June 2, 1942. G. R. CUNNINGTON 2,284,727

METHOD OF MAKING DECORATED FABRIC

Filed May 19, 1941

FIG.1.

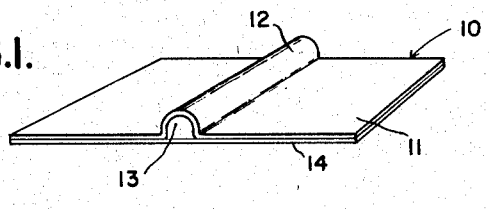


FIG.2.

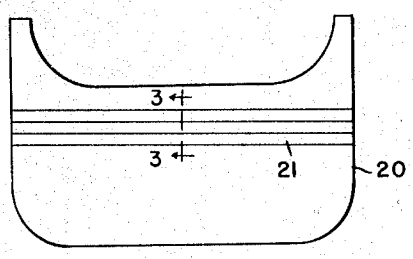


FIG.3.

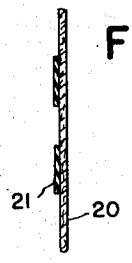


FIG.4.

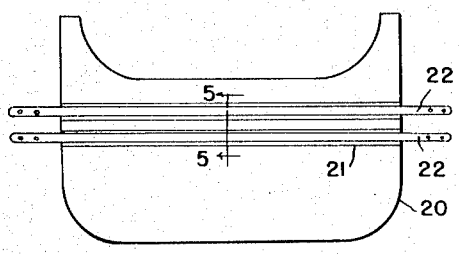


FIG.5.

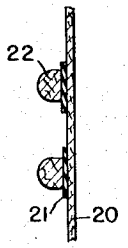


FIG.6

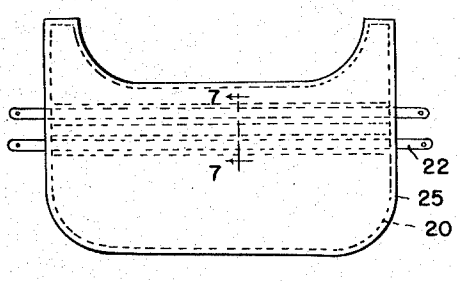


FIG.7.

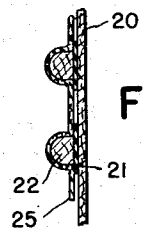
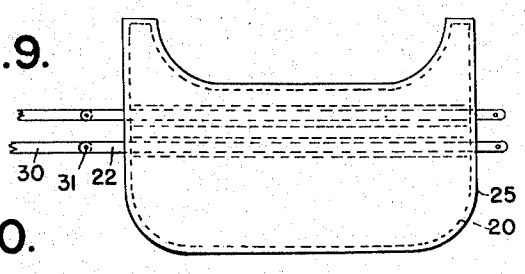


FIG.9.



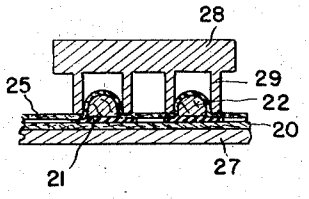
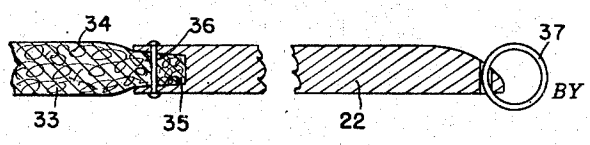


FIG.8.

FIG.10.



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METHOD OF MAKING DECORATED FABRIC

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Application May 19, 1941, Serial No. 394,228

4 Claims. (Cl. 154—2)

The present invention relates to a decorated fabric and more particularly to the method of making the same.

The present invention is applicable to the decoration of a piece of fabric in a manner to provide an elevated design therein, and it is also useful in decorating a fabric which is applied to a panel board such for example as a trim panel used in the interior trim of automotive vehicles.

In the past it has been proposed to provide a relief design in fabric, either alone or applied to trim panels, by various methods. In all of these prior methods of decorating fabric two aims or objects have been of prime importance. In the first place it is desirable to employ a riser which retains the decorated portion of the fabric in elevated position, and this riser should be soft and yieldable. By making the riser soft and yieldable, the portion of the fabric overlying the riser is less subject to wear and at the same time the decorated fabric is thereby rendered soft to the touch. It is desirable that the material forming the riser shall be resilient, at least to the extent that it will resume its original position after being pressed down.

In the second place, it is oftentimes desirable to provide an elevated portion of the fabric which extends beyond the general plane of the fabric a very substantial distance in order to provide for striking contrast between the decorated portion of the fabric and undecorated portions thereof.

According to the present invention, I obtain these results in an inexpensive and simple manner, and obtain a product which is characterized by elevated portions of any desired height while at the same time the riser material at the rear of the elevated portions may be soft and yieldable.

Briefly described, I obtain these results by initially forming the fabric to be decorated over a forming member, which I term herein a removable riser. This forming member may be of any convenient material but is preferably substantially unyieldable or rigid so that the elevated portion of the design in the fabric may be of substantially the same configuration as the removable riser. At the rear of the fabric and removable riser, I provide a reinforcing sheeting, which may be of any inexpensive material and which, in the event that the fabric is being decorated apart from the trim panel, will be flexible. A fabric is suitable for this purpose. In the event that trim fabric is being decorated in association with a panel board, the panel board itself may serve as the reinforcing sheeting.

After forming the fabric over the removable riser or forming member, I secure the fabric to the reinforcing sheeting along the sides of the removable riser. This may be accomplished in any one of a number of manners, but I prefer to accomplish this by providing a thin sheet of vulcanizable rubber between the rear surface of the trim fabric and the front surface of the reinforcing material. The fabric may be formed over the removable risers by means of heated dies, particularly where the fabric is being decorated in association with a trim panel. If the fabric is being decorated apart from a trim panel, similar die elements may be employed, but the heat necessary to vulcanize the rubber may be supplied from the rear of the reinforcing sheeting.

The next step in the manufacture of my improved fabric is to secure the riser which is to be permanently associated with the decorated fabric to one end of the removable riser, and then to withdraw the removable riser longitudinally from the pocket formed between the trim fabric and the sheeting. This will draw the permanent riser into the said pocket and when the removable riser has been completely withdrawn from the pocket, it will be disconnected from the permanent riser, thus completing the article.

With the foregoing general description in mind, it is an object of the present invention to provide a relief design in a decorated fabric by forming the fabric over a removable riser into contact with a reinforcing sheeting at the rear of the removable riser, securing the fabric and sheeting together along the sides of the removable riser, securing a permanent riser, preferably formed of a flexible, resilient material, to one end of the removable riser, and withdrawing the removable riser longitudinally from the pocket formed between the fabric and the sheeting in a manner to draw the permanent riser into position therebetween.

It is a further object of the invention to carry out the method as described in the preceding paragraph by employing a sheet of vulcanizable rubber as the securing medium for securing trim fabric to the reinforcing sheet along the edges of the removable riser.

Other objects of the invention will be apparent as the description proceeds, and when taken in

conjunction with the accompanying drawing, wherein:

Figure 1 is a fragmentary perspective illustrating a trim fabric made in accordance with the present invention;

Figure 2 is a front elevation of a panel board as employed in the present invention;

Figure 3 is an enlarged section on the line 3—3, Figure 2;

Figure 4 is a front elevation of the panel board shown in Figure 2, with the removable risers positioned thereon;

Figure 5 is an enlarged fragmentary section on the line 5—5, Figure 4;

Figure 6 is a front elevation of the trim panel, removable risers, and trim fabric illustrating the next succeeding step in the operation;

Figure 7 is an enlarged fragmentary section on the line 7—7, Figure 6;

Figure 8 is an enlarged fragmentary view illustrating a preferred method of securing the trim fabric to the sheeting;

Figure 9 is a front elevation illustrating a succeeding step in the manufacture of the decorated trim panels; and

Figure 10 is a vertical section through a removable riser or forming member, showing the manner of associating the permanent riser therewith.

In Figure 1 I have illustrated a portion of a fabric indicated generally at 10, made up of a trim fabric 11, which may be of any suitable or desired trim material. The decorated fabric 10 is provided with a high relief design, a portion of the design being indicated in this figure at 12. The trim fabric which is formed into the raised bead 12 is retained in its elevated position by means of a riser 13 which preferably is formed of a soft, resilient material such for example as fibrous material. A number of different materials are suitable for the riser, and by way of example I refer particularly to a "rope" of loosely aggregated cotton, or similar material, retained in rope formation and given body by a wrapping or envelope of very light threads. Numerous other materials are suitable for this purpose.

At the rear of the trim fabric 11 is a reinforcing sheeting 14. The sheeting 14 is substantially inextensible and may be either flexible or rigid, according to the use to which the decorated fabric is to be put. Thus for example, if the decorated fabric is to be employed in cushions, or anywhere where the fabric is to remain flexible, the reinforcing sheeting may be any inexpensive, reasonably strong fabric. In some cases, as will later be described in detail, the fabric is associated with a trim panel, in which the panel board itself may form the reinforcing sheeting. The trim fabric 11 and the reinforcing sheeting 14 are secured permanently together along the edges of the riser 13. The attachment between the trim fabric and the sheeting may be accomplished by any suitable manner, but I prefer to provide a vulcanized bond between the sheeting and the fabric.

Referring now to Figures 2 to 10, I have illustrated a series of steps in the manufacture of decorated trim panels made in accordance with the present invention. In Figure 3 I have shown a panel board 20 of the type which is attached to doors to provide a decorative interior trim in automotive vehicles. Panel boards of this type are familiar, and are substantially rigid boards made of various types of materials. A suitable type of board and one which is at present widely used in the industry, is "KB" board, which is impregnated with asphalt. At 21 in Figures 2 and 3, I have illustrated thin strips of unvulcanized rubber, which are adhered to the panel board in the first step of the manufacture of my improved product. The strips 21 of rubber are of a width slightly greater than the desired width of the elevated portion of the design, for a purpose which will subsequently appear. Strips of rubber of this type are available in roll form, in which the rubber is calendered to a strip of paper, and in this case the paper side of the rubber strip will be adhered directly to the panel board 20.

In Figure 4 I have illustrated the next step in the manufacture of my improved product, and have shown removable risers or forming members 22 positioned over the strips of rubber 21. It will be observed that the removable risers 22 are of less width than the strips of rubber, so that the strips of rubber 21 extend laterally a short distance beyond the removable risers 22. In these figures I have shown two separate strips of rubber 21, but of course it will be appreciated that if desired a single, wider strip may be employed.

The removable risers 22 may be formed of any suitable material such for example as wood, metal, or the like. Their essential property is that they shall not be injured by the heat which is employed to vulcanize the rubber strips 21, and that they shall be substantially incompressible so as to form pockets between the trim fabric and the panel board or reinforcing sheeting of a size equal to the cross-section of the removable risers 22.

The next step in the manufacture of my improved product is to place a trim fabric 25 over the removable risers 22. Preferably the trim fabric 25 is cut to the same configuration as the panel board 20, but is somewhat larger so as to provide edge portions which may later be folded over or adhered, or otherwise secured to the rear of the panel board 20.

The next step in the manufacture of my improved product is best illustrated in Figure 8. In this figure I have shown the assembly illustrated in Figures 6 and 7 as supported on a table or platen 27, over which is positioned a movable die 28 having depending die elements 29 adapted to register as shown with the removable risers 22. In the event that the reinforcing sheeting, which is shown in Figure 8 at 20, is the fibrous panel board, it will be necessary to supply the heat to vulcanize the rubber strips 21 from the front of the trim fabric 25. In this case the die elements 29 may be heated to a temperature sufficient to vulcanize the rubber without at the same time injuring the fabric 25. The strips of rubber 21 are compounded with accelerators so that they will vulcanize at relatively low temperatures and with relatively great rapidity.

If the reinforcing sheet which is employed is a flexible fabric, I prefer to supply the heat from the table or platen 27, in which case the die elements 29 may be cool.

In either case the table or platen 27 and the die 28 are moved toward each other to the position shown in Figure 8, in which position the die elements 29 have formed the trim fabric 25 over the removable risers 22 into contact with the reinforcing sheeting, or more specifically with the securing medium or rubber strip 21 therebetween. Sufficient pressure is applied to insure a good bond between the fabric 25 and

the sheeting **20**, and normally this pressure will displace all but a thin film of rubber from between the trim fabric and the sheeting, so that it is proper to say that the trim fabric is formed into contact with the reinforcing sheeting **20**.

In Figure 9 I have illustrated the next step in the manufacture of my improved product, and in this figure I have shown permanent risers **30** secured to the end of the removable risers **22**, as indicated at **31**. The precise method of securing the removable risers **22** to the permanent riser **30** will depend in large part upon the specific characteristics of the permanent risers, but in Figure 10 I have shown a satisfactory manner of securing a loose fibrous riser **33** to the removable riser **22**. In this case the fibrous riser **33** may be formed of loosely aggregated cotton, or similar fibrous material, which is retained in rope form by means of an envelope of threads indicated at **34**. This fibrous riser is not particularly strong, and in order to protect the same for the subsequent inserting operation, I prefer to provide the removable riser **22** with a socket or recess **35** into which one end of the permanent riser **33** may be introduced and secured by suitable means such as a pin **36** passed therethrough. In Figure 10 I have shown a ring **37** secured to the other end of the removable riser which may be grasped in withdrawing the same.

The product is completed by withdrawing the risers **22** to the right as seen in Figure 9 which, as will be obvious, will draw the permanent risers **30** into the pockets formed between the trim fabric **25** and the panel board **20**.

By this means risers of exceptional height and clearness of delineation may be provided. Since the formation of the pocket which determines the height and shape of the relief design provided in the fabric depends upon the cross-section of the substantially rigid removable riser, and since the removable risers may be used over and over again, the present method lends itself to a very inexpensive manufacture of articles having a relief design which is unique in its height and clearness of delineation. Very inexpensive material may be employed to make up the risers.

While I have illustrated the relief design in Figures 2 to 9 as composed of two straight parallel beads, it will of course be appreciated that other designs are possible. For example, it will be possible to provide curved or circular beads, and where the trim fabric being decorated is attached to a flexible reinforcing sheeting instead of to a panel board, substantially any design may be used. Also, while rubber has been disclosed as the securing medium, and is the best material I know for the purpose, other materials such as thermoplastic, or pressure-sensitive adhesives may be employed.

While I have illustrated in considerable detail the steps employed in the manufacture of a specific decorated trim panel, it will be appreciated that this has been done merely to enable those skilled in the art to practice the present invention, the scope of which is indicated by the appended claims.

What I claim as my invention is:

1. The method of forming a relief design in a fabric which comprises forming said fabric over the front of a substantially unyieldable, removable riser, securing said fabric at the sides of said riser to a reinforcing sheeting at the rear of said riser, securing a permanent riser element formed of soft, yieldable material to one end of said removable riser, and withdrawing said removable riser from between said fabric and sheeting in a manner to draw said permanent riser into the space formerly occupied by said removable riser.

2. The method of decorating a fabric which comprises assembling said fabric with an elongated removable riser of substantially unyieldable material and a reinforcing sheeting with the riser interposed between said fabric and sheeting, forming said fabric over said riser into contact with said sheeting, securing said fabric and sheeting together along the sides of said riser in a manner to leave the ends of said riser extending therebeyond, securing a permanent riser of soft, yieldable material to one end of said removable riser, and withdrawing said removable riser longitudinally from between said fabric and sheeting in a direction toward the other end thereof, whereby to draw said permanent riser into position between said fabric and sheeting.

3. The method of decorating a fabric which comprises assembling said fabric with an elongated removable riser of substantially unyieldable material and a reinforcing sheeting with the riser interposed between said fabric and sheeting, forming said fabric over said riser into contact with said sheeting, vulcanizing said fabric and sheeting together along the sides of said riser by means of rubber provided between said fabric and sheeting in a manner to leave the ends of said riser extending therebeyond, securing a permanent riser of soft, yieldable material to one end of said removable riser, and withdrawing said removable riser longitudinally from between said fabric and sheeting in a direction toward the other end thereof, whereby to draw said permanent riser into position between said fabric and sheeting.

4. The method of decorating a fabric which comprises assembling said fabric with an elongated removable riser of substantially unyieldable material and a reinforcing sheeting with the riser interposed between said fabric and sheeting, forming said fabric over said riser into contact with said sheeting, said riser having a recess at one end, securing said fabric and sheeting together along the sides of said riser in a manner to leave the ends of said riser extending therebeyond, securing a permanent riser of soft, yieldable fibrous material to the recessed end of said removable riser with an end of said permanent riser received in said recess, and withdrawing said removable riser longitudinally from between said fabric and sheeting in a direction toward the other end thereof, whereby to draw said permanent riser into position between said fabric and sheeting.

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