

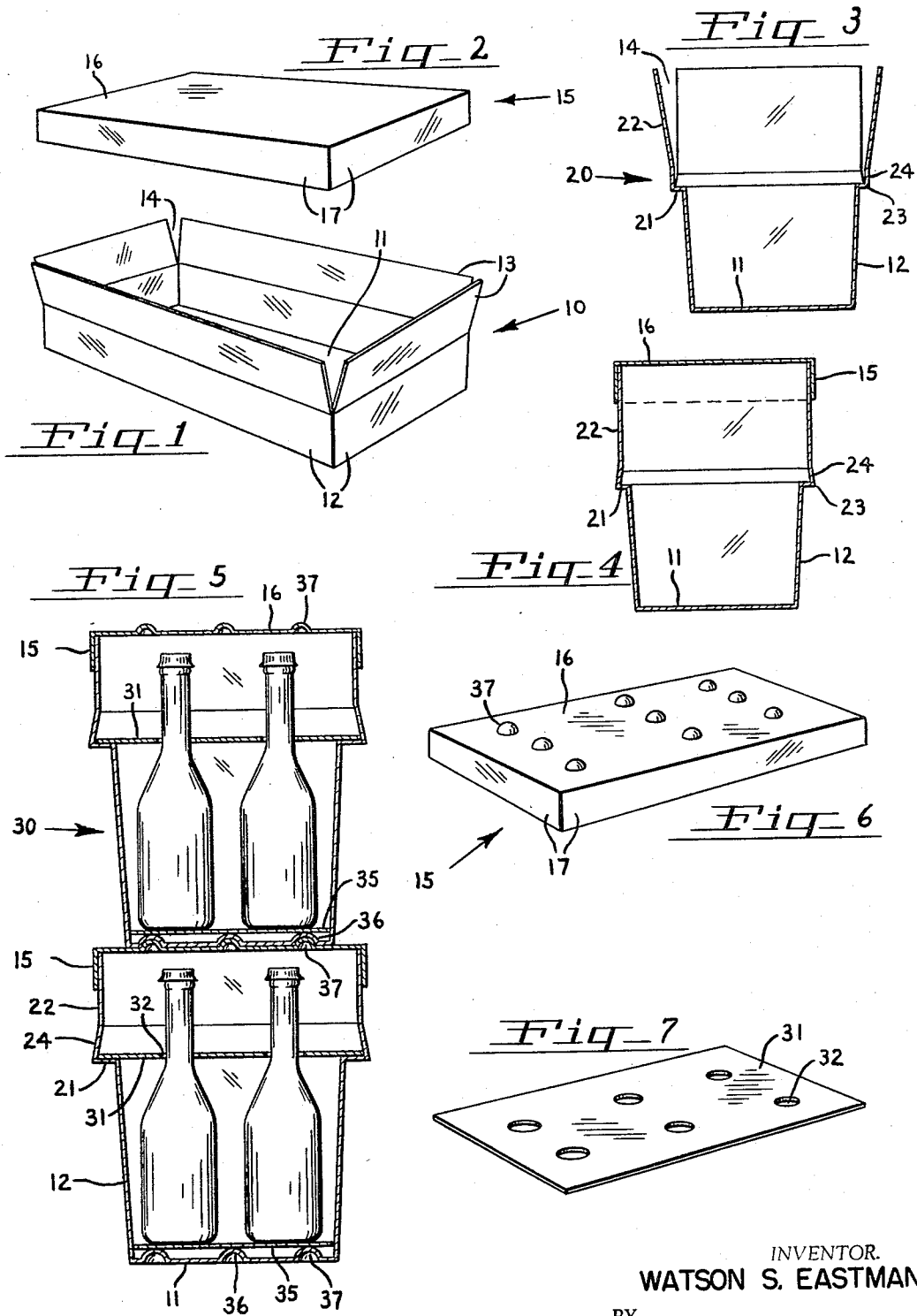
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MOLDED SHIPPING CONTAINER

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**MOLDED SHIPPING CONTAINER**  
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This invention relates to improvements in the construction of molded fiber containers to make them suitable for use as shipping containers.

Heretofore, shipping containers have generally been made of nailed wood construction or corrugated paper board. The manufacture of such containers involves many different steps and separate operations. For example, corrugated paper board containers require the manufacture of kraft paper, corrugating and laminating processes to make the board, cutting, scoring, slotting and trimming of the box blanks and the shipping of such blanks to the users. Then the user must perform the additional operations of folding and gluing the blanks into containers.

Molded containers in large sizes have heretofore been considered suitable and economically feasible only for such use as tote boxes which are used repeatedly and are too expensive to discard after a single use. The users of shipping containers have a need for a single use container which can be manufactured in quantity by a simple process and which will be in a form immediately ready for use when received from the manufacturer.

Objects of the invention are, therefore, to provide a molded shipping container, to provide a container which is nestable when empty, to provide a container which requires no assembling operations by the user, to provide a lightweight container which has the strength of a nailed wooden container, to provide a container which does not absorb moisture, to provide a liddable container, to provide a self-locking cover, to provide a container with a horizontal strengthening corrugation, to provide a self-locking separator, and to provide a container which ships and stores compactly when filled.

The present container is preferably suction molded from a suitable source of fiber such as a wood pulp slurry. Strength and water resistance are imparted by the use of resins and presses as in hardboard production. In order to provide for compact shipping of the filled containers, and to receive a lid, the upper side walls, which must be tapered for molding, are arranged to swing into vertical position. This allows the upper parts of the side walls to be molded with a greater taper than would be desired in a shipping container, for easy transfer to and from drying dies in manufacture. A horizontal offset may also be provided at intermediate height when desired to stiffen the container and support a horizontal separator board in the container. Such containers are nestable when empty and are delivered to the user in a ready-for-use condition whereby the folding and gluing operations of corrugated board containers and the nailing of wooden containers are eliminated.

Additional objects and advantages will become apparent and the invention will be better understood from the following description of certain preferred embodiments illustrated on the accompanying drawing. Various changes may be made, however, in the details of construction and arrangement of molded areas and certain features may be used without others. All such modifications within the scope of the appended claims are included in the invention. The invention is not limited to shipping containers and is not limited to suction molding. The containers may also be made of any other moldable material such as plastic.

In the drawing:

FIGURE 1 is a perspective view of a first embodiment

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of container illustrating the tapered shape in which it is originally molded;

FIGURE 2 is a perspective view of a cover for the container in FIGURE 1;

5 FIGURE 3 is a cross sectional view of a modification showing the form in which it is originally molded;

FIGURE 4 is a similar view showing the container with cover applied;

10 FIGURE 5 is a vertical sectional view of another modification showing two of the containers loaded, lidded and stacked;

FIGURE 6 is a perspective view of the cover of the containers in FIGURE 5; and

15 FIGURE 7 is a perspective view of one of the separator boards in FIGURE 5.

In FIGURE 1 the container 10 is molded with a bottom 11 and lower side walls 12 at a small angle of two to three degrees from vertical. Upper side walls 13 flare out at a greater angle of five to nine degrees which permits the container to have considerable depth and still be readily transferrable to and from drying dies in a molding machine. This shape allows the use of fully automated equipment in large scale production.

25 The upper side walls 13 are not connected together but are made rectangular, leaving a V-shaped notch 14 at each corner. This shape allows for nesting of the empty containers, the small taper of the lower side walls 12 preventing the containers from jamming tightly together so that they would be difficult to de-nest.

30 When the container is filled, the upper side walls 13 are bent into vertical position, closing the gaps at corner notches 14 and the cover 15 is applied. The cover has a top wall 16 with shallow near-vertical side walls 17 which may be referred to as vertical. Since the cover is so shallow, it is not necessary to flare the side walls to a marked degree in order to obtain proper transfer to and from the drying dies. The tendency of upper side walls 13 to spring outward holds the cover in place but the cover may also be secured by additional fastening means if desired.

35 The cover provides the strength which is obtained from a protruding lip formation in prior molded containers. A lip is objectionable because it complicates lidding and creates waste space in placing filled containers side by side. With the upper side walls 13 in vertical position, the filled containers fit together compactly with only a minimum of waste space occasioned by the small taper of the lower side walls 12.

40 The container 20 in FIGURE 3 has a bottom wall 11 and lower side walls 12 with a slight taper as in FIGURE 1. At the top of the lower side walls there is a horizontal offset 21 which forms a stiffening flange extending around all four sides of the container. The upper side walls 22 flare at a larger angle and are rectangular with cutout corners 14 as in FIGURE 1. The upper side walls may be bent in to vertical positions to receive and retain the cover 15 the same as in FIGURES 1 and 2.

45 FIGURE 3 shows the shape of container 20 as it is molded and ready for nesting for shipment to the user, and FIGURE 4 shows the shape of the container after it has been lidded. Each upper side wall 22 may be entirely flat and extend in a common plane to the corner 23 of shoulder 21 but, preferably, the upper side walls are molded with a short vertical or near vertical portion 24 below the main inclined portion. The lower end of notch 14 extends to the corner 23. The reason for this detail of construction will be explained in connection with the third embodiment illustrated in FIGURE 5.

50 The bottle container 30 in FIGURE 5 is generally similar to the container 20 in FIGURES 3 and 4 but has some additional features. In this case the shoulder

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21 provides a ledge for supporting a separator board 31 which is useful for various purposes. It provides a stiffener and brace for the sides of the container at intermediate height to strengthen the container. This permits an economy of material since the side walls of a deep container may be made in thinner section. The separator board also serves to divide the inside of the container into two separate compartments when desired.

In the present example, the separator board is provided with openings 32 to receive the necks of bottles and hold the bottles spaced apart so that they will not bump into each other when the container is jostled. When the upper side walls 22 are bent in to vertical positions, the originally vertical lower portions 24 bend inward from hinge points 23 to lock the separator 31 in place. If the separator is positioned adjacent the shoulders of the bottles, it thereby holds the bottles in the container so that they do not tend to force the cover off when the container is tipped over.

For use as a bottle carrier, the container 30 is also provided with additional features. The bottles are supported on a flat resilient pad 35 which rests on raised buttons 36 formed in the bottom of the container. This provides a shock absorber to prevent breakage. The pad 35 may be formed of any suitable material. If desired, both the separator 31 and pad 35 may be molded of material similar to that used for the container and cover.

In FIGURE 5, the cover is also provided with raised buttons 37 which fit into the buttons 36 in stacking the containers. This tends to stabilize the stack in shipment and facilitates handling the containers a stack at a time.

When the containers are molded from wood fiber, resins are added to impart strength and moisture resistance. In this way the container becomes a lightweight wood-like product with adequate strength for shipping purposes but sufficiently economical for disposal after a single use. Because of its moisture resistance it has a much wider field of utility than corrugated paper board cartons. Another advantage is that the used containers are nestable for disposal or re-use if desired.

The side walls may be vertically corrugated for extra strength if desired. Still other modifications will suggest themselves to persons skilled in the art for handling various types of products.

Having now described by invention and in what manner the same may be used, what I claim as new and desire to protect by Letters Patent is:

1. A molded container comprising a polygonal bottom and lower side walls on all sides of said bottom, an outward offset at the top of each of said lower side walls, upper side walls extending upward from said offset, said upper side walls being formed with vertical lower portions connected with and extending upward from the outer edges of said offsets and formed with outwardly inclined upper portions, a horizontal separator board resting on said offsets, said upper side walls having notched corner portions permitting the upper side walls to bend inward to bring their upper portions into vertical positions and close said corner portions together, and a cover having side walls holding said upper portions of said upper side walls in vertical positions causing said

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lower portions to bend inward and lock said separator board against said offsets, said upper side walls having a tendency to spring outward to their molded positions and clamp the cover on the container.

2. A container as defined in claim 1, said bottom having raised buttons which are concave on the under side of the bottom and said cover having raised buttons which fit in said bottom buttons of another container when the containers are stacked.

3. A container as defined in claim 1, said lower side walls being slightly inclined and said container being nestable with other like containers before said separator boards and covers are applied to the containers.

4. A deep, molded shipping container molded in a shape having a polygonal bottom, lower side walls having a slight degree of outward inclination, upper side walls having a greater degree of outward inclination and having V-notched corner portions permitting the upper side walls to bend inward to vertical positions and close said corner portions together, said upper side walls being of substantially uniform thickness throughout, including the upper edge portions thereof, whereby a container of considerable depth may be molded, a plurality of said containers being nestable when empty; and a relatively shallow cover having side walls arranged to hold said upper side walls of the container in said vertical positions, said upper side walls having a tendency to spring outward to their molded positions and clamp the cover on the container, whereby a plurality of said containers fit together compactly side by side when lidded with said covers.

5. A container as defined in claim 4, said lower side walls being inclined at an angle of approximately two to three degrees from vertical and said upper side walls being inclined at an angle of approximately five to nine degrees from vertical in their molded positions.

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