

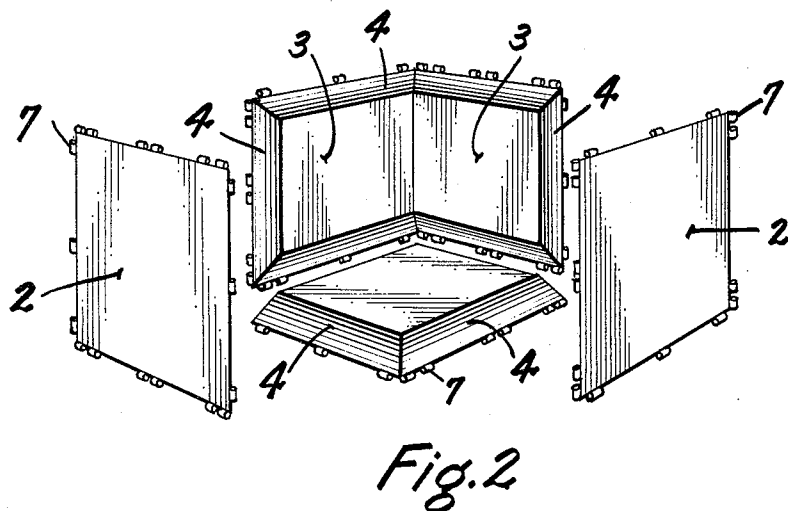
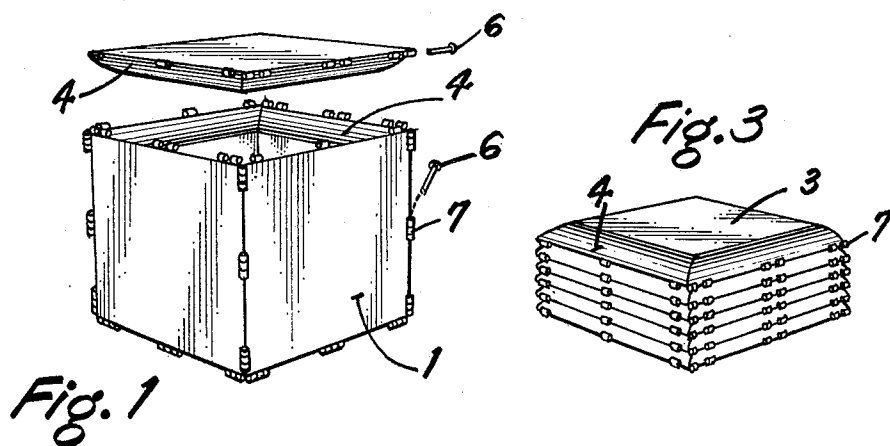
June 11, 1963

W. L. MORRISON
INSULATING CONTAINER

3,093,259

Filed March 3, 1960

2 Sheets-Sheet 1



INVENTOR.
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BY PARKER & CARTER
ATTORNEYS

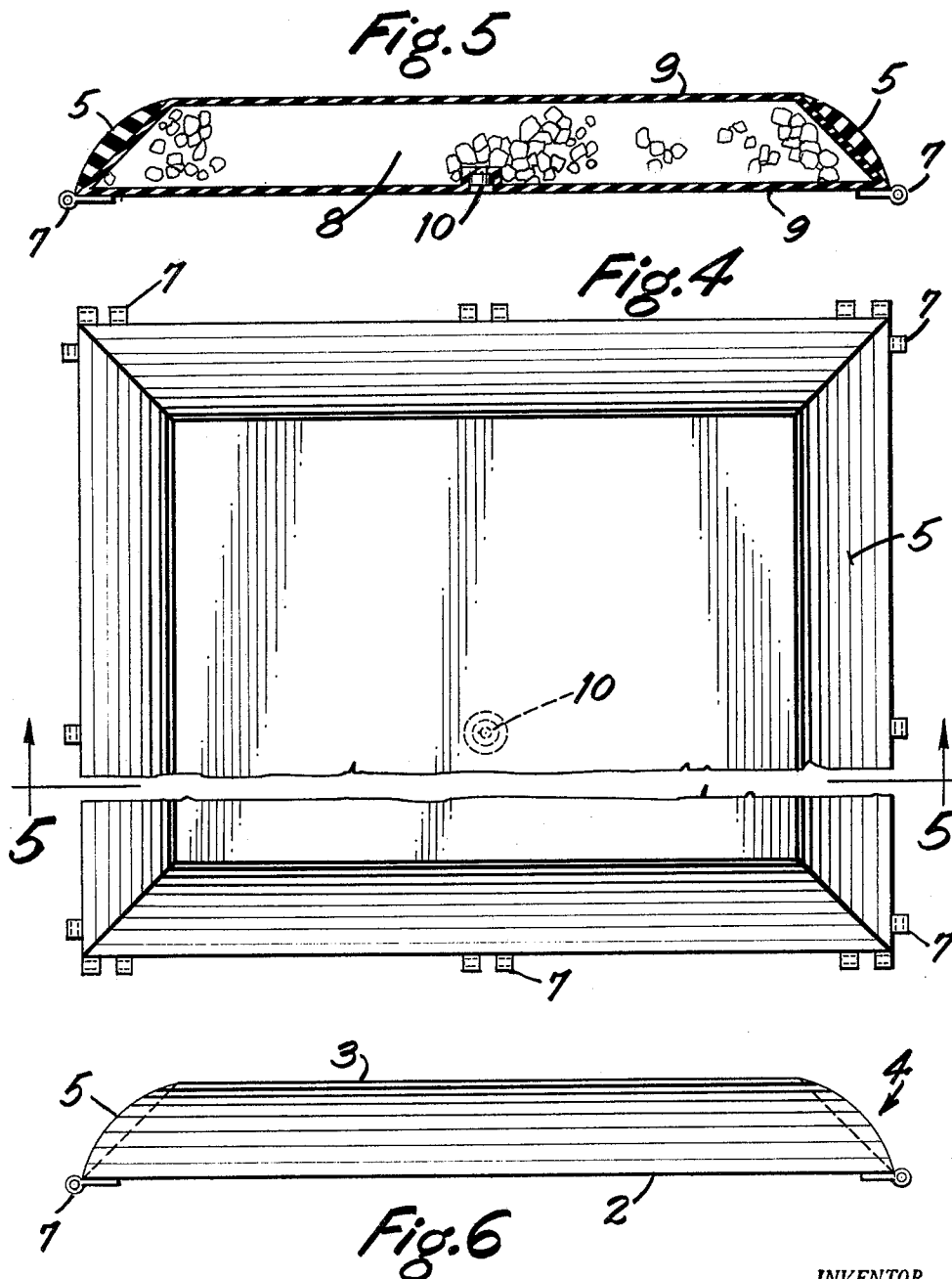
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INSULATING CONTAINER

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

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1 Claim. (Cl. 220-9)

My invention relates to improvements in insulated shipper containers and has for one object to provide a shipper container for the shipment of frozen food and the like, the temperature of which has been lowered far below zero degrees F.

Another object of the invention is to provide a shipper container which may be disassembled and collapsed for return shipment.

Another object is to provide a shipper container which will cushion the contents and which will receive little if any damage from shocks or rough handling.

Shipper containers now available usually include an outer shell, an inner shell and fixed insulating material between the shells with a removable door through both shells and the insulation so that the container may be filled and emptied. Such containers are usually of metal and as a result are heavy and expensive and easily damaged especially in cargo handling from ship to dock and the like. A container insulated for long distance shipment of frozen food may for a six foot cube of frozen food require twelve inches of insulation so that the container itself is an eight foot cube which cube must be when unloaded, returned to destination.

This invention includes a demountable shipper container where for example a cubic mass of frozen food may be enclosed in a built up shipper container which includes six edge engaging insulating panels removably held together and so disposed that when destination has been reached the panels may be disconnected, stacked or baled one on top of another for return shipment, requiring greatly reduced space.

My invention is illustrated more or less diagrammatically in the accompanying drawings, wherein—

FIGURE 1 is a perspective of the shipper container with cover about to be applied;

FIGURE 2 is an exploded view of the shipper container of FIGURE 1;

FIGURE 3 shows the container collapsed and the panels piled for return shipment;

FIGURE 4 is a plan view of one of the six panels which can be assembled together to make the shipper container;

FIGURE 5 is a section along the line 5-5 of FIGURE 4;

FIGURE 6 is an edge view of the panel.

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

The shipper container preferably comprises six self-contained parallel walled panels 1, removably pinned together edge to edge to form a box as indicated in FIGURE 1. In using this device, five of the panels will be pinned together as shown in FIGURE 1, the container will be filled with packages of frozen food and the sixth panel will be pinned in place to complete the container. This results in a cubic box container in condition for shipment.

When destination has been reached, the panels will be unpinned, the frozen food will be removed, the container panels will be laid one on the other in a thin flat mass and may be baled together for shipment as indicated in FIGURE 3.

The rectangular panels 1 are identical and interchangeable. Each panel includes an outer wall 2, an inner

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wall 3, inclined peripheral walls 4 joining the outer to the inner smaller walls. The inner and outer walls are parallel, the peripheral walls are at approximately a forty-five degree angle with respect to the inner and outer walls. Each peripheral inclined wall carries an elastomeric cushion 5 so that when the panels are pressed together and pinned as indicated by the use of removable pins 6 passing through the eyelets 7, a tight structure results. The elastomeric packing makes a close joint between each pair of opposed panels.

This assembly resembles to some extent the assembly of my co-pending application Serial No. 790,655 filed February 2, 1959, but the make up of the individual panels is quite different and will now be described.

Each panel comprises a block of foamed plastic 8. This block is parallel sided and chamfered about its edges to conform to the peripheral contour above indicated. Each block of foamed plastic is enclosed in an envelope 9 of gas tight material, of the type which does not preferably change its physical characteristics and is not embrittled in the presence of temperatures as low as the temperature of liquid nitrogen at atmospheric pressure, namely -320 degrees F. This envelope closely fits the block. The eyelets 7 outside the envelope are attached to the block in any suitable manner, for example, by cementing them to the envelope.

A vacuum valve 10 is disposed within each block extending through the envelope 9. The vacuum block 10 may well be a typical automobile tire Schrader valve but reversed so that when the panels are assembled, a vacuum may be drawn extracting gas from the interstices within the foamed plastic and from the entire mass inside the envelope. This puts each block under a substantial atmospheric pressure tending to rigidify the structure. It also increases the K factor of the insulation because the gases, whatever they may be, in the interstices between the bubbles or beads of the foamed plastic are withdrawn, thereby increasing the insulation effectiveness.

This invention has been illustrated as a cubic box and this makes it possible for the separate panels to be identical and interchangeable. The same principle may be used with boxes of other shape or with panels not identical. Some of the panels might be edge to edge in the same plane instead of being at right angles to one another. Under these circumstances the mating edges or edge walls would be perpendicular rather than inclined but as a general proposition a rectangular cube is considered better, is easier to assemble and generally more effective.

A suitable material for the core is styrene "Dyalite" a foaming plastic which occurs with sometimes air and sometimes "Freon" in the beads but with air in the clearances or spaces around the bead. When the vacuum is drawn, it may be left as a vacuum or may be broken by admitting "Freon," the envelope being then closed. Under these circumstances the danger of losing a vacuum through puncturing or something of the sort or through leakage, osmosis and the like is reduced to a minimum because if the vacuum is broken by "Freon," there is no pressure differential as there is when the vacuum alone is relied on.

If the core is made of other insulating material such as balsa wood, the vacuum may still be maintained or broken by "Freon" as the case may be. One advantage of the vacuum when such insulation as balsa is used is that the pressure, the vacuum being held, tends to hold the core together and may under some circumstances even permit the core, being loosely assembled, held in place by the pressure with the vacuum drawn without the necessity of gluing the parts together.

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The wrapper or envelope may well be made of "Ediprene" which is gas impervious and retains its strength and temperatures down as far as -320 degrees F.

I claim:

An insulated, knock down, shipping container comprising a plurality of panels of identical shape and dimension detachably joined one to another at adjacent edges to form the container, each panel comprising a stiff, porous, one-piece, self-supporting, foamed plastic core bounded on opposite sides by parallel symmetrical inner and outer faces with the outer face being larger than the inner face, and bounded peripherally by perimetric faces inclined approximately at a forty-five degree angle to the parallel inner and outer faces, a flexible elastomeric gas tight envelope enclosing the panel in engagement with all of the faces but unattached thereto, means for drawing a vacuum in the envelope whereby atmospheric pressure forces the envelope to conform with the adjacent surfaces of the faces and to be drawn into intimate continuous contact with the panel through-

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out its entire exposed area, an elastomeric member peripherally enclosing the panel to cover the entire perimetric surfaces of the panel, removable means carried by the envelope, extending laterally from the outer face of the panel, on all four sides thereof, arranged for locking a pair of such panels in removable edge to edge contact assembly.

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