May 16, 1967 B. Z. LANDE 3,320,108

METHOD OF FORMING TUFTED CUSHION ELEMENTS

Filed Nov. 26, 1963

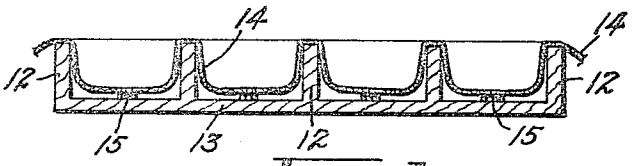

Fig. 1

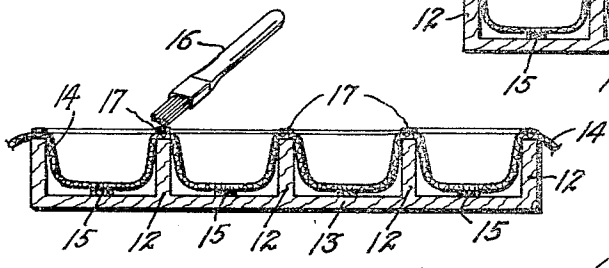

Fig. 2

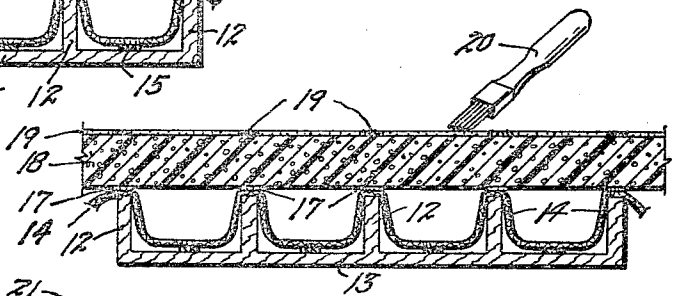

Fig. 3

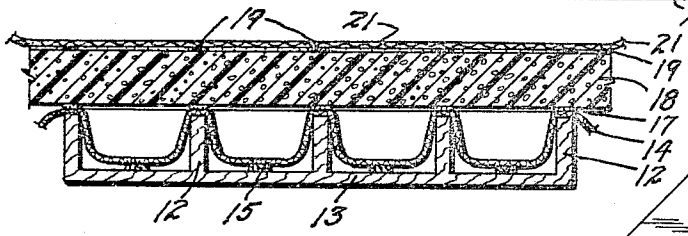

Fig. 4

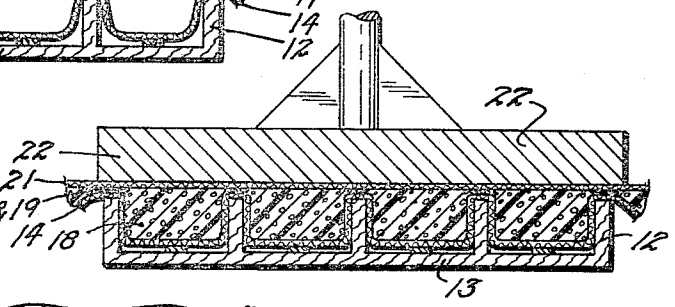

Fig. 5

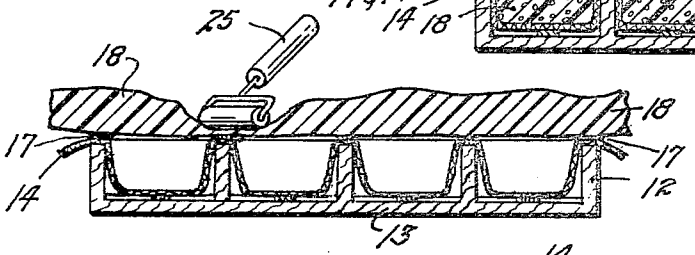

Fig. 6

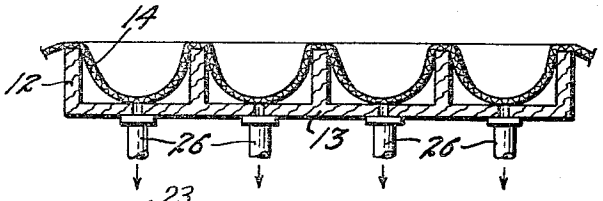

Fig. 7

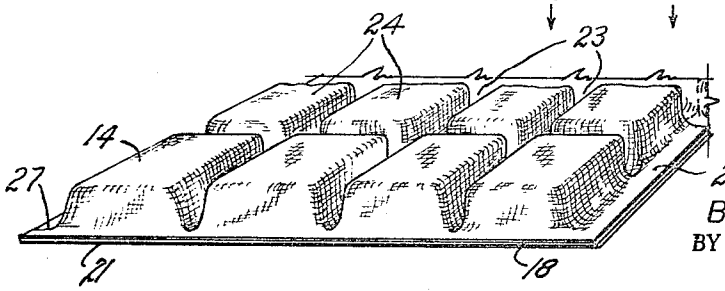

Fig. 8

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METHOD OF FORMING TUFTED CUSHION ELEMENTS

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This invention relates generically to the upholstering art wherein cushioned areas on pieces of furniture are shaped and indented to form patterns and designs. The general formation of the above areas is referred to as "tufting" and is accomplished in many ways such as by filling the raised portions with individual padding and stitching or tying back the indented portions.

Since the introduction of plastic foams, tufting has been attempted by thermo deformation and vulcanization of the foam padding. This method requires exceedingly expensive and complicated metal dies to withstand the necessary pressures and carry the necessary heat. Such methods are not commercially practical except for the mass production of identical pieces.

This invention relates specifically to a rapid and economical method and means for tufting cushion pieces which can be readily used in local upholstering shops and which can be quickly, easily and economically adapted to produce any desired tufted designs.

A further object is to provide an economical and highly efficient tufting method which will eliminate the stitching and tying of the earlier methods and the expensive metal dies and heating equipment of the latter methods.

Other objects and advantages reside in the detail construction of the invention, which is designed for simplicity, economy, and efficiency. These will become more apparent from the following description.

In the following detailed description of the invention, reference is made to the accompanying drawing which forms a part hereof. Like numerals refer to like parts in all views of the drawing and throughout the description.

In the drawing:

FIGS. 1–5, schematically illustrate sequential steps in this improved method which will be hereinafter described in detail;

FIGS. 6 and 7 similarly illustrate alternate steps; and

FIG. 8 illustrates a typical finished piece.

In this economical method, a mold is employed carrying the desired tufted design. The mold may be formed by gluing, or otherwise mounting, wooden pattern strips **12** upon a backboard **13** which may be an inexpensive panel of wooden plyboard. The pattern strips project uniformly upward from the backboard **13** to a height corresponding to the depth of tufting desired and follow the pattern of the desired tufted design and the outline of the finished piece. Such a mold can be quickly assembled, used and discarded, even for a single desired piece with very little expenditure of time and materials.

The selected mold is then placed upon a work table or bench and a sheet of the selected cover fabric **14** is laid over the entire mold and pressed by hand into the various pockets between the pattern strips **12** as shown in FIG. 1. To facilitate retension of the cover fabric **14** in the pockets, it is preferred to have a patch **15** of adherent material mounted on the backboard **13** in the bottom of each of the pockets.

The patches **15** may be of any type which will temporarily adhere to the cover fabric. In actual use, the patches are pieces of "Velcro," a flexible fiber tape having pressure-adhesive coatings upon both its top and bottom faces and which is available upon the open market.

A quick-drying transparent adhesive such as an amino-acetate plastic solution is now sprayed or brushed on the back side of the cover fabric **14** over all of the ridges formed by the upwardly extending pattern strips so as to form a relatively thick first layer of adhesive **17** conforming to the desired pattern, as shown in FIG. 2.

A flat pad of resilient plastic foam **18** is now placed over the patterned first adhesive layer **17** and a relatively thick second layer **19** of quick-drying transparent adhesive is applied to the back side of the plastic foam sheet, as indicated at **20** in FIG. 2. The second adhesive layer need not cover the entire area of the plastic pad but should at least provide a relatively thick adhesive plastic layer over those portions of the pad which are positioned directly above the pattern strips **12**.

A backing sheet of open mesh fabric **21**, such as "theatrical gauze," is now spread smoothly over the second adhesive layer **19**, as shown in FIG. 4, and a press plate **22** is positioned over the backing sheet **21** and forced downwardly, as shown in FIG. 5, until the pad **18** is completely flattened to a minimal thickness over the pattern strips and the adhesive is forced completely through the compressed portions of the pad to provide a continuous cross section of adhesive extending from the back of the cover sheet **14** through the pad **18** and through the backing sheet **21** over the entire areas of the tops of the pattern strips **12**. The press plate **22** is left in the compressed position until the adhesive has completely set. It is then removed and the finished piece is lifted from the mold, inverted and trimmed to form the finished tufted piece, such as shown in FIG. 8, with indentations **23** and raised portions **24**, conforming in design to the pattern selected for the mold and with a border strip **27** equal in thickness to the combined thickness of the backing sheet **21**, the cover sheet **14** and the completely compressed pad **18**.

The essential feature of the improved tufting method resides in the fact that the pores and interstices of the foam pad, at the indentations, are completely closed and completely surrounded by solidified adhesive so that a cross section through the bottom of an indentation at any point will show a solid plastic cross section reinforced by the fibers of the cover sheet **14**, the pad **18**, and the backing sheet **21**.

If it is desired to be certain that the porous structure of the pad along the design lines is completely broken-down and impregnated, an additional step may be added as shown in FIG. 6, prior to the pressing step of FIG. 5 in which the pattern lines are rolled, as indicated at **25** to pump the thick layer **17** of plastic adhesive into the interstices of the foam plastic pad before pressing the latter.

The first step of FIG. 1, if performed with care, can be accomplished without the assisting patches **15** or, if desired, a vacuum nipple **26** can be inserted through the back board **13** into each of the pockets between the pattern strips **12**, as illustrated in FIG. 7, and connected to a vacuum source for drawing and holding the cover sheet **14** downwardly in the pockets.

The pressure plate **22** may be a relatively thick metal plate forced downwardly by means of jackscrew or a hydraulically actuated plunger or plungers. The plate could, if only a few jobs were contemplated, be weighted with heavy weights to compress the cushion elements against the pattern strips.

While the pad **18** has been described as being formed from sheet foamed plastic, the method is equally applicable to any resilient, compressible, fibrous or cellular material capable of being compressed into a substantially solid state. For instance, it could be formed from a continuous sheet of wool or cotton batting, spanish moss or similar

aterial since there is no thermal or chemical action etween the pad and the cover and backing sheets.

While specific forms of the invention have been de-ribed and illustrated herein, it is to be understood that ie same may be varied, within the scope of the appended laims, without departing from the spirit of the invention.

Having thus described the invention, what is claimed nd desired to be secured by Letters Patent is:

1. A method of forming tufted cushion elements comrising:

(a) mounting upstanding pattern strips upon a backing board to form open-topped pockets of uniform height upon said board;

(b) spreading a fabric cover sheet over said pockets;

(c) depressing the cover sheet into the pockets to form upstanding ridges conforming to the desired pattern;

(d) applying a layer of adhesive along the upper crests of said ridges;

(e) placing a unitary pad of resiliently compressible material over said adhesive layer;

(f) applying a second layer of adhesive on the upper surface of said pad along and over the positions of said ridges;

(g) placing a continuous sheet of backing fabric over said second layer of adhesive;

(h) placing a flat press plate over said backing fabric and forcing said plate downwardly to compress said pad to a substantially solid state impregnated with adhesive over and along said ridges; and thence

(i) maintaining said compression until said adhesive has fully set.

2. A method as described in claim 1 including temporarily attaching the depressed cover sheet to the bottoms of said pockets before applying adhesive along the upper crests of said ridges.

3. A method as described in claim 1 including applying a rolling pressure to said pad along the tops of said ridges before applying said backing fabric thereover.

4. A method as described in claim 1 including creating a partial vacuum in the bottoms of said pockets to retain said fabric cover sheet in said pockets before applying adhesive along the upper crests of said ridges.

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