Dec. 28, 1954 W. E. CUSICK 2,698,009

FLUTED FABRIC AND METHOD OF MAKING THE SAME

Filed April 27, 1953

Fig. 1.

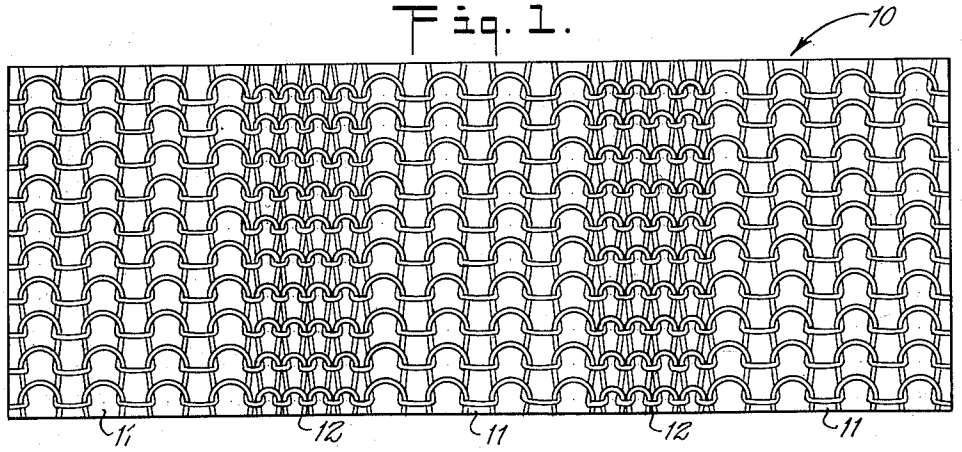


Fig. 2.

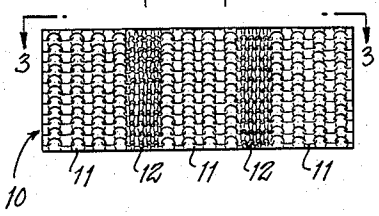


Fig. 3.

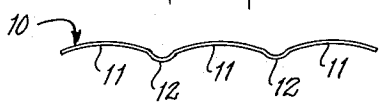


Fig. 4.

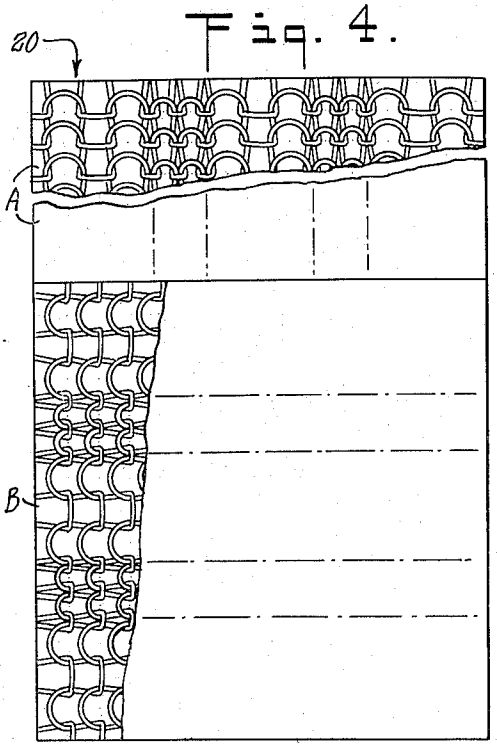


Fig. 5.

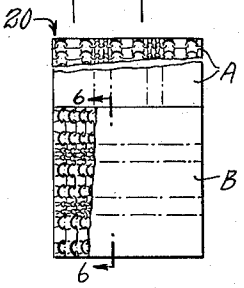


Fig. 6.



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FLUTED FABRIC AND METHOD OF MAKING THE SAME

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9 Claims. (Cl. 66—169)

This invention relates to the formation of a fluted material and more particularly to the method of knitting and shrinking a textile material to obtain the fluting effect. Various attempts have been made as illustrated by the prior art to obtain ornamental effects in fabric by varying the knitting. For example, a fabric may be produced with a silk fiber over a backing of soft pliable yarn in which a pleating effect may be obtained by knitting a plurality of rows in close order and by removing two or more of the knitting needles between adjacent rows. Thus the weft thread will be floated or stretched across until it is picked up by the next group of needles which supply the warp thread to provide the next strip of knitted fabric. Repeating this produces a plurality of separated pleats all obtained by the pattern of knitting. The prior art also discloses a method of forming a crepe effect throughout a nylon fabric. In this instance they do not depend upon any particular pattern of knitting but rather with a uniform knit using or rather combining a nylon and silk thread. The fabric so formed would have an even texture but by shrinking the silk threads, the fabric will take on a creped effect. This creped effect will be impressed upon the nylon and after the nylon has been set by this creped effect, the silk threads may be dissolved thus leaving a pure nylon fabric with a creped effect. A still further knitted effect produced in the prior art is a knitted fabric comprised of interlinking groups or interlinked courses of loops in which the loops of alternate groups are provided with relatively long and soft threads while the next alternating group is provided with relatively short and straw-like material. Thus with a uniform knitting, the short straw-like loops produces a curled or deformed effect and being positioned in alternate groups, each group will produce the same curled effect and the fabric will have an overall effect of corrugations. Thus various effects may be produced in material by varying the manner of knitting, the combination of different types of fibers or by impressing a particular set to a material such as nylon.

It is an object of this invention to provide a pleating effect in a single type of textile material by providing alternate tightness and looseness of the knit in the courses.

It is a further object of this invention to provide a fluting effect in a single type of textile material by first providing alternate tightness and looseness of the knit in the courses and secondly, treating the knitted textile with steam or hot water to shrink the textile and create the effect of fluting.

It is a further object of this invention to produce pleats of a predetermined size in a single type knitted material and to treat the textile material to produce a shrinking which in turn will produce a fluting effect of the entire material.

A still further object of this invention is to produce any predetermined design or pleating effect throughout a single type knitted textile material and to further treat the textile material to produce a shrinking which in turn will produce a fluting in one or more directions.

It is a further object of this invention to provide a permanent fluting set in a single type of textile material by first providing alternate tightness and looseness of the knit in the courses and secondly, treating the knitted textile with steam or hot water to shrink the textile and create a permanent fluting set.

It is a further object of this invention to provide a flexible fluting set in a single type of textile material by first providing alternate tightness and looseness of the knit in the courses and secondly, treating the knitted textile to shrink the textile and create a flexible permanent fluting set.

Further objects of this invention shall be apparent by reference to the accompanying detailed description and the drawings in which

Fig. 1 illustrates a textile material formed with alternate knitted vertical strips,

Fig. 2 illustrates the textile material illustrated in Fig. 1 after steam treatment has produced a shrinking effect,

Fig. 3 is an end view taken on line 3—3 of Fig. 2,

Fig. 4 illustrates a textile material in which two patterns are formed in the same method as Fig. 1,

Fig. 5 illustrates the textile material illustrated in Fig. 4 after steam treatment has produced a shrinking effect, and

Fig. 6 is a view taken on line 6—6 of Fig. 5.

Referring to Figs. 1, 2 and 3 there is illustrated a textile fabric **10** which may be formed of any material that may be knitted and that will shrink under the effects of steam such as wool, rayon, silk, etc. and any combination of two or more materials. With the particular type of material to be utilized such as rayon, the rayon thread must be first formed into a knitted fabric **10**. The method of producing this fabric with its pleating effect is to preset the knitting machine so that the first group of wales **11** of the fabric will be formed with a loose knit while the second group of wales **12** will be formed with a tight knit so that the alternating rows have different stitch density and by repeating this pattern of varying stitch density, each alternate group of wales will be formed in the same fashion. With a fabric formed as illustrated in Fig. 1, the general effect is a pleated fabric. This fabric is next subjected to a steam treatment to shrink the cloth to approximately one third its original size as illustrated in Fig. 2. Due to the varying stitch density in the wales of knitting, the shrinking will produce different effects on adjacent groups of wales thus the fabric **10** will take a more pronounced set similar to that illustrated in Fig. 3 which has the definite effect of fluting. After this steam treatment the fabric retains this set as a permanent set and no matter how the fabric is twisted, stretched or deformed, the fabric will return to the permanent set produced according to this method of treatment. Although the fabric has been described utilizing a single material, this invention shall include any variation of this method in which two or more different textile threads are utilized as for instance, using a wool thread to produce the wales **12** of the fabric **10** while using rayon thread to produce the wales **11**. Thus when the fabric is saturated with steam there will be a different shrinking effect but the overall result of fluting will still be obtained. However, the degree of fluting may be varied by using alternate wales of a different material.

Referring to Figs. 4, 5 and 6 there is illustrated a further embodiment of this invention in which a knitted textile fabric **20** may be produced with a variation in the design of the pleating. More specifically, in this example there are provided two squares of material, one square A provided with pleats in a vertical position while the second square B will be provided with pleats in a horizontal position. Thus when this material **20** is subjected to a steam bath treatment, the fabric **20** as illustrated in Figs. 5 and 6 will have a fluting effect in both the horizontal and vertical relation similar to the pleating pattern in the fabric before treatment. It is apparent that various combinations or designs may be produced in a fabric by first knitting the general pattern therein and by next subjecting the material to steam or hot water treatment.

It is apparent that the general fluting effect obtained by the method above described is suitable for a variety of uses such as in women's lingerie, blouses, dresses, jackets as well as in general for curtains, drapes and a variety of other uses. It is also apparent that this method of producing a fluting material produces a material that is much lighter than the general pleated or fluted material and a great deal easier to produce. The fluted material produced by this method is much more flexible than the old or prior method of producing fluted material and unlike most fluted material this method produces a permanent set in the material which will withstand the average stretching and deforming of the material and yet return to its original set. A further advantage of this type of pleating or fluting is the amount of material used. With the

textile material described in this invention, the pleating or fluting is obtained with less yarn than the materials heretofore known in the prior art.

Further embodiments of this invention shall be dependent upon the variations in the threads of material utilized, that is, the degree of shrinkage of a material may be predetermined before treatment and the degree of varying stitch density, that is, the tightness or looseness of the knitting may also be predetermined to produce a desired degree of shrinking. Thus with a known material, that is, the known degree of shrinkage and with a predetermined density, that is, the tightness or looseness of the knitting and with a predetermined size of pleat, the end result is apparent in each particular instance.

Various changes may be made to the above described method that is, as to the type of weave utilized whether it be in pleating effect or in any other design that may be obtained as long the treatment produces the desired shrinkage to in turn produce a fluting of the textile. Likewise this invention shall include the use of any and all fabrics that will shrink to thus produce a pleating effect and this invention shall be limited only by the appended claims.

What is claimed is:

1. A method of making a fluted fabric wholly of a single shrinkable material by first knitting a small group of consecutive wales with a degree of looseness and a small group of consecutive wales with a degree of tightness and repeating this pattern of knitting in alternate equal groups of consecutive wales to produce an overall pleating effect, treating the complete fabric with steam to shrink the fabric to approximately one third its original size.

2. A method of making a fluted fabric according to claim 1 in which said material utilized is wool.

3. A method of making a fluted fabric according to claim 1 in which said material utilized is silk.

4. A method of making a fluted fabric according to claim 1 in which said material utilized is rayon.

5. A method of making a fluted fabric comprised of a combination of two materials in which at least one material is shrinkable by first knitting alternate small equal groups of consecutive wales of the fabric so that the stitch density varies from group to group and each adjacent equal groups of wales is composed of one of the two materials to produce an overall pleating effect, treating the complete fabric with steam to shrink one of the materials to one third its original size.

6. A method of making a fluted designed fabric wholly of a single material by first knitting a small group of consecutive wales with a degree of looseness and a small group of consecutive wales with a degree of tightness and repeating this pattern of knitting in alternate equal groups of consecutive wales vertically in one portion of the fabric and by next knitting similar groups of consecutive wales as described above in alternate horizontal groups of wales in another section of the fabric so that an overall pleating effect in both a vertical and horizontal pattern is produced, treating the complete fabric with steam to shrink the fabric to approximately one third its original size.

7. A fluted textile fabric comprising a plurality of knitted groups of wales, said fabric comprised of two types of knitted groups of wales, the first type of wales knitted with a predetermined density of stitch and the other type of wales knitted with a different density of stitch, said fabric knitted into alternating groups and formed into a permanent fluting set by the shrinking of the original textile and the permanent setting of the material to approximately one third its original size.

8. A fluted textile fabric in which the fluting runs both horizontally and vertically comprising a plurality of both horizontal and vertical groups of wales, said fabric comprised of two types of knitted groups of wales, the first type of wales knitted with a predetermined density of stitch and the other type of wales knitted with a different density of stitch, said fabric knitted into alternating groups and formed into a permanent horizontal and vertical fluting set by the shrinking of the original textile to approximately one third its original size.

9. A method of making a fluted fabric wholly of a single shrinkable material by first knitting a small group of consecutive wales with a degree of looseness and a small group of consecutive wales with a degree of tightness and repeating this pattern of knitting in alternate equal groups of consecutive wales to produce an overall pleating effect, treating the complete fabric with hot water to shrink the fabric to approximately one third its original size.

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