United States Patent [19]

Kowalchuk

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[45] **Nov. 13, 1973**

[54] **PROCESS FOR MENDING FABRICS**

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[52] **U.S. Cl.** **156/98,** 156/88, 156/94, 161/39, 161/88

[51] **Int. Cl.** **B32b 3/02**

[58] **Field of Search** 156/88, 94, 95, 96, 156/97, 98; 161/39, 88

[56] **References Cited**

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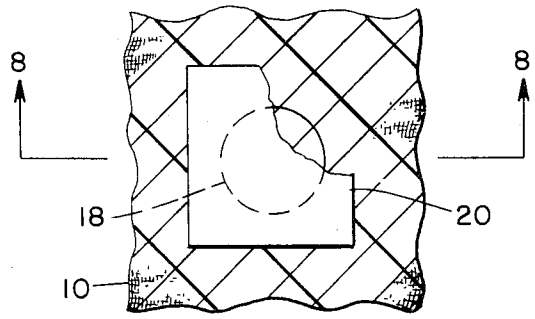
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Primary Examiner—Harold Ansher
Assistant Examiner—James J. Bell
Attorney—William L. Peverill

[57] **ABSTRACT**

A layer of adhesive is applied over and around the damaged portion of a fabric. When the adhesive has dried the damaged portion is removed by cutting through the fabric and layer of adhesive thereby leaving an opening which is preferably round. A piece of the same fabric somewhat larger than the opening is similarly coated with a layer of adhesive and then cut to form a patch identical in shape and size to the opening formed in the fabric. The patch is then fitted in the opening in the fabric and a piece of adhesive tape applied thereover and over adjacent portions of the fabric to temporarily hold the patch in place. An adhesive which on drying and setting forms a flexible heat-resistant layer is applied over the back surface of the patch and adjacent portions of the fabric. A piece of a coarsely woven cloth is then applied over the layer of adhesive while it is still soft and pressed thereagainst so that the adhesive flows into and at least partially through the interstices of the cloth. When the adhesive has substantially completely dried the piece of adhesive tape is removed from the front surfaces of the patch and fabric. The adhesive or adhesives used in the practice of this invention preferably contain a color additive designed to impart a color to the adhesive which will match or blend with the color of the fabric being mended.

4 Claims, 10 Drawing Figures



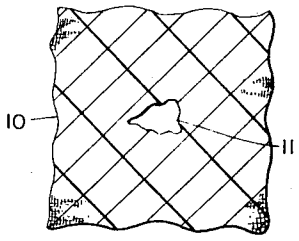


FIG. 1

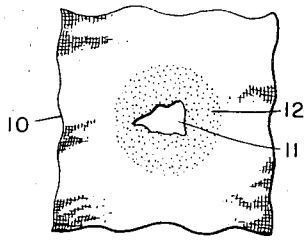


FIG. 2

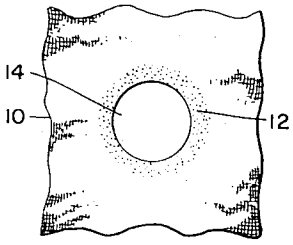


FIG. 3

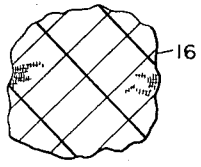


FIG. 4

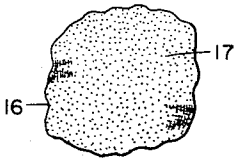


FIG. 5

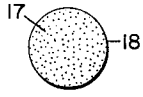


FIG. 6

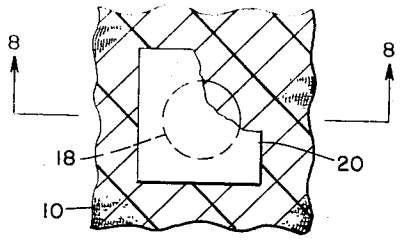


FIG. 7

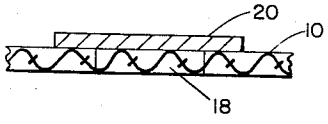


FIG. 8

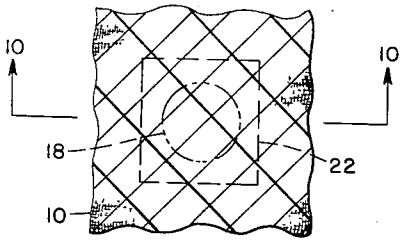


FIG. 9

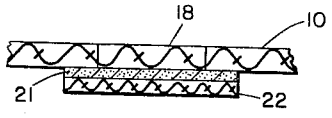


FIG. 10

PROCESS FOR MENDING FABRICS

This invention relates to the mending or repairing of fabrics having a portion thereof damaged as by a rip, tear, cigarette burn or the like.

It is known to mend or repair a damaged fabric such as a piece of wearing apparel e.g. coats, trousers and the like by a technique known as invisible mending. This involves a reweaving of the fabric in the area of the damaged portion and when properly done the damaged fabric is restored to its original appearance and strength. This technique, however, requires a high degree of skill and is time consuming and expensive.

It has also been suggested that a damaged fabric can be repaired by removing the damaged portion, replacing it with an undamaged portion of the same fabric and securing the latter in place by means of a heat softenable thermoplastic film and a more or less impermeable backing piece. When properly done, this procedure likewise results in a repair job having a good appearance. However, it is difficult, if not impossible, to determine and apply the proper amount of heat to obtain optimum binding without excessive penetration of the softened thermoplastic film into and through the fabric thereby spoiling its appearance. Moreover, the thermoplastic film is inherently heat sensitive so that when the fabric is subjected to the usual cleaning and pressing operations the film softens and deteriorates to a point such that the patch is no longer held in place.

A principal object of the invention is the provision of an improved process for mending or repairing damaged fabrics which is relatively easy and economical to carry out and which results in a mended fabric of improved appearance that is not weakened or deteriorated by the usual cleaning and pressing operations.

A further object of the invention is the employment in a process of the type described herein of an adhesive which when applied, dried and set has sufficient heat resistance to withstand deterioration and/or disintegration under the usual cleaning and pressing operations.

A still further object of the invention is the provision of an improved process for mending or repairing damaged fabrics which includes the use of improved materials and procedures for color matching the adhesive with the fabric whereby fabrics of various colors can be mended or repaired in a manner such that the adhesive is not visible through the fabric with consequent adverse effects on the appearance thereof.

Another object of the invention is the use, in a process of the type described, of a type of backing or securing member which in combination with the particular type of adhesive results in an improved bond of increased strength and durability whereby the resistance of the repaired portion of the fabric to deterioration and/or disintegration by the usual cleaning and pressing operation is substantially increased.

In accordance with the invention there is provided an improved process of mending a fabric having a damaged portion which comprises applying a thin layer of adhesive to the back surface of the fabric over and around the damaged portion, permitting the adhesive to dry at least partially, removing the damaged portion by cutting through the fabric and the applied layer of adhesive thereby leaving an opening in the fabric, the fibers in the fabric at and adjacent the edges of the opening being securely held in place by the adhesive, applying adhesive over the back surface of a piece of fabric which is the same as or substantially identical to the fabric to be mended and of a size somewhat larger than said opening, permitting the adhesive to dry at least partially, trimming the piece of adhesive coated fabric to the identical shape and size of the opening in the first mentioned fabric to form a patch for insertion into said opening, said trimming being carried out by cutting through the fabric and the layer of adhesive coated thereon whereby the fibers at and adjacent the cut edges of said patch are securely held in place by the adhesive, fitting the patch in the opening in a manner such as to carry out any design in the adjacent portions of the fabric to be mended, securing an adhesive strip over the patch and the adjacent portions of the fabric to be mended to hold the patch in its fitted position with respect to the fabric, applying a layer of a heat-resistant adhesive to the reverse sides of the patch and fabric along the adjoining edges thereof as well as portions of each adjacent thereto, placing a piece of coarsely woven material against said reverse sides of the patch and fabric of a size to overlap the adjoining edges of the patch and fabric, pressing the piece of coarsely woven material against the layer of adhesive applied to the patch and fabric to cause the adhesive to flow into and at least partially through the interstices of the coarsely woven material, permitting the adhesive to dry at least partially, and then removing the adhesive strip from the opposite sides of the fabric and patch.

When the process of the invention is carried out as above described, it results in a mended article comprising a fabric having an opening therein, the fibers in and adjacent to the edges defining the opening being firmly held in position and kept from unravelling by a layer of adhesive coating the fabric at and adjacent said edges, a patch of the same size and shape as said opening positioned therein, the fibers in and adjacent the edges defining said patch being firmly held in position and kept from unravelling by a layer of adhesive coating the patch at and adjacent said edges, said patch being formed from the same fabric as the article to be mended and being positioned in said opening in a manner such as to carry out any design in the fabric to be mended, said patch being firmly and securely held in position by a coarsely woven material covering the patch and adjacent portions of the fabric to be mended, said coarsely woven material being firmly bonded to said patch and fabric by an intervening layer of dried heat-resistant adhesive, portions of which extend into and at least partially through the interstices of said coarsely woven material to effectively and permanently hold the patch in position in the opening in said fabric.

The invention will now be described more specifically in connection with the accompanying drawings wherein:

FIG. 1 is a view of the front surface of a portion of a fabric article containing a damaged area.

FIG. 2 is a view of the back surface of the fabric portion of FIG. 1 showing a thin layer of adhesive applied over and around the damaged area.

FIG. 3 is a view similar to FIG. 2 but with the damaged portion removed by cutting a round opening through the fabric and the layer of adhesive.

FIG. 4 is a view of the front surface of a piece of fabric to be used for mending the damaged fabric shown in FIGS. 1, 2 and 3.

FIG. 5 is a view of the back surface of the fabric piece of FIG. 4 showing a layer of adhesive applied thereover.

FIG. 6 is a view of the patch formed from the fabric piece of FIG. 5 by cutting through the fabric and adhesive layers, said patch being identical in size and shape to the opening formed in the fabric to be mended.

FIG. 7 is a front view of the portion of fabric of FIG. 3 showing the patch of FIG. 6 positioned in the opening therein and an adhesive strip, partly broken away, for temporarily holding the patch in place.

FIG. 8 is an enlarged cross-sectional view taken on line 8—8 of FIG. 7.

FIG. 9 is a front view similar to FIG. 7 showing the patch permanently secured in place in the opening and the adhesive strip removed.

FIG. 10 is an enlarged cross-sectional view taken on the line 10—10 of FIG. 9.

Referring to the drawing, the numeral 10 denotes a portion of a fabric having a damaged portion 11 such as might be caused by a rip, tear, cigarette burn or perhaps a spot which cannot be removed without damaging or spoiling the appearance of the fabric. The fabric 10 may be a portion of a garment such as a coat, a pair of trousers or other article of wearing apparel made from synthetic or natural fibers or blends of the two.

The numeral 12, FIG. 2, denotes a layer of adhesive which is applied to the back or inner surface of the fabric portion 10 over and around the damaged area 11 to hold the fibers firmly in place when the damaged area is removed as hereinafter described.

The numeral 14, FIG. 3, denotes the opening in the fabric 10 which is left when the damaged area 11 is removed. Removal of the damaged area may be accomplished in any suitable manner as by cutting with a knife, scissors or the like or with a punch having a circular or other shaped cutting edge. The latter is preferred since the same punch can be used to shape the patch to be fitted in the opening 14. In removing the damaged area the cut is made through the fabric and the layer of adhesive, the latter, as previously indicated, serving to hold the fibers in place so that they do not unravel particularly along the edges of the cut. The opening 14 is preferably circular in shape, as shown, in the interest of simplicity and economy. It will be appreciated, however, that the shape of the opening 14, as well as its sizes, can be varied depending upon the shape and size of the damaged area.

The numeral 16, FIG. 4, denotes a piece of fabric which is somewhat larger than the opening 14. The fabric piece 16 can be cut from the fabric portion 10 and should be selected and cut so as to carry out and/or complement any design in the latter. In the case of a garment, such as a coat, the fabric piece 16 could be cut from an inside portion of the coat which would not be visible when the coat was worn. The numeral 17, FIG. 5, denotes a layer of adhesive which is applied over the back surface of the fabric piece 16 to hold the fibers in place in the subsequent cutting operation.

The fabric piece 16 is cut to the same shape and size as the opening 14 to form the patch 18. In forming the patch 18 the cut is made through the fabric and layer of adhesive 17, the latter as previously indicated, holding the fibers of the patch firmly in place particularly along the edges thereof.

As shown in FIGS. 7 and 8, the patch 18 is positioned and fitted in opening 14 in a manner such as to carry out and complement any design in the fabric portion 10. From the standpoint of appearance the patch 18 must blend in with the fabric portion 10 so as not to be distinguishable therefrom and hence it is essential that the selection, forming, positioning and fitting of the patch in the opening be carried out in such a manner as to attain this result. When properly fitted and positioned the patch 18 is temporarily held in place by a piece of adhesive tape 20 which is applied across the front surface of the patch and adjacent parts of the fabric portion 10.

With the patch 18 securely held in place by the piece of adhesive tape 20 a thin layer of adhesive 21, FIG. 10, of the particular type hereinafter described, is applied to the back surfaces of the patch 18 and adjacent areas of the fabric portion 10. A coarsely woven cloth or fabric 22 is then placed over the layer of adhesive 21 and pressed thereagainst until the adhesive flows into and at least partially through the interstices thereof to securely lock the fabric portion 10, the patch 18 and fabric 22 into a unitary assembly. The cloth or fabric 22 can be any coarsely or loosely woven material which is formed so that there are interstices between the fibers large enough for the adhesive to flow into and at least partially therethrough. A material known as "sleeve wigging," which is commonly used in the sleeves of coats, loosely woven cotton cloth and the like have been found satisfactory. Fabrics which are impenetrable or substantially impenetrable to the adhesive 21 are not satisfactory since they tend to work loose, particularly after being subjected to the usual cleaning and pressing operations.

In order to attain the objects of this invention it is essential that the adhesive 21 be one which when dried and set has a sufficiently high resistance to heat to withstand exposure to the usual cleaning and pressing operations without deterioration. An adhesive of this type which has been found quite satisfactory for use herein is Lepages heatless, fast-setting, non-metallic, liquid solder. This is available commercially in squeezable tubes. It is easily applied directly from the tube and can, if desired, be spread with a spatula or like instrument having a flat surface. Other commercially available adhesives having similar properties when set or cured can likewise be used. Heat sensitive adhesives such as thermoplastic films are not satisfactory since in their hardened or set state they lack the required resistance to heat such as is encountered in the usual cleaning and pressing operations.

It is not absolutely essential that the adhesive layers 12 and 17 have a high resistance to heat since their principal function is to hold the fibers of the fabric and patch in place during the cutting, fitting and final bonding operations. However, from the standpoint of convenience and as added protection against any possibility of weakening of the patched area of the fabric, it is preferred to use the same type of adhesive as the adhesive 21 described above.

It is also preferred to incorporate with the adhesive or adhesives used in the practice of this invention a color additive such as to impart to the adhesive a color which will substantially match or blend with the color of the fabric to be mended. The purpose of this is to prevent or at least minimize the possibility that any portions of the layers of adhesive applied to the back surfaces of the fabric portion 10, the fabric piece 16 or the patch 18 and which penetrate into and partly through

the fabric will not be visible to one looking at the front surface of the fabric. Obviously, if any portion of the adhesive is visible through the fabric, it spoils the appearance thereof. In order to be effective for this purpose the color additive must be readily and substantially completely dispersible in, or mixable with, the adhesive and must, of course, impart the desired color thereto. A color additive which has been found quite satisfactory is a liquid toner manufactured by the All Phase Color Corporation of Los Angeles, California, under the name INSTINT TONER. This material is in liquid form and can be purchased in small bottles in a variety of colors such as lamp black, blue, yellow, and so on. This color additive may be incorporated with the adhesive in any suitable manner as by adding and stirring. For most purposes the addition of one part by volume color additive to five parts adhesive will be sufficient. However, more or less may be added depending upon the particular shades required.

When the process of the invention is properly carried out as hereinabove described the adjoining edges of the patch **18** and the opening in the fabric are not readily discernible and the patch **18,** as such, is not readily distinguishable from the rest of the fabric **10** but rather blends into and with the fabric so that the appearance thereof is essentially the same as any other portion of the fabric. Moreover, the area of the repair or mend does not deteriorate or disintegrate when subjected to the usual cleaning and pressing operations but, on the contrary, the patch is securely held in place so that the appearance of the repaired area is not visibly affected.

While the invention has been rather specifically described herein with reference to the accompanying drawing, it should not be considered as limited by the details of such description and drawing except as the same may be included in the appended claims.

I claim:

1. The process of mending a fabric having a damaged portion which comprises applying a thin layer of adhesive to the back surface of the fabric over and around the damaged portion, permitting the adhesive to dry at least partially, removing the damaged portion by cutting through the fabric and the applied layer of adhesive thereby leaving an opening in the fabric, the fibers in the fabric at and adjacent the edges of the opening being securely held in place by the adhesive, applying adhesive over the back surface of a piece of fabric which is the same as or substantially identical to the fabric to be mended and of a size somewhat larger than said opening, permitting the adhesive to dry at least partially, trimming the piece of adhesive coated fabric to the identical shape and size of the opening in the first mentioned fabric to form a patch for insertion into said opening, said trimming being carried out by cutting through the fabric and the layer of adhesive coated thereon whereby the fibers at and adjacent the cut edges of said patch are securely held in place by the adhesive, fitting the patch in the opening in a manner such as to carry out the design in the adjacent portion of the fabric to be mended, securing an adhesive strip over the patch and the adjacent portions of the fabric to be mended to hold the patch in its properly fitted position with respect to the fabric, applying a layer of a heat-resistant adhesive to the reverse sides of the patch and fabric along the adjoining edges thereof as well as portions of each adjacent thereto, placing a piece of coarsely woven material against said reverse sides of the patch and fabric of a size to overlap the adjoining edges of the patch and fabric, pressing the piece of coarsely woven material against the layer of adhesive applied to the patch and fabric to cause the adhesive to flow into and at least partially through the interstices of the coarsely woven material, permitting the adhesive to dry at least partially, and then removing the adhesive strip from the opposite sides of the fabric and patch.

2. A process according to claim **1** wherein the adhesive used in the various procedures described contains a color additive to provide a color match between the adhesive and the fabric to be mended such that the adhesive is not visible from the side of the fabric opposite the side to which it is applied.

3. A process according to claim **2** wherein the adhesive is a heatless, fast-drying, non-metallic, liquid solder.

4. A process according to claim **3** wherein the color additive is a liquid toner containing the desired coloring material.

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