April 30, 1935. H. J. WOODALL 1,999,383

TRIM PANEL AND PROCESS OF FABRICATING SAME

Filed Nov. 18, 1933

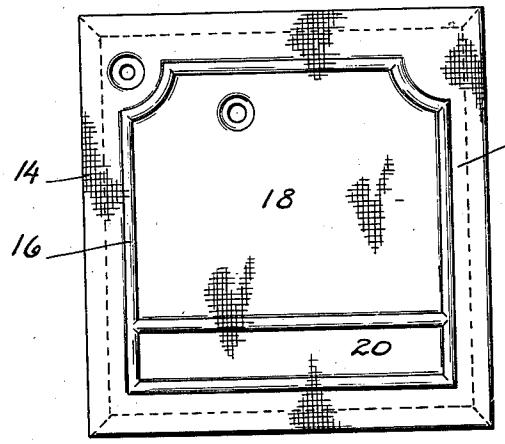
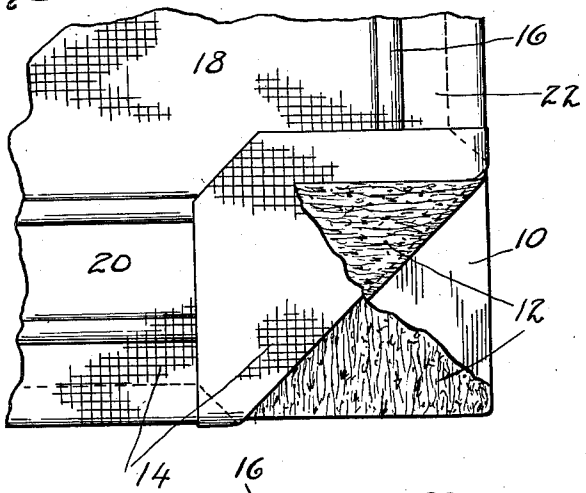


Fig. 1

Fig. 2



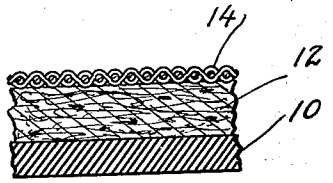


Fig. 3

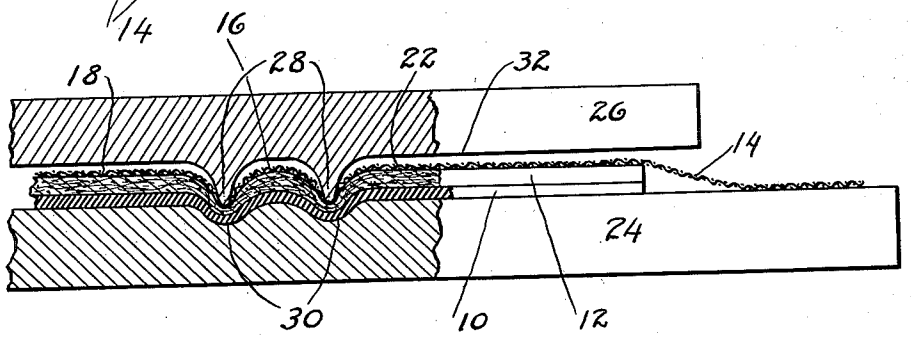


Fig. 4

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TRIM PANEL AND PROCESS OF FABRICATING SAME

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22 Claims. (Cl. 154—2)

My invention relates to an improved trim panel or the like and to improvements in the process of fabricating such panels.

An object is to provide a trim panel which possesses substantially the structure and the appearance of an expensive padded upholstered panel but which is inexpensive, which is capable of being formed at a single stamping operation, which is a unitary homogenous fibrous construction, which is rigid and self-supporting and which has a pleasing and attractive padded appearance.

My improvement is illustrated as embodied in a trim panel such as is used in the interior of automobile bodies. In the fabrication of such upholstered trim panels it has heretofore been common practice to secure suitable upholstery cloth over a foundation board and to provide suitable wadding between the board and the cloth. To form beads and risers the cloth was stitched to the board through the wadding providing, between spaced lines of stitching, elevated padded portions.

Such a method of fabrication was expensive. The stitching weakened the panel board. The stitch apertures provided points for entrance of moisture into the board.

My improved panel is cheap; it is easily formed; it is a sturdy integral structure; it comprises a complete fibrous unit; it has a rich upholstered appearance.

Various other objects, advantages, and characteristics of my invention will more fully appear from the following description, appended claims, and accompanying drawing, wherein:

Figure 1 is a plan of a panel embodying my invention,

Figure 2 is a fragment of the same panel with portions of the laminations turned back,

Figure 3 is a cross sectional view through my improved panel prior to stamping, and

Figure 4 is a diagrammatic illustration showing the stamping of my panel.

In the fabrication of my improved panel I employ composition fibrous material. A portion of the thickness of the material is relatively rigid, dense, and self-supporting composition fibrous stock. This thickness supports a normally greater thickness of loosely integrated, compressible, non rigid, non self-supporting fibrous stock. The fibrous material comprises cellulose fibers or the like held together by a suitable thermoplastic binder.

I prefer to employ a foundation board which may be of any suitable composition fibrous material. Many are known to the industry. I prefer to employ a fiber board which possesses thermoplastic characteristics. Such fiber boards are on the market and comprise cellulose fibers held together by suitable binding agents. A commercial product is one known as "K B" which is formed of cellulose fibers held together by an asphaltum compound. This type of board is responsive to heat and pressure to assume and permanently retain a deformed shape.

In the drawing this foundation board is indicated as 10. A layer or lamination 12 of loosely integrated, compressible, fibrous wadding possessing thermoplastic characteristics is then spread over one surface of the board. The foundation board is of course normally rigid and self-supporting. The wadding is of such a loosely integrated character that it is not self-supporting. I adhesively secure the wadding by rubber cement, a suitable latex compound, or other suitable adhesive, to the panel board.

A suitable wadding is one formed of a multiplicity of film like paper stock laminations held together by a suitable binder, such as an asphalt compound. Binder particles are scattered throughout the cellulose fibers of the film like paper laminations securing the laminations together to form the layer of wadding. This wadding material is relatively inexpensive. It is soft and easily compressible. Under a predetermined pressure it may be compacted and densified and due to the material cohesion of the binder particles it will retain such densified and compacted form.

Over the wadding I adhesively secure a covering 14 of upholstery fabric or the like. The upholstery cloth may be folded over the edge of the wadding and the panel board and onto the back of the board and adhesively secured thereagainst.

A composite panel comprising the lamination of a self-supporting panel board, the layer of compressible fibrous wadding, and the upholstery cloth is then placed in a die and stamped with the desired configuration. A configuration such as shown in Figure 1 is illustrative. The covered surface presents a bead 16 which defines the broad central elevated area 18. A lower elevated area 20 is also outlined by the bead and there is a marginal portion 22 of elevated wadding. Obviously the appearance may be arranged as desired. The uncompressed areas are outlined by the lines of compression along the bead 16.

The mechanism wherein the composite panel is shaped is so formed that pressure is exerted on the composite panel only along selected lines,

such as along the line of the bead formation, which outline the uncompressed areas of the panel. As the wadding is compacted throughout these selected areas the thermoplastic particles loosely scattered through it are brought into cohesion and the wadding is permanently densified along these areas. The wadding in its densification carries the covering material with it. Due to the adhesion of the covering material, the complete panel presents the upholstered appearance illustrated without the employment of stitching or any other securing means.

To obtain this effect the die mechanism is relieved so that it exerts its pressure upon the composite panel only along these selected areas. At other places the force does not act upon and compress the wadding material. The wadding is therefore compressed only along the selected areas outlining the uncompressed portions to hold the covering material to the panel board.

In Figure 4 a die member is indicated at **24** and a force at **26**. These indications are diagrammatic. Die and force members are well known. Suitable means would be provided for heating such members. This is not here shown. Portions **28** are adapted to compress the panel into cooperating grooves **30**. The die is illustrated as relieved elsewhere as at **32** so as not to compressively contact the panel at points other than **28**. Due to the compression being exerted on the panel only along the edges of the bead the laminated structure is stretched as it were over the elevated interior expanse so that it presents a smooth continuous surface without wrinkles or irregularities.

What I claim is:

1. A laminated panel including a self-supporting lamination of dense fibrous composition material responsive to heat and pressure to assume and retain a deformed shape and a non self-supporting lamination of soft fibrous cushioning material responsive to heat and pressure to assume and retain a deformed shape.

2. A laminated panel having a portion of its thickness adjacent to one face formed of relatively dense thermoplastic fibrous material and having another portion of its thickness adjacent the opposite face formed of relatively loosely integrated feathery resilient fibrous thermoplastic material.

3. A laminated panel comprising a foundation lamination, a layer of soft downy, resilient wadding secured thereto, said wadding provided with adhesive particles arranged therein and responsive to a predetermined compression of the wadding to hold the same to its compressed shape.

4. An upholstery panel comprising a self-supporting foundation board, a non-self-supporting layer of resilient, downy, fibrous wadding posessing themoplastic characteristics adhesively secured to the board, covering material adhesively secured to said wadding, said wadding being compacted along a line outlining an uncompressed area thereof holding the covering material toward the foundation board along said line.

5. That process of fabricating a trim panel which includes securing a non self-supporting layer of soft compressible fibrous material possessing thermoplastic characteristics to a self-supporting lamination of dense fibrous material possessing thermoplastic characteristics, and shaping said laminated structure under heat and pressure applied thereto.

6. That process of fabricating an upholstery panel including a dense self-supporting fibrous lamination and a soft compressible non self-supporting layer of thermoplastic wadding secured thereto which comprises subjecting the composite structure to a stamping operation wherein uncompressed areas are outlined by areas of compression along which the layer of wadding is compacted against the self-supporting lamination.

7. That process of fabricating a trim panel comprising providing a structure consisting of a lamination of self-supporting material, a lamination of non self-supporting wadding having thermoplastic characteristics and covering material over the wadding, and subjecting said composite structure to a stamping operation where the wadding is compacted only along the area outlining an uncompressed area thereof.

8. That process of fabricating a trim panel comprising providing a structure consisting of a lamination of self-supporting material, a lamination of non-self-supporting wadding having thermoplastic characteristics and covering material over the wadding, and subjecting said composite structure to a stamping operation between cooperating die members fashioned to compact the wadding along a line outlining an uncompressed area over which the die members are relieved so as not to compress the wadding.

9. A laminated panel comprising a self-supporting lamination of thermoplastic material, a non self-supporting lamination of soft resilient, cushion like wadding secured thereto possessing thermoplastic characteristics, covering material secured over the wadding, said laminated panel being compacted along a selected area wherein the wadding is permanently densified.

10. A laminated panel comprising a surface lamination of durable protective fibrous composition material, a loosely integrated lamination of soft spongy resilient fibrous material, each lamination characterized in that it is responsive to heat and pressure to assume and permanently retain a deformed shape, and covering material extending over said cushioning material.

11. A laminated structure comprising a lamination of fibrous composition protective material, a layer of resilient fibrous wadding adhesively secured thereto, said wadding responsive under predetermined compression to retain its compressed shape and having predetermined selected areas compacted and densified.

12. A laminated structure comprising an internal lamination of loosely integrated resilient fibrous wadding possessing thermoplastic characteristics arranged between two external laminations of protective material, said internal lamination being compacted and densified throughout a predetermined selected area holding one external lamination toward the other lamination throughout the said area.

13. A laminated structure comprising an internal lamination of resilient feathery fibrous material having thermoplastic particles scattered therethrough, external laminations of protective material arranged on opposite sides of said internal lamination, said internal lamination being compacted and densified along a line surrounding an uncompressed area thereof holding one external protective lamination toward the other along said line surrounding said area.

14. A laminated structure comprising an internal resilient cushion like lamination consisting of a plurality of filmy web-like fibrous layers loosely

integrated and having thermoplastic characteristics, external laminations of protective material arranged on opposite sides of said internal lamination, said internal lamination being compacted and densified along a line surrounding an uncompressed area thereof holding one external protective lamination toward the other external protective lamination along said line.

15. A laminated structure comprising an internal resilient lamination consisting of a plurality of filmy fibrous layers loosely integrated together and carrying asphaltum particles and arranged between two protective laminations, at least one protective lamination being formed of asphalt carrying fibrous material, said internal lamination being compacted and densified throughout the selected area holding the two protective laminations toward each other throughout said area.

16. A laminated structure comprising an internal resilient downy fibrous lamination having asphaltum particles scattered therethrough, two outer protective laminations arranged on opposite sides of said internal lamination and secured together at their edges completely enclosing said internal lamination, at least one of said protective laminations of fibrous material being rendered substantially waterproof by asphalt impregnation.

17. A laminated water resistant cushion pad structure comprising an internal resilient cushion like lamination formed of a plurality of web tissue like fibrous layers loosely integrated together and carrying water resistant binder particles scattered therethrough, and two outer protective fibrous laminations adhesively secured together at their edges enclosing said internal lamination.

18. An integral panel structure comprising a thickness of rigid self-supporting fibrous material supporting a surface thickness of non self-supporting springy feathery fibrous material, said surface thickness characterized in that it is responsive to heat and pressure to assume and permanently retain a deformed shape, and is compacted at spaced apart points against said supporting lamination.

19. A laminated panel comprising a fibrous thermoplastic protective lamination and a lamination of soft fluffy fibrous asphalt impregnated wadding-like material.

20. A laminated structure comprising a layer of fibrous protective water resistant material and a layer of fluffy fibrous asphalt impregnated wadding-like material.

21. A laminated structure including a layer of flexible protective material and a layer of fluffy fibrous loosely integrated asphalt impregnated wadding-like material.

22. The invention defined in claim 17 characterized in that at least one of said outer protective laminations is water resistant.

HERBERT J. WOODALL.