Sept. 19, 1950 S. H. ROBINSON 2,523,145

SHIPPING CONTAINER

Filed Feb. 15, 1947

FIG. 1

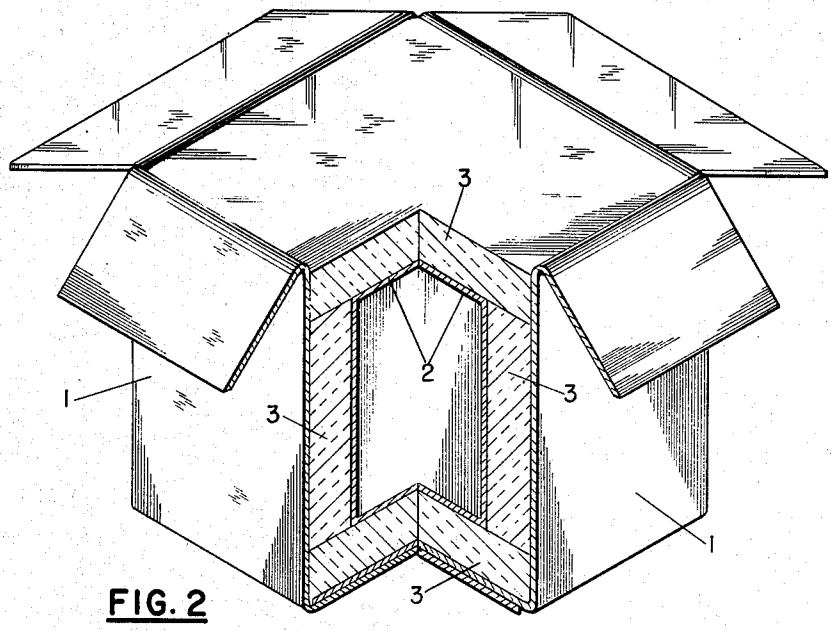


FIG. 2

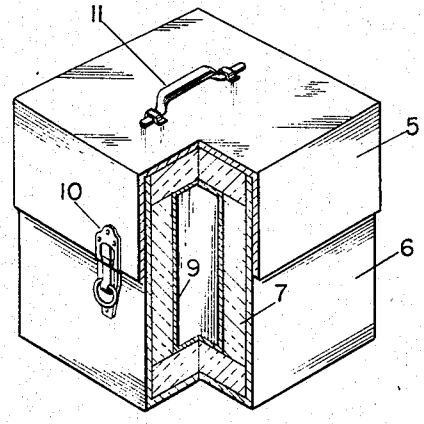


FIG. 3

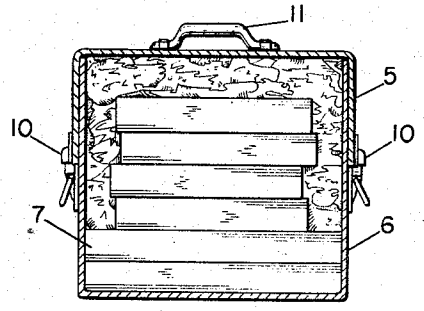


FIG. 4

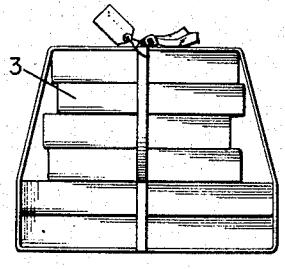
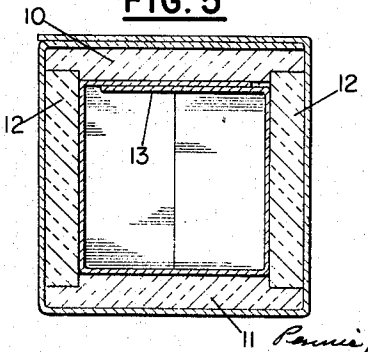


FIG. 5



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Patented Sept. 19, 1950 2,523,145

UNITED STATES PATENT OFFICE

2,523,145

SHIPPING CONTAINER

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Application February 15, 1947, Serial No. 728,923

3 Claims. (Cl. 229—14)

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This invention relates to insulating shipping containers for the shipment of food and other material which it is desired to maintain at a constant temperature during shipment. Such containers are used for the shipment of biological cultures, fresh yeast, butter, and various other materials of low melting point, as well as fresh fruits, vegetables and the like, which maintain their freshness for a longer period if maintained at a comparatively low temperature. Such containers are also useful for the shipment of articles and materials which would be damaged by freezing temperatures to which they may be subjected when shipped by ordinary common carriers in extremely cold weather.

Insulating containers as heretofore made have been of two general types, namely, single use containers which are usually made of ordinary corrugated board lined with some form of cheap fibrous heat-insulating material, and containers intended for repeated use which are usually of wood or metal with double walls filled with ground cork or other like insulation. Neither type of container as heretofore manufactured has proven entirely satisfactory. Those designed for a single use, if made at a reasonable cost, do not have sufficient insulating qualities to maintain the contents within the desired range of temperatures for a sufficient period to meet the needs of ordinary commercial shipping. On the other hand, the containers made for re-use require a capital investment which so adds to the shipping expense as to make the use of the container impractical for food and the like.

The object of my invention is to provide a shipping container which will have insulating qualities comparable with those of the permanent type of insulating containers heretofore used, but whose cost will be within the range of the insulating containers as heretofore manufactured for use on a one-trip basis.

A further object of the invention is to provide a container of this type which, although of low manufacturing cost, may be repeatedly used so that a large part of the manufacturing cost will be distributed over a number of shipments.

A further object of the invention is to provide a shipping container of the kind described which may be readily made in various sizes from ordinary stock material.

Further advantages of the invention will appear from the following specification and the accompanying drawings wherein I have shown and described several typical examples of my improved shipping container.

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In the said drawings:

Fig. 1 is a perspective view of one form of my improved container partly cut away;

Fig. 2 is a similar view of an alternate form of my improved container designed for repeated use for a long period of time;

Fig. 3 is a sectional view of the container of Fig. 2 as assembled for the return of the empty container to the shipper;

Fig. 4 is an elevational view of the insulating elements of the container as separately packed for return shipment; and

Fig. 5 is a sectional view of a modified form of the container shown in Fig. 1.

My improved container consists essentially of an outer shipping case, a separate inner case of smaller size in all dimensions and with the intervening spaces between the two cases filled with panels of rigid, self-sustaining, cellular material, e. g. balsa wood of a thickness equal to one-half the difference in the corresponding dimensions of the two cases. The balsa panels are completely detached from both the inner and outer cases so that when the container arrives at its destination the articles may be removed with the inner case, which may be a cheap cardboard box, and the balsa panels are then sent back to the shipper for reuse. If the outer case is not damaged the panels may be shipped back in the outer case and both the balsa panels and the outer container used again.

In Figure 1 of the accompanying drawings 1 indicates the outer shipping case which may be made of ordinary corrugated paper, fibreboard or like materials having the required characteristics as to strength, rigidity, etc. that are required for shipping cases of the particular size and weight capacity. I have illustrated an ordinary shipping case with overlapping top and bottom flaps to be sealed with adhesive or sealing tape, but if desired the outer case may be of more substantial character, for example, of the type illustrated in Fig. 2 which will be later described. Within the outer case 1 and spaced from it on all sides is an inner case which may be of any suitable material depending on the goods to be shipped. A light pasteboard box will usually be sufficient. Between the outer case 1 and the inner case 2, and filling the space between the two cases are panels 3 of balsa wood which may be of varied thickness, depending upon the degree of insulation required. For shipping fresh yeast, butter and the like, which are usually packed at temperatures around 35° to 36°, a thickness of one and one-half inches is sufficient to maintain a

temperature within three or four degrees of the initial temperature for forty-eight hours during shipment in ordinary summer weather.

These panels 3, as shown in Fig. 1, are of the proper relative size to be assembled into a hollow cube. As here shown, the top and bottom panels are of the same dimensions as the bottom of the carton on the inside, while each of the others is equal in height to the outside height of the inner box and of a width equal to the width of the box plus the thickness of the panel. Other shapes and sizes may obviously be employed so long as the panels when put together form a complete hollow box filling the spaces between the outer and inner containers. For example, the panels may be cut with their outer faces equal in area to the inner faces of the walls of the outer carton and with their inner faces of an area co-extensive with the outer dimensions of the walls of the inner carton, the edges between the two faces being beveled so that when the panels are assembled in the outer case they form in effect a box with mitred corners. By mitring the corners of the balsa panels as described, the assembled panels, although not fastened together in any way, contribute to the rigidity and strength of the case, but are protected against damage by the outer case so that they may be repeatedly used.

In assembling my improved package the bottom and the four side panels of the balsa wood are assembled in the outer case, which leaves a central opening of proper size to fit the inner case 2 in which the goods to be shipped are placed within the balsa panels. The top balsa panel is then put in place and the flaps of the outer container sealed in the usual fashion. Balsa wood is very soft and is easily split. Consequently the insulating shipping containers as heretofore made out of balsa wood with the various panels fastened together with nails and screws in the usual fashion are easily damaged by rough handling, the balsa wood splitting at the points where the nails or screws are driven in.

With my improved container the balsa panels will withstand a much rougher handling without injury. As the panels are not fastened together they can shift slightly with respect to each other under these stresses of handling without putting any strain on the panels themselves. If desired the panels may be given a coat of varnish or paint to protect the soft wood from scuffing. The paint or varnish does not interfere with the insulating qualities of the balsa wood, and where the container is used for the shipment of foodstuffs such as butter, cheese, and the like, the coat of paint or varnish prevents the absorption of moisture and odors by the balsa wood.

The inner package 2, as stated above, may be an ordinary pasteboard box as illustrated, of sufficient strength to permit handling the material. As the inner box is fully protected in shipment by the outer casing and also the balsa panels, the materials out of which it is fabricated contribute nothing to the overall strength of the package.

If the outer casing is used to return the balsa panels to the shipper it is necessary merely to place the panels in the bottom of the outer casing and fill the balance of the carton with a small amount of crumpled paper. The balsa panels are very light and need very little resistance to hold them against movement in the case.

In Figs. 2 and 3 I have shown a modification of my invention wherein the outer case is specifically designed for repeated use. As here shown, the outer case consists of two telescoping parts 5 and 6, respectively, of compressed fiber. Fitted within the inner case are the balsa wood panels 7, here shown as having square edges and of properly correlated sizes to form a complete enclosure for the inner container 9. When the panels of the inner container are assembled in the outer member 5 of the telescoping fiber sections, the outer face of the top balsa wood panel will be exactly flush with the top edges of the bottom fiber section. The fiber section 5 is then placed over the section 6, the two parts being fastened together by any suitable means, preferably metal hasps 10 of the kind commonly employed on trunks, to draw the lid down firmly on the lower section. A handle 11 may be provided on the upper section.

In using this type of container the consignee of the shipment removes the inner package with the contained goods which have been maintained at the desired low temperature, then places the panels flat in the bottom of the inner fiber section, adds some crushed paper to hold the panels against free movement in the box, and returns the box to the shipper for reuse.

A fiber case of the character shown may be repeatedly used without damage for shipment of perishable goods at an ultimate cost, except for the return postage, far less than the cheapest single use insulating container now on the market.

In the practical use of containers such as illustrated in Fig. 1, the outer carton can be opened in a way to avoid substantial damage to the carton so that it may be used in the same manner as the fiber case for the return of the balsa panels to the shipper. However, if the carton is too badly damaged for return shipment the balsa panels can be simply tied together in a bundle as illustrated in Fig. 4 and returned to the shipper. The panels are light and when not weakened by nail holes or the like, will withstand repeated shipment without packing of any kind.

In Fig. 5 I have illustrated a modification of my improved container wherein the balsa panels are shaped so as to provide a self-sustaining hollow square within the outer container without support from the inner container. To this end the top and bottom panels 10 and 11, respectively, are reduced in thickness around their edges for a distance equal to the thickness of the side panels 12, thereby forming the central raised portion 13 with an area co-extensive with the top and bottom faces of the inner container. The side panels 12 are of greater height than the height of the inner container by a distance equal to the depth of the cut-away portions of the top and bottom panels, so that when the panels are put together in the outer container the side panels are held in place against the edges of the raised portions 13. With this form of container the panels can be fitted together for return to the shipper in the same way that they are fitted around the inner package whose contents are to be protected against temperature changes.

It will be understood, of course, that my improved container may be otherwise modified within the scope of the appended claims as regards its details of construction, and retain the elements of the invention such elements of the invention being the self-sustaining individual detached panels of insulating material of the prop-

er sizes and shapes to form within the outer container a hollow insulating shell which will insulate the space within the shell against significant temperature changes over a substantial period of time.

I claim:

1. An insulating container comprising a rectangular outer container having sides, top and bottom walls, a rectangular inner case having sides, top and bottom walls corresponding to the shape of the sides, top and bottom walls of the outer container but of dimensions less than the corresponding sides, top and bottom walls of the outer container, said inner case being substantially centrally positioned within the outer container to provide a space of substantially uniform width between the corresponding sides of the inner case and the outer container, and six rigid, self-sustaining panels each comprising slabs of balsa wood, one of said panels being between the bottom of the inner case and the bottom of the outer container, another of said panels being between the top of the inner case and the top of the outer container and the other four panels being between the four sides of the inner case and the corresponding sides of the outer container, said panels being independent of each other and of the outer container and the inner case, readily removable and of such dimensions that, collectively, they fill the entire space between the outer container and the inner case and form insulation of substantially uniform thickness completely surrounding the inner case.

2. An insulating container comprising a rectangular outer container having sides, top and bottom walls, a rectangular inner case having sides, top and bottom walls corresponding to the shape of the sides, top and bottom walls of the outer container but of dimensions less than the corresponding sides, tops and bottom walls of the

outer container, said inner case being substantially centrally positioned within the outer container to provide a space of substantially uniform width between the corresponding sides of the inner case and the outer container, and six rigid, self-sustaining panels each comprising slabs of cellular insulating material, one of said panels being between the bottom of the inner case and the bottom of the outer container, one of said panels being between the top of the inner case and the top of the outer container, and the other four panels being between the four sides of the inner case and the corresponding sides of the outer container and between the top and bottom panels, said panels being independent of each other and of the outer container and the inner case, readily removable and of such dimensions that, collectively, they fill the entire space between the outer container and the inner case and form insulation of substantially uniform thickness completely surrounding the inner case.

3. An insulating container as defined in claim 2 in which the panels interfit with one another and are thereby held against inward movement, and are held against outer movement by the walls of the outer container.

STUART H. ROBINSON.

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