PLASTIC TAMBOUR DOOR

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References Cited

UNITED STATES PATENTS
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ABSTRACT

Tambour or roll up door is made by vacuum forming a heated thin plastic sheet into a form wherein the front face of the door comprises a series of relatively wide parallel face strips which are joined to each other by integral thin connecting portions having a generally U-shaped cross section. The relatively thicker face strip portions provide rigidity to the door and resist vibration while the thin interconnecting portions act as hinges to permit the door to be easily guided in a curved door track having a relatively small radius. The frictional resistance of the door to sliding in a curved track can be minimized by curving the connecting portions so that they provide a very small area of contact with the track. The front surface of the sheet is preferably patterned with alternating raised and depressed areas which not only provide a pleasing appearance but also reduce the surface contact area in contact with the guides.

1 Claim, 4 Drawing Figures
3,814,493

PLASTIC TAMBOUR DOOR

BACKGROUND OF THE INVENTION

Tambour doors are by no means new, having been used in roll top desks at least as early as the 1800's. Tambour doors are especially useful for selectively closing compartments in structures such as desks and cabinets since they permit the door to be stored within the structure in a manner which takes up very little, if any, usable space. They are particularly useful as cabinet closures since they take up no floor space in front of the cabinet and do not present an obstacle into which a person could inadvertently walk, thus possibly injuring himself.

Although the majority of tambour doors made in the past comprise thin strips of facing material bonded to a flexible backing such as cloth, there are a number of patents which disclose simple corrugated members used either as door closures or as roll up awnings. These latter patents include U.S. Pat. Nos. 2,070,924, 2,206,347, 2,513,042, and 2,906,323 as well as British Pat. No. 827,218. A tambour door made from a plurality of individual elements is shown in Pat. No. 3,351,405. A piece plastic tambour door having self hinges is shown in Pat. No. 3,645,597. In addition to the types of construction shown in the aforementioned patents, tambour doors have also been made by cutting a plurality of parallel channels in a flat sheet member with the thin sections remaining after the cutting performing a hinge function.

SUMMARY

It is an object of this invention to provide a light weight, low cost, attractive looking, tambour door that will have sufficient rigidity and strength for its intended purpose and which will slide quite readily in a curved track. The tambour door of the present invention meets these and other objectives quite readily. The improved tambour door is preferably made from a thin sheet of thermoplastic material such as ABS or vinyl by a vacuum forming operation but could also be made by an extrusion process. One particular advantage of the vacuum forming method in that it permits sheet material to be used which has an embossed face. The embossed face gives a far more pleasing appearance to the door than would be the case with a smooth finish. Furthermore, the embossed finish provides alternating raised and depressed areas which reduce the surface area of contact in the guide tracks and thus makes the door easier to slide. To prevent the thin plastic from being inadvertently bowed and slipped out of its track, the leading and trailing ends are preferably affixed to a stiffening bar. A handle, and latch means carried by the leading end stiffening bar permit the door to be easily moved in its track and latched to the cabinet in a closed position.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to FIG. 1, a tambour door indicated generally at 10 is shown in engagement with a pair of curved guide track members 12 which are stapled or otherwise fastened to end panels 14 of a cabinet 16. The tambour door 10 has a handle member 20 attached to it which enables it to be moved up and down in guide tracks 12 so that a latch member 22 carried by the door can be brought into or out of engagement with a cooperating latch member 24 mounted on the cabinet 16.

Since the tambour door 10 may be formed from very thin plastic material 26 having a maximum thickness of approximately 0.045 inches, it would be possible to pull the door out of its guide tracks 12 if the end of the door to which the handle 20 is attached is not made relatively rigid. The necessary rigidity is provided by a stiffening bar 28 which may be formed of a material such as wood or plastic having a thickness much greater than the thickness of the plastic material 26. The upper end of the tambour door is fastened to the upper stiffening bar 28 by a plurality of screws 30. Additional screws 32 are provided to fasten the latch member 22 to the plastic sheet 26, the stiffening bar 28 and the handle 20.

Although the lower end of the door 10 which is hidden from view in FIG. 1 does not absolutely have to be stiffened in order to work, it is preferable that a stiffening bar 36 be fastened to the lower end of the door by screws 38. Thus, items which might be positioned incorrectly within the cabinet 16 in the path followed by the door 10 will be able to either block movement of the door, or be deflected by it rather than cause the door to deform and be deflected out of its guide tracks 12.

The tambour door 10 is preferably formed in a vacuum forming operation from a flat sheet of thermoplastic material such as ABS or vinyl so as to produce a plurality of relatively wide, face strip portions 40 having the thickness of the original material. The vacuum forming of the material while it is hot causes the portions of the plastic immediate the face strip portions 40 to be drawn away from the plane of the face strip portions and reduced in thickness so as to form generally U-shaped connecting portions 42 which include side portions 44 and rear portions 46. The side and rear portions 44 and 46 are separated by rounded corner portions 48. The presence of rounded corner portions 48 on each side of the imaginary plane normal to the common plane of adjacent face strip portions 40 and midway between them, greatly reduces the area of rear portions 46 which is available for contacting the guide track members 12, thus reducing the frictional engagement between the tambour and its guide channels and making the door easier to slide.

One advantage of making the tambour door 10 by a vacuum forming process is that the flat plastic sheets which are formed to make the door can be quite simply embossed in their flat state to produce an aesthetically pleasing design. The embossing operation can be used for example, to provide a grained pattern of alternate raised portions 50' and depressed portions 50". Where this is done, the area extent of the raised portions 50' which is above the plane of the sheet will be less than the area extent of the sheet on which the raised portions 50' are formed. Accordingly, only a fraction of the area of the face strip portions 40 will engage the
guide track members 12 and the door will have the additional advantage of offering less frictional resistance to sliding movement than if the door had a non-embossed surface.

The louver door of the invention has been found especially useful for cabinets mounted inside recreational vehicles where its properties of extremely low weight, low cost, attractiveness, freedom from vibration, and resiliency in event of impact are very desirable. Although the cross sectional shape of the door can vary from the shapes shown in FIGS. 3 and 4, it is desirable that the rear portions 46 be spaced at least several thicknesses of material away from the face strip portions 40. This spacing of the face strip portions 40 from the rear portions 46 so as to form a plurality of channel portions greatly increases the rigidity of the door. It would of course be possible in a vacuum forming operation to cause the rear portions 46 to be of a thickness approximately equal to the thickness of the original material and the face strip portions 40 to be drawn to a reduced thickness. However, a door produced in such a matter would be more prone to vibrate and less able to resist impacts applied to the outside face of the door than would a door having thick face strip portions 40 and thin rear portions 46.

As depicted in FIG. 4, the rear and side portions 46,44 have thicknesses about one half the thickness of the face strip portion 40. Although this thickness relationship is quite satisfactory and permits the material 26 of the door 10 to readily bend in the area of the corner portions 48, other thickness relationships can be used depending on the forming equipment used, the depth of side portions 44, and the relative widths of face and rear portions 40,46 desired. A spacing of the rear portion 46 from the face strip portion 40 by an amount approximately equal to the spacing between side portions 44 has been found to provide the door with a large resistance to bending relative to the plane of any face strip portion 40.

I claim as my invention:

1. A corrugated, vacuum formed, one piece plastic tambour door comprising a plurality of parallel, relatively wide, constant thickness face strip portions located in a common plane and spaced from each other by relatively narrow connecting portions which are recessed relative to said common plane so that the rear surface portions of said door which are defined thereby are spaced from said face strip portions by a distance equal to at least several times the thickness of said face strip portions, said connecting portions having a cross-sectional thickness less than the thickness of said face strip portions and a transverse width in the plane of the rear surface of the door which is several times less than the transverse width of said face strip portions, said face strip portions having an embossed textured surface and said rear surface having a relatively smooth surface to facilitate sliding of said door.

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