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Yarbrough

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[54] **CONTAINER HAVING RESILIENT SUPPORT MEANS**

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[52] **U.S. Cl.** ..... **220/1.5**, 220/77, 206/60 A, 217/52, 248/350

[51] **Int. Cl.** **B65j 1/02**

[58] **Field of Search** ..... 220/1.5, 41, 84, 38, 69, 220/77; 248/350, 358; 108/58; 217/52; 206/60 A

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Primary Examiner—William I. Price
Assistant Examiner—Steven M. Pollard
Attorney, Agent, or Firm—Richard F. Carr

[57] **ABSTRACT**

A container including a metal frame over which are plastic sheets secured to it by fasteners, a bottom support for the container including spaced pads filled with foam material capable of withstanding compression loads and providing shock absorbing properties, the door of the container having a peripheral flange which overlaps a comparable flange around the door opening, the flanges having convergent portions so that they can be wedged together, with a gasket providing a seal, while latches hold the door in the secured position.

7 Claims, 15 Drawing Figures

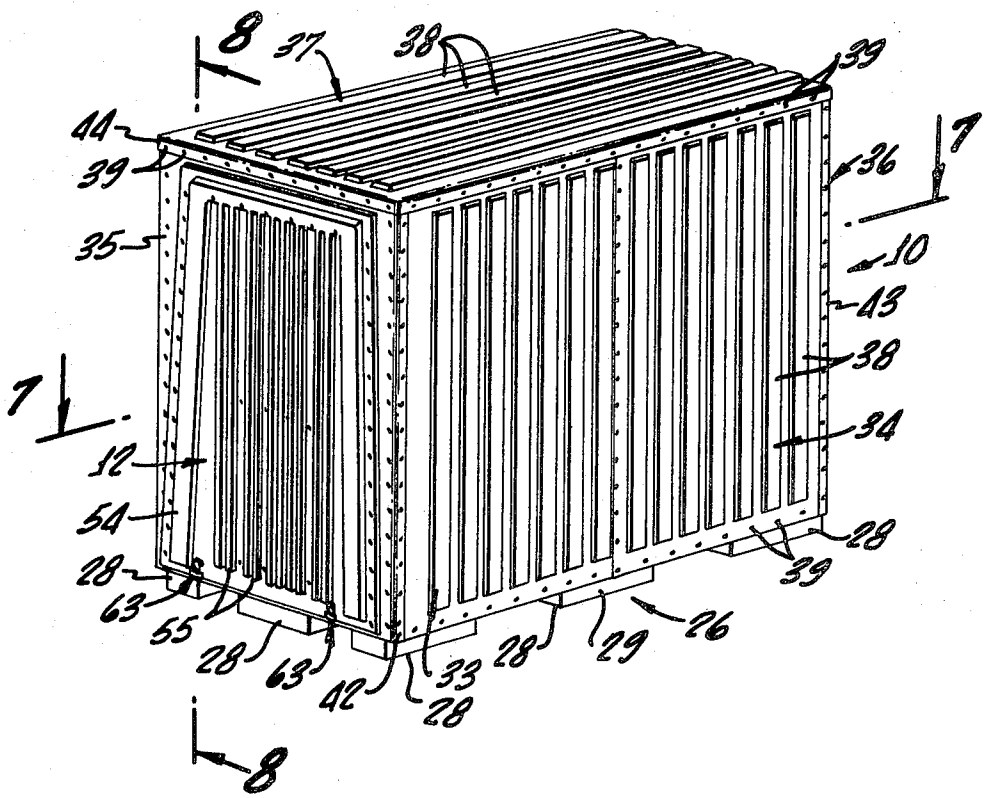
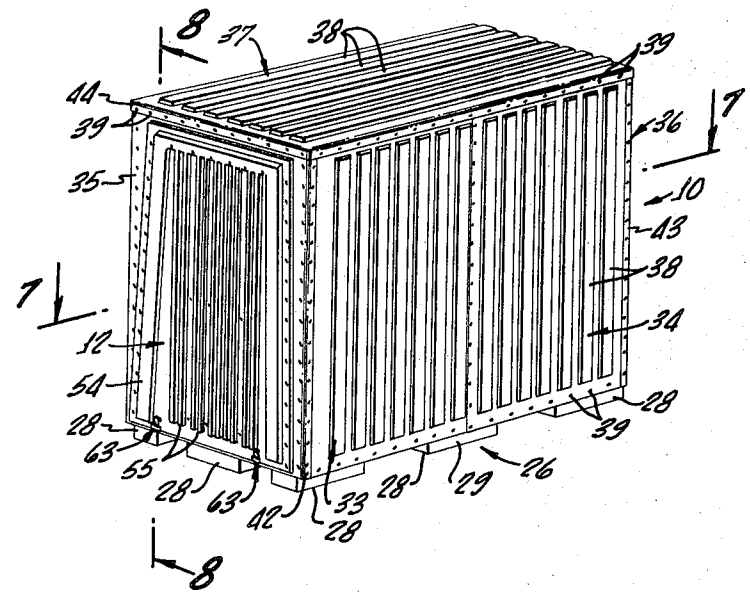


FIG. 1.



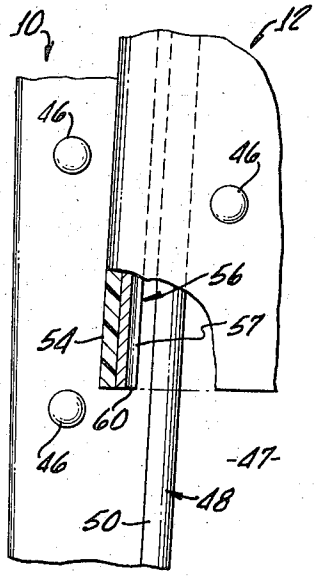


FIG. 14.

FIG. 2.

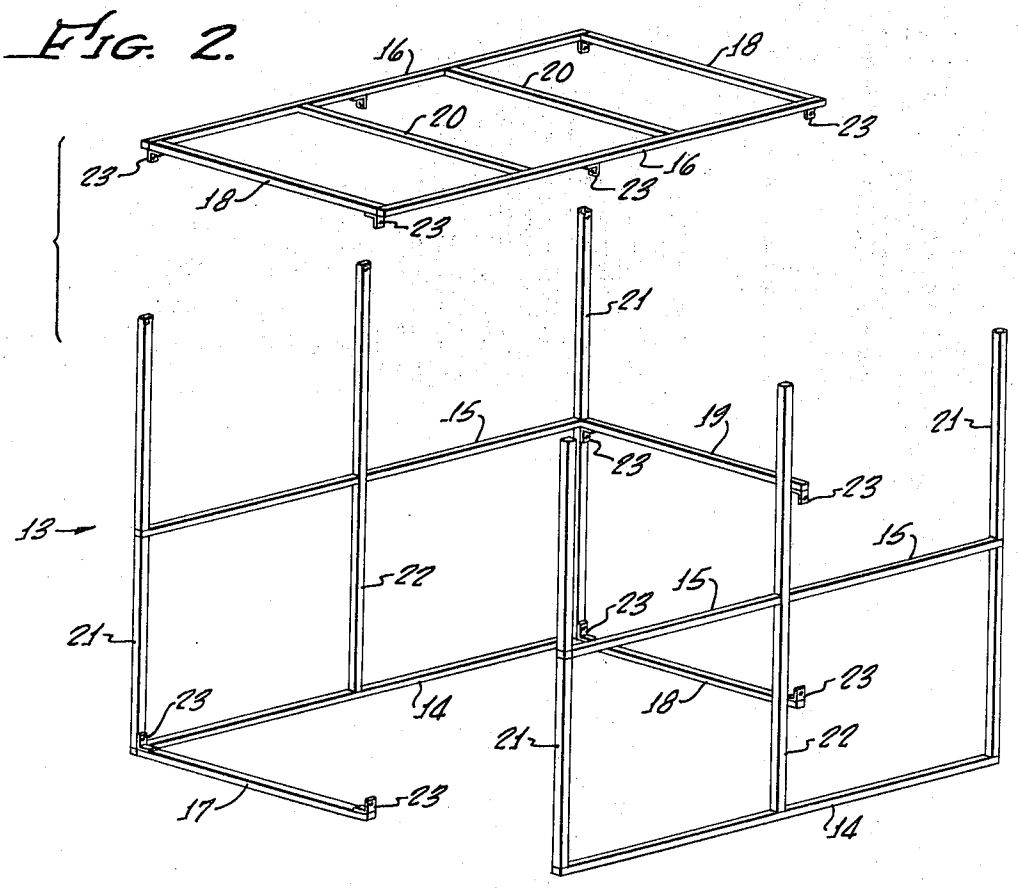


FIG. 3.

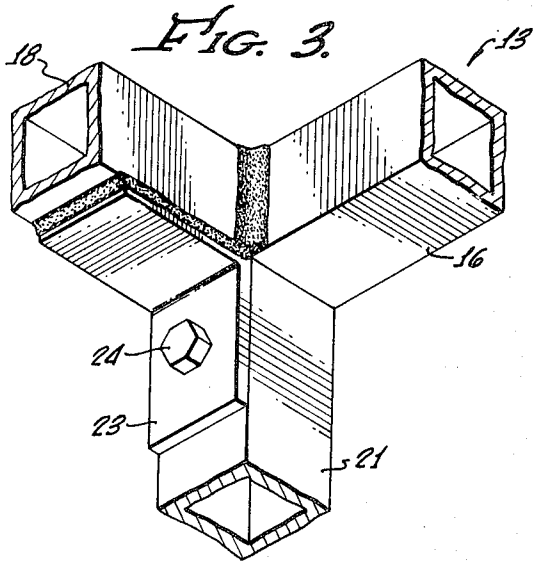


FIG. 4.

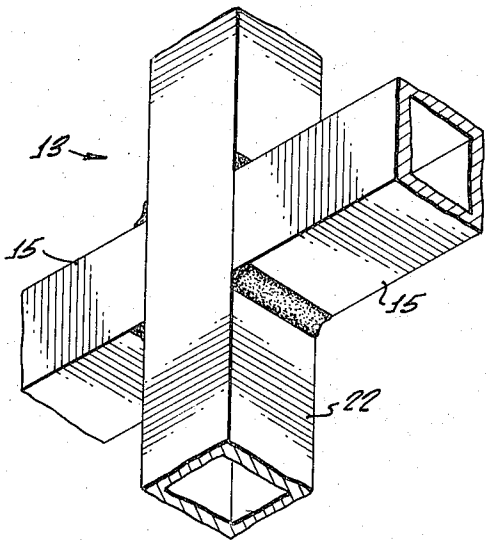


FIG. 13.

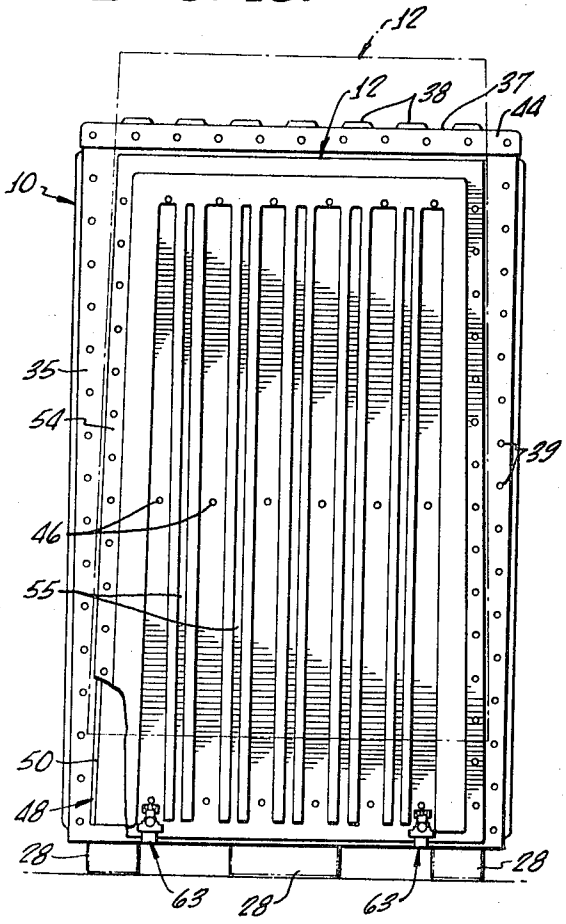


FIG. 15.

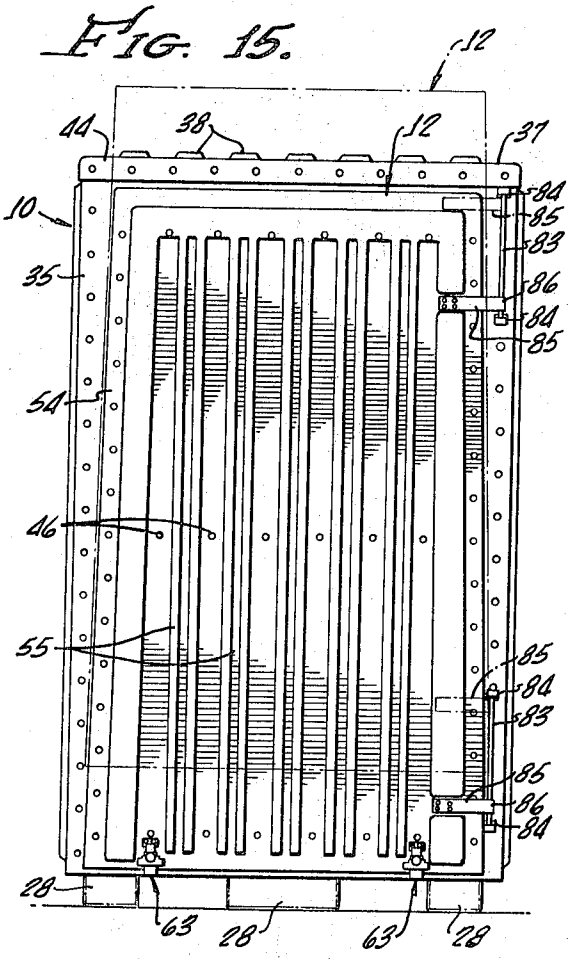


FIG. 5.

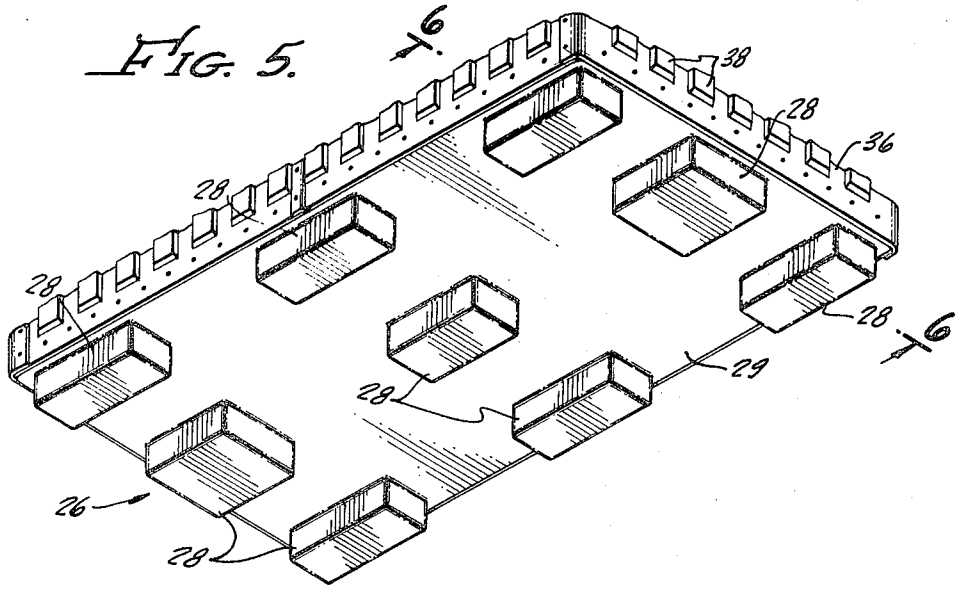


FIG. 6.

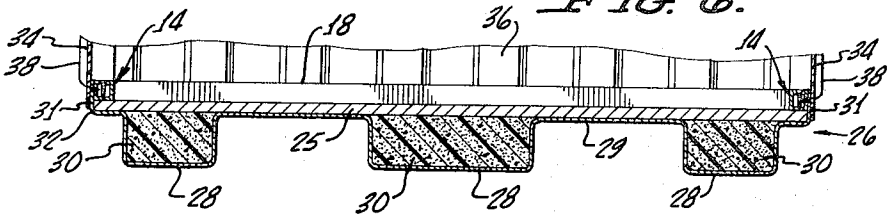


FIG. 12.

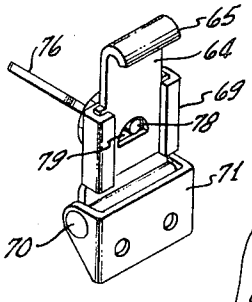


FIG. 10.

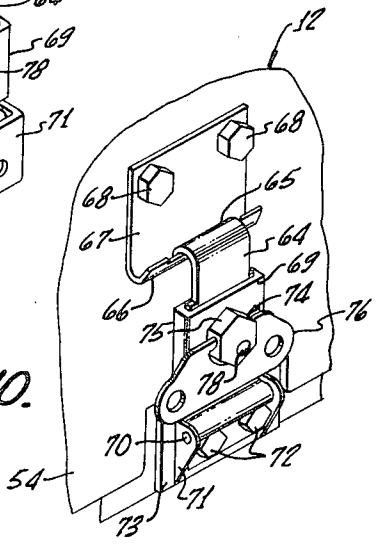


FIG. 11.

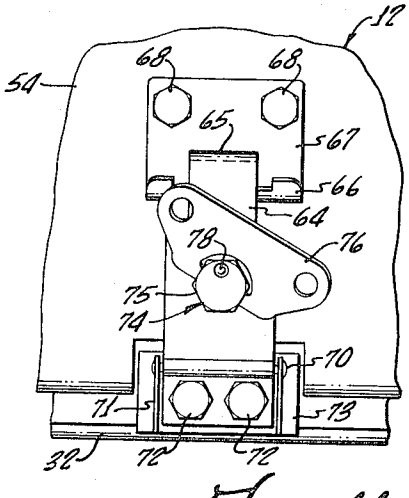
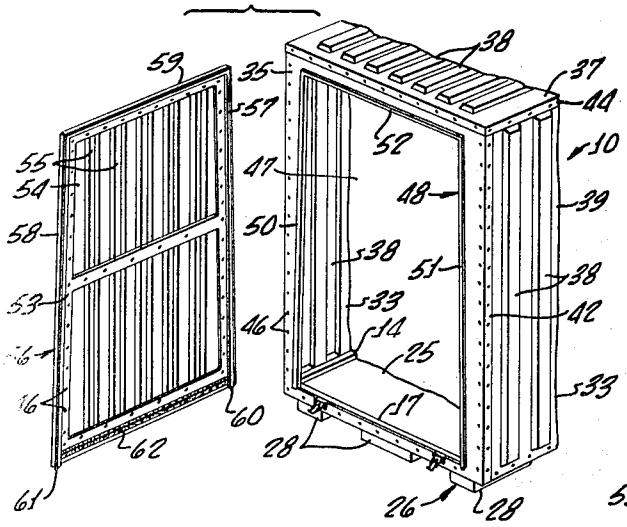


FIG. 9.



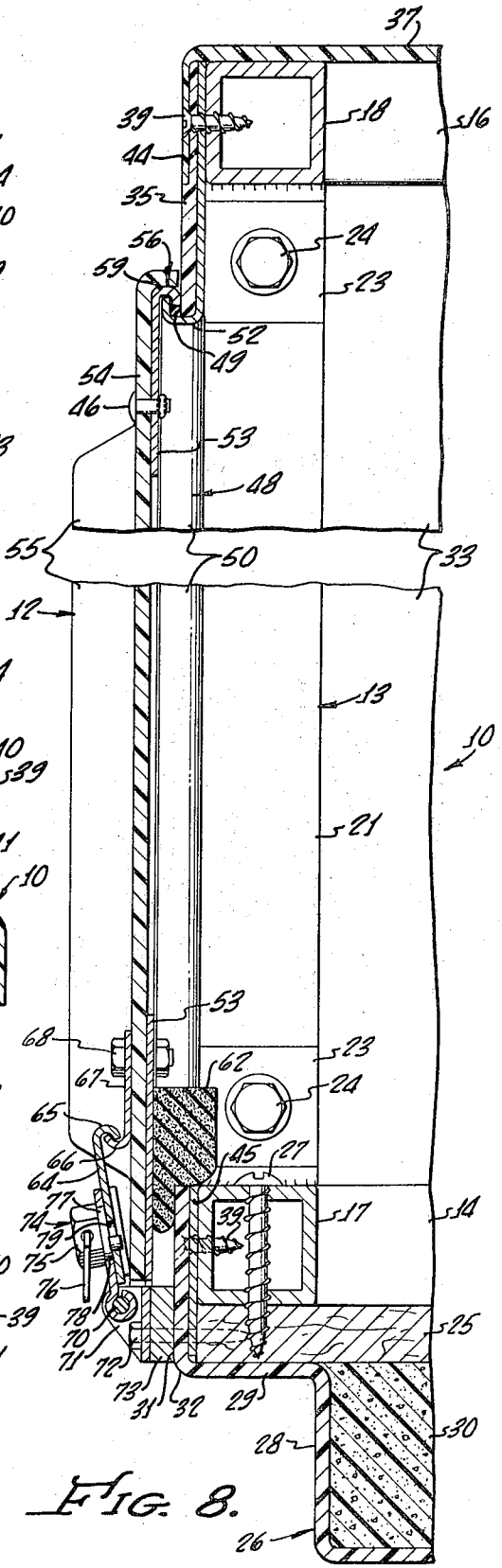


FIG. 7.

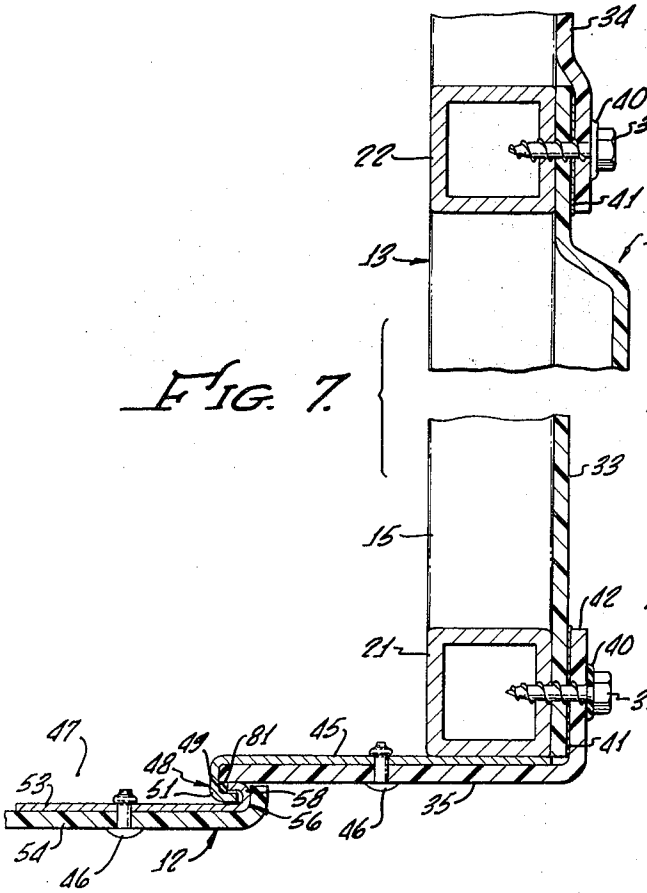


FIG. 8.

CONTAINER HAVING RESILIENT SUPPORT MEANS

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention pertains to a container.

2. Description of Prior Art

Containers, such as those intended for the shipment of household goods, are subject to severe punishment during service and, hence, must be of the most rugged construction. Nevertheless, despite efforts to increase the strength of such containers, those of conventional design frequently are subject to failure and do not offer full security for their contents. Neither will conventional containers meet the exacting requirements of military standards which have been issued for such containers. These include drop tests, stacking tests and tests for racking, impact and puncture. Other tests specified in the military standard relate to resistance to condensation of moisture, watertightness and temperature. In any of these categories, the ordinary container may fail, and none will pass all of the specified tests.

When a conventional container is dropped, even if the container is not damaged, the contents may be severely harmed from the impact. This is because there is nothing to soften the impact, which is transmitted directly to the contents. Opening and closing of conventional containers frequently is an involved and lengthy procedure that may include the addition of caulking in an effort to retard the ingress of moisture to the container. This wastes labor in the use of the containers. Wooden containers frequently are banded to help hold them together so that they will not be knocked apart when in use. This, again, involves an extra expense in the banding operation. Conventional containers also require paint to prevent deterioration over a period of time and to enhance their appearance. This, of course, necessitates continual maintenance.

SUMMARY OF THE INVENTION

The present invention provides an improved container which overcomes the above-noted difficulties, providing a unit of greatly improved strength and durability. The container is built around a sturdy tubular metal frame, which is welded and bolted into a unitary assembly. Over the frame are plastic sheets, which are ribbed to increase their rigidity, and which also enables the sheets to expand and contract under temperature changes without damage to the container. The plastic sheets are secured directly to the frame by fasteners. At the overlapping joints of the plastic wall sheets, caulking material is provided which permanently seals and prevents entry of moisture. The base of the unit includes a plywood sheet, to which the bottom portion of the frame is attached, so that loads may be transmitted directly through the frame to the base. Beneath the plywood is an integral plastic sheet formed to define spaced pockets that act as pads for the base. In these pockets is a foam plastic material. This support for the container is not only durable, but also provides an important shock-resistant property so that the contents of the container are not subjected to sharp jolts when the container is dropped.

The door for the container includes a peripheral flange on three sides, which engages a comparable flange around the door opening. These flanges include

opposite portions which converge upwardly, allowing the door to be wedged on the flange of the container. A gasket between the flanges provides a seal. An additional gasket is provided at the bottom of the door to provide a seal at the lower edge of the door opening. Latches at the bottom of the door help draw it into a tight engagement with the flange of the container and securely hold it in place. The door is installed and removed simply by rectilinear movement, so that there is no necessity for a wide space around the end of the container as would be the case for a swinging door. However, if desired, hinges can be provided with pins which allow lateral movement of the door in engaging and disengaging the flange of the container, for pivotal movement when the flanges are disengaged.

The container constructed in this manner can pass all of the government specifications provided in MIL STD 1489. Despite its strength and durability, it is relatively light in weight. Moreover, the container saves labor by such features as the quick opening and closing of the door, the lack of need to caulk around the door, the absence of the requirement for banding and the lack of maintenance required for the plastic wall coverings. The container is attractive in appearance and will retain its appearance throughout its life, with no painting being required.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of the container of this invention;

FIG. 2 is an exploded perspective view of the framework of the container;

FIGS. 3 and 4 are enlarged fragmentary views showing the connections of portions of the frame;

FIG. 5 is a fragmentary perspective view showing the bottom of the container;

FIG. 6 is a transverse sectional view taken along line 6—6 of FIG. 5;

FIG. 7 is an enlarged fragmentary sectional view taken along line 7—7 of FIG. 1;

FIG. 8 is an enlarged sectional view taken along line 8—8 of FIG. 1;

FIG. 9 is a fragmentary perspective view showing the front end portion of the container with the door open;

FIG. 10 is an enlarged fragmentary perspective view illustrating one of the latches in the secured position;

FIG. 11 is an elevational view of the latch in the released position;

FIG. 12 is a perspective view of the portion of the latch that is attached to the container;

FIG. 13 is an end elevational view of the container;

FIG. 14 is an enlarged fragmentary view illustrating how the flanges of the door and the container are disengaged when the door is to be separated from the container; and

FIG. 15 is an end elevational view of the container modified to provide for pivotal as well as vertical movement of the door.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The shipping container 10, in the example shown, is a rectangular unit approximately 7 feet high, 8 feet long and 4 feet wide. At one end of the container is a door

12, which provides access to its interior. Beneath the skin of the container 10 is a frame 13 made of square steel tubing welded and screwed together to form a rigid unit (see FIG. 2). The frame includes bottom, intermediate and top longitudinal, horizontal side rails 14, 15 and 16, as well as bottom and top horizontal end rails 17 and 18. An intermediate horizontal end member 19 is included in one end of the framework, the other being open to allow for the door. There are also intermediate top horizontal members 20 extending perpendicularly between the two top longitudinal frame rails 16. The frame 13 also includes vertical end corner posts 21 and intermediate vertical posts 22 at the midpoints of the sidewalls.

The side frame parts 14, 15, 21 and 22 are welded together as a subassembly. Similarly, the top frame members 16, 18 and 20 are joined by welding. L-shaped brackets 23, one leg of each of which is welded to a frame member, receive screws 24 that complete the fabrication of the frame.

The bottom horizontal frame rails 14 and 17 rest upon the upper surface of a flat rigid plywood sheet 25 of the container base 26. The frame rails 14 and 17 are positioned along the side edges of the sheet 25, to which they are attached by means of screws 27. This allows forces on the container, such as compression loads from above, to be transmitted directly through the frame to the base. Beneath the plywood sheet 25, which appropriately is three-quarter inch plywood having a finished upper surface, are spaced pads 28. The latter elements act as skids to support the container. By being spaced apart, they allow the prongs of a forklift to be extended beneath the container 10 from its ends or sides. Nine pads 28 are provided in the example illustrated.

An integral plastic sheet 29 fits beneath the plywood sheet 25, being molded to provide pockets which define the outer contours of the pads 28. Intermediate the pads 28, the plastic sheet 29 overlies the undersurface of the plywood sheet 25 and is bonded to it. The sheet 29, which may be of polyethylene approximately three-sixteenths of an inch thick, includes a short upstanding vertical flange 31 around its periphery, which overlaps the side edges 32 of the plywood sheet 25 and the bottom frame rails 14 and 17.

Within the pads 28 is foam plastic material 30, such as polyurethane foam. This provides the base 26 with an ability to withstand compression loads, while also giving it a shock absorbing quality. The foam plastic, confined by the sheet 29, is substantially rigid, but will yield upon impact, cushioning the container and its contents if the container is dropped during handling. This gives effective protection to the contents of the container. The plastic foam 30 and plastic sheet 29 have memory, and return to their original shapes after distortion.

The skin of the container 10 includes two wall sections 33 and 34 on either side, front and back parts 35 and 36, and a top 37. The skin may be of the same plastic as the base cover sheet 29, provided (except for the front wall 35) with stiffening ribs 38. Screws 39 attach the skin to the framework 13 of the container. The fastener 39 includes a seal 40 beneath its head, so that leakage is not permitted at the openings for the screws.

The screws 39 along the lower edges of the walls extend also through the flange 31 of the bottom sheet 29, where it overlaps the bottom frame rails 14 and 17.

The rear side skin section 34 is deflected at one vertical edge so as to overlap the adjacent edge of the other side skin 33, as seen in FIG. 7. A caulking material 41 is included between the overlapped portions to produce a watertight joint. At the corners of the container, the front and back skin portions 35 and 36 include vertical right-angle edge flanges 42 and 43, respectively, which overlap the adjacent edges of the side skins 33 and 34. Again, caulking material 41 seals the overlapping portions of the skin. The top skin section 37 has a depending flange 44 around its periphery which overlaps and is sealed with respect to the top edges of the adjoining side and end walls of the container. Fasteners 39 extend through the flange 44 of the top 37, as well as the upper edges of the side skin sections 33 and 34, and the ends 35 and 36, attaching them directly to the upper frame rails 16 and 18. Additional fasteners 39 secure the midportion of the top 37 to the intermediate upper frame rails 20.

The forward part of the side flange 44 of the top 37 and the upper edge of the front end skin 35 are of reduced thickness as seen in FIG. 8. Also, flush head fasteners are used in making the attachments to the frame at this location. This causes the forward part of the flange 44 to be flush with the forward end skin 35. Flush head screws also are used in securing the lower edge of the front end skin 35 to the forward lower frame rail 17.

Beneath the forward skin section 35 is a flat sheet metal piece 45 to which this skin is secured by rivets 46. The sheet metal member 45 and the front skin 35 provide only a relatively narrow border at the end of the container, defining a door opening 47, as seen in FIG. 8, which is nearly the full width and height of the container. Around the edge of this opening is an L-shaped projection of the member 45, resulting in an outwardly facing flange 48 which is parallel to the outer surface of the forward wall skin 35. Within the flange 48 at its base portion is a gasket 49 of elastomeric material. The flange 48 has two straight opposite side portions 50 and 51, and a straight horizontal upper part 52, but does not extend across the lower edge of the door opening. The two side portions 50 and 51 of the flange 48 are not parallel but, instead, converge slightly toward the top.

The door 12 includes a frame 53 of sheet metal over which is a skin 54 of plastic material having stiffening ribs 55. The same plastic may be used for the door cover sheet 54 as for the other plastic sheets of the container. Additional rivets 46 secure the skin 54 to the outside of the frame 53. Along the side edges and the top of the frame 53 is a projection which forms an inwardly facing doubled-over flange 56. The flange 56 is substantially complementary to the flange 48. Thus, its straight side portions 57 and 58 are not parallel, but converge toward the top where they are interconnected by a horizontal upper part 59. The bottom ends 60 and 61 of the flange 56 are open, and there is no flange across the lower edge of the door. Instead, intermediate the bottom ends 60 and 61 of the flange 56 is a gasket 62, which may be of foam rubber.

Two latches 63 are used in securing the door 12 to the container 10. Each latch 63 includes a strap 64 having a hook 65 at its upper end adapted to engage a hook

66 at the lower end of a strap 67 secured to the door by bolts 68. The strap 64 is movable vertically in a flanged guide member 69, which at its lower end is mounted on a hinge pin 70, carried, in turn, by a yoke 71. Screws 72 secure the yoke 71 and a spacer 73 beneath it to the plywood base sheet 25. A rotary member 74, having a hexagonal head 75 to which is attached a handle 76, has a short circular disk portion 77 complementarily received in an opening in the strap 64. An eccentric pin 78 extends from the disk 77 into a longitudinal slot 79 in the strap 64. Consequently, rotation of the member 74 causes vertical movement of the strap 64 in the guide 69. This allows it to secure or release the hook 66 carried by the door. When the latches are released, their lower portions may be pivoted outwardly around the hinge pins 70 so that the door opening is clear and the hook elements 65 and 66 are separated.

When the door 12 is to be attached to the container 10, it is elevated slightly relative to the container, generally as seen in phantom in FIG. 13. Because of the convergence of the side flanges of the door and container, the door then can be positioned flat against the front end wall. The door 12 next is allowed to drop straight downwardly, which causes the side portions 57 and 58 of the door flange 56 to fit behind the side parts 50 and 51 of the container flange 48. Because the side portions 50 and 51, and 57 and 58, of these flanges are convergent upwardly, they wedge together as the door 12 moves downwardly relative to the container 10. This brings the inner edge 81 of the flange 56 of the door 12 into engagement with the gasket 49. Also, the horizontal sponge rubber door gasket 62 engages the lower horizontal corner of the door opening 47 to form a seal at the lower edge of the door. When the rotary latch members 74 have caused the straps 64 to pull downwardly on the door 12 by virtue of the engagement of the hooks 65 and 66, the entire lengths of the flanges 48 and 56 overlap and the door is held firmly in place. The result is a simple attachment which securely holds the door to the container by only two latching members cooperating with the overlapping flanges. The entire periphery of the door is held to the container and effectively seals the door opening 47.

The door is opened merely by releasing the latches 63, after which the door is lifted up to a slightly elevated position, such as indicated in phantom in FIG. 13 as well as in FIG. 14. Because of the upward convergence of the side flanges, the lower ends 60 and 61 of the door flange 56 then clear the flange 51 of the container. This disengages the door and container flanges so that the door 12 then can be moved away from the forward end of the container and set aside. Thus, the door opens very easily with the interior of the container then being accessible through the large opening 47 in the forward end. It is not necessary to have much space around the forward end of the container, as would be necessary where a hinged door must be swung open, because the door will open with only lateral movement.

If desired, the door 12 may be secured to the container 10 and swung between open and closed positions, at the same time retaining the wedge-type sealed closing arrangement for the door. This modification is shown in FIG. 15. Here, there are provided two rods 83 extending vertically along one side edge of the front end of the container. Brackets 84 secure the rods 83 to the container. The rods 83 act as hinge pins for hinge members 85 secured to the door 12. The hinge members 85 are flat straps, much narrower than the lengths of the rods 83, with loop ends 86 that receive the rods 83. The ends 86 are not only rotatable but also axially slidable relative to the rods 83. Therefore, the door 12 is permitted to move vertically relative to the container 10, and the door can be wedged on the flange 48 and securely attached and sealed as in the previously described embodiment. However, once it has been raised upwardly a sufficient distance to disengage the flange 48, the door can be rotated around the hinge pins 83. The door no longer is a loose element that can be separated from the container.

The foregoing detailed description is to be clearly understood as given by way of illustration and example only, the spirit and scope of this invention being limited solely by the appended claims.

What is claimed is:

1. A container device comprising

means defining an enclosed space for receiving objects,

and a support for said means, said support including

a substantially rigid member at the bottom of said means defining an enclosed space,

sheet means on the lower surface of said rigid member having at least portions thereof in a spaced relationship with said rigid member,

and a resiliently deformable material intermediate said portions of said sheet means and said rigid member for providing said support with shock absorbing properties,

said sheet means including an integral plastic sheet member beneath the entire area of said substantially rigid member,

said portions of said sheet means being defined by spaced pockets in said sheet member,

said sheet member overlying said rigid member intermediate said pockets, said resiliently deformable material being substantially complementary to the confines of said pockets,

said sheet member entirely covering said resiliently deformable material.

2. A device as recited in claim 1 in which said pockets have substantially flat undersurfaces.

3. A device as recited in claim 2 in which said pockets are substantially rectangular in plan, and arranged to provide spaces therebetween both longitudinally and laterally of said sheet for allowing a fork to enter the space beneath said rigid member from any side thereof.

4. A device as recited in claim 2 in which said rigid member is planar and has side edges, and said sheet member is of substantially uniform thickness and has an upstanding flange on its periphery overlapping said side edges.

5. A device as recited in claim 4 in which

said means defining an enclosed space includes a frame,

said frame having a lower portion engaging said substantially rigid member,

said upstanding flange overlapping said lower portion as well as said side edges,

and including means connecting said flange to said lower portion.

6. A device as recited in claim 5 in which

said lower portion of said frame includes rails adjacent said side edges of said substantially rigid member,

said means connecting said flange to said lower portion including fasteners extending through said flange and into said rails.

7. A device as recited in claim 6 including additional fasteners attaching said rails to said rigid member.

* * * * *