May 11, 1943. J. R. MILLAR 2,318,702

UPHOLSTERY

Filed March 27, 1939 2 Sheets-Sheet 1

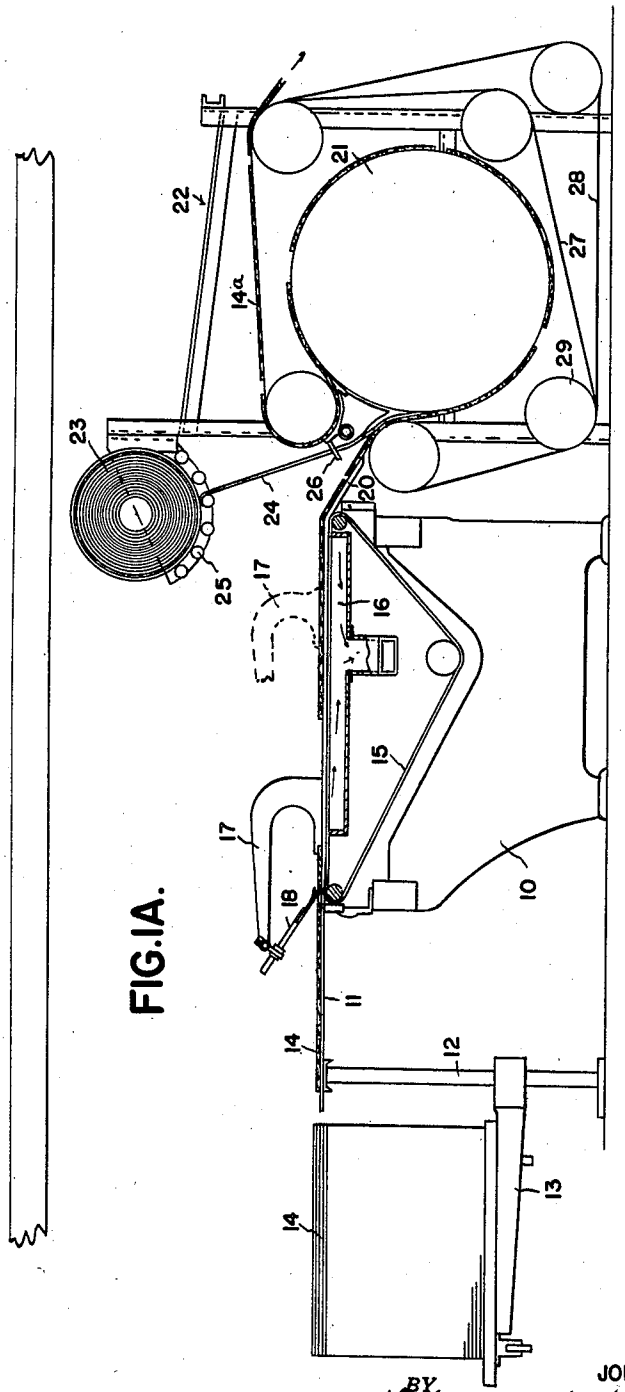


FIG.IA.

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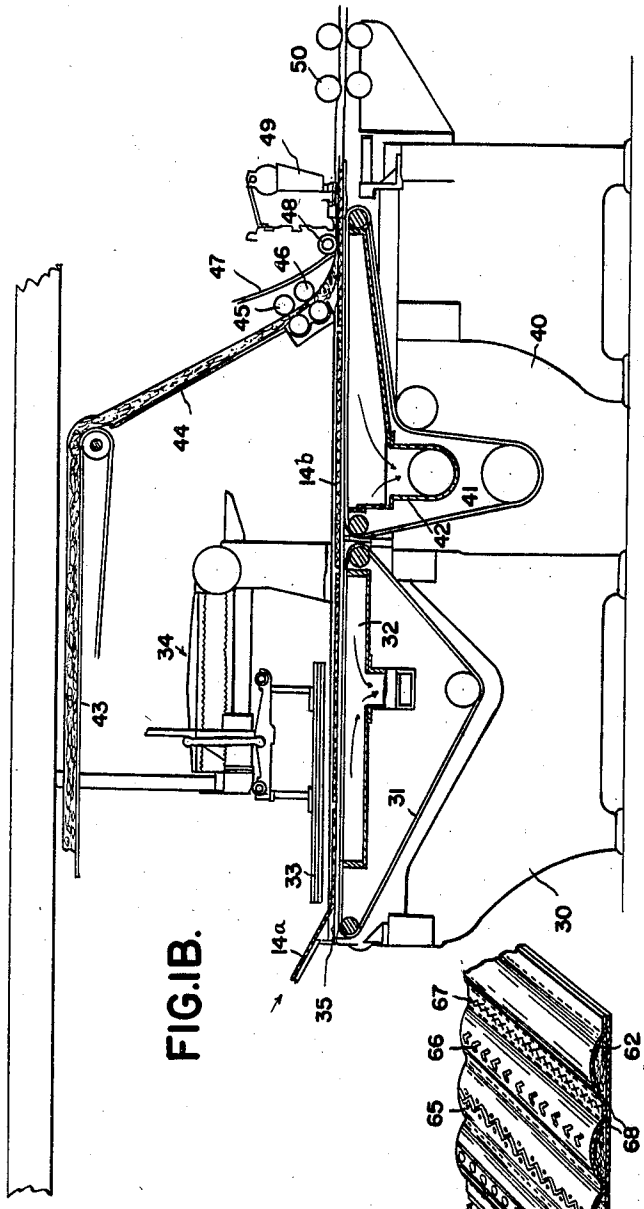


FIG.1B.

FIG.2.

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UPHOLSTERY

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4 Claims. (Cl. 154—33)

The present invention relates to upholstery and more particularly to an improved method of manufacturing decorated, padded upholstery material.

In the past upholstery material has been manufactured by providing a padding, such for example as a cotton batt or a plurality of more or less cylindrically formed cotton battings between sheeting and upholstery fabric. Sewed seams were then provided interconnecting the sheeting and the upholstery material and retaining the padding more or less evenly distributed throughout the upholstery material. In some instances the sewing took place along lines intermediate adjacent individual batts. In addition to the function of uniting the sheeting and fabric and retaining the padding in distributing position, the sewing formed the additional function of imparting an attractive appearance to the upholstery material.

Proposals in the past have involved numerous modifications of the sewing of the seams, all directed primarily to the end of improving the appearance of the upholstery material. There are certain inherent limitations in decorations which can be imparted by sewing. In the first place, if the upholstery material is to be produced continuously and economically, there is the primary limitation that the sewing must be continuous and in straight lines. If it is desired to sew curved seams and to impart arbitrary and fanciful decorations by means of sewing, the operation is necessarily a hand operation.

It has been found that the fabric may be decorated before it is combined into the upholstery material by a method which includes abutting a strip of deformable adhesive material against the rear surface of the fabric and simultaneously deforming the fabric and deforming the material into a relief design while at the same time bringing about a permanent union between the fabric and the deformable material. As a deformable adhesive material, uncured rubber has been found highly suitable. This material admirably answers the demands of the process referred to in that it may be readily formed in its uncured state and vulcanized permanently to the fabric. In the sense employed, vulcanization of the rubber to the fabric is to be regarded as a particular form of adhesive union. As is well understood, the vulcanized bond between the cloth and rubber is for all intents and purposes permanent, and it has been found in practice that the bond is sufficiently strong so that the fabric will be destroyed before the bond can be disrupted.

The design which may be imparted to the fabric by the method referred to may vary widely from a straight line bead by way of example to a purely arbitrary and fanciful design involving curved lines and diagonals.

It is desired further at this time to emphasize the fact that the flexibility of the cloth is not affected to an appreciable degree. The rubber which is applied is in an extremely thin strip, and both before and after vulcanization it is highly flexible. Furthermore, the design which is imparted to the fabric is composed, as will be evident, of soft resilient riser portions formed by the rubber. This is highly desirable for the reason that it materially enhances the life of the decorated fabric and at the same time prevents undesirable wear on surfaces in contact with the fabric. This is to be strongly contrasted with the result obtained by employing rigid or relatively rigid riser members. Rigid riser members would destroy the flexibility of the fabric, would cause severe localized wear of the fabric at the points overlying the risers, and would cause a corresponding wear on any surface in contact with the fabric.

It is contemplated in the present invention that by a continuous process the elements of the upholstery material may be treated and assembled into a decorated, sewed, padded upholstery material. As will be evident, in order to obtain a finished product of attractive appearance, it is essential that the lines of stitching and the lines of decoration be definitely correlated. According to the present invention, it is possible, if desired, to provide a sewed seam passing directly along the line of relief decoration. As an alternative, it is possible to provide a pair of closely spaced parallel lines of sewing having a decorative relief design therebetween and having the padding material excluded between said lines of sewing. Finally it is possible to provide the relief design intermediate the seams, or, in other words, along the mid portion of the pipes formed in the upholstery material.

With the foregoing general remarks in view, it is accordingly an object of the present invention to provide a continuous process for decorating upholstery fabric and assembling the fabric into a pleated upholstery material.

It is a further object of the present invention to provide a continuous process for applying parallel lines of relief decoration and sewing to a stuffed upholstery material.

It is a further object of the present invention to provide upholstery material by a process which

is characterized by the continuous advance of the upholstery material past the decorating station and past a sewing station definitely correlated to the decorating station.

Other objects of the invention will be apparent as the description proceeds, and when taken in conjunction with the accompanying drawings wherein:

Figures 1A and 1B are side elevations of the apparatus for carrying out my improved method; and

Figure 2 is a perspective illustrating the product.

The herein disclosed process is intended to be continuous from end to end, and for convenience I have illustrated the apparatus in two separate figures. It will be understood that Figures 1A and 1B are to be considered together. The material passing from the right of Figure 1A as indicated by the arrow to the corresponding arrow at the left of Figure 1B.

In Figure 1A I have illustrated a casing 10 to which is connected a table 11 supported at its free end by standards 12. A support 13 adjustably mounted on the standards 12 is adapted to hold a plurality of precut upholstery cover fabrics 14. If desired, suitable mechanism, which forms no part of the present invention, may be employed to elevate the support 13 to keep the topmost cover fabric substantially at the level of the table 11. A conveyor belt 15 is mounted in the casing 10 and its upper lead is adapted to receive and movably support cover fabrics in contact therewith. For this purpose, the belt 15 is preferably foraminous, and suitable suction means indicated generally at 16 are provided. Suction means 16 provide suction at the openings in the foraminous belt 16 which permanently retains the cover fabric 14 in place on the traveling belt and prevents lateral or other displacement.

In order to give the operator ample time to properly position the fabrics 14 on the table 11 and in position to be fed into contact with the belt 15, I provide an intermittently acting feed member 17. This member comprises a spring pressed pusher element 18 which is adapted to engage a cover fabric 14, as shown in the full line position, and to move it relatively rapidly to the right to the dotted line position. By means of this apparatus the operator has ample time to accurately locate a cover fabric 14. Preferably suitable tabs or guides will be provided on the table 11 so that the fabric 14 may be positioned with extreme accuracy. The member 17 then moves to the left and the pusher element 18 engages the cover fabric. At this time member 17 moves relatively rapidly to the right, moving the cover fabric. The arrangement is such that each succeeding cover fabric is moved up to a position closely adjacent the preceding cover fabric. This substantially increases the output of the machine and at the same time, as will subsequently appear, effects substantial economies in material, such for example as sheeting, and the deformable adhesive, such as rubber.

The closely spaced series of cover fabrics 14 pass over a downwardly inclined apron 20 and into contact with the apparatus for imparting the decoration thereto. This apparatus takes the form of a large drum 21 which is rotated at a slow speed and which is provided with heating means, such for example as electric resistance elements (not shown). The drum 21 is mounted on the frame indicated generally at 22 which supports one or more rolls 23 of deformable adhesive 24, such as strips of rubber. Preferably to avoid friction losses and to avoid the necessity for positively feeding the rubber, the roll 23 is supported on a plurality of rollers 25.

As previously stated, the fabrics 14 are positively retained by pneumatic suction means against lateral displacement, and are therefore guided into contact with the drum 21 in accurately predetermined relation, particularly so far as lateral displacement is concerned.

The frame 22 is provided with a guide 26 which is in the form of a bifurcated element which accurately positions the strip material 24 insofar as lateral position is concerned.

Means are provided for applying pressure to the exposed face of the fabric along lines overlying the strip material 24. These means take the form of one or more forming bands 28 and, if desired, a corresponding number of pressure bands 27. These bands lead around rollers 29, and suitable means (not shown) are provided for tensioning the bands a desired amount. In certain instances it will not be necessary to employ a pressure band since the forming band may be tensioned sufficiently to impart adequate pressure to the fabric. In other cases, particularly where a complex design is to be imparted to the fabric, it will be preferable to employ a forming band under little or no tension in combination with a pressure band adapted to apply relatively high unit pressure to the forming band.

In carrying out the method as thus far described, precut fabric, if such as employed, or a continuous strip of upholstery material, if preferred, is advanced by the foraminous belt 15. At this time the dress face of the fabric is downward. The strip of deformable adhesive material 24, as intimated, is thus brought into contact with the rear face of the fabric. The strip 24 may and preferably does have a reinforcing backing, such as sheeting or paper, but the forward face of the strip material which engages the fabric is exposed and comes into direct contact with the fabric. As will be evident from an inspection of Figure 1A the forming band 28 is adapted to engage the dress face of the fabric.

The pressure of the forming band, or of the forming band and pressure band in combination, if employed, is sufficient to deform the rubber or other material at the rear of the upholstery material. This deformation takes the form of the forming band. Thus, for example, if the forming band is a straight continuous strip, the decoration imparted will be in the form of a groove having on each side thereof a resilient rubber riser. If on the other hand the forming band is of a decorative design, for example having apertures therein, the rubber or other material will be displaced from beneath imperforate portions of the band into the apertures provided and laterally to provide beads adjacent the edges of the band. It will thus be evident that the field of design is practically unlimited.

The drum 21 is rotated at a rate adapted to provide a substantially complete vulcanization of the rubber or deformable material, if another material is employed, during rotation of the drum. Where rubber is employed, the apparatus is timed in view of the heat applied and the time required to cure the particular rubber employed.

The cover fabric or fabrics 14 are illustrated at 14a as they emerge from the decorating apparatus. At this time they are advanced by the advancing pressure, forming and/or pressure bands 27 and 28 to the apparatus shown in Figure 1B. At this time the fabrics have imparted

thereto a permanent relief design which, however, does not substantially affect the flexibility of the cloth.

Referring now particularly to Figure 1B, a casing 30 is provided having a second foraminous belt 31 and associated suction means 32, in all respects similar to the corresponding apparatus in the casing 10. A decorated cover fabric 14a advances on to the moving belt 31 and is advanced beneath a plurality of forming bars 33. Suitable mechanism 34, whose details form no part of the present invention, are provided for reciprocating and raising and lowering the forming bars 33 in predetermined relation to the advance of the upholstery material. Cooperating with the forming bars 33 are a plurality of ridges indicated at 35 over which the fabric advances. The forming bars 33 are each located intermediate a pair of ridges 35, and the arrangement is such that upon depression of the forming bars the fabric is formed over the ridges 35, thus providing fullness in the fabric for a purpose subsequently to be described. Preferably the forming bars 33 reciprocate longitudinally of the apparatus and follow a closed path in a generally counter-clockwise direction. Thus when a cover fabric 14a is positioned beneath the forming bars 33, the bars are lowered to form the cloth over the ridges 35. The bars then advance with the fabric a predetermined distance after which they are elevated and returned to their initial position. The decorated fabric 14a is thus provided with one or more pleat fullnesses at the position occupied by fabric 14b.

A third casing 40 is provided which in turn carries a third foraminous belt 41 provided with suitable suction applying apparatus 42 for retaining the decorated formed fabric in predetermined position and particularly retaining said fabrics against lateral displacement. This is essential since the fabrics at this time have their relief decoration imparted thereto, and it is necessary to perform the sewing operation in accurately predetermined position with respect to the relief design. The strips of deformable material interconnect the separate fabrics and keep them accurately aligned.

I have indicated at 43 an overhead conveyor for advancing a supply of fibrous material, such for example as a wide sheet of cotton batting or a plurality of individual generally cylindrical cotton batts. An apron 44 guides the padding material downwardly into position adjacent the upholstery fabric. It will be understood that the pleat fullnesses provided are each adapted to receive one or more individual cotton batts, if such are employed. On the other hand, if a single wide continuous web of cotton batting is employed it will not be necessary to form the upholstery material into pleat fullnesses, although in some instances it may be desirable to do so. In order to avoid wastage of padding material, two pairs of breaker rolls 45 and 46 are employed. Suitable automatic mechanism, which forms no part of the present invention, is provided to control the rotation of the rolls 45 and 46. The arrangement is such that the rolls 45 may be stopped momentarily while the rolls 46 continue to rotate. Preferably the rolls are provided with teeth, or the like, and continued rotation of the rolls 46 during interruption of the rolls 45 breaks the cotton intermediate the rolls. By properly timing the interruption of the rolls 45 the break in the cotton or other padding material may be caused to coincide with the space between adjacent cover fabrics, if individual precut fabrics are employed.

After the padding material has been applied to the upholstery material, as just described, a strip of sheeting 47 of about the same width as the advancing upholstery material is fed into position against the cotton batting. The elements of the upholstery cushion are now completely assembled and are further advanced beneath a plurality of rolls 48 and beneath a plurality of definitely positioned sewing heads 49.

The sewing heads 49, as previously stated, may be positioned with respect to the advancing fabric so as to sew seams intermediate lines of relief decoration, to sew seams along a line of relief decoration, or to sew a pair of closely spaced seams receiving therebetween a bond of relief decoration.

Suitable feed rolls 50 are provided for advancing the completed upholstery material out of the machine.

In order to illustrate a few of the possibilities of my improved method of decoration, I have shown in Figure 2 a perspective view of a cushion embodying several different designs. In this figure the cushion 60 comprises a backing sheet 61 and a cover fabric of upholstery material 62. In this embodiment I have illustrated padding material 63 as in the form of individual batts, and the completed cushion as provided with sewed seams intermediate adjacent individual batts. Such individual cushion or upholstery unit just described is obtained after the continuous upholstery material has been severed along lines extending between adjacent cover fabrics thereof.

As shown at 64 a relief design comprising a plurality of circular elements and a pair of parallel beads is provided at the top of the pipe formed in the upholstery material.

At 69 I have illustrated a sewed seam, and as a modification of the design I have illustrated at 65 a design comprising a zigzag line in combination with a plurality of round beads. This is shown merely to illustrate the flexibility of the method and a few of the designs which may be employed. The design indicated at 66 comprises a plurality of chevron shaped elements. At 67 I have illustrated a relief design which is received between a pair of sewed seams 68. It will be noted that there is no padding material 63 intermediate the seam 68. This is optional, and if desired and particularly where a continuous wide sheet of batting is employed there would be padding material intermediate the seam 68 and underlying the design 67.

While I have illustrated specific apparatus for carrying out my invention, it will be understood that this apparatus is not essential and the invention resides primarily in the associated steps defined. Thus for example, while I have illustrated various automatic mechanism for performing certain operations, it is entirely within the contemplation of the invention that some or all of these steps may be carried out manually or at least with manually operable apparatus.

While I have illustrated and described several specific embodiments of my invention, it will be apparent to those skilled in the art that various additions, modifications, omissions, combinations and substitutions may be made which will be within the spirit and scope of my invention as defined by the appended claims.

What I claim as my invention is:

1. The method of making upholstery material

having a cover fabric, a backing sheet, padding between the cover fabric and backing sheet and stitching connecting the cover fabric to the backing sheet; comprising the steps of advancing padding material into surface to surface engagement with the back of a continuous strip of resilient material having attached in surface to surface relation to the front face thereof a series of individual cover fabrics, then advancing a continuous backing sheet into surface to surface engagement with the padding material, and then sewing the cover fabrics to the backing sheet along laterally spaced lines to provide completed upholstery material whereof the continuous strip and sheet may be severed along lines extending between adjacent cover fabrics to provide individual upholstery units.

2. The method of making upholstery material having a cover fabric, a backing sheet, padding between the cover fabric and backing sheet, and stitching connecting the cover fabric to the backing sheet; comprising the steps of advancing fibrous padding material into engagement with the back of a continuous strip of resilient material having attached in surface to surface relation to the front face thereof a series of closely spaced precut cover fabrics, then advancing a continuous backing sheet into engagement with the padding material, and then sewing the cover fabrics to the backing sheet along laterally spaced lines to provide completed upholstery material whereof the continuous strip and sheet may be severed along lines extending between adjacent cover fabrics to provide individual upholstery units.

3. The method of making upholstery material having a cover fabric, a backing sheet, padding between the cover fabric and backing sheet, and stitching connecting the cover fabric to the backing sheet; comprising the steps of shaping by cooperating pressure elements a continuous strip of resilient material having attached in surface to surface relation to the front face thereof a series of individual cover fabrics to provide the assembly with pleat fullnesses, then advancing padding material into engagement with said pleat fullnesses, then advancing a continuous backing sheet into engagement with the padding material, and then sewing the cover fabrics to the backing sheet along lines extending between the pleat fullnesses to provide completed upholstery material whereof the continuous strip and sheet may be severed along lines extending between adjacent cover fabrics to provide individual upholstery units.

4. The method of making upholstery material having a cover fabric, a backing sheet, padding between the cover fabric and backing sheet, and stitching connecting the cover fabric to the backing sheet; comprising the steps of shaping by cooperating pressure elements a continuous strip of resilient material having attached in surface to surface relation to the front face thereof a series of closely spaced precut cover fabrics to provide the assembly with pleat fullnesses, then advancing fibrous padding material into engagement with said pleat fullnesses, then advancing a continuous backing sheet into engagement with the padding material, and then sewing the cover fabrics to the backing sheet along lines extending between the pleat fullnesses to provide completed upholstery material whereof the continuous strip and sheet may be severed along lines extending between adjacent cover fabrics to provide individual upholstery units.

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