

Sept. 6, 1966

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A. SCHMIDT  
PORTABLE CONTAINER OF SYNTHETIC  
MATERIAL ADAPTED TO BE STACKED

3,270,922

4 Sheets-Sheet 1

Fig. 1

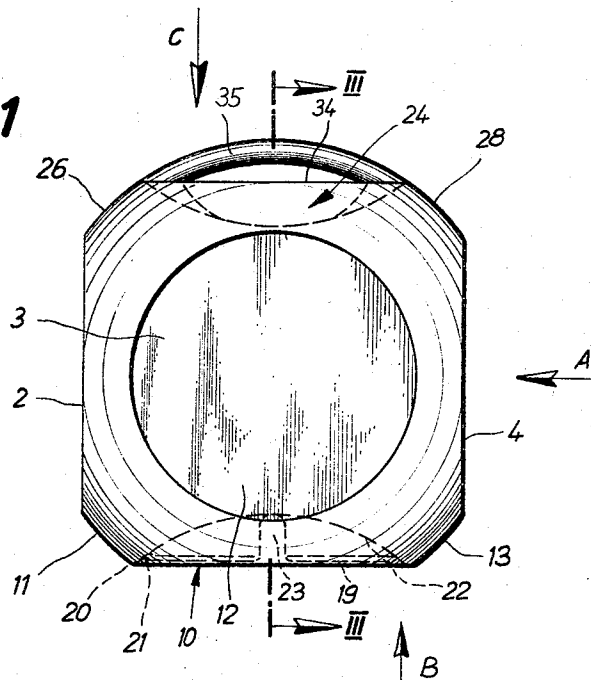
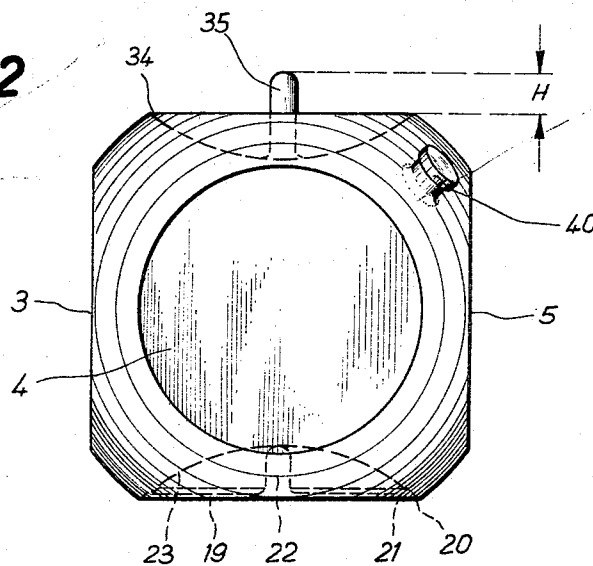


Fig. 2



INVENTOR.  
Alfred Schmidt  
BY  
Walter Bukey.

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[illegible]

INVENTOR.  
*Alfred Schmidt*  
BY  
*Walter Duhay*

Sept. 6, 1966

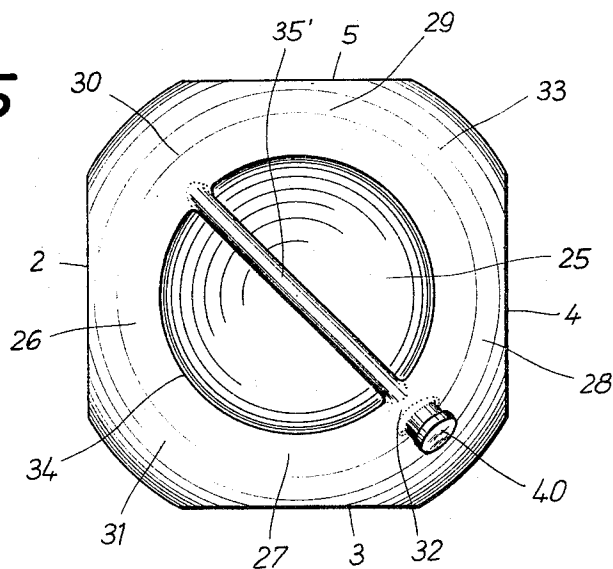
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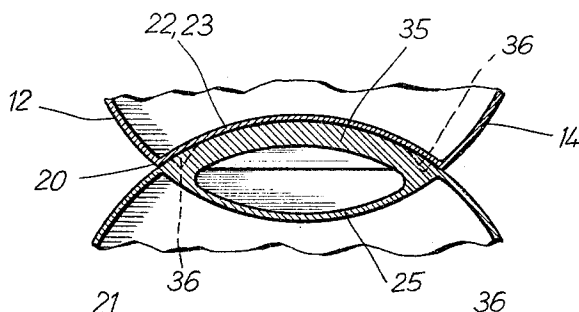
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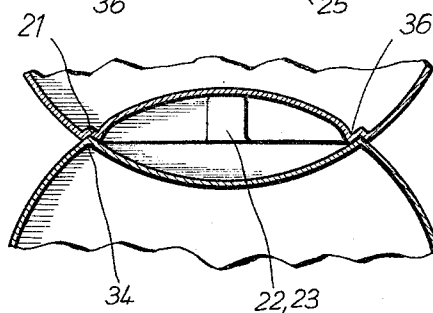
**Fig. 5**



**Fig. 6**



**Fig. 7**



INVENTOR.

*Alfred Schmidt*

BY

*Walter Duke*

Sept. 6, 1966

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Fig. 9

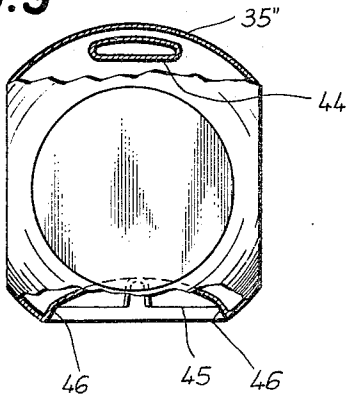


Fig. 8

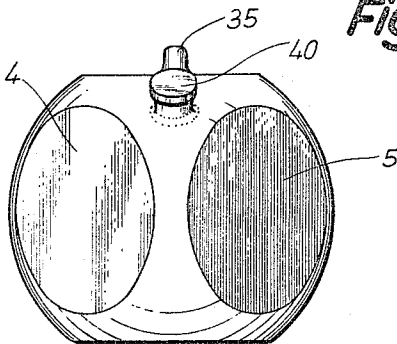


Fig. 11

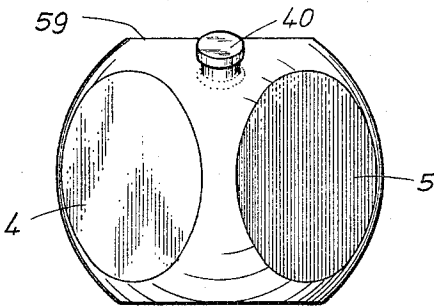


Fig. 10

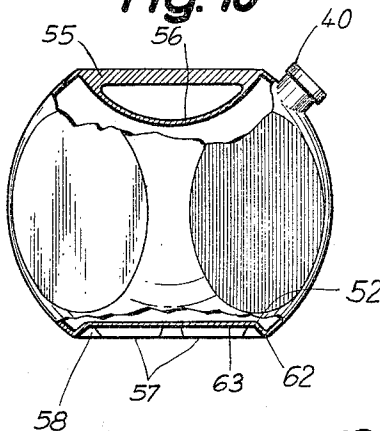


Fig. 12

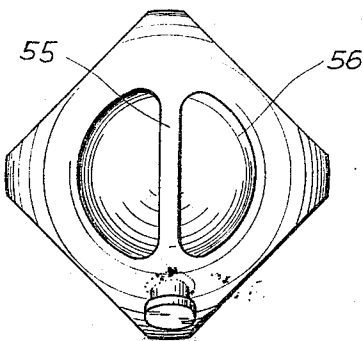
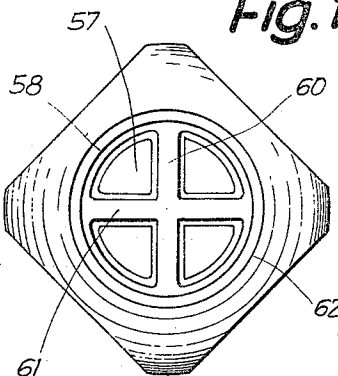


Fig. 13



INVENTOR.

Alfred Schmidt

BY

Walter Buker

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3,270,922

## PORTABLE CONTAINER OF SYNTHETIC MATERIAL ADAPTED TO BE STACKED

Alfred Schmidt, Dusseldorf, Germany, assignor to -form-Gesellschaft für Formgebung m.b.H., Dusseldorf, Germany

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F 38,282

4 Claims. (Cl. 222-143)

The present invention relates to a portable container of synthetic material adapted to be stacked and provided with horizontal and vertical surfaces and with handle means and a spout at the upper portion of the container.

Containers of this general type have been known in which the container has a rectangular or square cross section. Containers of this design have the horizontal top section provided with a handle for carrying the container, said handle being arranged adjacent the spout.

There is also known a container for liquids which comprises a cubic or box-shaped outer portion and an inner balloon of synthetic material for receiving the liquid or pourable material, said balloon obtaining its shape by insertion into the box-shaped portion. This two-part container is not a self-supporting container adapted to be stacked in the meaning of the present invention with regard to the balloon which receives the liquid and consists of a thin skin of synthetic material.

When considering heretofore known containers adapted to be stacked, the wall thickness of the containers is to be so selected that the walls will be able to support a plurality of superimposed containers. Consequently, the wall portions of the container have to have sufficient thickness and stiffness, and when producing containers having a cross section with a plurality of corners, it will be appreciated that these containers will be thinnest at the corners forming the static connecting points of the containers. This is especially the case when making the containers of synthetic material. The supporting capability of heretofore known containers having a rectangular or multi-cornered cross section is as to the quantity of material to be used therefor greatly dependent on the thickness of the corners of the container, i.e., the nodules of the adjacent or abutting surfaces.

It is an object of the present invention to provide a self-supporting container which is adapted to be stacked and is made of synthetic material while having on all sides thereof horizontal and vertical supporting and engaging surfaces and is provided with means for carrying the container. Moreover, the upper portion of the container is to be provided with a spout.

It is another object of this invention so to design a container of the type just mentioned that not only a great saving in synthetic material will be obtained but also a great stability of the individual container will be assured while a greater number of containers may be stacked one upon the other.

It is a further object of this invention to provide a container as set forth above which will have a sufficient drop strength and resistance against breakage while protrusions or the like in the container will be avoided where residues may collect.

It is still another object of this invention to provide a container which can easily be transported by merely rolling the same on the ground. This is of particular importance when large size containers are employed or when the container content has a high specific weight.

Still another object of this invention consists in the provision of a portable container of synthetic material which can easily be tilted so as easily to discharge any desired quantity of the contents in the container.

These and other objects and advantages of the inven-

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tion will appear more clearly from the following specification in connection with the accompanying drawings, in which:

FIG. 1 is a front view of a container according to the present invention.

FIG. 2 shows the container of FIG. 1 as seen in the direction of the arrow A of FIG. 1.

FIG. 3 represents a section taken along the line III-III of FIG. 1.

FIG. 4 is a view of FIG. 1 as seen in the direction of the arrow B.

FIG. 5 shows the container of FIG. 1 as seen in the direction of the arrow C but with the handle offset thereover by 45°, and with smaller side walls and smaller top and bottom portions than in FIGS. 1 to 4.

FIG. 6 shows a section through the bottom and top portion of two containers according to the invention as stacked one upon the other, said section being taken along the line VI-VI of FIG. 4, and with smaller side walls and smaller top and bottom portions than in FIGS. 1 to 4.

FIG. 7 illustrates a section through the bottom and top portions of two superimposed containers, said section being taken along the line VII-VII of FIG. 4.

FIG. 8 represents a view of a modified container according to the invention.

FIG. 9 shows a container with flat top portion.

FIGS. 10 to 13 respectively illustrate further modification of a container according to the invention with a straight handle.

The container according to the present invention, which is preferably made of synthetic material, is characterized primarily in that it is designed as a body of revolution with flattened side wall surfaces and with recesses at the top and bottom while being equipped with a handle.

With a container of this type it is possible to design the flattened portions of the container, which is preferably produced by blowing low pressure polyethylene, of the same thickness as the arched wall sections. This results in a considerable decrease in material over heretofore known containers while having the same strength as the latter. A container of the design according to the invention also furnishes the possibility of transporting the container by rolling the same along a circular or ellipse-shaped edge located below the vertical flattened side wall sections, as is customarily with trash cans. The container shape according to the invention also facilitates the tilting and emptying of the container for discharging any desired quantity of the contents thereof. This is made possible by the fact that when being tilted, the container rests on an arched wall surface and can roll along the same.

Referring now to the drawings in detail and FIGS. 1 to 7 thereof in particular, the container illustrated therein has an outer ball-shaped contour with vertical flattened wall portions 2, 3, 4 and 5 which are arranged relative to each other so that the planes confine with each other angles of 90°. These sides are interconnected by arched or spherical portions 6, 7, 8 and 9 as is clearly shown in FIG. 4. The flattened surfaces, which when the basic contour is spherical are circular but are elliptical when the basic contour is an ellipsoid, may receive any markings, such as markings of origin, destination and advertisements. The arched sections 6 to 9 have approximately the same wall thickness as the flattened wall portions 2 to 5. Between the container bottom, generally designated 10, and the flattened wall portions 2 to 5 there are likewise located arched sections 11, 12, 13 and 14 confined by likewise arched sections 15, 16, 17 and 18 (FIG. 4) and extending between the bottom 10 and the arched sections 6 to 9.

The container bottom 10 has a likewise flattened por-

tion 19 which in the embodiment of FIGS. 1 to 7 is of a circular shape. This portion 19 is slightly offset inwardly with regard to the lower edge 20 of the arched sections 11 to 18. The peripheral part of the flattened portion 19 is provided with a groove 21 (FIG. 7) for a purpose which will presently appear. In this way an inwardly extending rib 36 is formed.

The rib 36 stiffens and reinforces the container walls while the groove 21 permits a proper engagement and resting of the bottom of one container on the top of another container so that the stability of the stacked containers is greatly enhanced. The strength of the bottom and the stability of the stacked containers may furthermore be increased by providing the bottom 10 of the container with at least one groove conforming to the shape and arrangement of the handle. This groove is engaged by the handle of the container stacked therebelow and thus determines the relative location of the containers with regard to each other. An accidental lateral displacement of one container relative to the other when in stacked position will thus be avoided which displacement might otherwise occur when the containers are empty. Preferably two such grooves are arranged in the bottom portion at an angle of 90° with regard to each other so that the containers to be stacked upon each other may be offset with regard to each other by 90°.

More specifically, referring to the drawings, diagonally with regard to the surfaces 2 to 5 (FIG. 5) or perpendicularly to the surfaces 2 to 5 (FIG. 4) there are provided grooves 22, 23 in the bottom portion 19 of the container. These grooves 22, 23 cross each other at the longitudinal axis of the container and have a certain depth with regard to the peripheral groove 21. Where the grooves 22, 23 and the peripheral groove 21 meet, they merge with each other as will be evident from FIG. 1. Grooves 22 and 23 are arch-shaped.

The top portion 24 of the container has an arched depression 25 (FIG. 3) of calotte shape. Between this depression 25 and the flattened wall portions 2 to 5 there are provided arched sections 26, 27, 28 and 29 between which there are provided likewise arched sections 30, 31, 32 and 33. These sections 30, 31, 32 and 33 are located between the arched surfaces 6 to 9 and the top portion 24. The surfaces 26 to 33 together with the depression 25 form a supporting edge 34 the diameter and location of which is illustrated by the two lines *a* and *b* in FIG. 3, according to which the edge 34 as to location and shape precisely fits into groove 21 of the next stacked upper container. The handle for carrying the container according to the invention may be arched in conformity with the curvature of the arched container wall portions. While arched handles of various types are known, the handle according to the present invention forms the continuation of the outer contour of the container wall. However, if desired, the handle may also be straight.

More specifically with regard to FIG. 1, the handle shown therein is represented as an arched handle 35 having a curvature corresponding to the curvature of the adjacent container portions 26, 28. The height *H* of the handle 35 (FIG. 2) with regard to the marginal portion 34 corresponds to the distance between the deepest point of groove 22 and the plane through the deepest points of groove 21. The grooves 22, 23 are, as is evident from FIGS. 1 to 3, arched and shaped in conformity with the shape of the handle 35. Where grooves 22, 23 meet groove 21, they merge with each other, i.e., the rib 36 is interrupted at this point. Here the grooves 22, 23 end at points 20 located at the arched sections 11 to 14 (see FIG. 4).

The arrangement of FIG. 5 differs from that of FIGS. 1 to 3 in that the handle 35' is arranged diagonally with regard to the surfaces 2 to 5 so as to be in alignment with the spout 40 located on the arched section 32. This arrangement has the advantage that when grasping the handle 35' it is possible to roll the container over the

corresponding arched surfaces 15 to 18 which facilitates the discharging of precise quantities of the content of the container. For purposes of rolling the container, it is possible after grasping the handle 35' to roll the container about the circular line *K* (FIG. 4)—or a corresponding elliptical line if the basic contour of the container is an ellipse. The line *K* is located on the surfaces 11 to 18.

Referring now to FIGS. 6 and 7 illustrating the relative location of two containers stacked upon each other, it will be seen that the grooves 22 and 23 merge with the peripheral groove 21 or, in other words, the groove 21 is interrupted at this point so that the handle 35 will be located in one of the grooves 22 and 23 while its ends will be located adjacent the edge 20 of sections 11 to 14. Outside the range of handle 35, the marginal portion 34 of the lower container is located in the non-interrupted portion of groove 21 of the adjacent upper container. This engagement assures a high stability of the stacked container. The engagement of the handle 35, 35' in one of the grooves 22, 23 prevents a lateral displacement of the containers relative to each other, particularly when the containers are empty. Preferably the grooves 22, 23 are so designed that they slightly clamp the handle 35, 35' which is of particular advantage for empty containers.

The bottom portion and top portion of the container are so designed that they will have approximately the same wall thickness as the other wall portions of the container. The handle 35, 35' and the grooves 22, 23 are so designed that the handle will substantially engage the bottom of the respective adjacent superimposed container at the central portion thereof, i.e., within the groove 22. Instead of providing a flat bottom 19 with an arched groove 22, 23, it is also possible to arch the entire bottom in conformity with the arch of the handle 35, 35'.

With regard to FIG. 8, the container illustrated therein has the flattened side walls (only side walls 4 and 5 being shown) and also the top and bottom portions designed larger than with the embodiment of FIGS. 5 to 7. In all other respects the container of FIG. 8 corresponds to the container of FIGS. 1 to 7.

The container of FIG. 9 has an arched handle 35'' which extends over a plane top portion 44. The bottom is likewise plane and extends into the interior of the container whereby a rim 46 is formed adapted to retain the annular rim portion of the top portion 44 of the respective container stacked therebelow.

According to a further modification of the invention illustrated in FIG. 10, the bottom portion 63 is not arched but is substantially plane. The bottom portion 63 is furthermore somewhat depressed so as to form an outer marginal edge 62 and an inner marginal edge 52. The edge 62 performs the same function as the edges 20 and 46 referred to above, namely retaining the respective adjacent stacked container. Furthermore, the bottom portion 63 is provided with triangular shaped downwardly extending protrusions 57 which confine therebetween crosswise arranged grooves 60 and 61, which grooves receive the handle of the next adjacent stacked container (FIG. 10). Protrusions 57 confine with edge 62 groove section 58.

According to the embodiment of FIGS. 10 to 13, the handle, designated with the reference numeral 55, is straight while the depression adjacent the handle is designated with the reference numeral 56 and is somewhat deeper than the corresponding depression 25 of the embodiment of FIGS. 1 to 4.

It is, of course, to be understood that the present invention is, by no means, limited to the particular constructions shown in the drawings but also comprises any modifications within the scope of the appended claims.

What I claim is:

1. A self-supporting container, especially of synthetic material, having substantially plane side wall portions, a

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top wall portion with handle means, a bottom wall portion with depression means therein of a contour corresponding to the contour of said handle means, and additional outer surface portions interconnecting all of said side wall top and bottom portions and conforming to the outer contour of a body of revolution, the planes of each two adjacent plane side wall portions confining with each other an angle of substantially 90°, said depression means including two cross-wise arranged grooves.

2. A self supporting container of synthetic material having circular top and bottom end walls of substantially equal diameter and four similar vertical side walls of equal area spaced from said end walls, the margins of said end and side walls lying in planes forming the surface of a rectangular prism, said walls being within the surface of said prism with the top and bottom end walls having portions depressed inwardly of said surface, said margins being connected by a continuous curved wall within the surface of said prism, and an integral handle projecting above the margin of said top end wall, said bottom end wall being formed to receive and contact the handle of a similar container on which it is stacked with its bottom margin resting on the top margin of the lower container.

3. A self supporting container of synthetic material having circular top and bottom end walls of substantially equal diameter and four circular vertical side walls of equal diameter spaced from said end walls, the margins of said end and side walls lying in planes forming the surface of a cube, said walls being within the surface of said cube with the top and bottom end walls having portions depressed inwardly of said surface, said margins being connected by a continuous curved wall lying in a spherical surface, and an integral handle projecting above the margin of said top end wall, said bottom end wall being formed to receive and interlock with the handle of a similar container on which it is stacked with its bottom margin resting on the top margin of the lower container.

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4. A self supporting container of synthetic material having circular top and bottom end walls of substantially equal diameter and four similar vertical side walls of equal area spaced from said end walls, the margins of said end and side walls lying in planes forming the surface of a rectangular prism, said walls being within the surface of said prism with the top and bottom end walls having portions depressed inwardly of said surface, said margins being connected by a continuous curved wall within the surface of said prism, said curved wall curving downwardly and upwardly from the top and bottom margins, respectively, of said end walls, and a spout projecting diagonally upwardly and outwardly from said curved surface adjacent said top margin and lying outwardly of the curved surface of the bottom portion of another similar container stacked on the said container with the bottom and top margins of said containers in engagement, so as to allow access to said spout when a container is stacked on top of said container with the spout, and an integral handle extending diametrically across the margin of the top wall.

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ROBERT B. REEVES, *Primary Examiner.*

RAPHAEL M. LUPO, *Examiner.*

F. R. HANDREN, *Assistant Examiner.*