

PATENT SPECIFICATION

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DRAWINGS ATTACHED

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(54) IMPROVEMENTS RELATING TO CONTAINERS

(71) We, CONCARGO LIMITED, a British company of Salisbury Road, Totton, Southampton, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention is concerned with containers for the bulk transport of goods, for example, shipping containers. Such containers have to carry heavy loads and may have to be lifted by crane. Consequently, they must be of considerable strength. Frequently, they are required to be thermally insulated to a very high degree in order to protect the cargo from changes of temperature. Since the outside dimensions of such containers are usually standardised, the thickness of the walls determines the inner dimensions of the container and therefore the pay-load volume. The inner dimensions must therefore be as large as possible compatible with the required strength and degree of thermal insulation.

Glass-reinforced plastics material has been used for the skins of container wall panels, the outer and inner skins of the panel being separated by thermal insulation and interconnected through the insulating material at regularly spaced intervals by ribs of glass-reinforced plastics material, these ribs permitting the internal skin to take a part of the stresses exerted on the container.

According to the present invention, in a container having side walls each of which has a layer of thermally insulating material between inner and outer skins of glass-reinforced plastics material, each side wall is formed without close-pitch reinforcing bolts or rivets between the inner and outer skins and without ribs of glass-reinforced plastics material extending through the layer of insulating material; each side wall has a metal angle member of L-shaped cross-section extending along its lower edge, the inner surface of one wall of the angle member being glued to the outer skin of the

side wall of the container over substantially the whole of the area of the said inner surface and the inner surface of the other wall of the angle member extending under the lower edge of the side wall of the container. The gluing of the angle member to the container side wall not only gives a large area of attachment between the two but also provides a weatherproof seal between them. The absence of plastics ribbing between the inner and outer plastics skins reduces the heat paths which would otherwise be present between the skins and therefore reduces the thickness of thermally insulating material required between the skins to meet a given heat loss specification. For a container of given size, the reduced wall thickness enables a greater internal container volume to be obtained. Moreover, the attachment of the side walls of the container to the angle members by glue is preferable to the known method of attaching wall panels to metal members by bolts or rivets, since it is found that under the stresses to which these containers are subjected, the bolts or rivets tend to work in the panels and therefore to enlarge the holes through which they pass. A few bolts or rivets may still be included to hold the glued surfaces to one another during the gluing operation and also to prevent "peeling" of the glue when the container is in use, but these bolts or rivets are serving simply as clamps and can, in fact, be replaced by equivalent clamping devices. They do not take stress in the manner of the bolts or rivets in the known containers and are spaced at relatively long intervals, in contrast to the close pitch bolting or riveting of the known containers.

In the preferred form of container, the glass-reinforced plastics outer skin of each side wall is coated on a sheet of plywood, which thus lies between the outer skin and the thermally insulating material. The plywood imparts sufficient rigidity to the side wall and can in fact be replaced by a "core" board of equivalent rigidity. The plastics coating

gives weather protection and also impact protection to the side walls. The metal angle members carry the majority of the loading stresses and transmit the stresses into the panels through the glue.

In one particularly advantageous form of construction, the container has a floor panel which is supported by extension of those walls of the angle members which lie under the side walls of the container. The floor panel may be in turn glued to these extensions of the angle members. The angle members provide a high resistance to abrasion along the vulnerable lower margins of the container and interconnect the side walls and the floor without constituting additional heat loss paths between the external surface of the container and its internal surface. If desired, some interconnecting members may be provided to prevent the floor from being lifted out of the channel if the container is dropped so that the central portion of its floor strikes a projection before the marginal portions are supported. Such interconnecting members will not, however, be of the size or quantity which would be required without the angle members glued to the side walls and floor and therefore they do not provide a comparable heat loss.

In order that the invention may be better understood, a section through a portion of one side wall and the floor of a container embodying the invention is illustrated in the accompanying drawing. In this example, the side wall of the container consists of an inner skin 1 of glass-reinforced plastics material, a layer 2 of thermally insulating material and a composite outer layer of sandwich form consisting of skins 3 and 4 of glass-reinforced plastics material separated by a plywood sheet 5.

The floor consists of an inner layer formed by a glass-reinforced plastics skin 6 on a plywood sheet 7; an intermediate layer 8 of thermally insulating material; and an outer layer formed of an outer skin 9 of glass-reinforced plastics material on a plywood sheet 10.

A metal angle member extends along the horizontal edge where the side wall meets the floor of the container. The vertical wall 11 of this angle member is attached to the skin 4 of the side wall of the container by a layer of glue 12. The lower wall 14 of the angle

member has an extension which turns upwards at right-angles from the edge of the wall 14 and then turns at right-angles again to form a horizontal portion 13 which supports the floor, to which it is connected by a continuous layer of glue. The portion 14 of the angle member forms a metal capping which gives protection and support at the margins of the container.

WHAT WE CLAIM IS:—

1. A container, for the bulk transport of goods, having side walls each of which has inner and outer skins of glass-reinforced plastics material and a layer of thermally insulating material between the said skins, each side wall being formed without close-pitch reinforcing bolts or rivets between the inner and outer skins and without ribs of glass-reinforced plastics material extending through the layer of insulating material between the skins, and each side wall having a metal angle member of L-shaped cross-section extending along its lower edge, the inner surface of one wall of the angle member being glued to the outer skin of the said side wall of the container over substantially the whole of the area of the said inner surface and the inner surface of the other wall of the angle member extending under the lower edge of the said side wall of the container.

2. A container in accordance with Claim 1, including a plywood sheet between the outer skin of glass-reinforced plastics material and the layer of thermally insulating material.

3. A container in accordance with Claim 1 or 2, in which the wall of the metal angle member which extends under the lower edge of the side wall of the container is formed with an extension terminating in a flange lying parallel to and in a plane above that of the said wall of the angle member, the said flange supporting and being glued to a floor panel.

4. A container in accordance with Claim 1, substantially as herein described with reference to the accompanying drawings.

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