April 5, 1955 J. S. KAMBORIAN 2,705,522

METHOD OF APPLYING COVERING MATERIAL TO CUSHIONED PANELS

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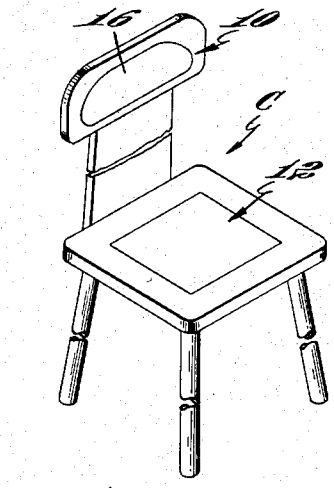


Fig. 4

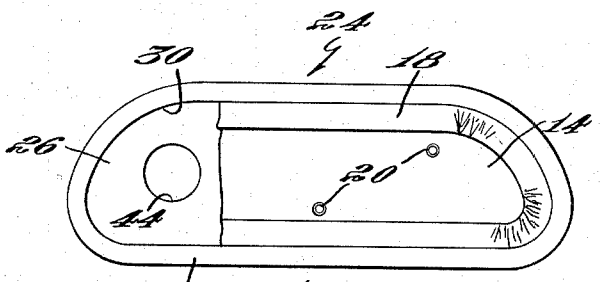


Fig. 2

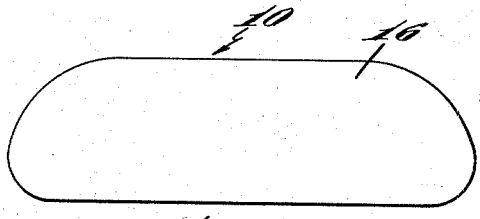


Fig. 1

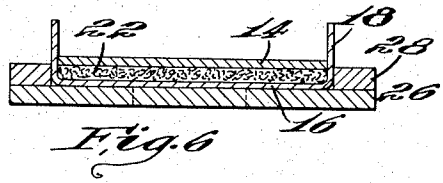


Fig. 6

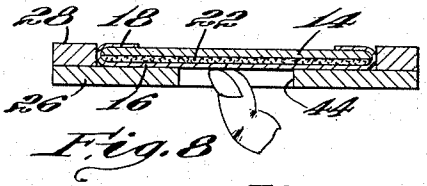


Fig. 8

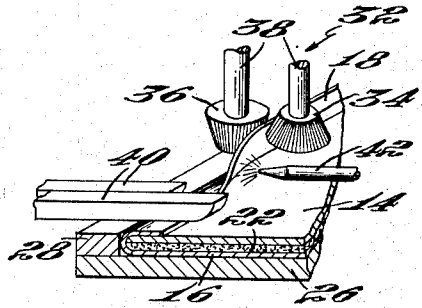


Fig. 7

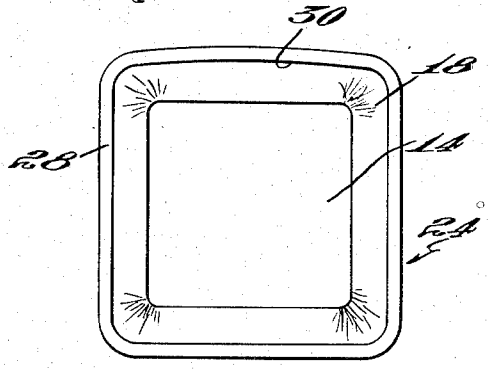


Fig. 3

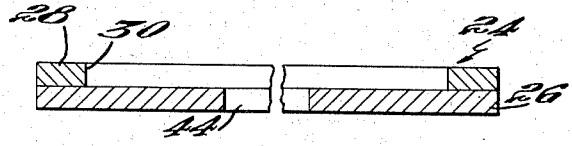


Fig. 5

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METHOD OF APPLYING COVERING MATERIAL TO CUSHIONED PANELS

Jacob Simon Kamborian, West Newton, Mass.

Application September 26, 1950, Serial No. 186,717

10 Claims. (Cl. 154—41)

This invention relates to a method of and apparatus for applying padding and/or a covering or finish ply of pliable sheet material to one side of a relatively rigid back panel or body member and constitutes a continuation-in-part of my pending application for a method of applying flexible covering material to a relatively rigid backing, Serial No. 88,402, filed April 19, 1949, now Patent No. 2,576,121.

There are illustrated in the above-mentioned application several methods of applying the covering material to a rigid panel or backing member but in all instances the ultimate tautness of the covering material over the surface of the panel and about its edges is dependent to a considerable extent upon the original disposition of the forces stretching the material across the panel and around its edges prior to folding the edges and securing them in place. In the aforesaid application, uniformity of stress was sought by attaching the margins at several points located approximately equidistant about the perimeter of the panel and then applying the stressing forces and lasting forces. The principal object of the improved method is to insure a uniform initial stress over the entire area of the covering material in all directions prior to and during the application of the stresses at the edges and the wiping forces so that the resultant product is smooth and unwrinkled in its final appearance and so that there is no tendency for portions of the covering to creep, causing an excess at one or more points.

Accordingly, and as herein illustrated, the cushion sandwiched between the panel and the covering material is operated upon initially by pulling it taut over the backing member and folding its entire marginal edge over the edges of the cushion and into contact with the edges of the backing member and then while holding its entire marginal edge clamped against the perimeter of the backing member, subjecting small areas of the margin progressively to stresses in directions to pull them taut, releasing them and finally subjecting them to wiping forces applied in seriatim to press them into contact with the rear face of the body member. To afford the initial uniformity of stress desired over the entire area and perimeter of the covering material, a holder is provided having a hollow retaining element of substantially the configuration of the panel but of slightly larger overall size into which may be forced the assembly of cushion, backing member and covering material. By forcing the assembly into the holder, the covering is stretched taut, uniformly in all directions and the marginal edges are gripped between it and the perimeter of the backing member. The stressing and wiping instrumentalities include a pair of gripper rolls arranged successively to grip small areas of the margins, pull them taut and then to release them, and wipers located close to the gripper rolls at the discharge side thereof operable to press the released marginal areas into contact with the rear face of the backing member. One of the rolls serves as an abutment with which the holder is held engaged during the pulling and wiping operation to limit movement of the work in the direction of the applied stress and there is means in the form of a nozzle for introducing a quantity of adhesive between the margin and the panel located between the point of release of the gripping rolls and the point of wiping.

The invention will now be described in greater detail with reference to the accompanying drawings wherein:

Fig. 1 is a plan view of a finished covered panel made in accordance with the method described herein as seen from the display side thereof;

Fig. 2 is a plan view of the reverse side of the covered panel shown in Fig. 1, broken away in part to show the holder used in making the panel;

Fig. 3 is a plan view of the reverse side of a differently shaped covered panel prior to removal from the holder;

Fig. 4 is a perspective view of a chair illustrating the use of the panels shown in Figs. 1 to 3 inclusive;

Fig. 5 is a vertical section through a holder used in practicing the method described herein for making covered panels;

Fig. 6 is a vertical section of the holder to smaller scale showing the initial steps in the operation in which the cushion sandwiched between the panel and the covered material is forced into the holder, the covering material being in contact with the bottom of the holder and its marginal edges being folded into engagement with the perimeter of the panel;

Fig. 7 is a fragmentary, isometric view of the stressing and wiping instrumentalities shown operating upon the covering material as held in the holder in the position illustrated in Fig. 6; and

Fig. 8 shows the completed panel after the covering material has been wiped about the perimeter of the panel and adhesively anchored thereto and is ready to be ejected from the holder.

Natural and/or artificial leather and other pliable material is widely used as a covering of parts of furniture and especially for making covered panels for chair bottoms and backs. Such panels covered with decorative material may be constructed and arranged to be removably attached to the article of furniture so that the article of furniture may easily be supplied with a color scheme in accord with the whim of the customer or if the purchaser finds it is desirable to change the decorative scheme of the room in which the furniture is being used it is comparatively simple and inexpensive to replace the panels with a differently covered material or to recover them. Accordingly it is highly desirable to provide a simple and inexpensive method of applying such covering materials to the back panels in such a manner that it is perfectly smooth and unwrinkled throughout its surface area and also at the edges of the panel regardless of the contour thereof.

One instance of the use of such panels is illustrated in Fig. 4 in which a narrow generally elliptical panel **10** is shown attached to the back of a chair C, and a substantially rectangular panel **12** is inserted in the seat portion thereof. The finished panel **10** as shown in Fig. 1, comprises a stiff backing member **14** to which has been applied a smooth covering of flexible material **16**, for example any of the natural or artificial leathers, sheet plastic and/or fabric so that its marginal edge **18** is folded over onto the back side of the backing member as illustrated in Fig. 2 and adhesively secured thereto. Prior to application of the covering to the backing member **14**, the latter, which is made of relatively stiff material, for example plywood, heavy cardboard or sheet metal, may have inserted therein at appropriate places one or more internally threaded grommets **20**, the heads of which lie between the covering material and the backing member and the stems of which penetrate the panel and are accessible from the rear side thereof. The panel thus equipped may then readily be attached to the back of a chair by screws set into the back of the chair so as to engage the threaded grommet. Usually it is desirable to introduce a cushion **22** between the covering material and the backing member in the form of a pad of soft felt-like composition, for example felt, foam rubber, etc., although this is not necessary if the covering material itself has considerable body.

The method of applying the covering and cushion to the backing so as to provide a smooth and uniform appearance is essentially one of holding the covering material uniformly stretched over the entire surface of the backing member with its marginal edges firmly pressed against the perimeter thereof, and while so holding the marginal edges and the material stretched taut over the face of the backing member, pulling the marginal edges taut, wiping them in over the rear surface of

the backing member and adhesively securing them. As illustrated, this is accomplished by providing a holder **24** (Fig. 5) in the form of a rigid plate **26** having a rim **28**, the inner surface of which constitutes a wall **30** having substantially the configuration of the perimeter of the panel to be made and being slightly larger in overall area than the area of the baking. With the foregoing holder an assembly of cushioning material **22** sandwiched between the covering material **16** and the rigid backing member **14** is forced into the holder as shown in Fig. 6 by placing the assembly across the rim **28** and pressing it into the cavity located inside of the rim. Application of pressure to the assembly stretches the covering material uniformly over the entire area of the backing material and simultaneously folds the marginal edges about the edges of the cushion **22** and into engagement with the perimeter of the backing member. The clearance between the perimeter of the backing member **14** and the wall **30** is such that when the assembly is forced into the cavity the marginal edges **18** are squeezed firmly against the perimeter of the backing member with the result that the portion of the covering material resting on the bottom of the holder is held taut across the face of the backing member. The assembly as thus held in the holder is then presented to stretching and wiping instrumentalities **32—34** and **40—40** which pull the marginal edge taut over the perimeter of the backing member and then fold it into contact with the exposed surface thereof. The stretching instrumentalities comprise a pair of frusto-conical gripper rolls **34—36** arranged to rotate about vertical axes on parallel shafts **38** so that their peripheral surfaces grip the margin **18** as it is introduced therebetween, and apply a stress to a small area thereof in a direction to pull it taut, and then release it to the wiping instrumentality. The lower end face of the roll **36** serves as an abutment against which the rim of the holder may be held during the pulling operation, and thus limits the movement of the work in the direction of the applied stress. As illustrated (Fig. 7), the upper surface of the rim **28** has a flat continuous bearing surface which is held against the end face of this roll. Engagement of the rim with the end of the roll **36** not only prevents the roll from taking too deep a bite on the margin of the covering material by limiting the upward movement of the holder but also serves as a guide which assists the operator in manipulating the holder. The wipers **40—40** consist of a pair of wiping blades situated close to the discharge side of the gripper rolls, reciprocable in a substantially horizontal plane at right angles to the axis of rotation of the gripper rolls and operable in seriatim to press the marginal edges as they are released from the gripper rolls into contact with the exposed surface of the backing member.

Between the gripper rolls and the wipers there is located a nozzle **42** through which adhesive may be extruded for entrance between the under side of the marginal edge and the backing member so that when the edge is pressed into engagement with the backing members it will be adhesively secured thereto.

The depth of the cavity in the holder is substantially equal to the thickness of the finished panel after the covering material has been applied and adhesively secured thereto. During application of the covering the assembly is pressed into the cavity sufficiently tightly to compress the cushion material somewhat. Hence when the panel is completed, the natural resilience of the cushioning material tends to plumb the covering material and hold it smooth and taut.

The holder **24** is preferably provided in its bottom with an opening **44** inwardly of its rim through which the thumb of the operator or some instrumentality may be introduced to eject the finished panel from the holder.

While as herein illustrated, the application of the covering material to a backing member is applied to the upholstery of chairs, it is evident that it is equally useful for application of covering material to backing members for any other purposes and that the method involved has the special advantage over prior methods of initially holding the material taut and retaining the tautness over the entire surface of the backing member and its perimeter during the folding and securing of the marginal edges to the reverse side thereof.

It should be understood that the present disclosure is for the purpose of illustration only and that this invention includes all modifications and equivalents which fall within the scope of the appended claims.

I claim:

1. A method of making cushioned panels comprising assembling a stiff backing member and covering material of larger area, surface to surface, with the backing member centrally located on the covering material so that the margin of the covering material projects substantially uniformly from the edges of the backing peripherally thereof, applying tension to the covering symmetrically with respect to the geometric center thereof initially to draw the covering uniformly taut over the peripheral edge of the backing, bending the marginal portion of the taut covering material against the peripheral edge of the backing, applying pressure thereto to hold the covering uniformly taut and while the covering is so held, seizing a narrow area of the marginal edge of the covering material and applying a stress thereto in a direction to stretch it over the edge of the backing member, releasing the stretched area and concomitantly wiping the released stretched area into contact with the exposed surface of the backing member, said seizing, stretching, releasing and wiping being carried out on successive narrow areas, progressively and uninterruptedly around the entire perimeter of the backing member.

2. A method of making cushioned panels according to claim 1 wherein a cushion layer is interposed between the stiff backing member and the covering material, the cushioning material being coextensive in area with the backing member.

3. A method of making cushioned panels according to claim 1 wherein pressure is applied to hold the marginal portion of the covering material against the edges of the backing member, said pressure being applied with sufficient intensity to hold the covering taut but to yield the material to a stress applied perpendicular to the plane of the member in a direction to increase the tautness.

4. A method of making cushioned panels according to claim 1 wherein the wiping forces are applied inwardly parallel to the surface of the backing member.

5. A method of covering cushioned panels according to claim 1 wherein adhesive is introduced between the stretched margin and the exposed surface of the backing member.

6. A method of making cushioned panels according to claim 1 wherein the operation starts with seizing the marginal material and is carried out progressively from the starting point and in the order named around the entire perimeter of the backing member.

7. A method of making cushioned panels comprising providing a holder with a cavity corresponding in area and configuration to the panel to be made, assembling a cushion between a backing member and covering material, placing the assembly in the cavity covering side inmost, so as to bend the marginal edges of the covering material over the edges of the cushion and backing member and temporarily to anchor the entire marginal edge to the backing member, and then progressively seizing small areas of the projecting margin, stretching them to pull the covering taut about the edge of the backing member, releasing them and concomitantly applying wiping forces thereto in seriatim until the entire marginal edge of the covering is wiped in over the backing member.

8. A method of covering cushioned panels comprising providing a holder having a supporting surface on which an assembly of a cushion material sandwiched between a backing member and a covering material may be placed and continuous walls for holding the marginal edge of the covering bent over the edge of the cushion and the edge of the backing member so as to be held thereagainst around the entire perimeter with a portion thereof extending beyond the exposed surface of the backing member, seizing a narrow area of the margin and applying a stress thereto in a direction to stretch it over the edge of the backing member, releasing the stretched area and concomitantly wiping the released stressed area into contact with the exposed surface of the backing member, said gripping, stretching, releasing and wiping being carried out progressively and continuously around the entire perimeter of the backing member.

9. A method of making cushioned panels according to claim 1 wherein compressive pressure is applied perpendicular to the plane of the panel during the application of the stress to the margin.

10. A method of making cushioned panels comprising, providing a holder with a cavity bordered by a rim having a continuous uninterrupted flat bearing surface, said cavity corresponding in area and configuration to the panel to be made, assembling a foundation board and covering material face to face with the marginal edge of the covering material extending beyond the edge of the foundation board, placing the assembly in the cavity with the covering material innermost and pressing the assembly thereinto so as to bend the projecting marginal edge of the covering material over the edge of the foundation board, thereby temporarily to anchor the entire marginal edge of the covering material against the edge of the foundation board, applying stresses to successive small areas of the projecting margin progressively about the entire edge of the foundation board with drafting rolls adapted to grip the margin therebetween and to apply stresses substantially perpendicular to the plane of the foundation board and simultaneously to traverse the margin therebetween, supporting the holder with the flat bearing surface of the rim against one of the rolls throughout application of the stress to the margin, to guide and resist upward displacement of the holder, and wiping the stressed areas of the margin as they leave the stress applying rolls into overlapping contact with the exposed side of the foundation material by applying wiping stresses to the released areas substantially parallel to the exposed surface and in seriatim.

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