

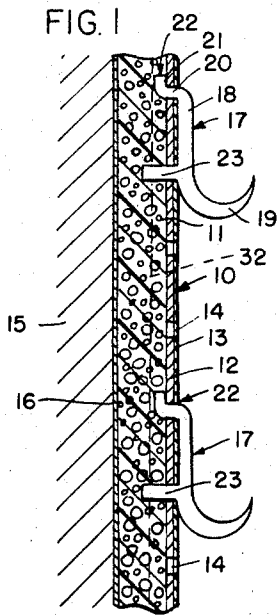
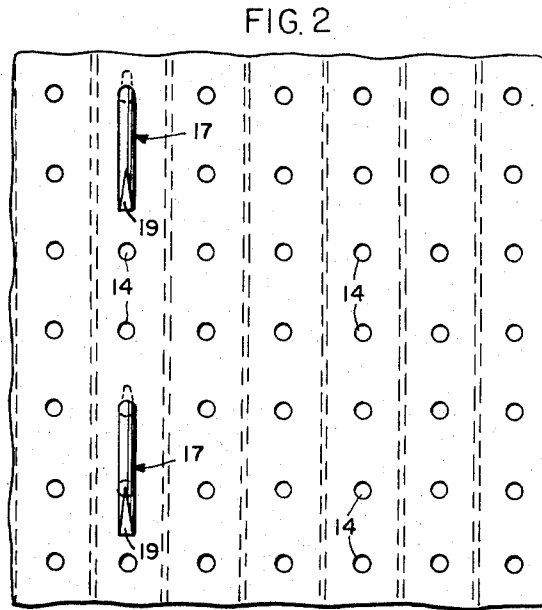
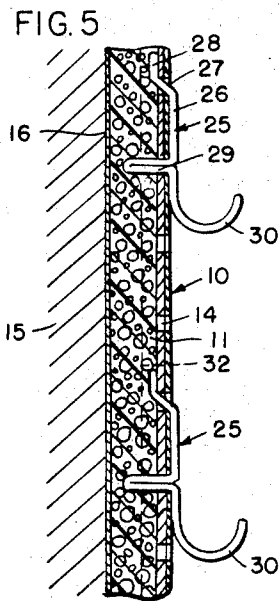
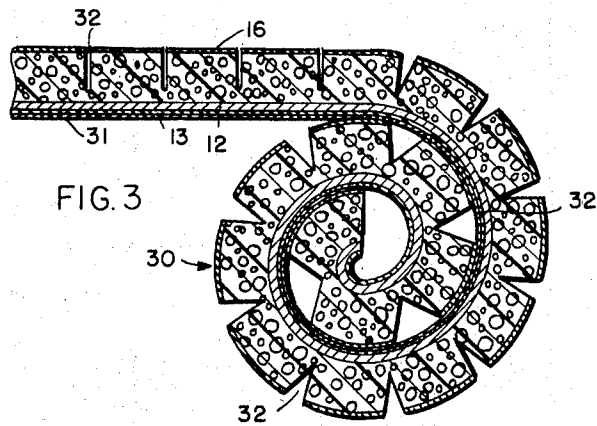
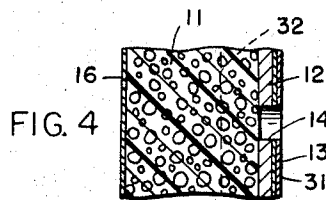
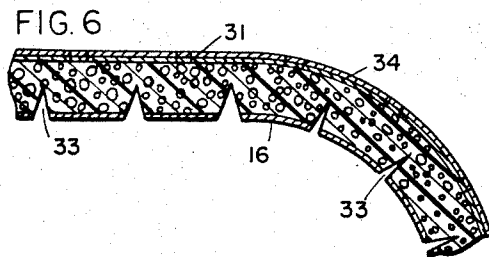
Feb. 4, 1969

G. W. WILLITS, JR

3,425,889

FLEXIBLE, MULTILAYER PANELS OR STRIPS

Filed April 20, 1964



INVENTOR:
GEORGE W. WILLITS, JR.

BY

Margell, Johnston, Cook & Root

ATT'YS

1

3,425,889

FLEXIBLE, MULTILAYER PANELS OR STRIPS
George W. Willits, Jr., Glen Ellyn, Ill., assignor to Selfix, Inc., a corporation of Illinois

Filed Apr. 20, 1964, Ser. No. 361,006

U.S. Cl. 161—43

4 Claims

Int. Cl. B32b 5/18, 3/10, 3/26

ABSTRACT OF THE DISCLOSURE

A flexible multilayer panel or strip including a core of semi-rigid cellular foam, a covering having openings therein for receiving supporting elements and a layer of adhesive on the opposite surface of said foam for securing the panel or strip to a support.

This invention, in general, relates to flexible multilayer panels or strips structurally adapted to serve as display, storage or similar members. More particularly, these panels or strips have a perforated outer face for receiving support pins and/or hooks and like projections on the base portions of hooks, brackets, rods, shelves and like supporting members. They, furthermore, are lightweight, flexible, multilayer panels or strips of the aforesaid character wherein said panels or strips are adapted to be coiled into convenient coils for shipping and merchandising and thereafter ultimately uncoiled when applied to a wall surface or the like.

Hardboard or fiberboard with uniformly spaced perforations are widely used as support sheets for hanging or otherwise supporting on hooks, rods, etc., many types of articles either for storage or for display purposes. This perforated hardboard or fiberboard, however, suffers several disadvantages in areas of convenience and ease of marketing and shipping, for example. Perforated hardboard or fiberboard is rigid and, hence, is commonly sold in flat sheets. It is, furthermore, very dense material, and heavy (approximately 0.7 lb. per sq. ft. of 1/8" thick material) comparatively speaking, and awkward to handle in large sheets, all factors which add materially to the sales price due to handling and shipping costs.

Another disadvantage of these rigid, perforated boards is that they must be applied to a wall or other supporting surface with spacer members between the wall or surface and the rear face of the board to allow space for the pins, hooks and/or like projections of the supporting hardware to extend through perforations and hook behind the perforated board. Furthermore, because of the aforesaid disadvantages of the hardboard or fiberboard sheets, the product is not easily saleable through many kinds of retail outlets, e.g., food supermarkets and grocery stores, retail drug stores and the like.

This invention provides a new type of perforated members which are lightweight and sufficiently flexible so that the panels or strips thereof can be coiled during the shipping and marketing thereof. Another advantage of the flexible, perforated panels or strips of this invention is that they can be applied directly on a flat wall or other surface, a curved wall or other surface or around the corner of two walls and can be attached directly to the wall or surface.

It is, therefore, a primary object of the invention to provide new and advantageous flexible, perforated panels or strips structurally adapted to serve as display, storage or similar members. A further object of the invention is to provide lightweight, flexible panels or strips having

2

an outer face which is perforated for receiving pins, hooks and/or like projections on the bases of hooks, rods, brackets or like supporting members adapted to be attached removably to and supported on said flexible panels or strips.

Still another object of the invention is to provide multilayer panels or strips embodying as a layer thereof a cellular foam, synthetic polymer having on a face of said layer a thin sheet of a perforated material having sufficient structural strength at the perforations to support weighted hooks, brackets, rods and like supporting members having on the bases thereof hooks, pins or studs and/or like members extending through the perforations and into the cellular, foam layer.

Another important object of the invention is to provide flexible, perforated panels or strips which can be coiled for shipment and marketing.

Another object of the invention is to provide panels or strips of the aforesaid character which can be applied directly to a wall or other surface.

A more specific object is to provide flexible panels or strips of the aforesaid character embodying a layer of adhesive on the rear face thereof whereby the panel or strip can be directly, adhesively secured on a wall or other surface.

The foregoing and numerous other important objects, advantages, and inherent functions of the invention will become apparent as the same is more fully understood from the following description, which, taken in connection with the accompanying drawings, discloses preferred embodiments of the invention.

In the drawings:

FIG. 1 represents a transverse section through a flexible panel applied adhesively on a wall;

FIG. 2 represents a front elevation of said flexible panel;

FIG. 3 represents a longitudinal section of said flexible panel in coiled form;

FIG. 4 is an enlarged, fragmentary, vertical section in a plane through perforations in front face of said panel;

FIG. 5 is a section similar to FIG. 1 showing a different type of hook member mounted in the panel; and

FIG. 6 represents a longitudinal section of a fragment of another embodiment of flexible, perforated panel.

Referring to the drawings, there is shown a flexible, multilayer panel or strip 10 structurally adapted to serve as display, storage or similar panel. The multilayer panel 10 comprises a sheet or strip 11 of a cellular, foamed synthetic polymer or resin. This cellular sheet or strip constitutes the thickest layer of the flexible panel. Its thickness is in the order of 3/16" to 1/2". In order to accommodate commonly available hooks, rods and brackets, however, thickness of the cellular layer over or under the aforesaid approximate dimensions may be employed when special hooks, rods or brackets are used. The cellular foam material is lightweight. It may comprise a cellular, foamed polyurethane which is semirigid, i.e., a polyurethane foam having an essentially nonelastic quality but having sufficient flexibility about the transverse axes to permit the foam sheet or strip to bend so that it can be coiled, cellular, expanded polyvinyl resins, cellular, expanded cellulosic compounds, etc. Most preferably, the cellular foamed sheet or strip 11 comprises an expanded polystyrene foam of a semirigid character, i.e., having the qualities aforescribed with respect to the polyurethane.

The outer face of the strip or sheet 11 may have applied thereto a perforated sheet or layer. In the illustrated embodiment, this layer comprises a sheet or strip 12 of heavy paperboard, kraft paper, jute board or sulfate paper which has sufficient flexibility about the transverse axes to bend when the panel or strip is coiled. The grain of the paper preferably is oriented so that the layer 12 bends relatively easily about the transverse axes. The layer 12 is bonded to the cellular foam layer 11 by adhesive or other suitable bonding means.

The outer face of the layer 12 is covered with a sheet or strip of a flexible, aesthetically attractive material having good antireep and tear-resistant properties. Such materials may be woven Fiberglas, epoxy resin-impregnated textile fabric (woven, knitted or matted), synthetic polymer resin sheets, such as polyvinyl chloride, polystyrene, polypropylene, etc., or flexible, thin metal sheet or foil, such as steel or aluminum sheet or foil. This outer layer 13 constitutes the visible face of the flexible panels or strips when they are applied to a supporting surface.

The flexible panels or strips 10 can be applied to a wall or other surface by any suitable means, including nails, pins, screws, bolts, or the like. It is preferred, however, to apply the panels or strips 10 to a wall or other surface 15 by means of a layer of adhesive 16 applied over the rear face of the panel or strip 11. The adhesive, which is preferably a water-soluble adhesive, provides a very strong bond, and the panel can be applied without auxiliary hardware by simply wetting the adhesive and pressing the flexible panel or strip 10 against the wall or other surface 15.

The fibrous sheet or strip 12 of paperboard, kraft paper, jute board, sulfate paper, or the like has a thickness in the order of 5 to 30 mils depending on the strength or rigidity desired. The outer layer 13 may be of any thickness suitable to support weight applied to the hooks, rods or brackets so long as the flexibility thereof is maintained in sufficient degree that it does not interfere with the coiling of the panel or strip 10. It is also contemplated that the paper layer 12 may be omitted, in which case the outer layer 13 should be of adequate thickness to provide the desired strength at the perforations to support, without tearing or substantial distortion of the perforations, the aforesaid hooks, rods, brackets, etc., with articles hung or supported thereon. A thickness of the layer 13, in this case, in the order of at least about 20 mils is usually adequate. The perforations 14 may be provided in the layers 12 and 13 prior to application thereof to the cellular, foam sheet 11. Alternatively, the perforations may be made in the layer 12 and 13 after the layers have been applied as an unbroken sheet to the cellular, foam layer 11. Ordinarily, the foam layer 11 is not perforated, at least not to any substantial degree. When the hooks, etc., are inserted into the perforations by the user, the foam layer 11 has sufficient penetrability so that the hooks, pins, or like projections extending through the perforations 14 penetrate the layer 11. The layer 11 thus functions as a spacer member spacing the surface 13 from the wall 15 a sufficient amount to allow penetration of the supporting pins, hooks, etc. of the hardware to be properly positioned on the flexible strip or panel 10.

FIGURE 1 shows one type of hardware which may be removably secured on the strip or panel 10. For purposes of describing this invention, the term "hardware" shall include members made of metal, plastic, or any other material having the desired strength characteristics. The hardware shown in FIGURE 1 is a plastic hook 17 having a vertical, base shank 18 adapted to lie flat against the outer face of the layer 13. The base shank 18 has at its lower end a hook portion 19. The hook portion 19, however, is shown only for sake of illustration and may be, instead, an outwardly projecting rod extending outwardly from any segment of the shank 18, a bracket, or any other like supporting structure.

The hardware has at the upper end of the shank 18 a

hook portion 22 composed of a pin or rod segment 20 extending substantially at right angles to the shank 18. This rod 20 is of a length sufficient so that the rod 20 extends through the layers 12 and 13. At the inner end of the rod 20 there is formed a hook segment 21 adapted to lie against the rear face of the layer 12. Near the lower end of the shank 18 there is a pin or stud 23 extending at right angles to the base shank 18. This pin or stud 23 penetrates the layer 11. The hardware is inserted by first extending hook portion 21 through an aperture 14 until it has penetrated to the point of junction between the segments 20 and 21, and the hook portion is then rotated downwardly so that the hook portion 21 lies behind the rear surface of the layer 12 and the stud or pin 23 penetrates another, usually the next adjacent, aperture 14 and the foam cellular material therebehind. The hook is fully inserted when it has reached the position illustrated in FIGURE 1.

The hardware shown in the embodiment of FIGURE 5 comprises bent wire hardware. The specific hardware illustrated comprises a bent wire hook 25 comprising a base shank 26 having an offset wire segment 27 at the upper end thereof which terminates in a hook end 28 extending substantially parallel to the base shank 26 and offset a distance corresponding substantially to the thickness of the layers 12 and 13. The hook end 28 lies immediately behind the rear surfaces of the layer 12 when the hook is in fully inserted position as shown in FIGURE 5.

The hook 25 further comprises a stud or pin portion near the bottom of the shank 26. This pin or stud portion is formed by a tight, reverse bend in the wire used to form the hook. The lower end of the shank 25 has a bent portion forming the hook 30.

The hook 25 is inserted into the panel substantially in the same manner as described heretofore with respect to the hook 17. The hooks 21 and 28 lie behind the layer 12 and thus prevent the hook from being pulled out of the structure when a weight is hung on the hook members 19 and 30, respectively. The lower pin or stud members 23 and 29 are the primary weight bearing members.

In the illustrated embodiments, the perforations 14 are spaced equidistant whereby the respective hooks and pins or studs of the hardware pieces are inserted in contiguous perforations. It is within the contemplation of the invention, however, that the pins or studs and the hooks may be utilized on longer base shank portions so that they extend into apertures spaced apart by one or more intermediary apertures, i.e., by using a longer shank on the hardware structure.

The panels of the invention are relatively rigid and the foam material, as aforesaid, is of a semirigid character. One of the main advantages of the panels of the instant invention is that they can be coiled for shipment and merchandising and are thus more conveniently handled than the rigid hardboard or fiberboard heretofore discussed. In order to improve the flexibility and permit a tighter coiling of the panels of the invention, the rear face of the layer 11 is provided with narrow, transverse slits 32 (FIG. 3) which allow the layer to be more flexible and thereby more readily coiled into a coil 30 as shown in FIGURE 3. If desired, a release coating 31, e.g., a silicone or like material may be applied over the face of layer 13 so that the adhesive layer 16 does not accidentally become stuck to the front face of the layer 13 when the strip or panel is coiled. In the embodiment shown in FIGURE 3, the narrow slits become wider as the strip or panel becomes more tightly coiled as shown in the illustrated embodiment.

In FIGURE 6, the structure is essentially the same except that the slits are V-shaped slits in the normal flat position instead of a narrow elongated slit. The transverse V-shaped slits 33 are utilized when the rear face becomes the inner radius of the coil, and they narrow or close when the panel member 10 is coiled. The outer face of this

embodiment is a perforated, single layer 34 of plastic film, fabric, metal sheet or foil of the character previously described.

The invention is hereby claimed as follows:

1. A panel adapted to be mounted on a wall for the storage or display of articles and adapted to receive support elements for supporting the articles, said panel comprising a sheet of semirigid, cellular, foamed synthetic polymer, a cover layer of flexible fibrous material adhesively secured to the front side of said sheet, a layer of activatable adhesive secured to the back side of said sheet, and a plurality of opening in said cover layer spaced apart in a predetermined pattern of discrete locations for co-acting with said sheet for receiving and mounting only at said discrete locations the support elements on said panel.

2. A panel as defined in claim 1, and a plurality of parallel extending slits in the back side of said sheet rendering said panel flexible for coiling.

3. A panel as defined in claim 2, and an outer layer of flexible aesthetically attractive material secured over said cover layer having openings aligning with the cover layer openings.

4. A panel as defined in claim 2, wherein each said support element includes an upper hook member and a lower stud member for extending into respective openings

in said cover layer and penetrating into said cellular polymer sheet.

References Cited

UNITED STATES PATENTS

2,962,407	11/1960	Aykanian.	
3,016,317	1/1962	Brunner	161—121 X
3,171,544	3/1965	Unsworth	248—223 X
3,173,826	3/1965	Campbell et al.	
3,211,293	10/1965	Tarnoff	248—223 X
3,235,218	2/1966	Graham	248—225
2,663,527	12/1953	Joslyn	161—103 XR
2,785,739	3/1957	McGregor et al.	
3,042,562	7/1962	Peterson	161—123 XR
3,222,697	12/1965	Scheermesser	161—123 XR

FOREIGN PATENTS

1,192,889 4/1959 France.

20 JACOB H. STEINBERG, *Primary Examiner*.

WILLIAM A. POWELL, *Assistant Examiner*.

U.S. Cl. X.R.

25 161—48, 113, 117, 123, 159, 167; 156—305; 248—223