, and flattening said tube so that said zones extend along the opposite folded edges of the flattened tube whereby each of the garments will have laterally yieldable zones extending centrally along the back and front thereof.

5. The method of making garments of the class described as set forth in claim 2; including the preliminary step of folding the outer portions of an elongated sheet of flexible material along two parallel longitudinal fold lines so that said outer portions overlie the central portion of the sheet with the edges of said folded outer portions being in substantially confronting relationship along the center of the sheet thereby to provide said two superposed layers.

6. The method of making garments of the class described as set forth in claim 2; including cutting each blank along a centrally located line extending down the related front forming portion from the neck opening thereof; and securing releasable fastening means to said front forming portion at the opposite sides of said centrally located cut line extending from the neck opening.

7. The method of making garments of the class described comprising providing two superposed elongated layers of flexible material joined together along folded outside edges thereof; cutting both of said layers along spaced transverse lines and a transversely centralized longitudinal line interrupted by pairs of branched arcuate lines concaved toward each other at locations midway between successive ones of said transverse lines to define a longitudinally arranged series of side-by-side paired and folded garment forming blanks each extending along the adjacent folded outside edge of said layers, and along other arcuate lines each intersecting said adjacent folded outside edge at two points spaced unequally from the transverse medial line of the related blank; opening each folded blank to provide back and front forming portions defined by the unfolded opposite end portions of the blank and a neck opening therebetween defined by said other arcuate lines and extending deeper into said front forming portion than said back forming portion; refolding the opened blank about its transverse medial line so that said front forming portion overlies said back forming portion; and stitching together said back and front forming portions by seams extending along the side edges thereof from the bottom to the arcuate sections thereof defined by said branched arcuate lines interrupting of said longitudinal cut line so that a sleeveless garment is

provided having arm openings at the sides above said seams.

8. The method of making garments of the class described comprising flattening a circularly knitted tube of flexible material to provide two superposed layers joined along the folded side edges thereof; cutting both of said layers along spaced transverse lines and a transversely centralized longitudinal line interrupted by pairs of branched arcuate lines concaved towards each other at locations midway between successive ones of said transverse lines to define a longitudinally arranged series of side-by-side paired and folded garment forming blanks extending along said folded side edges of the flattened tube, and along other arcuate lines each defining a neck opening in the related folded blank and intersecting the adjacent folded side edge at two points spaced unequally from the transverse medial line of the related blank; opening each folded blank to provide back and front forming portions defined by the unfolded opposite end portions thereof and a neck opening therebetween extending deeper into said front forming portion than into said back forming portion; refolding the opened blank about its transverse medial line so that said front forming portion overlies said back forming portion; and stitching together said back and front forming portions by seams extending along the side edges thereof from the bottom to the arcuate sections thereof defined by said branched arcuate lines so that a sleeveless garment is provided having arm holes at said arcuate sections of the sides thereof.

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