United States Patent [19]

Radke

[11] **3,814,493**

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[54] **PLASTIC TAMBOUR DOOR**

[75] Inventor: **Arthur O. Radke,** Milwaukee, Wis.

[73] Assignee: **Universal Oil Products Company,** Des Plaines, Ill.

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[52] **U.S. Cl.** **312/297,** 160/201, 161/123

[51] **Int. Cl.** **E06b 9/14**

[58] **Field of Search** 312/297; 160/25, 37, 368, 160/231, 201; 161/123

[56] **References Cited**

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FOREIGN PATENTS OR APPLICATIONS

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Primary Examiner—James T. McCall

Attorney, Agent, or Firm—James R. Hoatson, Jr.; Barry L. Clark; William H. Page, III

[57] **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

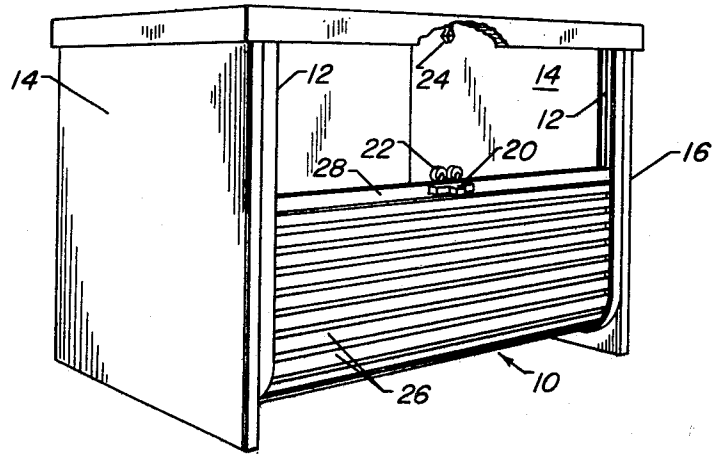


Figure 1

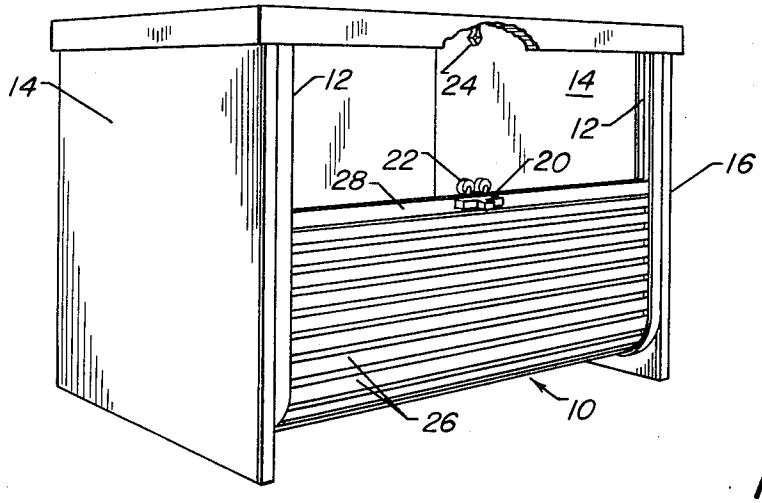


Figure 2

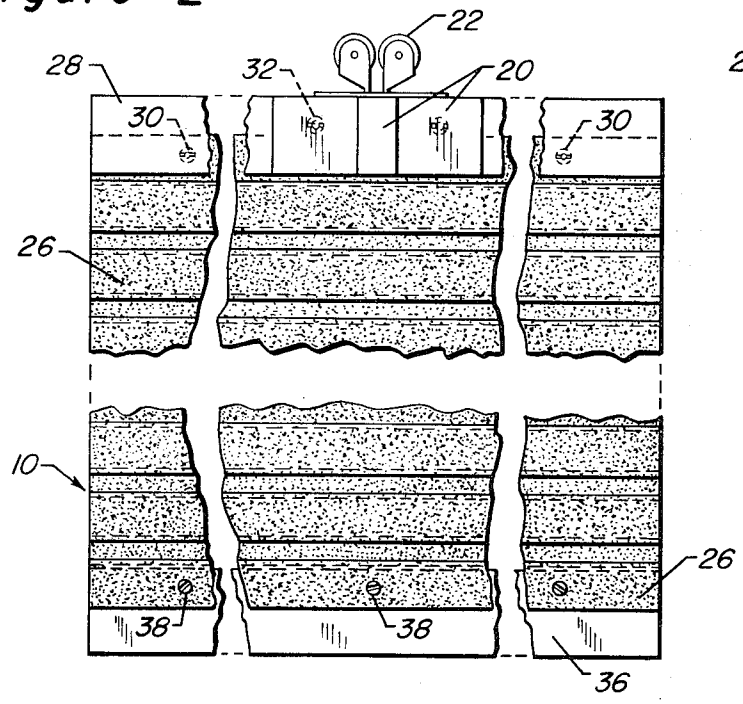


Figure 3

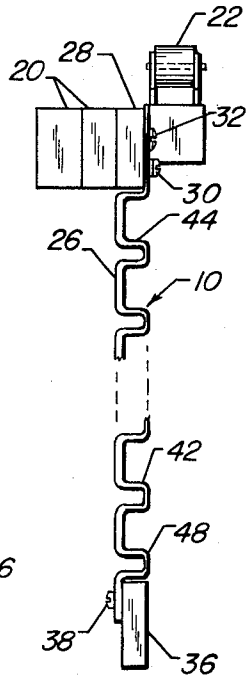
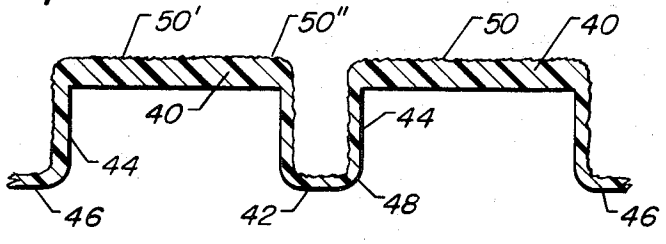


Figure 4



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. Pats. 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 one 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.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a perspective view of the improved door in combination with a cabinet;

FIG. **2** is a front view of the door as shown in FIG. **1**;

FIG. **3** is a side view of the door as shown in FIG. **2**; and

FIG. **4** is an enlarged cross-sectional view taken from FIG. **3**.

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 preferrable 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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