

UNITED STATES PATENT OFFICE

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PROCESS OF CUTTING FABRIC AND PRODUCT THEREOF

No Drawing.

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This invention relates to the method of cutting fabric made of thermoplastic or organic derivatives of cellulose in such a manner that the cut edges will not fray or ravel. This application is in part a continuation of my prior applications No. 206,120, filed July 15, 1927, and No. 224,287, filed Oct. 5, 1927.

An object of my invention is to cut fabrics in such a manner that the cut fabric will not fray or ravel along its edges. A further object of my invention is to provide a method of cutting fabrics so that it is not necessary to hem or otherwise fold or sew the cut edges in order to prevent fraying. Other objects of my invention will appear from the following detailed description.

Heretofore whenever a woven or knitted fabric was cut in the ordinary manner such as by means of a knife or shears, it has been necessary to hem or sew the cut edge before the fabric could be used in order to avoid fraying or ravelling along the cut edge. The ravelling or fraying of cut fabrics has always previously been considered a necessary evil.

Furthermore, in the making of ribbons, it has been necessary to weave each ribbon as a separate unit. To be sure it has been possible to weave several ribbons on one loom, made specially for this purpose, but in order to prevent fraying or ravelling along the edge, it has been necessary to weave a selvedge on each edge of the ribbon. This method of making ribbon is costly both in time consumed in making the ribbon and in the initial cost of the looms. Some tapes have been made by cutting strips from wider fabric and then hemming the edges of the strip. Obviously such method is not applicable to making ribbon as the added thickness and the necessary stitching are objectionable. Moreover even for tapes, the cost of the extra material and labor involved is considerable.

In accordance with my invention, I provide a method of cutting fabric whereby the cut fabric may be used directly without any further operations to avoid fraying.

The fabric to be used in practicing my invention is made in whole or in part of a material that can be dissolved by a solvent, or can be softened by a softening agent. Among the materials that may be used are thermoplastic compounds of cellulose or other derivatives of cellulose, particularly the organic derivatives or cellulose, such as organic esters of cellulose and cellulose ethers. Examples of organic esters of cellulose are cellulose formate, cellulose acetate, cellulose propionate and cellulose butyrate. Examples of ethers of cellulose are methyl cellulose, ethyl cellulose and benzyl cellulose. The fabric may be composed entirely of one of the above compounds or of a mixture of two or more of such compounds. Moreover, the fabric need not be made entirely of the above cellulose compounds, but may be a mixed fabric containing yarns of the above cellulose compounds and yarns of vegetable or animal fibres. Examples of such mixed fabrics are, mixed cellulose acetate and natural silk, mixed cellulose acetate and cotton, mixed cellulose acetate and wool, etc. The fabric to be used in practicing my invention may be of any desired construction. It may be a woven fabric of any desired weave, or it may be a circular or warp knitted fabric.

In carrying out my invention, a fabric constituted as above set forth, is cut into the desired configuration by means of knives or other cutting means which may be either hot or cold and the cut edges are sealed against fraying by the action of the solvent or of a softening agent.

In one form of my invention, the cut edges of the fabric are sealed against fraying or ravelling by applying a solvent to the edges in any suitable manner. The solvent should preferably be applied in such a manner that the solvent is permitted to remain only at the edge of the material being treated or is permitted to penetrate to a point only slightly removed from the edge in order to prevent the destruction of the fabric. Among the solvents that may be used are acetone, diacetone alcohol, chloroform, cyclohexanone, etc. Although these solvents are mentioned specifically, it is to be understood that any appropriate solvent may be used. The solvent dissolves a part of the soluble material along the edge, and upon evaporation causes coalescence between the cut yarns and leaves a film of the material which acts as

a sealing means for, or bond between, the cut edges of the yarn. Instead of using agents which are so drastic in their action as to be classed as solvents, softening agents such as triacetin, diethyl phthalate, may be used for the purpose of sealing the cut edge. The solvent or softening agent may be applied to the sides of a rotating or reciprocating cutting blade and thus applied to the cut edge of the fabric.

The fabric used in my process may be of any desired weave or it may even be a knit fabric. The application of this process to circular knit fabrics composed of the material as set forth above presents great advantages, since ordinary methods of cutting this material cannot be used because of its pronounced tendency to ladder or "run". However, when a solvent or softening agent is applied to the cut edges in accordance with my invention, the solution of the material along the edge will serve to coalesce the adjacent threads or filaments to effectively prevent any laddering at the edge. This is especially valuable, since it makes possible the use of circular knit fabric in a manner heretofore impossible.

This method of cutting and sealing fabric is of general application and may be used to cut fabrics into any desired shape or form. Among the many uses may be suggested the making of bias tape by cutting fabric on the bias into strips. Such tape need not be folded as is necessary with ordinary bias tape. By this invention, ribbons, webs and tapes may be made from fabrics of standard width, instead of weaving each width individually.

This invention is useful in making garments, since the sealed edges act as selvages and therefore it is not necessary to make any hems. In the making of garments with fabric cut in accordance with my invention, the only sewing necessary is the making of a more simple seam where pieces of fabric are to be joined. Moreover, where flat articles of any shape whatsoever are to be made, such as table covers, doilies, strips, etc. no sewing whatever is necessary by the use of my invention since when such articles are cut by my process, no hemming is necessary to avoid fraying or ravelling. Likewise, in the making of shoulder straps for feminine wearing apparel the straps may be made with varying width without any bulky hems. By the use of my invention, not only is the time and labor of sewing avoided, but articles of greater beauty and less bulkiness may be made.

While I have described my invention in detail, it is to be understood that many variations may be made therein without departing from the spirit of this invention.

Having described my invention, what I

claim and desire to secure by Letters Patent is:

1. Process of preparing a cut fabric composed at least in part of a material that is soluble in a solvent comprising cutting such fabric and sealing the cut edge thereof against fraying or ravelling by at least partially softening or dissolving the edge and then causing the edge to harden by removing the solvent or softening agent.

2. Process of preparing a cut fabric composed at least in part of organic derivative of cellulose comprising cutting such fabric and sealing the cut edge thereof against fraying or ravelling by at least partially softening or dissolving the edge and then causing the edge to harden by removing the solvent or softening agent.

3. Process of preparing a cut fabric composed at least in part of cellulose acetate comprising cutting such fabric and sealing the cut edge thereof against fraying or ravelling by at least partially softening or dissolving the edge and then causing the edge to harden by removing the solvent or softening agent.

4. Process of cutting a piece of fabric composed at least in part of a material that is soluble in a solvent comprising cutting the same in a direction irrespective of the weave or knit thereof, applying a solvent or softening agent to the cut edge, and then causing the edge to harden by removing the solvent or softening agent.

5. Process of cutting a piece of fabric composed at least in part of an organic derivative of cellulose comprising cutting the same in a direction irrespective of the weave or knit thereof, applying a solvent or softening agent to the cut edge, and then causing the edge to harden by removing the solvent or softening agent.

6. Process of cutting a piece of fabric composed at least in part of cellulose acetate comprising cutting the same in a direction irrespective of the weave or knit thereof, applying a solvent or softening agent to the cut edge, and then causing the edge to harden by removing the solvent or softening agent.

7. A piece of fabric composed at least in part of a material that is soluble in a solvent having an edge that has been sealed against fraying by softening or solution in a softening agent or solvent, and the subsequent removal of the solvent or softening agent.

8. A piece of fabric composed at least in part of an organic derivative of cellulose having an edge that has been sealed against fraying by softening or solution in a softening agent or solvent, and the subsequent removal of the solvent or softening agent.

9. A piece of fabric composed at least in part of cellulose acetate having an edge that has been sealed against fraying by softening or solution in a softening agent or solvent,

and the subsequent removal of the solvent or softening agent.

5 10. A garment having pieces of fabric joined together by a simple seam, said pieces of fabric being composed at least in part of a material that is soluble in a solvent and which has been sealed against fraying by solution or softening in a solvent or softening agent, and the subsequent removal of the
10 solvent or softening agent.

11. A garment having pieces of fabric joined together by a simple seam, said pieces of fabric being composed at least in part of an organic derivative of cellulose and which
15 has been sealed against fraying by solution or softening in a solvent or softening agent, and the subsequent removal of the solvent or softening agent.

12. A garment having pieces of fabric joined together by a simple seam, said pieces of fabric being composed at least in part of cellulose acetate and which has been sealed against fraying by solution or softening in a solvent or softening agent, and the subsequent removal of the solvent or softening agent.
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In testimony whereof, I have hereunto subscribed my name.

CAMILLE DREYFUS.

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