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G. WEISS

3,286,277

STRETCH GARMENT

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FIG. 1

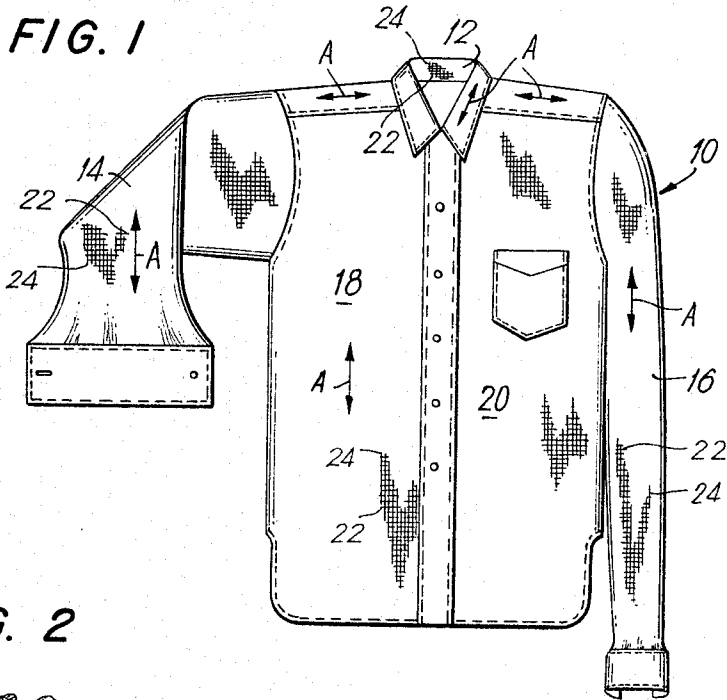


FIG. 2

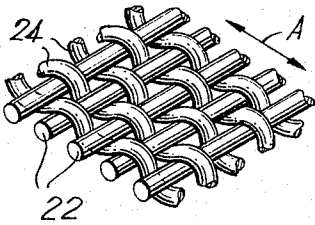


FIG. 3

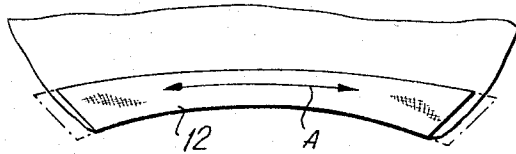
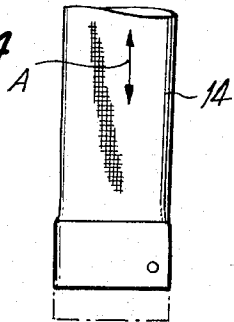


FIG. 4



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STRETCH GARMENT

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The present invention relates to stretch fabrics, and more particularly to an improved article of wearing apparel constructed of stretch fabric.

Stretch fabric is understandably widely used in garment construction, the stretch of such fabric materially adding to the commercial value of the garment. For example, this type fabric is used almost exclusively in so-called foundation garment construction wherein the stretch is advantageously employed to apply body-flattening forces on the wearer. Another popular example of prior art usage is that where the stretch fabric is used in select areas in casual garments to provide ease of action for the wearer.

In sharp contrast to the foregoing, the present invention contemplates the use of stretch fabric for garment construction in such a way that still another significant benefit, equaling that of any presently derived benefit, is achieved by the use of this fabric in the construction of a garment. Underlying the present invention is the recognition that stretch fabric, such as for example a fiber blend including Lycra Spandex or so-called slackmercerized Dacron polyester-cotton blend fabrics, can be made to hold an elongated or stretched condition if subjected to sufficient heat, and that this phenomenon of this fabric can be used to provide significant advantages and benefits to garments constructed of such fabric. Heretofore, this phenomenon was not employed to any useful purpose in prior art garment construction.

Broadly, it is an object of the present invention to overcome the foregoing and other shortcomings of the prior art. Specifically, it is an object to provide an improved garment fabricated of stretch fabric in a manner which utilizes to full advantage all of the attributes and features of stretch fabric.

A method practicing the present invention includes the arranging of the stretch fabric at the time of manufacture of a garment (e.g. a boy's shirt) such that the principal direction of stretch thereof is in the direction to accommodate to the growth of the wearer. Thus, in the critical area of the collar, the stretch is oriented circumferentially of the neck of the wear. Similarly, in the sleeves, the stretch is oriented lengthwise of the wearer's arms. With such a garment, the present invention is practiced by stretching the fabric to provide an increased size to the garment, and then permanently imparting this increased size to the garment by subjecting it to sufficient heat, as by hand-ironing the stretched fabric. By "permanent" it is meant that the increased garment size is substantially maintained through repeated washings of the garment with little or no touch-up ironing being necessary to restore the increased size.

The above brief description, as well as further objects, features and advantages of the present invention, will be more fully appreciated by reference to the following detailed description of a presently preferred, but nonetheless illustrative embodiment in accordance with the present invention, when taken in conjunction with the accompanying drawings, wherein:

FIG. 1 is a front elevational view of a garment which may be employed in the practice of the method of the present invention;

FIG. 2 is a greatly enlarged perspective view of the woven construction of the fabric of said garment;

FIG. 3 is a partial plan view of the collar of said garment; and

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FIG. 4 is a partial plan view of one of the sleeves of said garment.

Reference is now made to the drawings where in there is shown a shirt 10 fabricated of a stretch fabric, and intended as an article of wearing apparel for a boy in order to best take advantage of the novelty of the present invention. That is, in accordance with the method of the present invention as will be described in greater detail subsequently herein, the shirt 10 is capable of being increased in size beyond that possessed at the time of manufacture, and as such has an obvious advantage of being able to accommodate itself to an increase in the size of the wearer. This has an obvious increased significance for a growing boy who may grow several sizes in a relatively short time.

Thus, a boy may wear the shirt 10 in his proper size for a period of time, the shirt being laundered in any appropriate manner and performing satisfactorily. During this time the boy's size will undoubtedly change due to natural growth requiring a larger neck and sleeve size. When this growth change becomes significant and the shirt 10 is too small for the boy, it is then contemplated that the boy's mother will adjust the shirt 10 to the proper size by merely ironing it at a higher than normal temperature while it is stretched out to the increased size to accommodate the growth of the boy.

An essential prerequisite for the practice of the method of the present invention resides in the manner in which the shirt 10 is manufactured. More particularly, it is essential that during manufacture of the shirt 10 that certain critical garment parts to which it is desired to impart an increased size or dimension, be so arranged or patterned that the stretch of said parts is in the direction in which growth occurs in the wearer of the garment. Thus, in recognition that growth of the wearer occurs mostly in the circumference of the neck and in the length of the arms, the shirt 10 not only is provided with stretch fabric in the collar 12 and sleeves 14, 16, but the direction of stretch of these garment parts, denoted by the double-headed arrow A, is arranged in the logical direction to accommodate itself to the increase in size occurring in the wearer's neck and arms. That is, the collar 12 is patterned so that the stretch A is lengthwise of this garment part and is thus oriented to stretch circumferentially of the neck of the wearer which will be recognized as being the logical direction to enable the collar to accommodate to an increase in size in the neck of the wearer. Similarly, the stretch A in each of the sleeves 14, 16 is oriented in the direction lengthwise of the arms of the wearer and thus also is in the logical direction to accommodate itself to an increase in size in the length of the arms of the wearer. In the illustrated embodiment of the shirt 10, it is also desirable to fabricate the front panels 18, 20 and back panel (not shown) of stretch fabric and to orient the stretch of this fabric lengthwise of these garment parts.

As is clearly illustrated in FIGS. 3, 4, it is a simple matter to permanently increase the size of the shirt 10, particularly the collar 12 and sleeves 14, 16 by applying sufficient heat to these garment parts, as by ironing, while these parts are in a stretched condition. It has been found that the application of sufficient heat is effective to permanently set the stretch fabric at the increased size which is provided by the stretching thereof. By "permanent" it is meant that the ironed fabric substantially retains its increased size or dimension through subsequent washings of the shirt 10. For a usual Dacron polyester-cotton blend fabric satisfactory results in maintaining an increased size or dimension in a shirt 10 fabricated of such fabric has been obtained by hand-ironing the stretched fabric with an iron set at higher than the usual temperature setting for a polyester-cotton blend fabric, as

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recommended by the appliance manufacturer, but at one which will avoid scorching the fabric. Thus, assuming that the shirt 10 has a collar 12 or sleeve 14 of an original purchased size depicted respectively in full line in FIGS. 3, 4, the size of these garment parts is easily increased by stretching the same to the increased size shown in phantom perspective in said figures, and ironing these stretched parts at such a temperature as to render them stable at said increased stretched size.

The ability to achieve the foregoing results in accordance with the method of the present invention as just described can be better understood from FIG. 2 to which attention is now directed. Shown diagrammatically in this figure is a typical woven construction of what will be understood to be a Dacron polyester-cotton blend stretch fabric which manifests stretch A in the direction of the weft yarns 24. As is generally understood, both the weft yarns 24 and also the warp yarns 22 in such a blend fabric are comprised of cotton and Dacron polyester fibers. As is further generally understood, during the weaving of the fabric the weft yarns 24 which are carried by the shuttle are provided with an undulating pattern across the warp yarns 22 from selvage to selvage of the woven fabric. Following this weaving, the fabric (commonly referred to as greige goods at this stage of manufacture) is subjected to a mercerizing process which for present purposes it is suffice to understand includes being treated with caustic and other liquid chemicals to improve yarn strength, luster, and other attributes. Moreover, during the production of so-called slack-mercerized fabric, as the name implies, the fabric is held in a slack condition during chemical treatment. One of the results of the chemical treatment is that the liquid chemicals are absorbed by and cause a swelling of the cotton fibers. This in turn results in an increase in diameter of the yarns, including of course the warp yarns 22. Thus, the weft yarns 24, by virtue of being undulated about the increased diameter warp yarns 22, are imparted with an accentuated undulating pattern. This condition manifests itself in the fabric by a decrease in width of the fabric, or stated another way, in a taking-up of the slack in the fabric during mercerization. After mercerization is completed, the greige goods are subjected to an amount of heat sufficient to set the Dacron polyester fibers in their accentuated undulated condition in the weft yarns 24. Thus, the stretch of so-called slack-mercerized blend fabrics is due to an unfolding of the undulations of the weft yarns 24. Normally, after removal of the force producing stretch, the fabric returns to its original dimension since there is an inherent urgency or memory in the Dacron polyester fibers of the weft yarns 24 to return to their original undulated condition.

An important contribution of the present invention is the recognition that a stretch fabric, such as a slack-mercerized Dacron polyester-cotton blend fabric, when subjected to a certain degree of heat while stretched, is imparted with a new pattern consisting of the unfolded undulations in the weft yarns 24, and that this phenomenon can be employed to significant advantage in garment construction. Thus, the present invention contemplates the further application of a greater amount of heat to the fabric in a stretched condition and also the arrangement of this fabric in the garment so that the increased size of the fabric, which is provided by the stretching and heat-setting thereof, can be permanently imparted to increase the size of the garment in a useful way. This in turn produces an obvious noteworthy and significantly desirable attribute for a garment fabricated of such stretch fabric wherein it is possible to increase the size of the garment, particularly in the critical collar and sleeve areas, to accommodate to an increase in size in the wearer of the garment.

A latitude of modification, change and substitution is intended in the foregoing disclosure and in some instances some features of the invention will be employed without

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a corresponding use of other features. Accordingly, it is appropriate that the appended claims be construed broadly and in a manner consistent with the spirit and scope of the invention herein.

What is claimed is:

1. A method of making and resizing a garment comprising the steps of cutting thermoplastic and stretchable fabric garment parts to an initial size having a prescribed lengthwise dimension, said fabric garment parts being oriented during cutting to arrange the stretch thereof to extend substantially in said lengthwise dimension and having a thermoplastic content selected to enable said garment parts when stretched to have a substantially permanent heat set imparted thereto to effectively permanently elongate said lengthwise dimension, assembling and securing said parts to form a garment, imparting a predetermined lengthwise stretch to said garment parts to increase said lengthwise dimension in an amount appropriate to resize said garment parts in accordance with the wearer's growth, and while retaining said predetermined lengthwise stretch applying heat to said parts at a temperature and for a time sufficient to overcome the plastic memory of said thermoplastic fabric to impart a substantially permanent heat set to said garment parts such that said parts will remain permanently elongated and, thereby resized during subsequent use thereof.

2. A method as defined in claim 1 wherein heat is applied to said fabric by hand-ironing the fabric.

3. A method as defined in claim 1 wherein said fabric includes yarns having an undulating pattern which renders said fabric stretchable by an unfolding of said undulations.

4. A method as defined in claim 3 wherein said fabric is slack-mercerized to produce such undulations in said yarns.

5. A method of making and resizing at least the collar of a garment comprising the steps of cutting thermoplastic and stretchable fabric collar parts to an initial size having a prescribed lengthwise dimension, said collar parts being oriented during cutting to arrange the stretch thereof to extend substantially in said lengthwise dimension thereof and having a thermoplastic content selected to enable said collar when stretched to have a substantially permanent heat set imparted thereto to effectively permanently elongate said lengthwise dimension, assembling and securing said parts to form a collar on a garment, imparting a predetermined lengthwise dimension in an amount appropriate to resize said collar in accordance with the wearer's growth, and while retaining said predetermined lengthwise stretch applying heat to said collar at a temperature and for a time sufficient to overcome the plastic memory of said thermoplastic fabric to impart a substantially permanent heat set to said collar such that said collar will remain permanently elongated and, thereby resized during subsequent use thereof.

6. A method as defined in claim 5 wherein heat is applied to said collar by hand-ironing the collar.

7. A method as defined in claim 5 wherein the fabric of said collar parts includes yarns having an undulating pattern which renders said fabric stretchable by an unfolding of said undulations.

8. A method as defined in claim 7 wherein said fabric is slack-mercerized to produce such undulations in said yarns.

9. A method of resizing a garment unrestricted as to style, size, design and type wherein the garment is made of a polyester and cotton blend of stretchable fabric comprising the steps of cutting garment parts to an initial size having a prescribed lengthwise dimension from said fabric, said garment parts being oriented during cutting to arrange the stretch thereof to extend substantially in said lengthwise dimension and having a polyester content selected to enable said garment parts when stretched to have a substantially permanent heat set imparted thereto to effectively permanently elongate said lengthwise di-

mension, assembling and securing said parts to form a garment, imparting a predetermined lengthwise stretch to said garment parts to increase said lengthwise dimension in an amount appropriate to resize said garment parts in accordance with the wearer's growth, and while retaining said predetermined lengthwise stretch applying heat to said parts at a temperature and for a time sufficient to overcome the plastic memory of said polyester to impart a substantially permanent heat set to said garment parts such that said parts will remain perma-

nently elongated and, thereby resized during subsequent use thereof.

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JORDAN FRANKLIN, *Primary Examiner.*R. J. SCANLAN, Jr., *Assistant Examiner.*