Jan. 24, 1967 W. M. SWARTZ 3,300,367

ADVERTISING DISPLAY

Filed April 29, 1964

FIG. 1

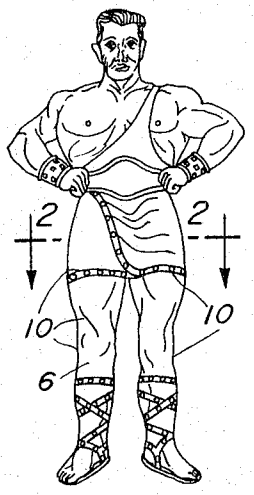


FIG. 2

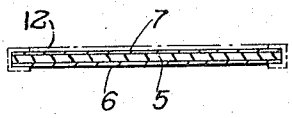


FIG. 4

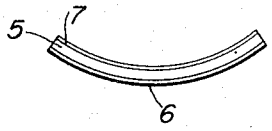
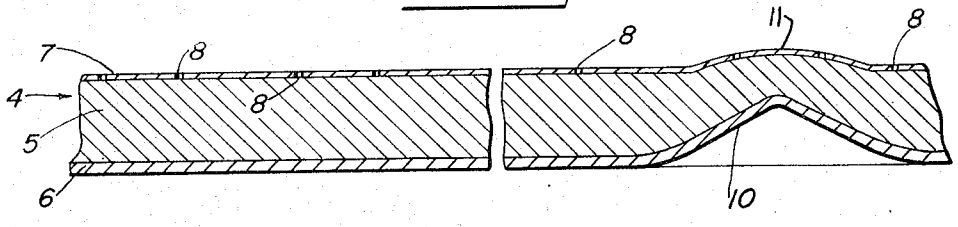


FIG. 3



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ADVERTISING DISPLAY

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7 Claims. (Cl. 161—113)

This invention relates to displays, such as are used, for instance, in advertising, wherein the surface of a flat sheet like material is appropriately treated so that the desired effects are produced when the sheet is supported in a curved or flexed position.

In the interest of economy, the construction of the display must be such as to permit it to be shipped flat and must be such that the ultimate user of the display can, with a minimum of time and effort, impart the desired contouring to the display and be assured that the display will maintain its contoured condition.

It is one of the objects of the present invention to provide a display having the above mentioned characteristics and which does not require special bracing or other equipment for maintaining the display in its flexed or contoured condition.

In accordance with the principles of the present invention, the display is made of one or more sheets of paper board, chip board, with metal foil, such as aluminum foil, laminated over the opposite surfaces thereof. Both surfacing sheets of foil are quite thin but one is thicker than the other. The thicker sheet is a vapor barrier, being sufficiently thick for that purpose. The other foil sheet is not a vapor barrier. It has distributed pin holes therethrough preferably sufficiently small as not to be noticeable by the naked eye and yet sufficiently large and sufficiently numerous that that foil sheet is pervious to moisture vapor. The paper board between the foil laminations has a comparatively high moisture content at the time the display is set up in its appropriately flexed condition. The subsequent drying is all from only one surface of the sheet, namely that surface which is covered by the perforated foil. The resulting shrinkage of the paper board is therefore first at that surface. This produces controlled warping. The flexing of the display sheet is purposely made in such direction that the subsequent warping upon drying of the sheet accentuates the previously imparted flexing.

The attainment of the above and further objects of the present invention will be apparent from the following specification taken in conjunction with the accompanying drawing forming a part thereof:

In the drawing:

FIG. 1 is a front view of an advertising display in its flat form as it is shipped to the customer;

FIG. 2 is a section taken along line 2—2 of FIG. 1 and enlarged as to thickness of facilitate illustration;

FIG. 3 is an enlargement of a portion of FIG. 2 to further illustrate the construction; and

FIG. 4 is a top plan view of the display after the display has been curved and set up in position.

Reference may now be had more particularly to the drawing wherein like reference numerals designate like parts.

The display is made of a laminated sheet 4 comprising a paper chip board sheet 5 to one side of which is laminated a sheet of aluminum foil 6 and to the opposite side of which is laminated a sheet of aluminum foil 7, both aluminum sheets covering the respective surfaces of the sheet 5. The paper chip board, at the time of lamination, contains an appreciable amount of moisture, although it is sufficiently dry to be self-sustaining and so that the moisture content is not noticeable by the average person. The aluminum foil 6 is imperforate so that it constitutes a vapor barrier completely covering one surface of the chip board. It may be of any desired thickness consistent with its imperviousness to moisture. A preferred thickness is of the order of 0.001 inch. The foil 7 completely covers the opposite surface of the chip board and is laminated thereto. This foil is intentionally made so that it is pervious to water vapor. It is preferably made as thin as possible. In one embodiment this foil is of the thickness of 0.00035 inch. Aluminum foil of this thinness, in commercial forms, contains large numbers of promiscuously distributed minute holes 8, smaller than pin holes. These minute holes are so small as not to be discernable by the naked eye, yet they permit the passage of water vapor therethrough so that this foil is not a vapor barrier. While the minute holes in the aluminum foil 7 are generally objectionable for other uses of the foil, those holes are desirbale in the present use of the foil and if equally thin (or thicker) foil is used which is made by a process that obviates the pin holes, that foil must be formed with minute holes before it is used as a laminate in the present structure. The paper chip board 5 is of a thickness of the order of 0.024 inch.

The foil 6 preferably constitutes the front of the display, although in some instances it may constitute the back. The foil 6 is preferably of high light reflecting properties. In fabricating the display a design is formed on the exposed front surface of the lamination 6, of the laminated sheet stock 4. This design consists of embossing a series of lines on the front surface in the shape of the figure, and may also include the cutting of the sheet 4 to the contour of the figure. In this case the particular figure embossed is that of a male athlete. The lines of embossing are indicated at 10. As indicated in FIG. 3, the embossed line 10 may extend into the chip board 5 to a depth of the order of half the thickness of the chip board 5 and to produce a bulge 11, of smaller thickness at the back surface of the laminated sheet 4. The embossing somewhat compresses the chip board 5 at the embossed line and it also somewhat stretches the aluminum foil 6 but the amount of stretch is small so as not to produce a tear in the foil since a tear constitutes a fault which may be major or minor, depending upon the extent of the tear. At the time of the embossing of the figure, or immediately before or after the embossing, a pattern of transparent color is printed on the surface 6, the pattern being coordinated with the design, so that the surface 6 is of different colors at different portions of the design; for instance the portion that represents the body may be flesh color; the portions that represent the hair, or the eyes, or the lips, may be colored appropriately for such parts, and the portions that represent the shoes or apparel of the figure are also appropriately colored. The color generally consists of a transparent but colored stain which accentuates the reflection of light from the display.

The display figure as formed above is a flat figure, to be shipped in flat form to the ultimate user. In order to prevent or inhibit drying of the chip board, the outer surface of the foil 7 may be covered by a temporary water barrier sheet 12. When the display figure is to be set up, the water barrier protective layer 12 is removed. Thereafter, the display sheet is flexed to its desired ultimate shape. In this instance it is flexed to a shape wherein the outer lamination 6 is convex and the inner lamination 7 is concave, as illustrated in FIG. 4. This is done manually by generally flexing the edges of the display sheet as

desired. For instance, each of the two legs of the figure may be flexed to a shape similar to that of FIG. 4, to give the appearance of thickness to the legs. The same applies to the torso of the body, the outer edges being flexed back so that the center portion is forward, whereby the figure appears as a three dimensional figure. The placing of the sheet facilitates the mounting of the display figure in a vertical position, the figure being supported against falling, in any desired manner.

During the initial use of the figure for display purposes the chip board 5 commences to dry. Moisture passes from the chip board through the minute holes 8. Since the drying action takes place only at the back side of the display figure, at the holes 8, the rearmost areas of the thickness of the chip board 5 become drier than the foremost portions of the chip board. This drying tends to produce shrinkage of the chip board. Since the portions of the chip board that are in contact with the laminated foil 7 get dry faster than do the portions of the chip board that are adjacent to the laminated foil 6, it is clear that the back side of the chip board will shrink faster than will the fore side. This faster shrinkage will cause the display to tend to increase its curvature rather than to decrease its curvature. During the time that the rearmost part of the display is drying and shrinking and therefore producing further curving of the display, the front portion may be stretching to accommodate that increased flexing of the material. Ultimately, all of the chip board will dry and become stiffer than it was before and thus serve to maintain the display figure in the curved shape.

It is clear that if the flat display sheet is initially flexed to maintain form, such as in FIG. 4, except that the film 6 is on the concave side and the film 7 is on the convex side, then as the moisture dries through the film 7 and there is a corresponding progressive shrinking of the chip board, that shrinkage will cause the curved display to tend to decrease its curvature rather than increase its curvature. This would, therefore, be taken into account in the initial manual placing of the product to the concave shape.

The normal life of the display is generally very much longer than the time required for the chip board to dry and rigidify the display. During this normal life, after the chip board has dried, the display is a rigid laminated structure wherein the front and rear layers of aluminum foil, joined together and spaced by the much thicker rigidified chip board. This is a compound structure that has appreciable strength in compression insofar as concerns its self-sustaining properties and the metal foil gives the structure strength in tension.

The embossing of the metal foil breaks the grain of the metal (and of the paper board where there is grain therein), and thereby serves to inhibit the development of cracks in the advertising display. Any crack that may develop stops at the embossing and since the embossed lines are relatively close together, there can be substantially no discernable cracking of the exposed surface of the advertising display.

In compliance with the requirements of the patent statutes, I have herein shown and described a preferred embodiment of the present invention.

What is new and sought to be secured by Letters Patent is:

1. An article of manufacture comprising a sheet of paper board material of the kind that is subject to shrinkage upon drying and having a moisture impervious film laminated over one surface thereof, portions of the opposite surface being exposed to the atmosphere, said article having an embossed design at the exposed film surface to a depth greater than the thickness of the film, said paper board having a moisture content at a vapor pressure above that of the surrounding atmosphere whereby the board is subject to moisture reduction by evaporation from the oposite surface of the board.

2. An article as defined in claim 1 wherein there is a vapor pervious film laminated over the opposite surface of the paper board and controlling the rate of drying of the board.

3. An article as defined in claim 2 wherein both films are of light reflecting metal foil with the second of the two films having holes therethrough permitting the passage of water-vapor therethrough for the controlled drying of the paper board.

4. An article of manufacture comprising a sheet of paper board material having a moisture impervious film laminated over one surface thereof, said paper board having a moisture content that is subject to reduction by evaporation from the opposite surface of the board, said film with its paper board backing being sufficiently yielding to permit flexing of the sheet, with the film on the outside of the curve flexure, an amount such that the sheet does not return to its initial position and yet the film remains unruptured and laminated to the board, and a vapor pervious film laminated over the opposite surface of the board and controlling the rate of drying of the board, whereby the shrinkage of the paper, upon drying occurs first at the surface thereof that is overlaid by the second film and thereby said shrinkage tends to accentuate the aforesaid flexing of said sheet.

5. An article as defined in claim 4 wherein both films are of light reflecting metal foil with the second of the two films having holes therethrough permitting the passage of water-vapor therethrough for the controlled drying of the paper board.

6. A display representing a three dimensional figure, said display comprising a sheet of paper board material of the kind that is subject to shrinkage upon drying and having a moisture impervious film laminated over one surface thereof, portions of the opposite surface thereof being exposed to the atmosphere so that moisture evaporation may take place at said opposite surface, said paper board having a moisture content of such magnitude that the board is subject to reduction of moisture by evaporation from the opposite surface of the board, said film with its paper board backing being sufficiently yielding to permit flexing of the sheet with the film on the outside of the curve flexure of the permissive flexing being an amount such that the sheet does not return to its initial postion and yet the film remains unruptured and laminated to the board, and a vapor pervious film laminated over the opposite surface of the board and controlling the rate of drying of the board, whereby the shrinkage of the paper, upon drying occurs first at the surface thereof that is overlaid by the second film and thereby said shrinkage tends to accentuate the aforesaid flexing of said sheet, said display being embossed on one surface thereof along lines suggestive of the contour of portions of the figure, the depth of the embossing being greater than the thickness of the foil on the embossed surface of the article but insufficient to pierce the embossed foil.

7. A display representing a three dimensional figure, said display comprising a sheet of paper board material of the kind that is subject to shrinkage upon drying and having a moisture impervious film laminated over one surface thereof, said paper board having a moisture content of such magnitude that that is subject to reduction by evaporation from the opposite surface of the board, said film with its paper board backing being sufficiently yielding to permit flexing of the sheet with the film on the outside of the curve flexure of the permissive flexing being an amount such that the sheet does not return to its initial position and yet the film remains unruptured and laminated to the board, and a vapor pervious film laminated over the opposite surface of the board and controlling the rate of drying of the board, whereby the shrinkage of the paper, upon drying occurs first at the surface thereof that is overlaid by the second film and thereby said shrinkage tends to accentuate the aforesaid flexing of said sheet, said display being embossed on one surface thereof along lines suggestive of the contour of portions of the figure,

the depth of the embossing being greater than the thickness of the foil on the embossed surface of the article but insufficient to pierce the embossed foil, the moist paper board material of the laminated article is of a thickness in excess of fifteen times the thickness of the thicker metal foil, whereby after the article has been manually flexed to its desired three dimensional shape, the foil laminations resist additional flexing of the article resulting from its own weight when the article is in an upright position while the paper board material is still drying and becoming more rigid.

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DOUGLAS J. DRUMMOND, *Examiner.*