

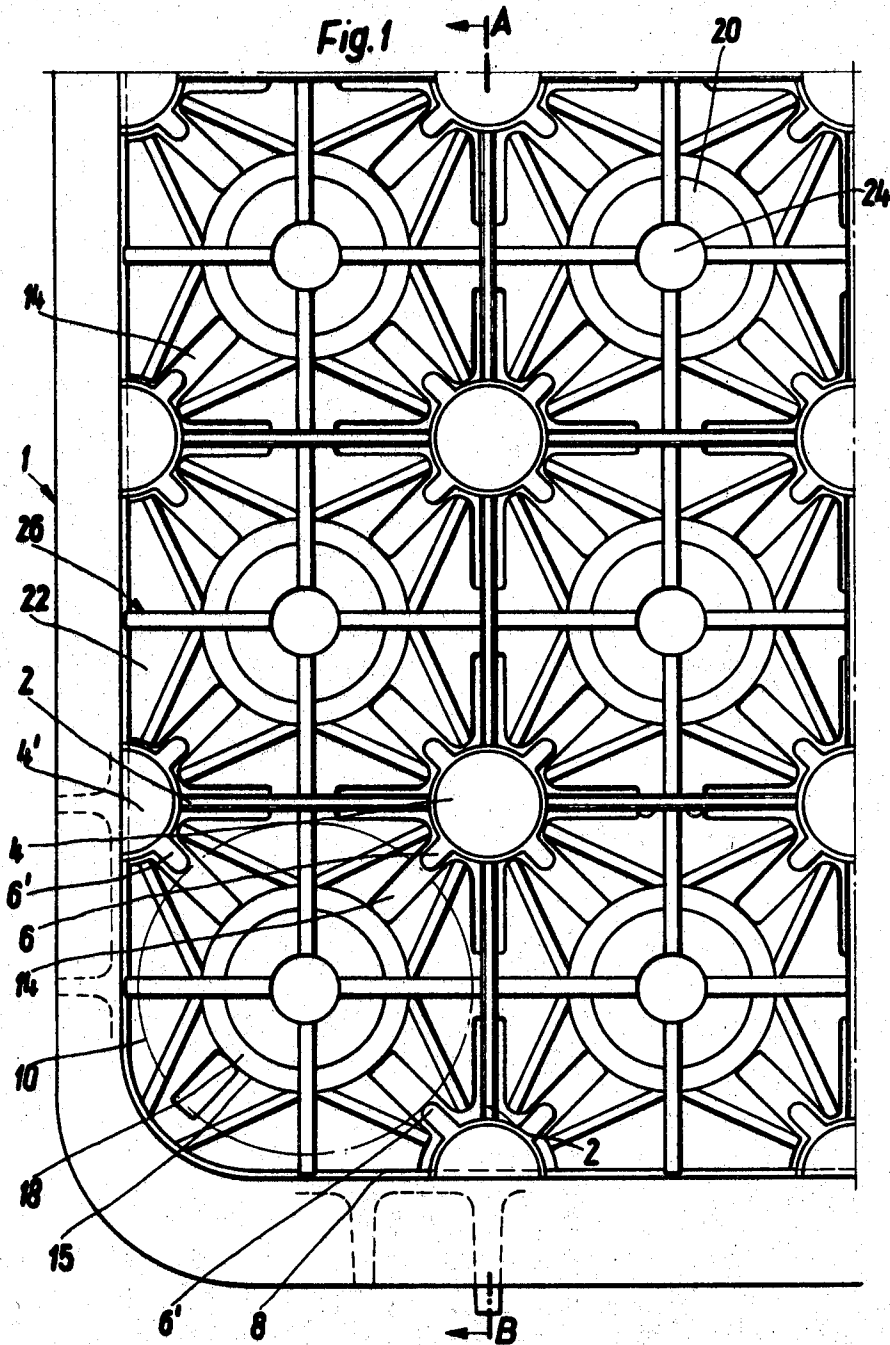
July 2, 1968

H. W. ADOMAT
BOTTLE CONTAINER

3,390,801

Filed Feb. 14, 1967

8 Sheets-Sheet 1



Inventor:
HEINZ W. ADOMAT

By *Cushman, Quiley & Cushman*
ATTORNEYS

July 2, 1968

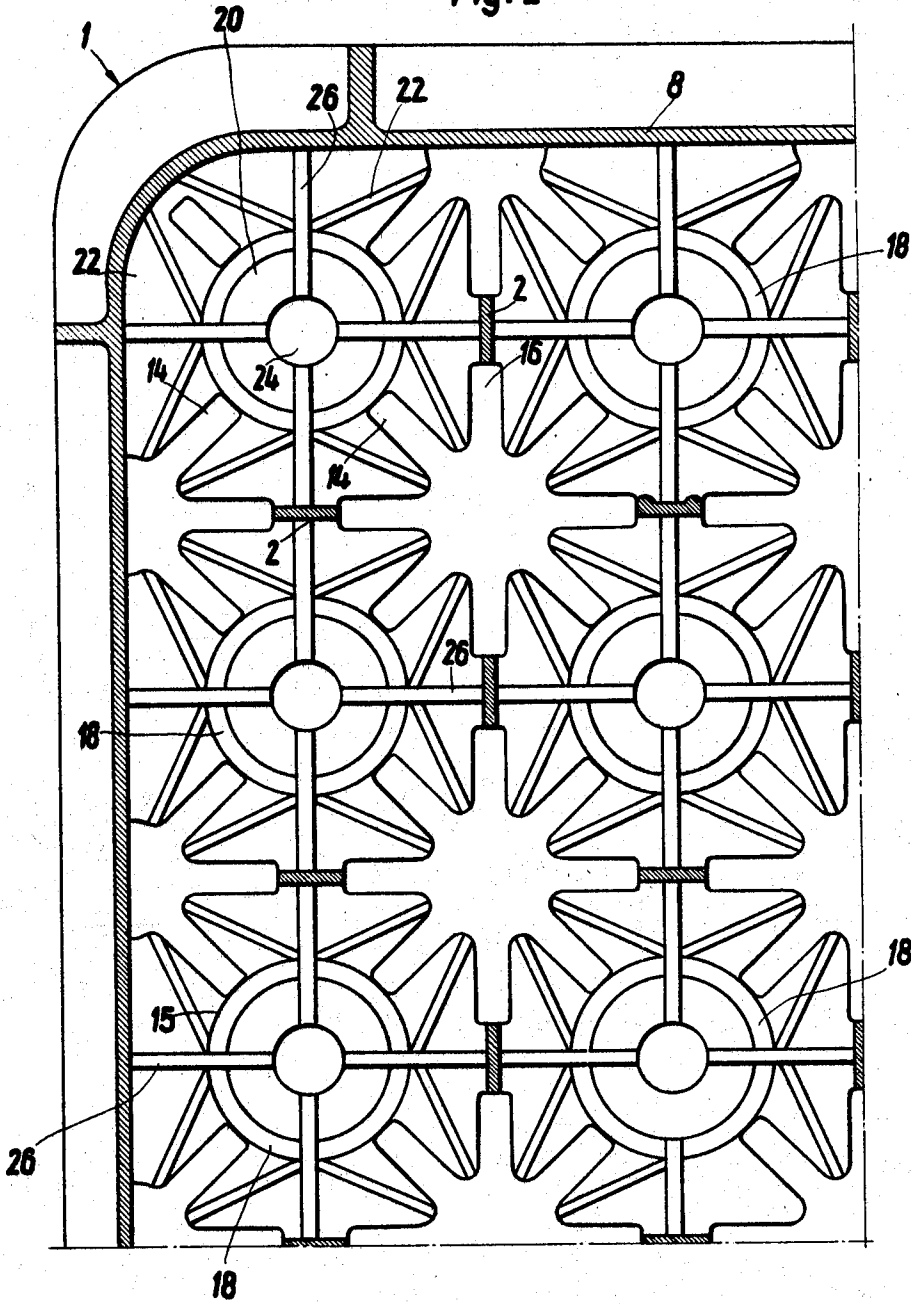
H. W. ADOMAT
BOTTLE CONTAINER

3,390,801

Filed Feb. 14, 1967

8 Sheets-Sheet 2

Fig. 2



Inventor:
HEINZ W. ADOMAT
By *Cushman, Seely & Cushman*
ATTORNEYS

July 2, 1968

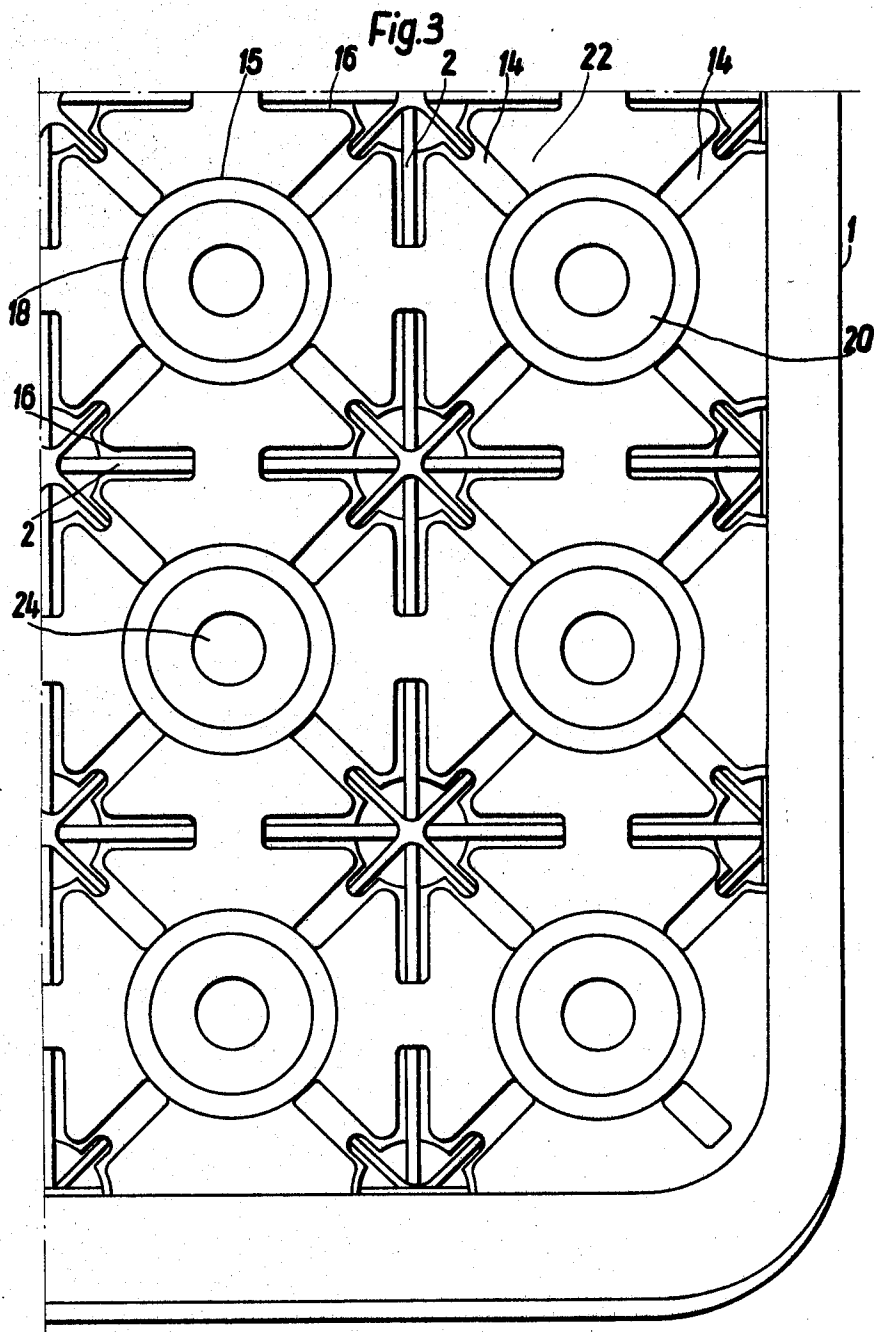
H. W. ADOMAT

3,390,801

BOTTLE CONTAINER

Filed Feb. 14, 1967

8 Sheets-Sheet 3



Inventor:

HEINZ W. ADOMAT

By *Cookman, Reddy & Cookman*
ATTORNEYS

July 2, 1968

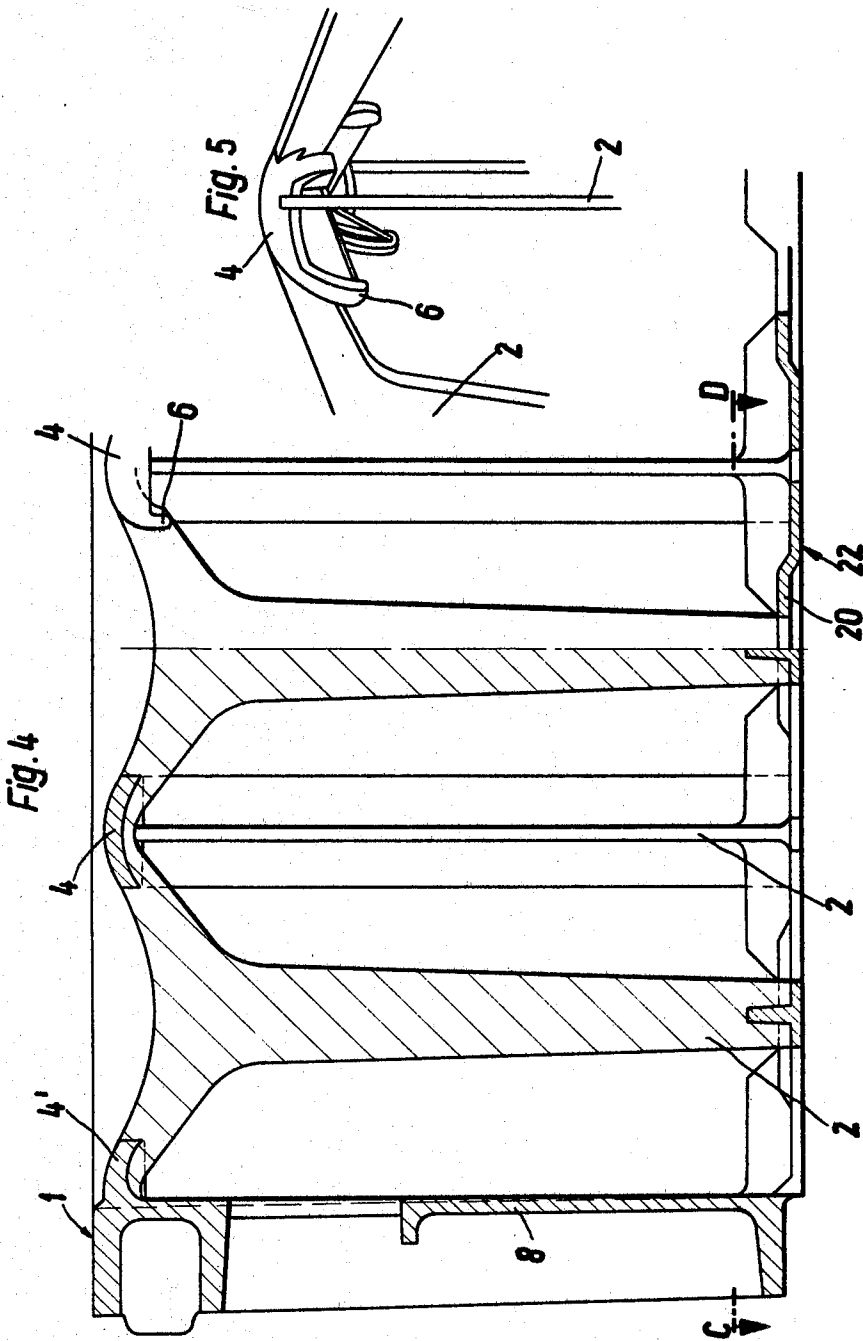
H. W. ADOMAT

3,390,801

BOTTLE CONTAINER

Filed Feb. 14, 1967

8 Sheets-Sheet 4



Inventor:

HEINZ W. ADOMAT

By
Cushman, Ingham & Cushman
ATTORNEYS

July 2, 1968

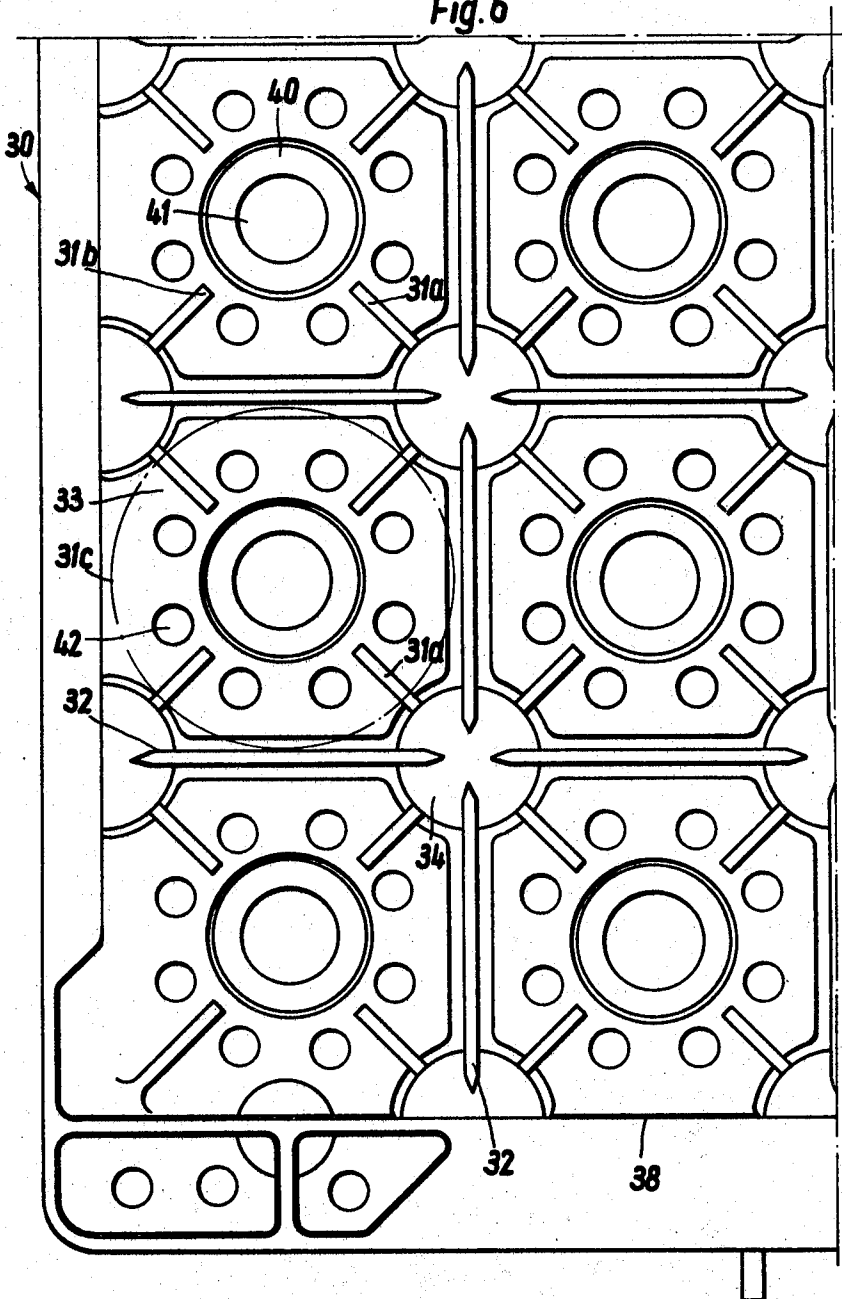
H. W. ADOMAT
BOTTLE CONTAINER

3,390,801

Filed Feb. 14, 1967

8 Sheets-Sheet 5

Fig. 6



Inventor:

HEINZ W. ADOMAT

By
Cushman, Decker & Cushman
ATTORNEYS

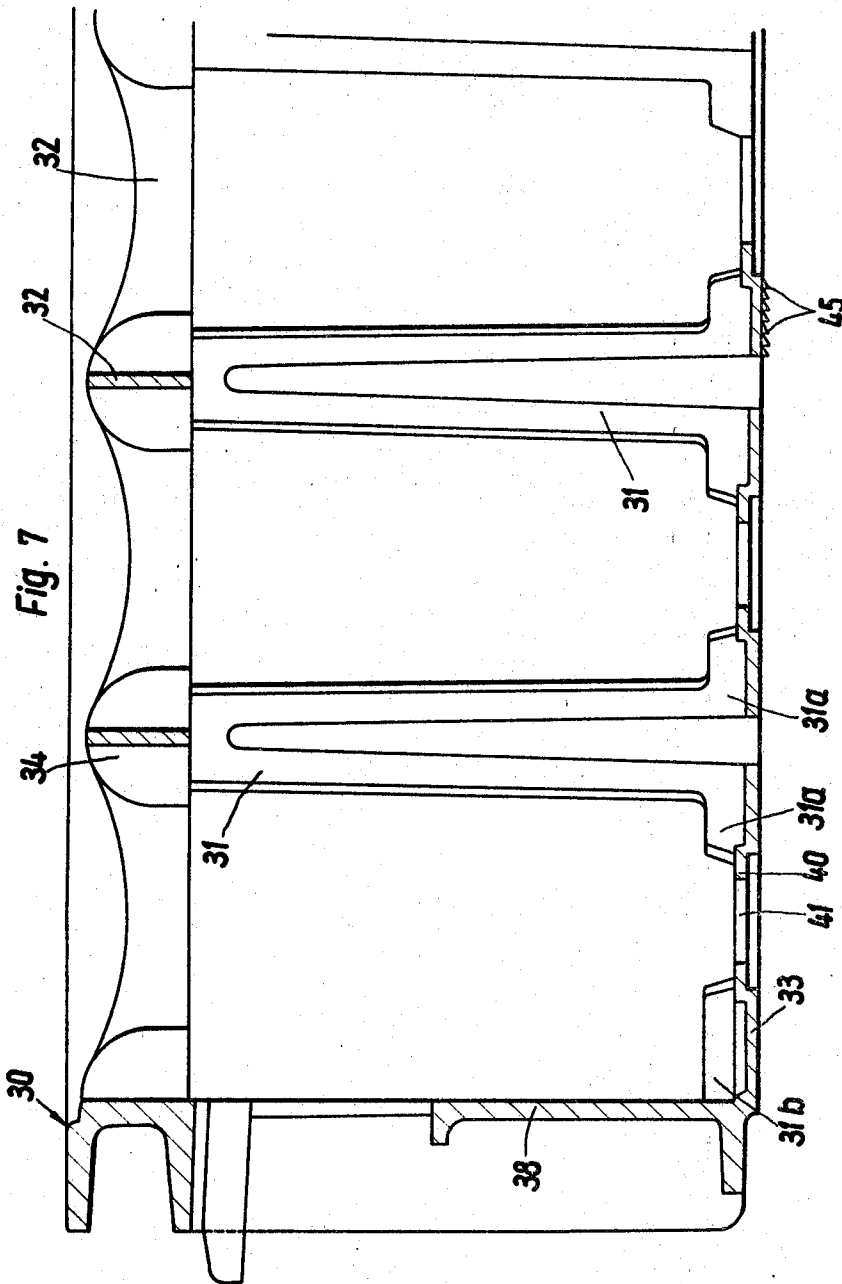
July 2, 1968

H. W. ADOMAT
BOTTLE CONTAINER

3,390,801

Filed Feb. 14, 1967

8 Sheets-Sheet 6



Inventor:

HEINZ W. ADOMAT

By
Cushman, Quiley & Buchanan
ATTORNEYS

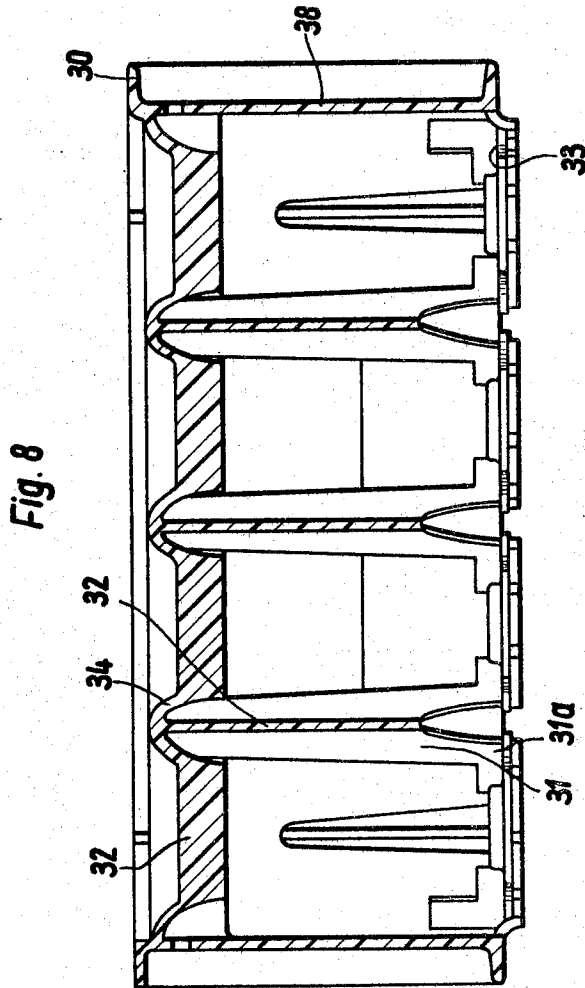
July 2, 1968

H. W. ADOMAT
BOTTLE CONTAINER

3,390,801

Filed Feb. 14, 1967

8 Sheets-Sheet 7



Inventor:

HEINZ W. ADOMAT

By *Cushman, Deley & Cushman*
ATTORNEYS

July 2, 1968

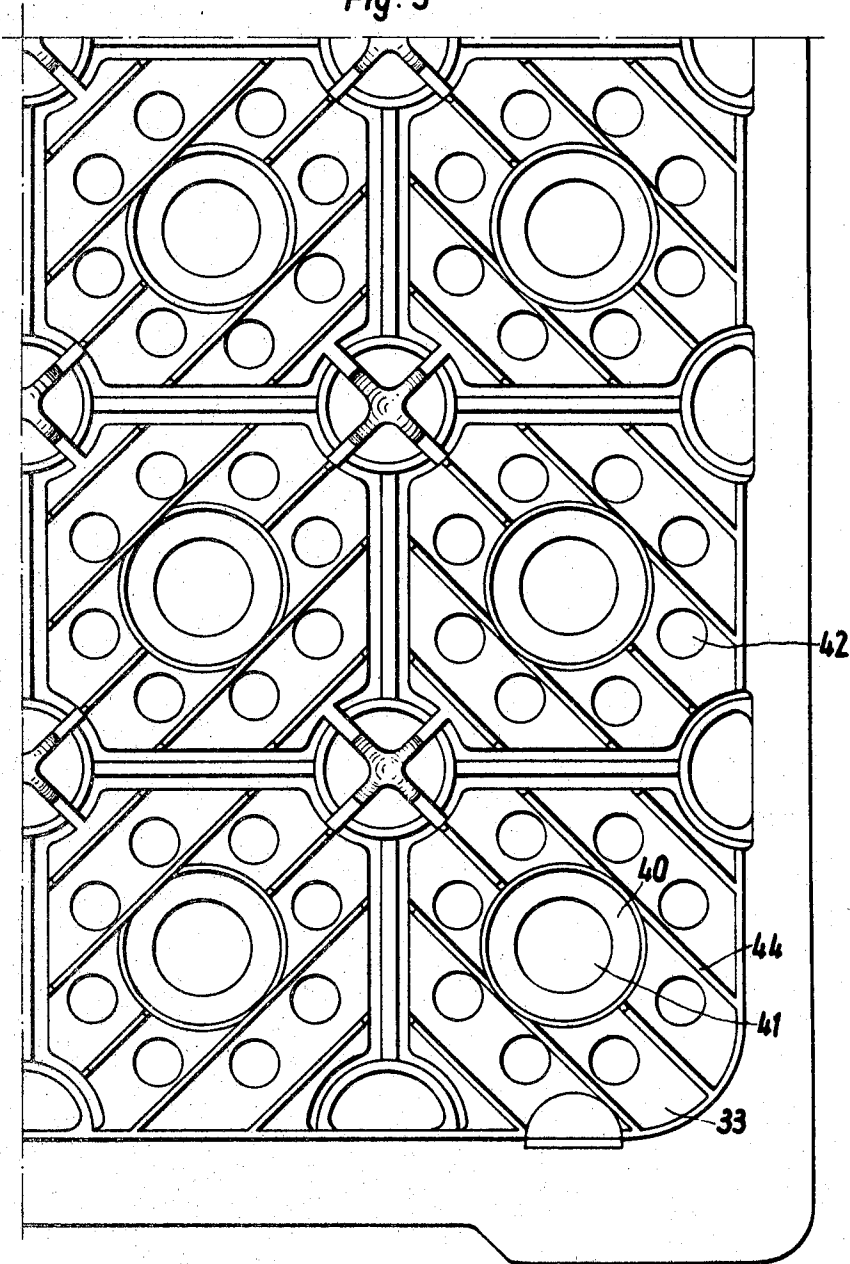
H. W. ADOMAT
BOTTLE CONTAINER

3,390,801

Filed Feb. 14, 1967

8 Sheets-Sheet 2

Fig. 9



Inventor:

HEINZ W. ADOMAT

BY
Cushman, Dooly & Cushman
ATTORNEYS

3,390,801

BOTTLE CONTAINER

Heinz W. Adomat, Hamburg, Germany, assignor to Kommanditgesellschaft Lenox-Plastik G.m.b.H. & Co., Hamburg, Germany, a corporation of Germany
 Filed Feb. 14, 1967, Ser. No. 616,118
 Claims priority, application Germany, Feb. 15, 1966, K 58,447; May 26, 1966, K 59,346
 9 Claims. (Cl. 220-21)

ABSTRACT OF THE DISCLOSURE

This invention provides a compartmented beverage bottle case integrally formed of molded synthetic resin. At the intersection of the compartment walls with other compartment walls, and with the case walls, a domed spacer is provided at the upper portion of the intersection. An aperture is provided in the case bottom directly below each spacer; the dimensions of the aperture in the horizontal plane are at least as great as the dimensions of the spacers in that plane. Raised apertured platforms are provided in the bottom of the bottle case whereby a recessed portion is formed on the underside of the case bottom for receiving the closure caps of bottles, whereby an interlocking of stacked cases containing bottles is accomplished. In the preferred embodiment, the case bottom is not continuous, but instead comprises individual bottoms for each compartment, each individual bottom being carried by support rods disposed downwardly from the spacers of the compartment wall intersections and having a splayed end secured to adjacent individual compartment bottoms.

This invention concerns improvements in or relating to crates or cases for the transportation of bottles.

It is conventional in the transportation of beverage bottles to employ bottle crates or cases made of molded synthetic resin or so-called "plastic" material, the interior of these crates or cases being compartmented while their bottom is perforated in order to facilitate cleaning of the case and to help avoid condensation. Generally, such conventional bottle cases are deep enough to ensure that the whole of each bottle is within the case. The compartments generally extend to the neck of each bottle. The cases usually have a handling rim with recessed handles so that a number of cases can be stacked one upon another. However, for certain beverage bottles, such as cola beverage bottles, it has been proposed to use so-called "half-height" bottle cases in which the bottom surface of each compartment is indented upwards, so that internally the level of the compartment floor is raised and externally the bottom of the case has a complementary series of circular indentations with the result that the bottle necks protrude from the top of such half-height cases which, however, can still be stacked one upon another because the bottle necks protruding from one stacked crate or case fit into the circular indentations in the bottom surface of the case next above in the stack, and indeed this interfitting guarantees firm seating of one half-height case upon another.

It is, however, a disadvantage of the conventional bottle cases, and especially of the half-height bottle cases, that when the bottles are inserted they often slide badly into the short compartments, while during transportation and storage of the bottle cases, especially when moved or inclined sideways, the bottles are liable to shift in their compartments and to collide with one another. Leaving aside the dangers of breakage on collision, the bottles when displaced are liable to be pressed together in a non-

vertical direction and thus broken by the pressure of bottle cases stacked above them. The danger of this kind of breakage is particularly great with waisted bottles in half-height bottle cases.

The proposal for overcoming this disadvantage by fitting toothed spacers onto the intersecting surfaces of the compartments has not proved successful in practice since after fitting, these spacers tend easily to fall off, and if as can easily happen they are replaced by other spacers of different sizes, then either they allow too much play if dimensioned for larger bottles or they prevent insertion of the desired bottles if dimensioned for smaller bottles. To secure such toothed spacers in position by for instance welding or adhesive is, however, too cumbersome and expensive, while the molding of the spacers integrally with the rest of the case during manufacture has not yet proved possible for reasons of molding technology.

It is, therefore, an object of the present invention to provide a compartmented bottle crate or case which reduces the danger of breakage. A further object of the invention is to provide bottle cases, particularly half-height bottle cases, which can be readily manufactured from synthetic resins by molding, conveniently by injection molding processes, and in which spacers are formed integrally with the bottle case during manufacture whereby breakage of the bottles during insertion into the compartments and during transportation or storage in a stack is prevented. It is moreover yet another object of the invention to provide a preferred construction of half-height bottle crates or cases which when stacked will be more firmly interconnected than hitherto possible, by means of the bottle necks projecting from a lower case fitting into the recesses in the outer bottom surface of the overlying case in the stack. Other objects will be apparent from the following disclosure and drawings and from the detailed description of the preferred embodiments.

According to the invention there is provided a bottle case formed of molded synthetic resin and having an apertured bottom, in which an integrally molded domed spacer is formed at the upper end of the vertical lines of intersection of a compartment wall with an outer wall and/or with other compartment walls, and having a basal aperture formed in the case bottom immediately below each of said spacers whose dimensions in the horizontal plane are at least as great as the dimensions in that plane of said spacer.

The domed spacers are preferably of a round-headed mushroom shape, and desirably have downwardly extending projections thereon which extend further into each of the compartments so that the spacer has a star shaped appearance. The basal aperture will then conveniently have a corresponding, that is to say a star shaped, outline and, as previously indicated, must be at least as big or preferably somewhat bigger than the spacer in order to permit the bottle case to be removed from the mold in a satisfactory manner.

It will be appreciated that with the specified arrangement of spacers and basal apertures the bottle cases can be manufactured, for example, by an injection molding process without the difficulties which have hitherto made such molding impossible. Moreover, it will be appreciated that it becomes possible in such a manufacturing process to adjust the length of the projections on the spacers and correspondingly the length of the arms of the star shaped basal apertures merely by appropriate adjustment of the molding matrix and upper die.

In approximately the middle of each compartment bottom there should preferably be provided a raised portion, forming a platform which is usually circular and should include an aperture, the rim of that aperture being advantageously reinforced with an annular lip. This raised

portion provides a recess on the outer bottom surface of the bottle case for the reception of the bottle neck or the bottle closure on the bottle in an underlying case. For this purpose, it is clearly best if the diameter of the circular raised portion is somewhat greater than the diameter of the bottle cap or closure, while equally the diameter of the circular platform aperture should be smaller than the diameter of the bottle cap or closure, since this arrangement ensures that the bottles necks of the underlying bottles will fit easily into the recesses in the outer bottom surface of the upper case but will not jam therein with resultant damage either to the bottle case or bottle closure.

The centers of the raised platforms in one or more of the compartments can with advantage be slightly displaced with respect to the center of the compartments, since this tends to promote a more stable interconnection between two superposed cases by pressing the bottles whose closures are received in the recesses corresponding to the displaced platforms more firmly against the compartment wall, thus preventing displacement or wobbling of the upper case.

The individual raised platforms in each compartment bottom are preferably joined to neighboring platforms by means of usually straight ribs or bars which strengthen the case bottom and also serve as standing surfaces for the bottles, while promoting air-circulation in the compartment and thus reducing the danger of condensation forming which can loosen the bottle labels. The circular platforms can themselves be surrounded by a peripheral annular rib which also serves to strengthen the case bottom.

In many instances, it is also convenient to provide further strengthening ribs which radiate from the star shaped basal apertures in the case bottom, and run towards the rim of the platforms. The bottom surface in this bottle case can be joined to the compartment walls, or in the case of perforated compartment walls to such parts thereof as still remain, as well as also to the inside of the outer wall of the case. The bottom of the case can also be constructed as a gridded surface, or it can be made up from several interconnected annular surfaces, which either touch one another and/or intersect and/or are connected together by means of cross bars.

We have also found that the manufacture of bottle cases in accordance with this invention can be still further improved from the standpoint of the molding operation and also in relation to savings of material, if the bottle case is not provided with a continuous bottom surface but instead the bottom surface of each individual compartment is formed more or less independently, and is not connected directly with the vertical walls. In this preferred embodiment, the bottom surface of each compartment is secured instead to generally vertical support rods, which are attached to the spacers at the end opposite to the case bottom. The end of the support rods secured to the bottom surfaces of the case bottom are splayed so that a part of the end is secured to a bottom surface of the case bottom, the remaining parts being secured to other bottom surfaces.

In order that the invention may be more fully understood, preferred embodiments thereof will now be described with reference to the accompanying drawings, in which:

FIGURE 1 is a plan view from above of one corner of a preferred form of bottle case, whose bottom is joined to the compartment wall, the remainder of the case being essentially identical in construction;

FIGURE 2 is a horizontal cross-section, viewed from below, taken through the corner of the bottle case shown in FIGURE 1, a short distance from the base thereof;

FIGURE 3 is a plan view from below, of the corner of the bottle case shown in FIGURE 1;

FIGURE 4 is a vertical cross-section taken through the bottle case along the line A-B shown in FIGURE 1;

FIGURE 5 is a perspective view of the preferred form of spacer present in the bottle case shown in FIGURES 1 to 4;

FIGURE 6 is a plan view from above of another preferred form of bottle case, whose bottom areas are not attached to the compartment wall, the remainder of the case being essentially identical in construction to that of the corner shown;

FIGURE 7 is a vertical cross-section taken through the bottle case shown in FIGURE 6, in a plane running parallel, with the center of the compartment along the length thereof from spacer to spacer;

FIGURE 8 is a vertical cross-section, similar to that shown in FIGURE 7, but in a plane running through the spacers across the breadth of the compartment; and

FIGURE 9 is an underneath plan view of the bottle case shown in FIGURES 6 to 8.

The bottle case generally indicated 1, as shown in FIGURES 1-5, is subdivided in its interior by compartment walls 2, at whose intersections there are provided spacers 4, disposed towards the top of the compartment walls, and having star shaped projections or pegs 6. Essentially similar spacers 4' are mounted at the intersection points between the compartment walls 2 and the outer wall 8 of the case, but naturally those spacers 4' have only two pegs 6'. The length of these pegs 6 and 6' is so chosen that they will reach close to the sides of bottle 10 (shown in faint outline in the bottom left hand corner of FIGURE 1) but leaving a slight clearance.

The bottom surface 22 of the bottle case shown in FIGURES 1-3 is provided with star shaped recesses 14 which lies below the star shaped pegs 6 and in addition, further star shaped recesses 16 are present which lie below the compartment walls 2 which extend across the upper region of the case (as shown clearly in FIGURE 1).

The star shaped recesses 14 end, in this embodiment, in an annular step 15 to which can be attached, if desired, the annular reinforcing rim 18. Inside the annular step 15 lies an annular surface 20 which is formed raised in relation to the normal bottom surface 22. In the center of surface 20 is provided a circular perforation 24 through which condensation or cleaning water can run off. Each annular surface 18 is joined to the neighboring annular rims 18 or to the container wall 8 by means of joining ribs 26. By this means greater stability of the base of the bottle case 1 is achieved. It is also possible to continue the joining ribs 26 (as shown) through the annular surface 18 to the circular perforation 24 in the raised annular surface 20.

In such a bottle case are combined several advantages, namely smooth and safe insertion of the bottles which slide into their compartments on the mushroom-headed, round-headed, hemispherical or convexly-formed spacers 4. Furthermore, since the spacers are molded from one material integrally with the rest of the bottle case they cannot be removed. If it is desired to make cases for bottles with another diameter, a simple adjustment of the two parts of the mold for the cases suffices, i.e., a contraction or expansion of the slightly conically-formed matrix with star shaped mold parts which form the spacers 4 and projections 6. The bottle case is formed with somewhat bowed wall surfaces and with numerous perforations, which nevertheless provide improved stability of the case and of the compartments and/or of the whole case itself, although considerable material is saved.

In the preferred embodiment, the upper part of bottle case 30, shown in FIGURES 6-9, between the compartment walls 32 and at the point of intersection of the compartment walls, spacer 34 are provided which are of mushroom-headed form. From these spacers 34 bars 31 lead vertically downwards (see FIGURES 7 and 8), such that their lower ends 31a (which are wider than the main portion 31) are joined to the bottom surface 33.

In the compartments at the sides of bottle case 30, the bottom surface 33 can also be joined to the vertical

outer wall 38. This transition can take place at right-angles or by means of an angularly-extending reinforcement member 31b as shown in FIGURES 6 and 7. In FIGURE 6, the position of the bottles fitting in the bottle case is shown in faint outline by 31c. By such an arrangement, because of the freeing of an intermediate space from the bottom surface 33 to the bottom surface of the next adjacent compartment, a considerable quantity of material is saved. In addition, the whole case is elastic in its whole structure and becomes springy which, under heavy loading, prevents premature disruption or tearing apart of the various surfaces. In the total construction the freely suspended bottom surfaces 33 and/or the "four-legged" supports of the individual spacers 4 act elastically to a great extent. The case 30 also possesses in the bottom region raised annular surfaces 40 with centrally arranged perforations 41, and if desired, further apertures 42 (as shown). Preferably the raised annular surfaces 40 are arranged slightly eccentrically with respect to the center of the compartment base. Furthermore, on the under-surface of the base area, transverse strips 44 (or studs) or teeth 45 can be fitted in order to prevent slipping of the case.

The synthetic resin used in molding the cases of the present invention may be any thermoplastic resin such as polyethylene, polypropylene, polystyrene and polymethylmethacrylate.

It will be appreciated that various modifications can be made in the invention described herein without departing from the spirit of the invention. Hence, the scope of the invention is defined in the following claims.

What is claimed is:

1. A case for holding objects formed of molded synthetic resin and having individual compartments for receiving and separating individual objects, said case having spacer means disposed along axes the directions of which axes are defined by lines of intersections between compartment walls and by lines of intersections between compartment walls and adjacent outer walls, said spacer means functioning to receive and guide individual objects into individual compartments so that each object will be spaced from adjacent compartments, each compartment having a bottom member which is substantially independent from other compartment bottom members and said bottom member being connected with a support means which extends to and connects with said spacer means and compartment walls, each of said support means having separated and splayed end portions which separately connect and support adjacent bottom members so as to maintain a separation of bottom members from one another

other to thereby provide a degree of flexibility of bottom members relative to one another and to remaining portions of said case.

2. A case according to claim 1 for holding bottles, in which a portion of the bottom member within each compartment is raised to form a platform, each of said platforms having an aperture therein.

3. A case according to claim 2, in which an annular reinforcing rim is provided around each said platform aperture.

4. A case according to claim 2 in which the center of at least one of the raised platforms is slightly offset with respect to the center of the compartments.

5. A case according to claim 3, in which the raised portion forms a circular platform having a greater diameter and the platform aperture has a lesser diameter than that of a bottle cap.

6. A case according to claim 2 in which each bottom member has strengthening ribs thereon.

7. A case according to claim 1 for holding bottles, in which the spacers are disposed at the end of the said lines of intersection opposite the bottom members and have downwardly inclined projections thereon.

8. A case according to claim 7, in which those compartments being adjacent to the outer walls of the bottle case have independent bottom portions being carried peripherally by the outer walls and otherwise solely by said supports.

9. A case according to claim 7, in which said supports are four-legged rods, said generally vertical legs being disposed in the horizontal plane at right angles to each other and at an angle of 45° relative to the outer walls.

References Cited

UNITED STATES PATENTS

3,092,284	6/1963	Stout	220—21
3,106,308	10/1963	Kazimer	220—21
3,245,573	4/1966	Bakos	220—21
3,327,885	6/1967	Carle	220—21
3,337,081	8/1967	Earp	220—21

FOREIGN PATENTS

754,312	8/1956	Great Britain.
979,205	1/1965	Great Britain.
1,426,764	12/1965	France.

THERON E. CONDON, *Primary Examiner.*

GEORGE E. LOWRANCE, *Examiner.*