

Aug. 8, 1961

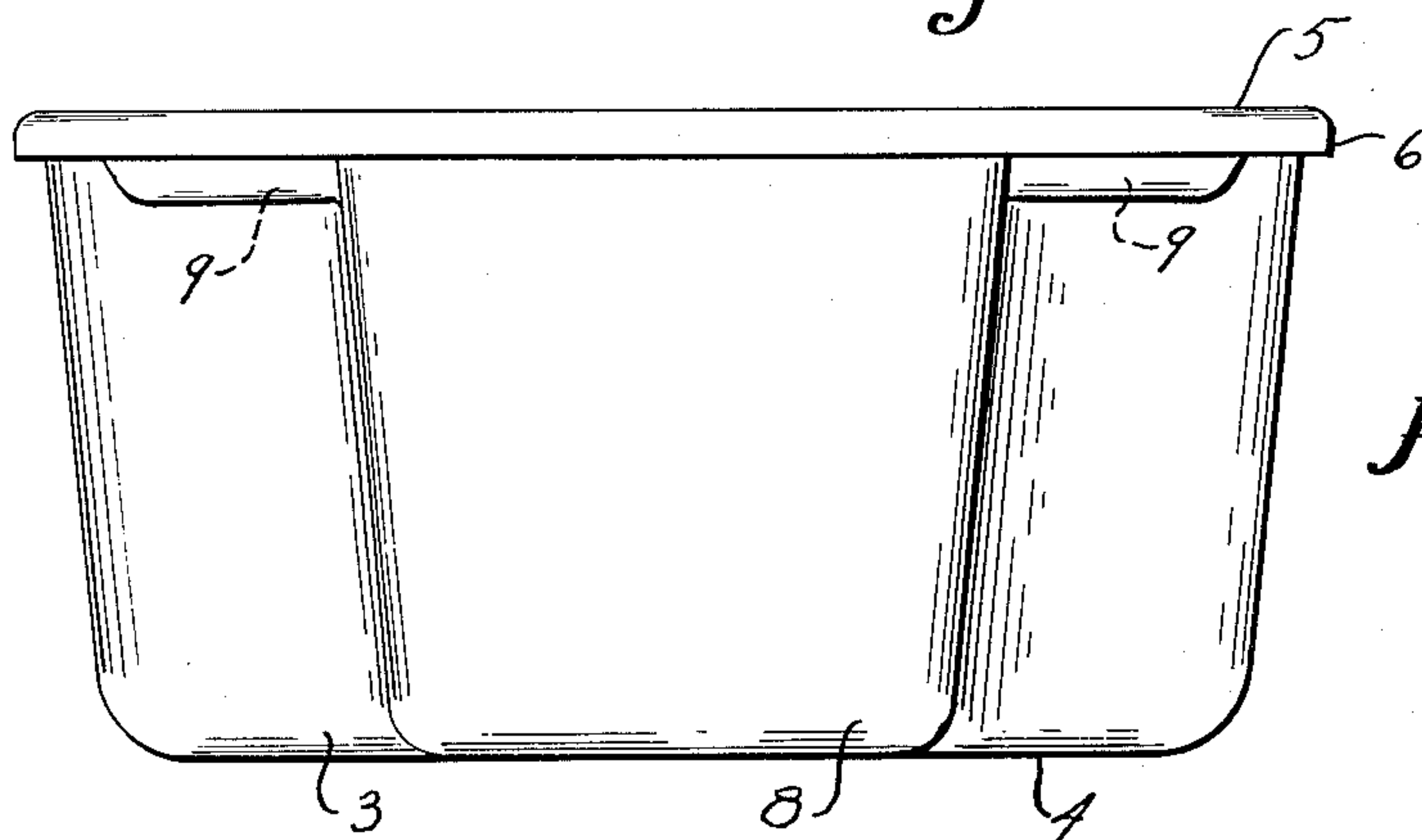
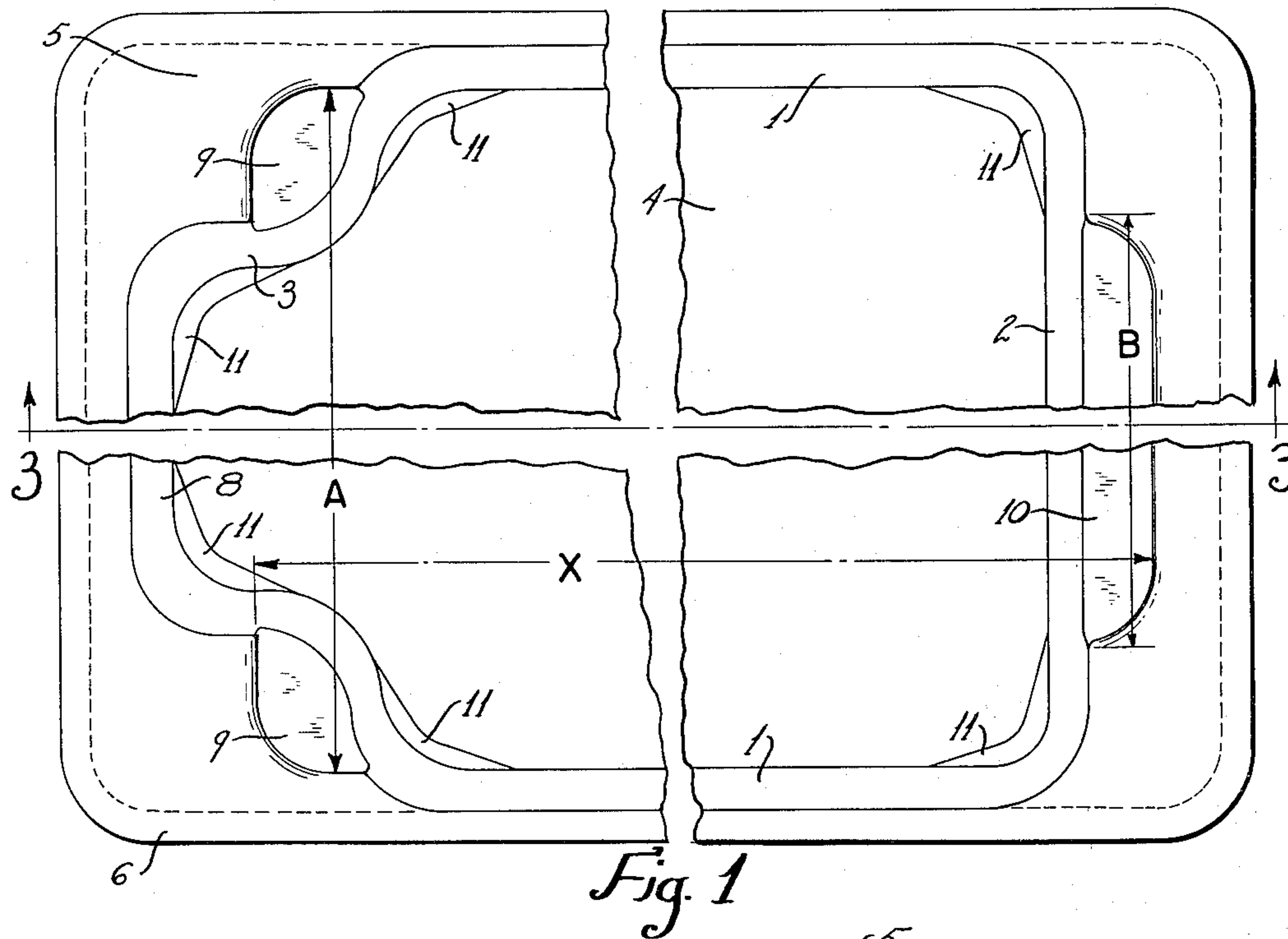
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2,995,271

STACKABLE AND NESTABLE CONTAINER

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3 Sheets-Sheet 1



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Fig. 3

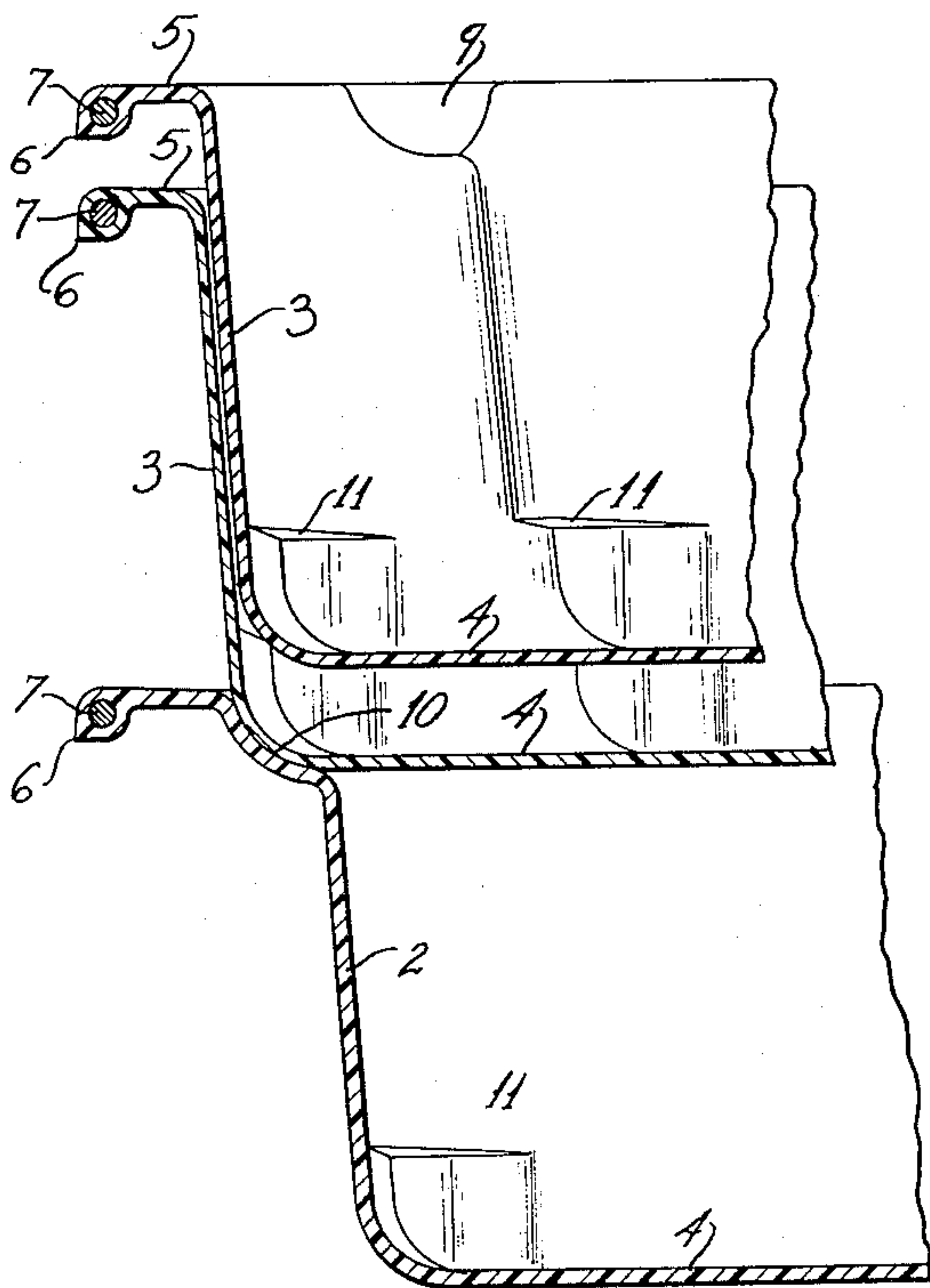
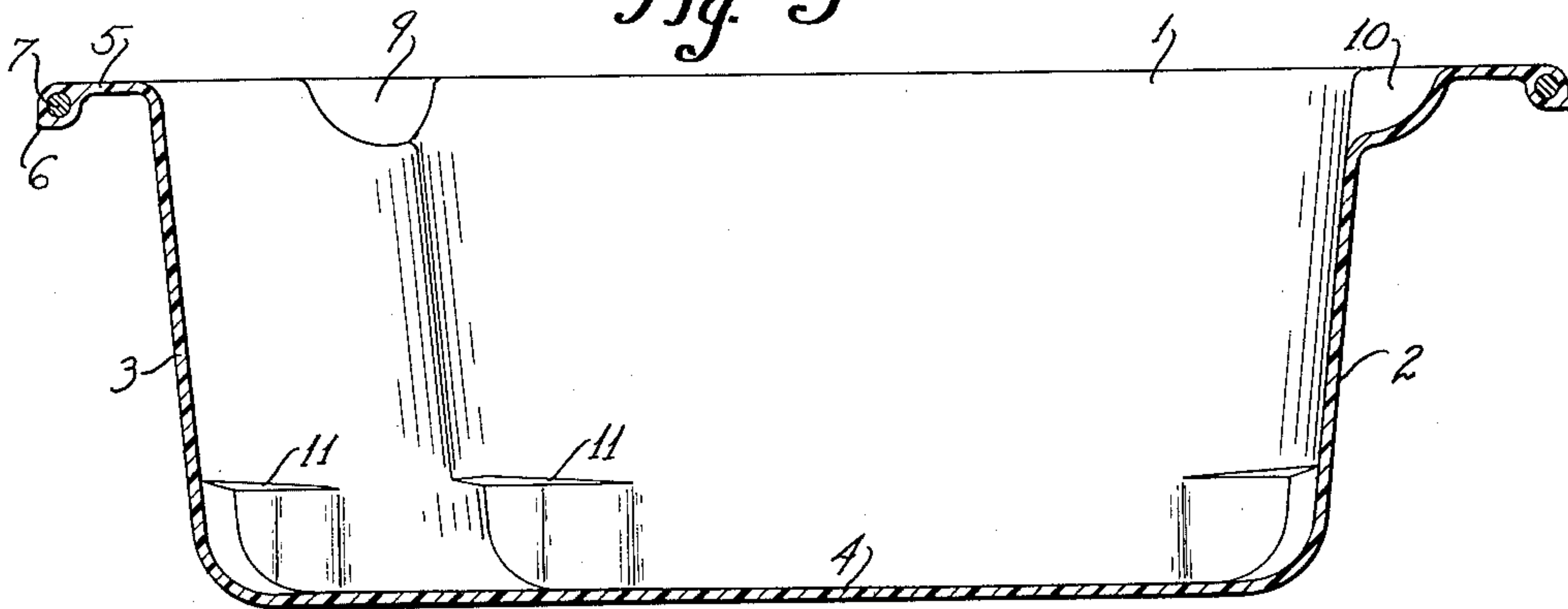


Fig. 4

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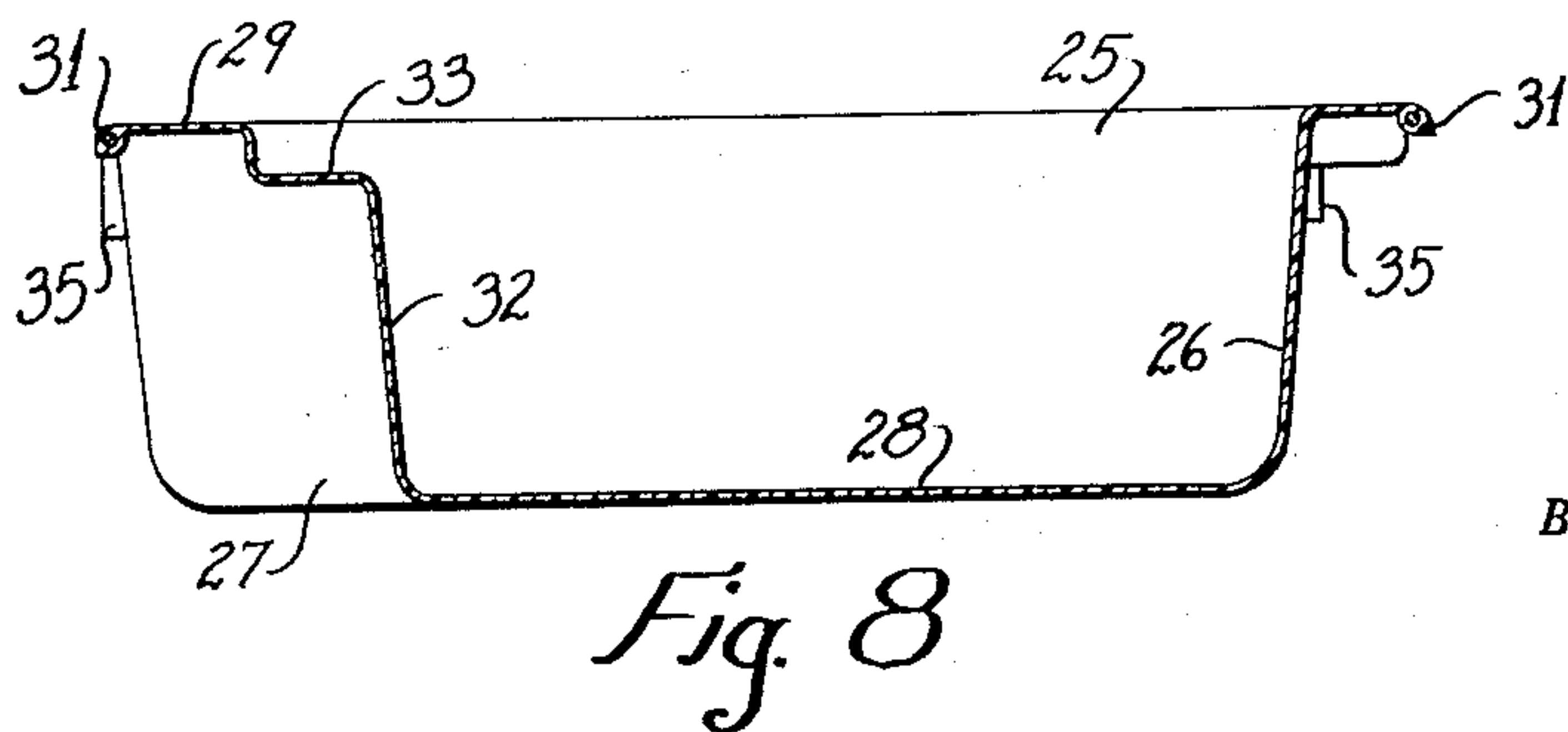
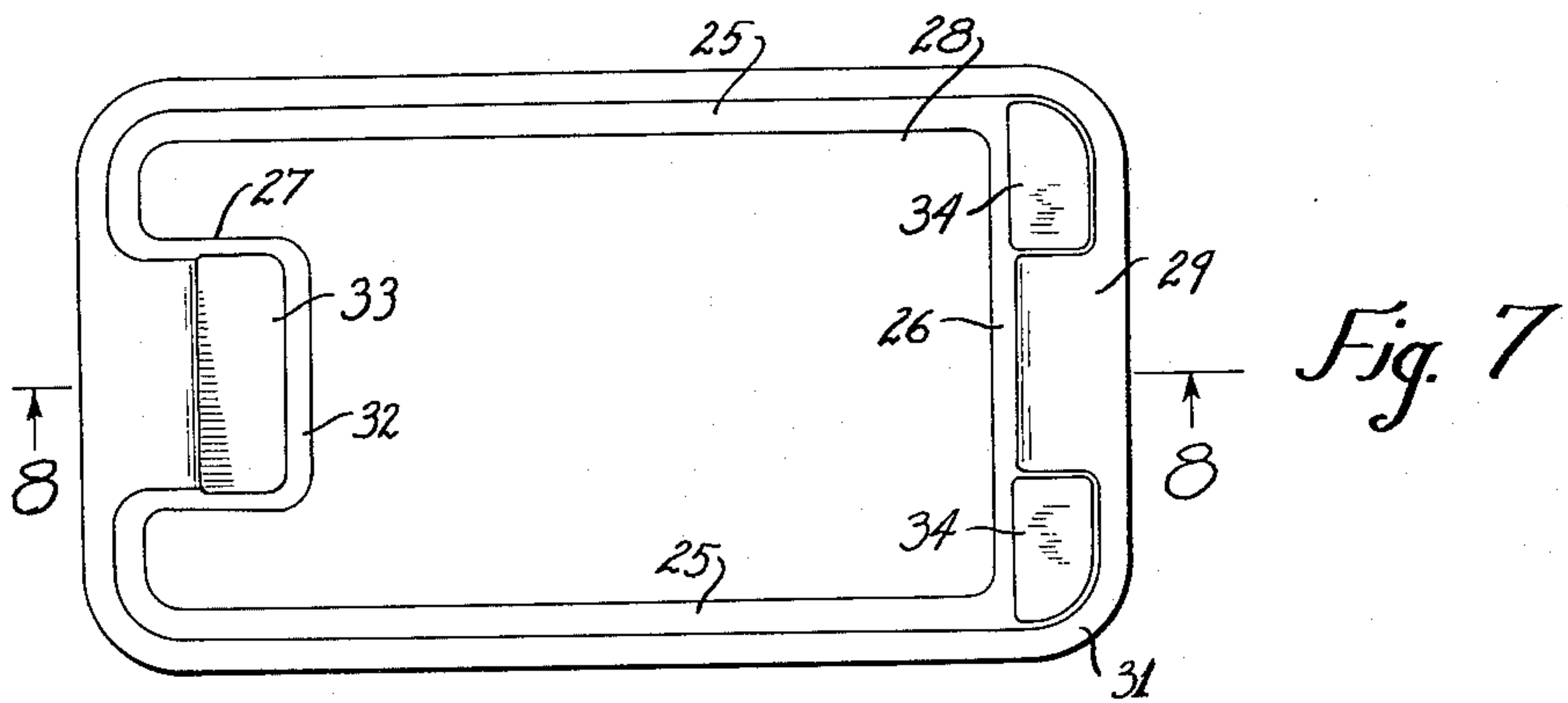
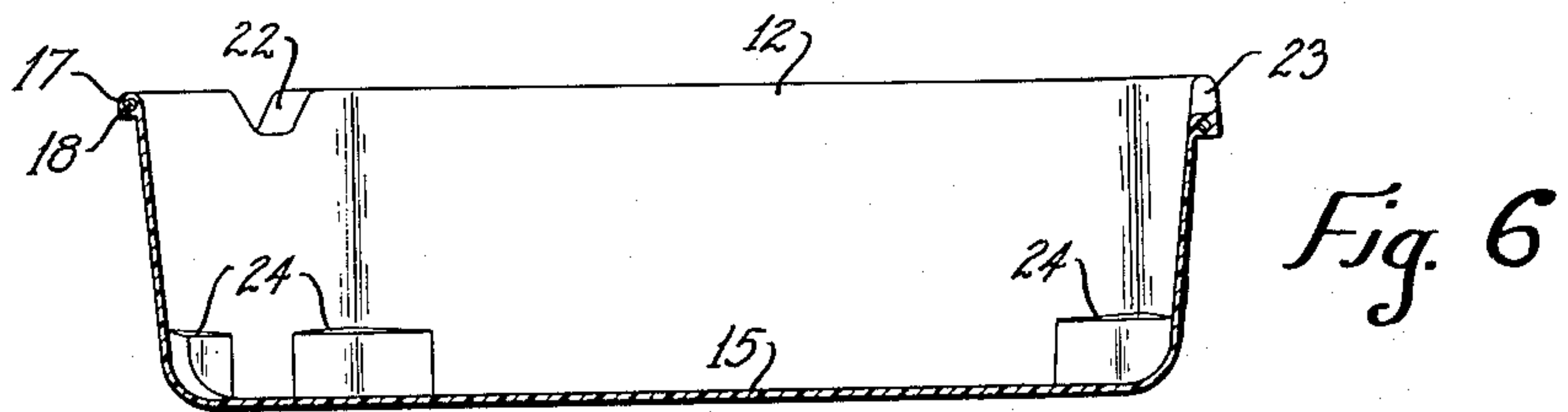
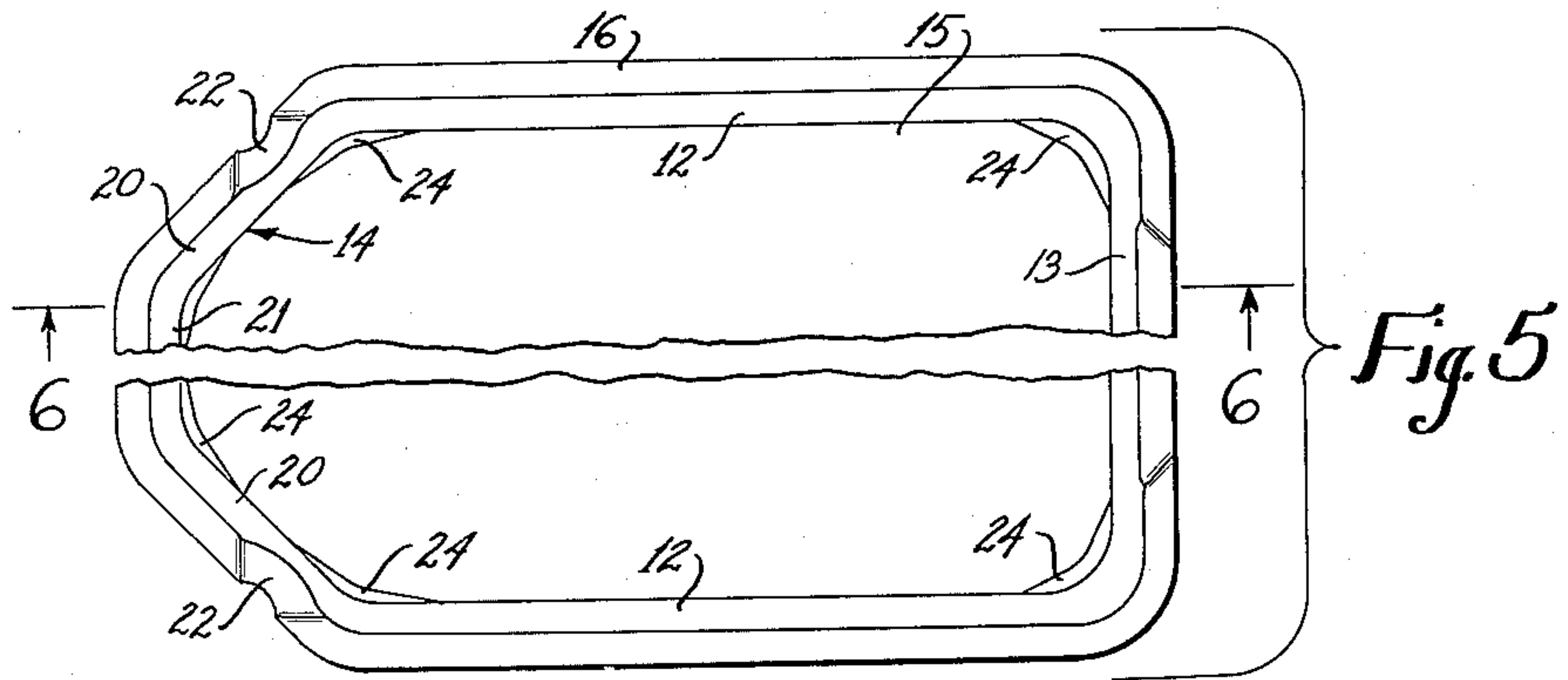
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STACKABLE AND NESTABLE CONTAINER

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12 Claims. (Cl. 220-97)

This invention relates to a stackable and nestable container and more particularly to a stackable and nestable container having three generally flat walls.

Containers are frequently constructed so that they will both stack and nest with identical shaped containers. For storing purposes, the containers can be nested one within the other, and during use, the upper container can be rotated 180° and stacked on the lower container. Containers of this general type are disclosed in the patents to Milton A. Frater, 2,823,828 and 2,823,829 and are generally constructed with both the end walls and the side walls sloping inwardly and downwardly to permit nesting of identical shaped containers. With stackable and nestable containers of this type, each end wall is provided with a series of convolutions so that when the upper container is rotated 180°, the lower surface of the upper container will be supported on the inwardly extending convolutions of the lower container.

When storing larger articles in a stackable and nestable container having convolutions in both ends, the articles, in many cases, cannot occupy the area between the convolutions so that a portion of the capacity or volume of the container is not used. In addition, in some applications, and particularly those in which the container is used in a conveyor system, a flat end surface is desired to serve as a bumper. With the conventional type of stackable and nestable containers having convolutions in both end walls, it is necessary to attach separate bumpers to the end surfaces to provide this function.

The present invention is directed to a stackable and nestable container having three generally flat walls. More specifically, the container includes a pair of side walls and a pair of end walls which are connected together at their lower edges by a bottom. Both the side walls and the end walls slope inwardly and downwardly to permit nesting of identical shape containers. A rim or flange is provided on the upper edge of both the side walls and end walls and extends completely around the container.

According to the invention, one of the end walls is generally flat or planar, while the other end wall is provided with at least one vertical convolution or projection. To enable the containers to be stacked vertically, the rim of the flat end wall is provided with a pocket or recess which receives the lower end of the convolution on the non-planar wall of the upper container. In addition, the rim of the non-planar end wall is provided with a pair of pockets which receive the lower corners of the flat end wall. With this construction, the upper container is supported in a vertically stacked relation and the engagement of the lower surface of the upper container with the pockets prevents lateral and longitudinal displacement of the upper container. By rotating the upper container 180°, it can be nested within the lower container for storing purposes.

As the container of the invention has three flat walls and a single wall having a convolution or curved contour, cheaper tooling results and the fabrication or molding of the container is simplified.

The use of one flat or straight wall provides more usable capacity for the volume of the container, particularly when larger three dimensional objects are being stored. Furthermore, the flat wall can serve as a bumper and has advantage when the container is used as an industrial drawer.

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Because one of the end walls is generally flat and the opposite end wall may have but a single convolution, the container can be fabricated in narrow widths to be used for small parts in assembly line operations.

Other objects and advantages will appear in the course of the following description.

The drawings illustrate the best mode presently contemplated of carrying out the invention.

In the drawings:

FIGURE 1 is a plan view of a container made in accordance with the present invention;

FIG. 2 is an end view of the container of FIGURE 1;

FIG. 3 is a longitudinal section taken along line 2-2 of FIGURE 1;

FIG. 4 is a vertical section showing containers in the stacking and nesting positions;

FIG. 5 is a plan view of a modified form of the invention;

FIG. 6 is a vertical section taken along line 6-6 of FIG. 5;

FIG. 7 is a plan view of a second modified container of the invention; and

FIG. 8 is a longitudinal section taken along line 7-7 of FIG. 6.

FIGS. 1-4 illustrate a stackable and nestable container which may be formed of plastic, metal or the like, and comprising a pair of opposed side walls 1 and a pair of end walls 2 and 3 which are connected together by a bottom wall 4 to provide an open top container. The side walls 1 and the end walls 2 and 3 slope downwardly and inwardly toward the bottom wall 4 to enable identical shaped containers to be nested one within the other for storing purposes.

A rim 5 extends outwardly from the upper edge of both the side walls 1 and end walls 2 and 3, and the outer portion of the rim defines a bead 6 which may be reinforced by a wire 7 or the like. The peripheral edge of rim 5 is generally rectangular in shape.

As best shown in FIGURE 1, the end wall 2 is generally flat or planar, while the opposite end wall 3 is formed with a substantially vertical, outwardly extending convolution 8 which extends from the rim 5 to the bottom wall 4.

To enable the containers to be stacked vertically, a pair of pockets 9 are formed in the rim 5 on either side of the outwardly extending convolution 8. The pockets 9 are disposed beneath the level of rim 5 and are adapted to receive the corners of the end wall 2 of the upper container when the containers are in a vertically stacked relation. As best shown in FIGURE 1, the distance A between the outer extremities of the pockets 9 is equal to or slightly greater than the width of the bottom of the container so that the corners of the end wall 2 will fit within the pockets and thereby prevent both lateral and longitudinal movement of the upper container with respect to the lower container.

In addition, a pocket 10 is formed in the rim 5 at the end wall 2 and is adapted to receive the lower end of the convolution 8 of the upper container when in the stacked position. The width B of the pocket 10 should be just slightly greater than the width of the lower end of the convolution 8 so that lateral movement of the upper container will be prevented when the containers are in stacked position.

In addition, the distance X, which is the distance between the outer longitudinal extremities of the pockets 9 and the outer longitudinal extremity of the pocket 10, should be just slightly greater than the length of the bottom of the container to prevent relative longitudinal movement between the upper container and the lower container when the containers are stacked.

As shown in FIG. 3, the rims 5 of the containers are

spaced apart when the containers are in the nesting position by the engagement of the lower surface of the upper container with an abutment 11 formed on the end walls 2 and 3 of the container. The abutments 11 are generally thickened or reinforced corners which not only serve to space the upper container above the lower container in the nesting position, but also serve to reinforce the projecting corners of the container.

FIGS. 4 and 5 illustrate the modified form of the invention in which the stackable and nestable container includes a pair of side walls 12 and end walls 13 and 14. The side walls and end walls slope downwardly and inwardly and are connected at their lower edges by a bottom wall 15.

As in the case of the first embodiment, a rim 16 extends outwardly from the upper edge of both the side walls and end walls and defines a bead 17 which may be reinforced by a wire 18 or the like. In this embodiment, the rim 16 follows the contour of the container and is of constant width.

As best shown in FIG. 4, the end wall 13 is generally flat or planar, while the opposite end wall 14 is formed with a substantially vertical, outwardly extending convolution or projection formed by the diagonal surfaces 20 and the central surface 21 which is disposed generally normal to the side walls 12.

To stack the containers, a pair of notches 22 are formed in the rim 16 at end wall 14 and receive the lower corners of the end wall 13 of the upper container. Similarly, the rim 16 of the end wall 13 is provided with a central notch 23 which receives the projecting end of the wall 14 when the containers are stacked.

A series of nesting abutments 24, similar to abutments 11, are provided on the end walls and serve to space the rims 16 of the container apart when the containers are in the nesting position.

FIGS. 6 and 7 illustrate a second modified form of the invention in which the stackable and nestable container comprises a pair of side walls 25 and end walls 26 and 27 which slope downwardly and inwardly and are connected at their lower edges by a bottom wall 28.

A rim or flange 29 extends outwardly from both the side walls and end walls and extends around the container. The outer edge of the rim defines a bead 31 which may be reinforced by a wire or the like.

As in the case of the previous embodiments, the end wall 26 is generally flat, while the end wall 27 is provided with an inwardly extending, vertical convolution 32.

A pocket 33 extends across the inner end portion of the convolution 32 and is adapted to receive the lower end of the flat end wall 26 of the upper container when the containers are in the stacked position. Similarly, a pair of pockets 34 are formed in rim 29 along the side edges of the end wall 26. In the stacked position, the side edges of the lower end of end wall 26 are received within the pockets 34 and prevent lateral displacement of the upper container.

To space the rim 29 of the upper container above the rim of the lower container when the containers are in the nesting relation, a series of abutments or stops 35 are provided on the end walls 26 and 27, as shown in FIG. 8. The lower end of the abutments engages the rim 29 of the lower container to space the rims apart in a manner similar to the function of the nesting abutments 11 and 24 of the previous embodiments.

The present invention provides a stackable and nestable container having three generally flat walls with a single wall having convolutions or an irregular contour. This construction provides a stable stacking construction and because of the three flat walls, provides a less expensive tooling operation and simplifies the fabrication and molding procedures.

As the container is formed with three flat walls, more usable capacity for the total volume is provided and the design is particularly adaptable when storing larger rec-

tangular objects which cannot occupy the area between convolutions in a conventional stackable and nestable container.

While the above description has shown the convolutions being in an end wall, the terms "side walls" and "end walls" are used interchangeably and it is contemplated that the convolutions or projections may be disposed in a side wall. In addition, one of the side walls and/or one of the end walls can be substantially normal to the bottom wall rather than sloping downwardly and inwardly without affecting the basic stack and nest characteristics of the container.

Various modes of carrying out the invention are contemplated as being within the scope of the following claims particularly pointing out and distinctly claiming the subject matter which is regarded as the invention.

We claim:

1. A container adapted to be nested and stacked vertically with a container of identical shape, comprising a pair of opposed first walls with at least one of said first walls sloping inwardly toward the other from top to bottom, a pair of second opposed walls connected to said first pair of walls along the side edges thereof with at least one of said second walls sloping inwardly toward the other from top to bottom, one of said second walls being substantially flat and the other of said second walls having at least one substantially vertical convolution, a bottom wall connecting the lower edges of the first walls and second walls to provide a generally rectangular open top structure, shelf means disposed in the second wall having said convolution and located beneath the level of the upper edge of said second walls to thereby provide support for the bottom surface of an upper container when the containers are in a vertically stacked relation, and second shelf means disposed in the flat second wall and located beneath the level of the upper edge of said second walls to thereby provide support for the bottom surface of the upper container when the containers are in a vertically stacked position.
2. A container adapted to be nested and stacked vertically with a container of identical shape, comprising a pair of opposed first walls sloping inwardly toward each other from top to bottom, a pair of second opposed walls connected to said first pair of walls along the side edges thereof and sloping inwardly toward each other from top to bottom, a bottom wall connecting the lower edges of the first walls and second walls to provide a generally rectangular open top structure, one of said second walls being substantially flat and the other of said second walls having at least one surface deviation extending substantially vertically from the bottom wall to the upper edge portion of said second wall, a ledge disposed in said surface deviation beneath the level of the upper edge of said second walls and adapted to support the bottom surface of an upper container when the containers are vertically stacked, and a second ledge disposed in the flat second wall and located beneath the level of the upper edge of said second walls and adapted to support the bottom surface of the upper container when the containers are in a vertically stacked position.
3. A container adapted to be nested and stacked vertically with a container of identical shape, comprising a pair of opposed first walls sloping inwardly toward each other from top to bottom, a pair of second opposed walls connected to said first pair of walls along the side edges thereof and sloping inwardly toward each other from top to bottom, one of said second walls being substantially flat and the other of said second walls having a central outwardly extending substantially vertical convolution, a bottom wall connecting the lower edges of the first walls and second walls to provide a generally rectangular open top structure, shelf means disposed in the second wall having said convolution and located on either side of said convolution and disposed at a level beneath the upper edges of said first and second walls, said shelf means adapted to receive the lower corners of the flat second

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wall of an upper container when the containers are in a vertical stacked relation, and second shelf means disposed in said flat second wall and located beneath the level of upper edges of said first and second walls, said second shelf means being disposed in longitudinal alignment with the convolution and adapted to receive the lower end of the convolution of the upper container when the containers are in a vertical stacked relation.

4. A container adapted to be nested and stacked vertically with a container of identical shape, comprising a pair of opposed side walls with at least one of said side walls sloping inwardly toward the other from top to bottom, a pair of opposed end walls connected to the side walls along the side edges thereof with at least one of said end walls sloping inwardly toward the other from top to bottom, a bottom wall connecting the lower edges of the side walls and end walls to provide a generally rectangular open top structure, a rim extending outwardly from the side walls and end walls and extending around the container, one of said end walls being substantially flat and the other of said end walls having a central outwardly extending projection extending vertically from said bottom wall to said rim, shelf means disposed in the end wall having said projection and located laterally on both sides of said convolution and disposed at a level beneath the rim, said shelf means adapted to receive the lower corners of the flat end wall of an upper container when the containers are in a vertical stacked relation, and second shelf means disposed in the flat end wall and located at a level beneath the rim, said second shelf means being disposed in longitudinal alignment with the projection and adapted to receive the lower end of the projection of the upper container when the containers are in a vertical stacked relation, the engagement of the upper container with said shelf means serving to prevent longitudinal and lateral displacement of the upper container when the containers are in a stacked relation.

5. A container adapted to be nested and stacked vertically with a container of identical shape, comprising a pair of opposed side walls with at least one of said side walls sloping inwardly toward the other from top to bottom, a pair of opposed end walls connected to the side walls along the side edges thereof with at least one of said end walls sloping inwardly toward the other from top to bottom, a bottom wall connecting the lower edges of the side walls and end walls to provide a generally rectangular open top structure, a rim extending outwardly from the side walls and end walls and extending around the container, one of said end walls being substantially flat and the other of said end walls having a central outwardly extending projection extending vertically from said bottom wall to said rim, a pocket disposed in the end wall containing said projection and located laterally adjacent said projection on either side thereof, said pockets being in lateral alignment with the distance between the lateral extremities of the pockets being slightly greater than the lateral width of the lower end of the flat end wall to thereby permit the lower corners of the flat end wall of the upper container to be received within the pockets when the containers are in a vertical stacked relation, and a shelf disposed in said flat end wall and located beneath the level of the rim, said shelf being disposed in longitudinal alignment with the projection and adapted to receive the lower end of the projection of the upper container when the containers are in a vertical stacked relation.

6. The structure of claim 5, in which the longitudinal distance between the outer longitudinal extremity of said pockets and the outer longitudinal extremity of said shelf is slightly greater than the length of the lower end of the container.

7. A container adapted to be nested and stacked vertically with a container of identical shape, comprising a pair of longitudinally extending side walls with at least one of said end walls sloping inwardly toward the other from top to bottom, a pair of laterally extending end walls

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connected to said side walls along the side edges thereof with at least one of said end walls sloping inwardly toward the other from top to bottom, a bottom wall connecting the lower edges of said end walls and side walls to provide a generally rectangular open top structure, a rim extending outwardly from the upper edge portion of said end walls and side walls and extending substantially completely around the container, one of said end walls being substantially flat and the other of said end walls including a laterally extending surface disposed substantially normal to said side walls and including a pair of diagonal surfaces connecting said laterally extending surface to said side walls, a pocket formed in the upper edge of each diagonal surface and located at a level beneath the rim, said pockets adapted to receive the lower corners of the flat end wall of an upper identical container when the containers are in a vertical stacked relation, and a shelf disposed generally centrally of the flat end wall and located beneath the level of said rim, said shelf being disposed in longitudinal alignment with the laterally extending surface of said opposite end wall and adapted to receive the lower end of the opposite end wall of the upper container when the containers are in a vertical stacked relation.

8. The structure of claim 4, and including means for spacing the rim of the upper container above the rim of the lower container when the containers are in nesting relation.

9. The structure of claim 4, in which the periphery of the rim is substantially rectangular in shape and lies in a plane parallel to said bottom wall.

10. A container adapted to be nested and stacked vertically with a container of identical shape, comprising a pair of opposed side walls with at least one of said side walls sloping inwardly toward the other from top to bottom, a pair of opposed end walls connected to the side walls along the side edges thereof with at least one of said end walls sloping inwardly toward the other from top to bottom, a bottom wall connecting the lower edges of the side walls and end walls to provide a generally rectangular open top structure, a rim extending outwardly from the side walls and end walls and extending around the container, one of said end walls being substantially flat and the other of said end walls having a central outwardly extending projection extending vertically from said bottom wall to said rim, shelf means disposed in the end wall having said projection and located laterally on both sides of said convolution and disposed at a level beneath the rim, said shelf means adapted to receive the lower corners of the flat end wall of an upper container when the containers are in a vertical stacked relation, second shelf means disposed in the flat end wall and located at a level beneath the rim, said second shelf means being disposed in longitudinal alignment with the projection and adapted to receive the lower end of the projection of the upper container when the containers are in a vertical stacked relation, the engagement of the upper container with said shelf means serving to prevent longitudinal and lateral displacement of the upper container when the containers are in a stacked relation, and abutment means disposed at the lower internal corners of the container and extending inwardly of the container, said abutment means serving to reinforce the corners of the container and adapted to engage the bottom wall of the upper container when the containers are in nesting relation to space the bottom wall of the upper container above the bottom wall of the lower container.

11. A container adapted to be nested and stacked vertically with a container of identical shape, comprising a pair of opposed side walls with at least one of said side walls sloping inwardly toward the other from top to bottom, a pair of opposed end walls connected to the side walls along the side edges thereof with at least one of said end walls sloping inwardly toward the other from top to bottom, a bottom wall connecting the lower edges

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of the side walls and end walls to provide a generally rectangular open top structure, one of said end walls being substantially flat and the other of said end walls having a central outwardly extending projection extending vertically from said bottom wall to the upper extremity of said end wall, and a rim extending outwardly from said side walls and end walls and extending substantially around the container with the peripheral edge of said rim following the contour of said walls, the end wall having said projection being formed with a pair of notches straddling said projection and extending through said rim, said notches disposed to receive the lower corners of the flat end wall of an upper container when the containers are vertically stacked, the flat end wall having a central recess in the upper edge thereof and extending through said rim, said recess disposed to receive the lower end of the projection of the upper container when the containers are vertically stacked, the engagement of the lower end of the upper container with said notches and recess serving to prevent longitudinal and lateral displacement of the upper container.

12. A container adapted to be nested and stacked vertically with a container of identical shape, comprising a pair of opposed side walls with at least one of said side

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walls sloping inwardly toward the other from top to bottom, a pair of opposed end walls connected to the side walls along the side edges thereof with at least one of said end walls sloping inwardly toward the other from top to bottom, a bottom wall connecting the lower edges of the side walls and end walls to provide a generally rectangular open top structure, a rim extending outwardly from the side walls and end walls and extending around the container, one of said end walls being planar and the other of said end walls having at least one inwardly extending substantially vertical convolution, shelf means disposed across the upper end of said convolution and located at a level beneath the rim, said shelf means adapted to receive the lower end of the planar wall of an upper container when the containers are stacked vertically, and second shelf means disposed in said planar end wall and located on either side of a longitudinal extension of said convolution and adapted to receive the lower ends of the portions of the opposed end wall straddling said convolution to thereby prevent longitudinal and lateral displacement of the upper container.

No references cited.