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O. FRICK ETAL
NOVELTY GLASS FABRIC

3,268,384

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Fig. 1

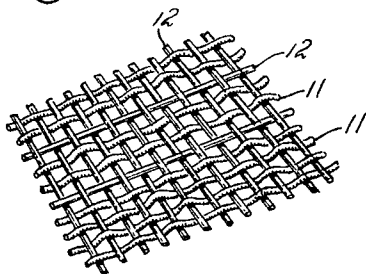


Fig. 2

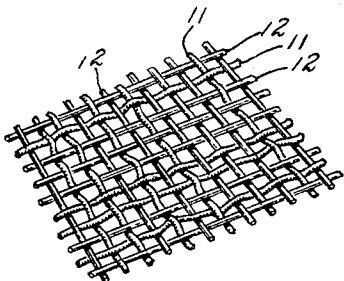


Fig. 3

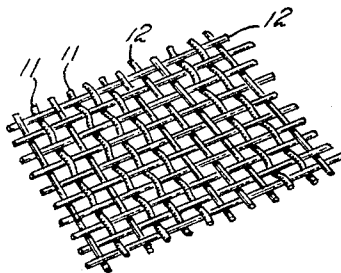


Fig. 4

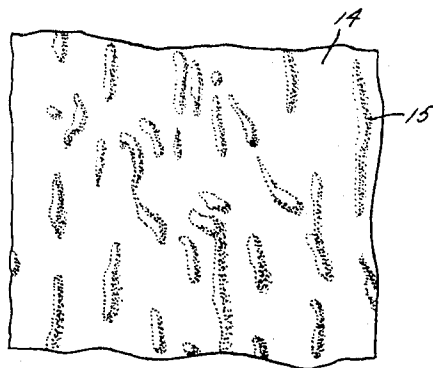
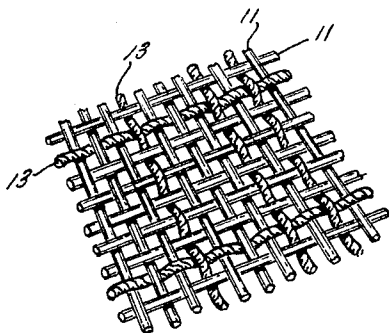


Fig. 5

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3,268,384

NOVELTY GLASS FABRIC

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This invention relates to a method for manufacture of novelty fabrics. More particularly, the invention is concerned with a method for the manufacture of fiber glass fabrics which have a novel appearance.

In recent years a great deal of research has been carried out in the field of textile materials in order to bring into commercial usage novelty fabrics and yarns in which the novelty effect is achieved by the physical structure of the fabric or yarn.

In the drawing:

FIG. 1 is a detailed view in perspective of a fabric according to the invention wherein a shrinkable and destructible yarn is utilized in the filling before removal of the shrinkable and destructible yarn;

FIG. 2 is a detailed view in perspective of a fabric according to the invention wherein a shrinkable and destructible yarn is utilized in both fillingwise and warpwise directions, before removal of the shrinkable and destructible yarn;

FIG. 3 is a detailed view in perspective of a fabric according to the invention wherein a shrinkable and destructible yarn is utilized in a warpwise direction, before removal of the shrinkable and destructible yarn;

FIG. 4 is a detailed view in perspective of a fabric according to the invention wherein a composite yarn made up of both fiber glass and a shrinkable and destructible component is utilized in both fillingwise and warpwise directions, before removal of the shrinkable and destructible yarn; and

FIG. 5 is a plan view of a fiber glass fabric according to the invention showing the crinkled and striated effect after removal of the shrinkable and destructible yarns.

In accordance with the present invention, there is provided a method for the production of fiber glass fabric comprising a fibrous glass component and at least one shrinkable and destructible component combined therewith, which shrinkable and destructible component is removed to leave a fabric of fiber glass having a novel appearance or pattern effect. The association of the components to form the fabrics of the present invention is accomplished by the new method disclosed and claimed herein. Generally, the method for manufacturing a fiber glass fabric according to the invention comprises forming the fabric from fiber glass yarn and at least one destructible yarn which has the ability to shrink or contract under stimulus from an outside source, contracting the shrinkable and destructible yarn, thereby drawing the fiber glass yarn into a contracted state therewith and subsequently heating the fabric in the contracted state while destroying the destructible yarn and leaving a fiber glass fabric having a pattern effect. The fabric comprising the fiber glass yarn and the destructible yarn can be manufactured by any known knitting or weaving process after which it is subjected to the process steps set forth herein.

The shrinkable and destructible yarn utilized in combination with the fibrous glass material can vary widely in nature. Generally, the shrinkable and destructible component can be any textile fiber suitable for combining with the fiber glass yarn and which can be shrunk and destroyed in a manner which does not affect the fiber glass yarn. In addition, the shrinkable and destructible yarn also has the ability to contract under stimulus from an outside source in an amount sufficient to produce a pattern effect in the fabric by drawing up the fiber glass yarn

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in a contracted state also. Examples of such shrinkable and destructible fibrous materials are nylon, rayon, cotton, polyesters, polypropylenes, acrylics, and other natural and synthetic materials which are capable of being shrunk and destroyed without affecting the fiber glass yarn. Generally, the pattern effect achieved by the contraction of the fabric due to the shrinkability of the destructible yarn will depend upon the amount of shrinkage and the contracting force of the particular shrinkable and destructible material being utilized, as well as the amount of such material present in the fabric. The pattern effect achieved can, of course, be varied greatly, depending upon the particular shrinkable and destructible yarn utilized as well as the particular way the destructible yarn is combined in a fabric. It will be appreciated, however, that in order to obtain a pattern effect, the shrinkable and destructible yarn generally has the ability to contract by at least about 10 percent.

The shrinkable and destructible yarn can be present in the filling or in the warp, or in both the filling and warp. More specifically, as illustrated in FIG. 1, a fabric according to the invention contains shrinkable and destructible nylon filling yarns 11 and fiber glass filling and warp yarns, generally designated as 12. The fabric illustrated in FIG. 2 contains shrinkable and destructible nylon yarns 11 running in both fillingwise and warpwise directions, as well as fiber glass yarns designated by 12 also running in fillingwise and warpwise directions. On the other hand, the fabric illustrated in FIG. 3 has shrinkable and destructible nylon yarns 11 running in a warpwise direction with fiber glass yarns 12 running in both fillingwise and warpwise directions. It is to be understood that regardless of whether the shrinkable and destructible yarn is present in either the filling or the warp, it makes up only a part of the filling and warp yarns, the remainder being fiber glass yarns which will not be destroyed when the shrinkable and destructible yarn is removed from the fabric. In this connection, the different fibrous materials or components, that is, the fiber glass yarn and the shrinkable and destructible yarn are normally woven or knitted as individual warp and/or filling yarns in a fabric manufactured in accordance with the invention. However, the different yarn components, as illustrated in FIG. 4, may be twisted together physically, bonded together with a sizing material, or combined in any other manner known in the textile field to form a composite yarn which can be utilized in a fabric of the invention. More specifically, as shown in FIG. 4, composite yarns 13 of fiber glass and nylon, twisted together, are used in both a fillingwise and warpwise direction along with fiber glass yarns 12 which also run in both directions in the fabric. Generally, however, throughout this specification and the appended claims the association of the fibrous components in the form of a composite yarn is referred to as being "plied."

As pointed out hereinbefore, once the fabric comprising the fiber glass yarn and the shrinkable and destructible yarn has been knitted or woven, the shrinkable and destructible yarn is then subjected to stimulus from an outside source in order to give the fabric a pattern effect brought about by contraction of the shrinkable and destructible component. The external stimulus utilized in carrying out the present method of manufacturing a novelty fabric will depend upon the particular shrinkable and destructible component being employed. For example, contraction or shrinkage can be brought about by the application of heat, by applying moisture to the fabric, or by the application of chemicals or any combination of these. In general, when heat is employed to bring about contraction of a fabric, the temperature can vary within wide limitations. For example, the temperature must be at least high enough to cause contraction of the shrinkable and destructible yarn. On the other hand, the tempera-

ture cannot be so high that the destructible yarn is destroyed before contraction takes place or so high that the fiber glass yarn is affected thereby. The particular temperature to be utilized in conjunction with a particular shrinkable and destructible yarn component is readily determinable in each case. Where moisture is utilized to bring about contraction of the fabric, the moisture may be water or chemical in solution form or water in the form of steam or chemical in a gaseous state. An excellent example of external stimulus is the application of phenol or caustic to a fabric in which the shrinkable and destructible component is nylon. Regardless of the particular means employed to bring about contraction or shrinkage of the shrinkable component, such means must be ones which will not affect the fiber glass yarn in the fabric.

The destruction of the shrinkable and destructible yarn is carried out by the application of heat to the fabric. Particular temperatures employed in order to destroy the component to be removed can be varied widely. For example, coronizing temperatures (about 1300° F.) for short periods of time, approximately 15–20 seconds, can be utilized to remove the destructible yarn. On the other hand, temperatures generally employed to heat clean glass fabrics (about 700°–800° F.) can be utilized to destroy the destructible yarn when applied to the fabric for a longer time cycle. Regardless of the particular temperature employed, the fabric should be subjected thereto not only long enough to destroy the destructible yarn component, but also to set the fiber glass yarn in the pattern effect achieved by contraction during the shrinking step.

A particularly useful fabric prepared in accordance with this invention is one which contains fiber glass yarn and nylon yarn where the nylon yarn is employed in the filling. After initial manufacture of the fabric, it has the ordinary physical appearance of any fiber glass and nylon fabric. Upon treating with a phenolic shrinking agent, the nylon yarn contracts, thus giving the fabric the appearance of a crinkled surface. Subsequently, the fabric is subjected to a temperature of about 1300° F. for a period of about 20 seconds during which time the glass yarn is set in its contracted state, and the nylon yarn is destroyed by the high temperatures, leaving the fiber glass yarn remaining in the fabric and giving the fabric the appearance of a material which is crinkled and striated, a novel effect very pleasing to the eye. This woven effect is shown in FIG. 5

wherein a fabric according to the invention designated by numeral 14 has a surface with randomly distributed striated or crinkled areas 15.

The fabric thus produced can be used in a wide variety of ways. For example, the fabric is excellent for use as drapery material or other areas where advantage can be taken of the novelty effect due to the crinkled appearance thereof.

While the invention has been illustrated and described in but one embodiment, it is to be understood that those skilled in the art may modify certain details thereof without departing from the spirit or scope of the invention as defined in the appended claims.

What is claimed is:

1. A novelty fabric comprising a warp and filling containing fiber glass yarns, the filling yarns being set in a contracted state and said fabric having a patterned surface containing randomly distributed striated and crinkled areas.
2. A novelty fiber glass fabric comprising a warp and filling containing fiber glass yarns, the warp and filling yarns being set in a contracted state and said fabric having a patterned surface containing randomly distributed striated and crinkled areas.
3. A novelty fiber glass fabric comprising a warp and filling containing fiber glass yarns, the warp yarns being set in a contracted state and said fabric having a patterned surface containing randomly distributed striated and crinkled areas.

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