Jan. 8, 1952 L. KAPHAN 2,582,132

DECORATED FLEXIBLE FABRIC AND METHOD FOR MAKING THE SAME

Filed Jan. 30, 1948

Fig. 1

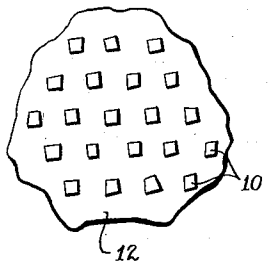


Fig. 2

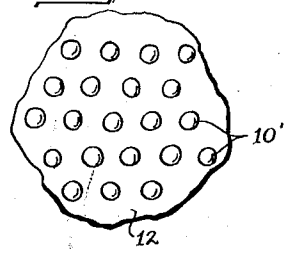


Fig. 3

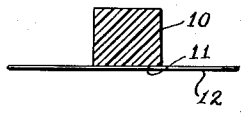


Fig. 4

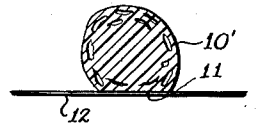


Fig. 5

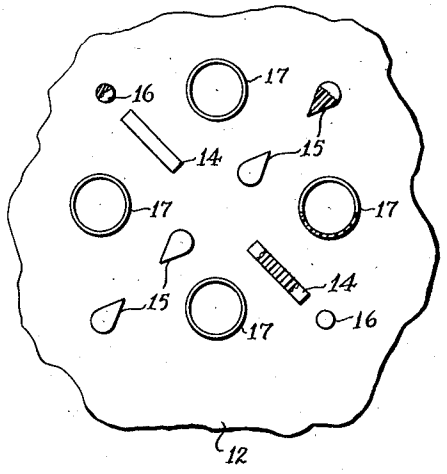


Fig. 6

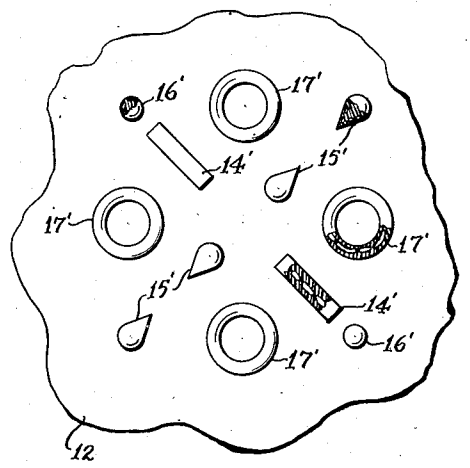
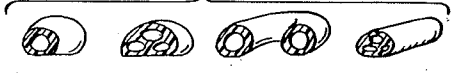


Fig. 7



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DECORATED FLEXIBLE FABRIC AND METHOD FOR MAKING THE SAME

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18 Claims. (Cl. 41—34)

1

The present invention relates to a decorated fabric, and more particularly to a flexible fabric studded with decorative plastic beads or elements, and to methods for making the same.

It is an object of the present invention to provide a novel type of decorated flexible fabric of the character described which is of highly ornamental and attractive appearance.

It is another object of the present invention to provide a decorated fabric of the character described which is capable of being formed in a great variety of patterns, designs and color combinations.

It is also an object of the present invention to provide a decorated flexible fabric of the character described which is suitable for numerous decorative and ornamental uses and purposes.

It is still another object of the present invention to provide a decorated flexible fabric of the character described which is of light weight, particularly when considered in view of the bulk of its appearance.

It is yet another object of the present invention to provide a decorated fabric of the character described which may be formed with decorative plastic elements of varying shapes, forms and sizes and in varying density and proximity of arrangement, in one form of which it may be made to resemble a beaded fabric but which may be produced at greatly lesser cost of labor and materials and in lesser time than such beaded fabric and is of much less weight than such beaded fabric.

Another object of the present invention is to provide a decorated fabric of the character described which is both durable and inexpensive to produce.

It is a further object of the present invention to device methods for the production of the fabrics of the present invention which are simple and easy to practice and which are certain in their effects.

It is a still further object of the present invention to devise methods for the production of the fabrics of the present invention which consume a minimum amount of time, labor and materials and which may be practiced with maximum economy.

It is yet a further object of the present invention to devise methods for the production of the fabrics of the present invention which may be practiced with the use of simple equipment which is of a standard character.

The foregoing and other advantages and superiorities of the products and methods of the

2

present invention will become more readily apparent to those skilled in the art from the several representative embodiments thereof shown in the accompanying drawings and from the description following. It is to be understood, however, that such embodiments are shown by way of illustration only, and without any intent of limiting the invention to the specific details therein shown.

In the drawings:

Fig. 1 is a plan view of a fragment of a studded fabric of the present invention, representing the fabric in an early stage of production, showing the stud or decorative elements secured to a base fabric, before undergoing stud processing;

Fig. 2 is a similar view of the same fabric fragment represented in finished state;

Fig. 3 is a vertical section through a stud element of the type used in Fig. 1, in enlarged representation, before processing;

Fig. 4 is a similar view representing the stud element of Fig. 3 after it has undergone processing;

Fig. 5 is a plan view of a fabric fragment studded with a plurality of differently shaped and formed stud elements before the same have been processed; some of said elements being cut away to show their original cross-section;

Fig. 6 is a plan view of the fabric and studs of Fig. 5, representing the same on approximately the same scale, after the stud elements have been processed; some of said stud elements being cut away to show their cross-section in finished state; and

Fig. 7 is a view taken through the stud elements of Fig. 6, showing their cross section after processing, on an enlarged scale.

I have found that small units or elements of synthetic plastic materials of a thermoplastic character, such as of cellulose acetate plastic, may be treated to effect a change and improvement in their appearance, without impairment, in a manner permitting the changing of a small, angular, rough and dull surfaced unit into a rounded, smooth and glossy surfaced unit of increased size or bulk, having definite ornamental and decorative characteristics.

I have discovered that when such thermoplastic units, in their rough stage, are immersed in a suitable solvent fluid, such as an acetone solvent in the case of a cellulose acetate plastic, to soften their outer surface or "skin" portion, and then subjected to a specified degree of heat, a reaction in the nature of an internal explosion or blowing up will take place which will tend to pull

the softened skin or surface of the unit away from its unsoftened core portion, if any, or from its opposed softened skin surface, and to expand the unit, forming air spaces between the softened skin portions and the core or between the several softened contacting skin portions, as the case may be. The expansion and blowing up thus confers a degree of porosity and a round contour on the unit, increasing its bulk without in any way increasing or even actually decreasing its weight.

I have further found that such expansion and blowing up does not affect the surface of the unit, which, upon cooling emerges whole, smooth and glossy.

In practice, I may take or form a great number of thermoplastic synthetic plastic units or elements **10**, which, in one form, may be in the shape of cubes of a small size, such as of approximately ⅛'' dimension. Such elements **10** may be varicolored and may be formed by cutting or chopping from rods, in the case of cubes, or from bars, strips, tubes, cylinders, depending on the shape of element desired, with great rapidity, in large numbers, at low cost. Since these elements are subsequently processed for finishing, their initial roughness, dullness and lack of finish is immaterial.

The elements, such as the cubes **10**, may preferably have at least one flat surface of substantial area, as **11**, by which they may be safely secured or anchored to a base fabric **12**. The fabric **12**, preferably of a flexible nature, may be of any kind or type, needing only one requirement that it be not soluble in the solvent intended to be used for the plastic elements **10**.

The elements **10** may be secured by their face **11** to the fabric **12** in any manner by which their adhesion to such fabric may be effected, as by a suitable cement, or by treating the adhering surface **11** to render it adhesive, as by treatment with a solvent or by the application of heat.

The elements, such as **10**, may be applied to the fabric **12** in spaced relation, in large numbers and at great speed, by mechanical or automatic means, in any desired density, either haphazardly or in a predetermined design, thus forming a low cost, light weight, flexible, plastic studded fabric, such as shown in fragmentary form in Fig. 1, wherein the fabric has the appearance of a beaded fabric.

The studded fabric is then immersed in a solvent fluid of a type effective for the plastic stud elements **10** but which will not affect the base fabric **12**. The time of immersion may vary from approximately ten (10) seconds to approximately ten (10) minutes, depending on many variable factors and conditions, such as the thickness of the elements **10**, the type of plastic from which they are made, the kind and concentration of the solvent used and the degree of change intended to be effected in the elements.

Upon removal from the solvent bath, the studded fabric is subjected to heat treatment for a period of time ranging from approximately one (1) minute to approximately ten (10) minutes, at a temperature of from approximately 200° F. to approximately 500° F., depending on many variable factors and conditions, such as the thickness of the unit, the depth to which it is softened, the material from which it is made, atmospheric conditions, degree of change desired to be effected, and others.

Upon cooling, preferably at a gradual rate, the processed elements **10** assume, as shown in Fig. 2, the enlarged, round contoured, porous, smooth-surfaced, glossy, decorative appearance, and remain in secure adhesion on the base fabric **12**, forming an ornamental, studded fabric suitable for numerous uses, such as in the making of ladies' handbags, belts, garments, or the like.

In Figs. 5, 6 and 7, I have illustrated, by way of example, a number of other, differently shaped and formed stud elements that may be made and used in the manufacture of the decorated fabrics of the present invention. I may, thus, start with a flat, bar-shaped element **14** to form, after processing, the approximately semi-cylindrical element **14'**; or with a flat, thin, pear-shaped element **15** to form the arcuate pear-shaped element **15'**; or with the disc-shaped element **16** and end with the hemispherical element **16'**; or with the thin, flat walled ring element **17** ending with the tubular ring element **17'**. In all cases, the final form, after processing, is of round contour and greater bulk; the increase in bulk being controllable to a large degree by controlling the intensity and duration of the processing steps.

This completes the description of the products and methods of the present invention. It will be readily apparent that many modifications and variations thereof may be made, in accordance with the principles hereinabove set forth, by anyone skilled in the art, without the use of any inventive ingenuity. I desire, therefore, to be protected for any and all such variations and modifications that may be made within the spirit of the present invention and the scope of the claims hereto appended.

I claim:

1. A decorated fabric of the character described, comprising a base fabric and a plurality of thermoplastic synthetic plastic stud elements having internal porosity and rounded contour and glossy surface secured on a face of said base fabric.

2. A decorated fabric of the character described, comprising a flexible base fabric and a plurality of thermoplastic synthetic plastic stud elements having internal porosity, a rounded contour and glossy surface secured on a face of said base fabric.

3. A decorated fabric of the character described, comprising a flexible base fabric and a plurality of thermoplastic synthetic plastic stud elements of small cross-section and having internal porosity, a rounded contour and glossy surface, adhesively secured to a face of said base fabric.

4. A decorated fabric of the character described, comprising a base fabric and a plurality of vari-colored, thermoplastic synthetic plastic elements of small cross-section and having internal porosity, a rounded contour and glossy surface, adhesively secured to a face of said base fabric.

5. A decorated fabric of the character described, comprising a flexible base fabric and a plurality of thermoplastic synthetic plastic stud elements set on said fabric, each of said stud elements having a flat face by which it is adhesively secured to said base fabric, a porous interior, a rounded contour and a glossy projecting surface.

6. The product of claim 5, wherein the base fabric is a textile fabric.

7. The method for producing a decorated fabric of the character described, comprising the steps of cementing a plurality of themoplastic synthetic cellulosic plastic stud elements to a base

fabric, immersing the studded fabric in a liquid solvent for the said plastic stud elements until, the surface of said stud elements is softened to a desired depth, and then subjecting the said studded fabric to heat at a temperature of between approximately 200° F. to approximately 500° F.

8. The method for producing a decorated flexible fabric of the character described, comprising the steps of cementing a plurality of thermoplastic synthetic cellulosic plastic stud elements, in spaced relation, on a surface of a flexible base fabric, immersing the studded fabric in a liquid solvent for the said plastic stud elements until the the surface of said stud elements is softened to a desired degree, and then subjecting the said studded fabric to heat at a temperature of between approximately 200° F. to approximately 500° F. and then cooling the studded fabric.

9. The method for producing a decorated flexible fabric of the character described, comprising the steps of cementing a plurality of thermoplastic synthetic cellulosic plastic stud elements of small cross-section in spaced relation on a surface of a flexible base fabric, immersing the studed base fabric in a liquid solvent for the said plastic stud elements until surface of the said stud elements is softened to a desired depth, subjecting the said studded base fabric to heat at a temperature of between approximately 200° F. to approximately 500° F. and then gradually cooling the same.

10. The method for producing a decorated fabric of the character described which comprises the steps of forming a plurality of thermoplastic synthetic cellulosic plastic stud elements of small cross section, each of said stud elements having a flat face of substantial area, adhesively securing a flat face of each of said stud elements to the face of a base fabric, immersing the studded base fabric in a liquid solvent or said plastic stud elements until the surfaces of said stud elements are softened to a desired depth, subjecting the said studded base fabric to heat at a temperature of between approximately 200° F. to approximately 500° F. and then gradually cooling the same.

11. The method for producing a decorated fabric of the character described which comprises the steps of forming a plurality of varicolored thermoplastic synthetic cellulosic plastic stud elements of small cross-section each having at least one flat face of substantial area, adhesively securing a flat face of a plurality of said stud elements, in spaced relation, to a face of a base fabric, immersing the studded base fabric in a liquid solvent for said plastic stud elements until their faces are softened to a desired depth, subjecting the said studded fabric to heat at a temperature of between 200° F. and approximately 500° F., and then gradually cooling the same.

12. The method of claim 11, wherein the base fabric is a flexible fabric.

13. The method of claim 11, wherein the base fabric is a textile fabric.

14. The method of claim 10, wherein the studed fabric is immersed in the said solvent liquid for a period of between approximately five (5) seconds and approximately ten (10) minutes.

15. The method of claim 10, wherein the studed fabric is subjected to said heat for a period of between approximately one (1) minute to approximately ten (10) minutes.

16. The method for processing a fabric studded with synthetic cellulosic thermoplastic elements which comprises the steps of immersing the studed fabric in a liquid solvent for said elements and non-solvent for said fabric until said elements are softened to a desired depth, subjecting the said studded fabric to heat at a temperature of approximately 200° F. to approximately 500° F., and then gradually cooling the studded fabric.

17. The method of claim 16, wherein the studed fabric is immersed in the said liquid for a period of between approximately 5 seconds to approximately ten minutes.

18. The method of claim 16, wherein the studed fabric is subjected to the said heat treatment for a period of between approximately 1 minute to approximately 10 minutes.

LUDWIG KAPHAN.

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