Dec. 23, 1969 R. H. DEMENT 3,485,405

FRAME STRUCTURE FOR CONTAINER

Filed July 5, 1968

FIG. 1.

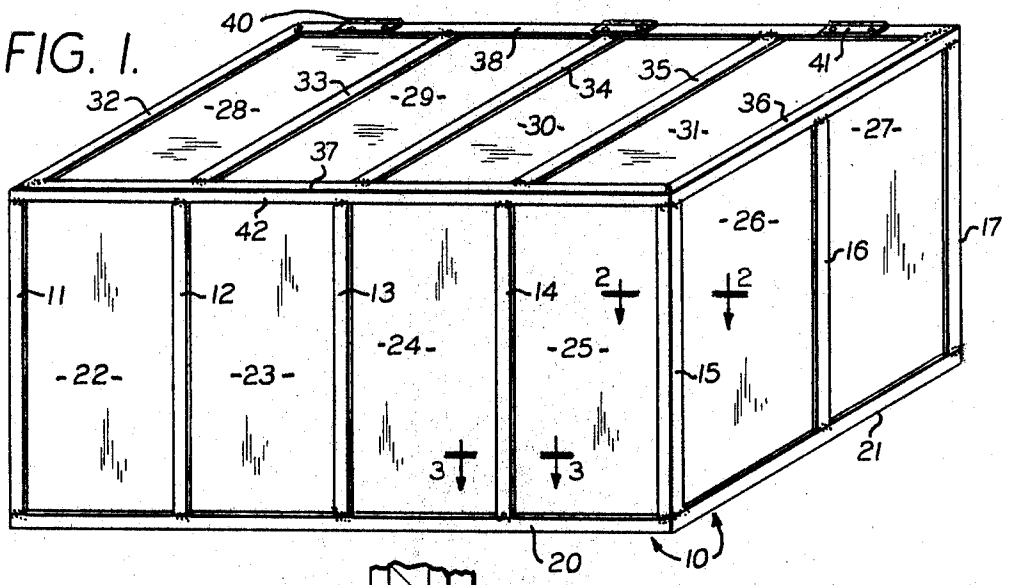


FIG. 2.

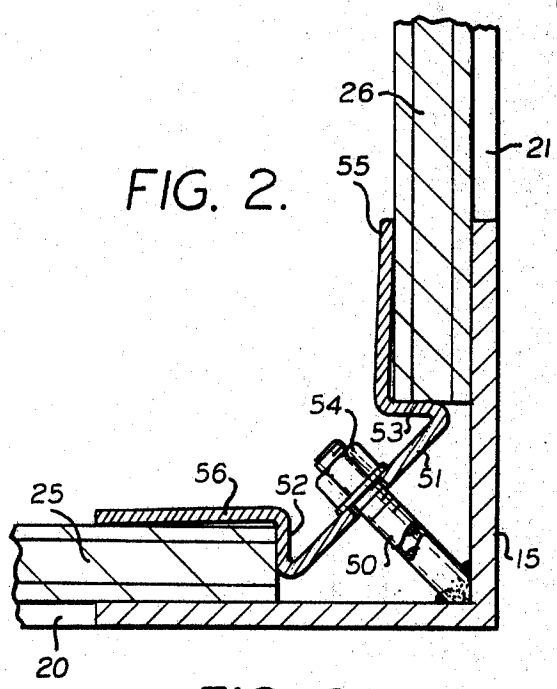


FIG. 4.

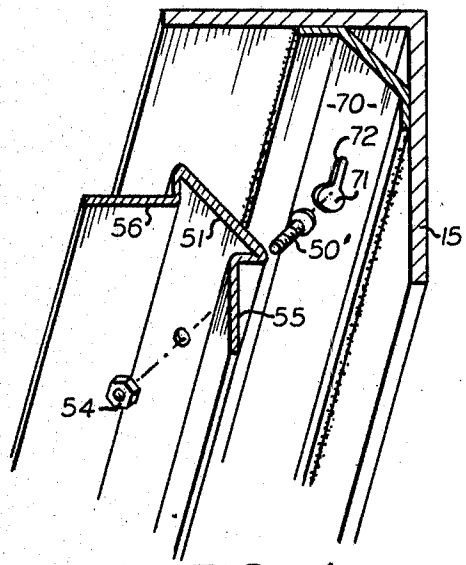
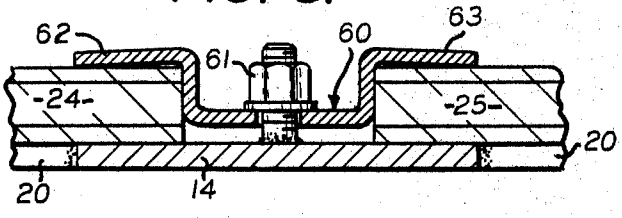


FIG. 3.



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FRAME-STRUCTURE FOR CONTAINER

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U.S. Cl. 217—65 4 Claims

ABSTRACT OF THE DISCLOSURE

Container which is designed particularly for utilizing panels, such as panels of plywood, wood, hardboard, reinforced plastic, metal, etc. for container construction. The container comprises a framework of rigid aluminum or other metal retention members designed to hold replaceable bridging elements against the framework and yet permit sufficient flexibility of movement of the panels so as to avoid undue stresses. Thus, tension stresses which tend to harm and damage the panels are eliminated or substantially reduced, and the panels are able to withstand the racking loads normally encountered in container usage.

Container which is designed particularly for utilizing panels, such as panels of plywood, wood, hardboard, reinforced plastic, metal, etc. for container construction. The container comprises a framework of rigid aluminum or other metal retention members designed to hold replaceable bridging elements against the framework and yet permit sufficient flexibility of movement of the panels so as to avoid undue stresses. Thus, tension stresses which tend to harm and damage the panels are eliminated or substantially reduced, and the panels are able to withstand the racking loads normally encountered in container usage.

The present invention is generally concerned with an improved, lightweight packaging and container assembly, particularly wherein plywood panels and other wood fiber boards are utilized in the container. While "plywood" will be mentioned throughout, the term will include the above-mentioned materials and their equivalents.

In essence, the container comprises suitable metal retention members or metallic framework wherein suitable means are used to secure the respective panels against the metal framework. This results in forming an economical, excellent shipping and storage box of light weight and with individually, readily replaceable panel sections. A certain amount of lateral movement of the panels is permitted which greatly increases the life and usage of the panels through elimination of faster shearing action in the panel. The construction of the present container causes compressive stresses to be placed on the panels and eliminates the tension stresses. The unique metal supporting structure absorbs all lifting stresses on the panels, such as laminated plywood panels.

In the art it has been suggested that plywood panels or other laminated panels, be utilized for shipping and storage containers. However, the very nature of the plywood panel, particularly if bolts, screws and rivets are used, causes the panel to deteriorate quite rapidly. The present invention eliminates the necessity of fastening through the plywood panels by the use of fasteners such as bolts, screws, rivets and the like, which results in excellent long-term usage of the container. Also, the present invention provides for gasketing of all joints to permit a water-tight assembly and protection of the gaskets from damage due to impact. The exterior and interior of the container is relatively free from projections which might be damaged by impact and might reduce the cubic capacity.

The container of the present invention may be readily understood by reference to the drawing illustrating one embodiment of the same.

FIGURE 1 is an overall view of the container.

FIGURE 2 is a cross-sectional view taken on the line 2—2 of FIGURE 1 and shows the assembly and method of affixing the panels to the corner sections of the unit.

FIGURE 3 is a cross-sectional view taken on the line 3—3 of FIGURE 1 and illustrates an adaptation of affixing the panels to the side and also end sections of the container. The top and bottom sections are similarly secured to the framework.

FIGURE 4 demonstrates an alternate approach with a braced corner member for the attachment of the retention members in the event that the use of Nelson or equivalent studs are not considered practical as is shown in FIGURES 2 and 3.

Referring specifically to FIGURE 1, a metal framework **10** is shown having a plurality of vertical members **11, 12, 13, 14, 15, 16** and **17**. Corresponding similar members on the opposite sides are not shown. Vertical corner members **11, 15** and **17** are right angle elements or L-shaped. The bottom front horizontal element **20** as well as the bottom side horizontal element **21** are also angular or L-shaped.

Front and side panels **22, 23, 24, 25, 26** and **27** are supported by the vertical elements as hereinafter described. Lid or top panels **28, 29, 30** and **31** are supported by lid metallic elements **32, 33, 34, 35** and **36**, along with elements **37** and **38**. The lid is suitably hinged by conventional means **40** and **41** to permit the lid to open by moving element **37** away from element **42**. The bottom panels of the container not shown are similarly supported, except obviously no hinges are required.

FIGURE 2 is a view on the line **2—2** illustrating corner element **15** supporting the two vertical plywood panels **25** and **26**. These elements are retained in place by a stud assembly **50** which is attached to corner element **15**. The wing section **51** of stud assembly **50** has a section **53** which seats along the end of the panel **26** and a right angle section **55** which seats along the back face of the panel **26**. Sections **53** and **55** are at right angles with respect to one another. The other side of wing **51** has a section **52** which seats along the end of panel **25** and a section **56** which seats along the face of panel **25**. The correct tension of stud assembly **50** on panels **26** and **25** is secured by threading a suitable nut **54** to the desired tension. The method of affixing panels **25** and **24** to upright member **14** is illustrated in FIGURE 3. Affixing stud vertical channel, or vertical molding member **60** is tightened by means of nut **61** so as to firmly affix wings **62** and **63** of the stud along panels **25** and **24**.

FIGURE 4 is a modified form similar to FIG. 2, but with the addition of a cross or corner brace **70** and a headed bolt **50'** which passes through the circular opening **71** and behind the shot **72** in the corner brace **70**. Hence, the nut **54** is screwed onto the end of bolt **50'** with wing section **51** thereon, and after the head of bolt **50'** is passed beneath the slotted brace **70** which is welded to the corner element **15**, the nut is screwed home to secure tightly the diverging panels between the corner **15** and the wing sections **55** and **56**.

The metallic supporting frame may be of any suitable metallic material and of any suitable dimensions. Suitable conventional means of hinging may be employed, and latching means of the top may also be conventional.

The number of individual panels likewise may be varied in the sides, in the ends, in the bottom and in the top. One typical suitable size is to have a box of about 20 feet in length, about 8 feet wide and about 8 feet high. The number of panels in the side may vary from 2 to 6 as,

for example, 4 while the number of panels in the end sections may be from about 1 to 3, such as about 2. Also, the length of the container may be reduced or extended by deletion or addition of additional structurals and panels.

Also a very desirable structure is to provide gaskets of any suitable material such as rubber, felt, and the like between the adjacent panel members, and between the panel members and the abutting supporting members to air and moisture seal the container.

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. Container assembly which comprises in combination (1) a metallic integrated structure comprising a plurality of spaced vertical extending metallic supporting elements and a plurality of spaced horizontal extending metallic supporting elements, said metallic elements being interlocked to form an open skeleton, boxlike structure; (2) a plurality of non-metallic solid panels positioned between and along said spaced vertical supporting elements and between and along said spaced horizontal supporting elements fully enclosing the area; (3) vertical outer and inner corner members affixing the adjacent corner panels to the container, and said panels having their face planes at right angles to each other; (4) a bolt affixed to said metallic structure at a corner thereof; (5) a nut on said bolt; (6) a wing element on said bolt, said wing element on said bolt being characterized by having a return portion of less width than the thickness of the panel and seated along the edge of the panel and a flange substantially at right angles to the return portion and lying substantially along the back of said first panel, and the other side of said wing element similarly seated along the edge and back face of said second panel whereby as said nut is tightened said sides of said wing element are securely positioned about said panels thereby tightly affixing the same to said structure.

2. Container assembly which comprises in combination (1) a metallic integrated structure comprising a plurality of spaced vertical extending metallic supporting elements and a plurality of spaced horizontal extending metallic supporting elements, said metallic elements being interlocked to form an open skeleton, boxlike structure; (2) a plurality of nonmetallic solid panels positioned between and along said spaced vertical supporting elements and between and along said spaced horizontal supporting elements fully enclosing the area; (3) vertical outer and inner corner members affixing the adjacent corner panels to the container; (4) a bolt rigidly affixed to said structure; (5) a nut adapted to be adjusted on said bolt; (6) a strap-like wing element movable on said bolt and having

an intermediate portion of less width than the thickness of the panel and seated along the edge of said panel and a flange substantially at right angles to the return portion and lying substantially along the back face of one panel, and the other side of said wing element similarly seated along the edge and back face of a second panel thereby tightly affixing the panels to said structure.

3. Container assembly which comprises in combination (1) a metallic integrated structure comprising a plurality of spaced vertical extending metallic supporting elements and a plurality of spaced horizontal extending metallic supporting elements, said metallic elements being interlocked to form an open skeleton, boxlike structure; (2) a plurality of non-metallic solid panels positioned between and along said spaced vertical supporting elements and between and along said spaced horizontal supporting elements fully enclosing the area; (3) vertical outer and inner corner members affixing the adjacent corner panels to the container, and said panels having their face planes at right angles to each other; (4) a web spaced from the junction of said outer corner member and secured to two sides of the same to provide a spaced between said web and said corner junction; (5) a wing element having sides which contact both the edges and back faces of said corner panels, and (6) a bolt secured to said web and to said wing element thereby affixing the panels to said structure.

4. assembly as set forth in claim 3 wherein said web has at least one slot therein, said slot having an enlarged area whereby the head of said bolt may be inserted and wedged behind the narrower area therein and retained between said web and said corner junction.

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U.S. Cl. X.R.

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