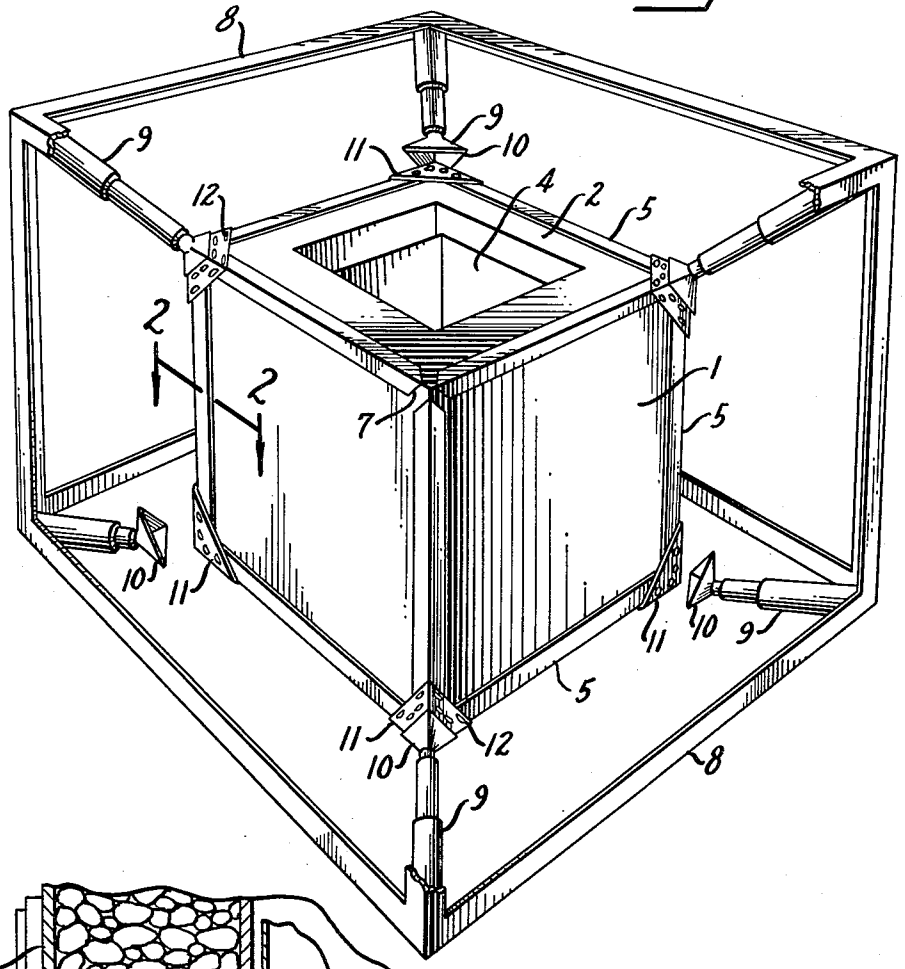
July 17, 1962 W. L. MORRISON 3,044,161

METHOD OF ASSEMBLING AN INSULATED SHIPPER CONTAINER

Filed Aug. 15, 1960

Fig. 1.



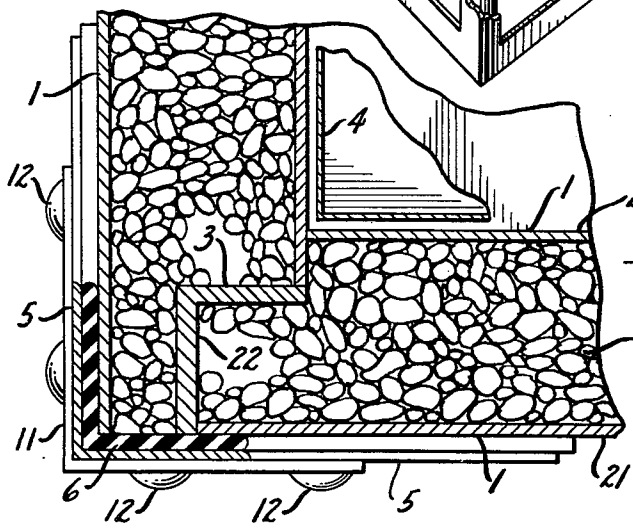


Fig. 2.

INVENTOR.
Willard L. Morrison,
BY Parker & Carter
Attorneys.

United States Patent Office 3,044,161 Patented July 17, 1962

3,044,161

METHOD OF ASSEMBLING AN INSULATED SHIPPER CONTAINER

Willard L. Morrison, Lake Forest, Ill., assignor to Liquefreeze Company, Inc., New York, N.Y., a corporation of New York

Filed Aug. 15, 1960, Ser. No. 49,731
3 Claims. (Cl. 29—445)

My invention relates to improvements in insulated shipper containers and method of making them. The invention is well adapted for small size shipper containers big enough to hold a ton or more of frozen food but is also applicable to automotive or other insulated vehicle bodies or freight cars.

One object of the invention is to provide a rectangular, preferably cubical shipper container which will be to all intents and purposes gas and liquid tight to the end that a minimum of heat inflow be possible.

Another object is to provide a shipper container and method of making it which lends itself to shipment of frozen food for long distances under circumstances such that no cooling is possible between beginning and end of shipment.

Other objects will appear from time to time throughout the specification and claims.

The invention is illustrated more or less diagrammatically in the accompanying drawing, wherein

FIGURE 1 is a perspective of a shipper container in process of assembly, together with the jig used in assembling it;

FIGURE 2 is a section along the line 2—2 of FIGURE 1.

Like parts are indicated by like characters throughout the specification and drawings.

The shipper container as illustrated is cubical. It has five sides 1 of each preferably of a single slab, self-supporting, laminated, sandwich panel, generally gas impervious insulating material such as dyalite though other materials may be used. Under some circumstances each side might be made of a plurality of panels face to face though a single panel is often entirely satisfactory. Under other circumstances, perhaps a plurality of panels edge to edge might be used but here also I prefer to use a single panel for each side. These panels are of a material which does not substantially suffer any loss of strength in the presence of intense cold. The panel may warp a little if one side is colder than the other but it will return to original shape when the differential temperature is no longer present.

The sixth side 2 is centrally apertured to receive any suitable insulated closure, not here illustrated as the details form no part of the present invention.

The abutting panels interlock as indicated in FIGURE 2, there being a compressible insulating packing 3 between their opposed interlocking edges though under some circumstances the flexibility of the inner insulation of the panels is resilient enough to insure substantial gas tight closure. Preferably, there is contained within the cubical container loosely socketed, a box of aluminum foil 4 or other material which does not suffer in the presence of excessive cold. Such a box will contain foodstuffs which are placed in the aluminum container and then saturated with a cold boiling liquid such as liquid nitrogen. The purpose of the aluminum box is to insure against leakage of the liquid nitrogen through the insulation before it evaporates.

The box is reinforced by twelve angle bars 5, each angle bar receiving one corner of the box. Each angle bar being somewhat less in length than the unstressed dimensions of the dyalite panels. Compressible packing 6 which might be rubber or other compressible material is interposed between each angle and the corner of the panel or panels associated with it. These angles where they approach one another as indicated at 7 are diagonally cut away and they are out of contact with one another. When the container is to be assembled, these various elements above enumerated are in place within a jig 8. The jig 8 is a rectangular frame member having at each corner a hydraulic ram or other pressure means 9 which terminates in a pressure foot 10 adapted to press against gusset 11, there being one gusset for each corner of the shipper container. When pressure is applied to these hydraulic rams the insulating panels are compressed so as to insure a snug contact between the outside corners or edges of each panel with its neighbor, which snug contact is transmitted through the compressible packing element 6. This pressure must be sufficient to insure that even when the inner face of the panel shrinks as a result of the cold of the contents, there still remains adequate compression so that the panels are still pre-stressed. When sufficient pressure has been applied, the gussets are riveted or bolted as at 12 to the angles to hold the panels under compression.

When food is to be frozen in the shipper container, the container having been removed from the jig for use, the container or the aluminum liner if that is used, may be filled with food and liquid nitrogen will be poured in to freeze the food to temperatures far below zero degrees F. for shipping. This includes cooling the inner walls or surfaces of the slabs or panels. As soon as they are cooler than the outer walls, the panels tend to warp, the shorter outer walls tending to warp inwardly and cause the panel to take a concavo convex contour with the convex outward. This difference, however, is comparatively small and is compensated for by the packing 3 and 6 which being under pressure yields sufficiently to maintain a tight joint and expand sufficiently when pressure is relieved by the warping of the panels to still maintain that tight joint.

By this arrangement, I am able to provide a cheap, inexpensive and durable shipper container which remains tight under all normal circumstances of use. This is of the utmost importance because while when refrigeration is added enroute you can compensate for loss by using some refrigeration, when the shipper container is used without refrigeration between the time it is filled and the time it reaches destination, heat inflow may be fatal so it is of the ultmost importance to maintain a really tight box, so tight that foodstuffs can be frozen to temperatures far below zero degrees F. and as treated by this method, such foodstuffs can be shipped clear across the country and arrive at destination at temperatures still below zero degrees F., something heretofore never known to be possible.

Each slab is preferably made of foamed plastic, of which there are many well known on the market, indicated at 20 and each slab is sheathed or armored by plywood as indicated at 21. A plywood partition as at 22 is interposed between the interlocking edges of the slabs.

I claim:

1. The process of building an insulated shipper container which consists in assembling a plurality of insulating panels in edge to edge contact to define a rectangular box having top, bottom and side walls, placing an angle bar along the abutting edges of each pair of panels to enclose each edge and engage both abutting panels, the length of the bar being slightly less than the uncompressed length of the abutting edge, placing at each of the eight corners of the box overlying each of the three adjacent angle bar ends, a three sided corner cover member, applying equal pressure simultaneously to the ends of the angle bars at each corner only, the pressure being applied to said corner cover members the lines of pressure intersecting generally at the center of the box, the pressure being sufficient to compress the panels and bring the ends

of the angle bars into immediate juxtaposition, then securing the adjacent ends of each of the three angle bars together at each corner by means of the corner cover to thereby form the angle bars and corner cover members into a unitary frame structure about said compressed insulated panels to thereby form a unitary angle bar frame structure about said compressed insulating panels and then relieving the pressure form each of the corner cover members.

2. The process of building an insulated shipper container which consists in assembling a plurality of relatively thick, compressible insulating panels in edge to edge interlocking contact to define a rectangular box having top, bottom and side walls, placing along the abutting edges of each pair of panels an angle bar wherein each arm of the angle is parallel to and engages throughout its entire length an adjacent panel face, the length of the bars being slightly less than the uncompressed length of the abutting panel edge placing at each of the eight corners of the box overlying each of the three adjacent angle bar ends, a three sided corner cover member, applying equal pressure simultaneously to the three adjacent ends of each three angle bars at the corner cover of the box only the pressure being applied to said corner cover members, the lines of pressure applied to the eight corners of the box intersecting generally at the center thereof and when the box panels have been compressed, securing the adjacent ends of each of the three angle bars together at each corner by means of the corner cover member to thereby form the angle bars and corner cover members into a unitary frame structure about said compressed insulated panels, to thereby form a unitary angle bar frame

structure about said compressed insulating panels, and thereafter relieving the pressure from each of the corner cover members and freeing the box for use.

3. The process of building an insulating shipper container which consists in assembling a plurality of relatively thick, compressible, self-supporting, insulating panels in edge to edge interlocking contact to define a rectangular box having top, bottom and side walls, placing along each of the twelve contact edges of the panels an angle bar whose length is somewhat less than the length of the edges, each angle bar engaging flatwise two of the panels, only, placing at each of the eight corners of the box, overlying each of the three adjacent angle bar ends, a three sided corner cover member, applying inward equal pressure simultaneously to each corner cover member along lines of pressure intersecting generally at the center of the box to compress the panels and bring the ends of each group of three angle bars into juxtaposition, then permanently attaching each corner member to its three associated angle bars to thereby form the angle bars and corner cover members into a unitary frame structure about said compressed insulated panels, and relieving the pressure from each of the corner cover members and freeing the box for use.

References Cited in the file of this patent

UNITED STATES PATENTS

2,693,027	Meyer	Nov. 2, 1954
2,746,824	Bond	May 22, 1956
2,892,564	Morrison	June 30, 1956