Feb. 16, 1965 F. N. BLACKMORE 3,169,659

RECEPTACLE

Filed Dec. 31, 1962 2 Sheets-Sheet 1

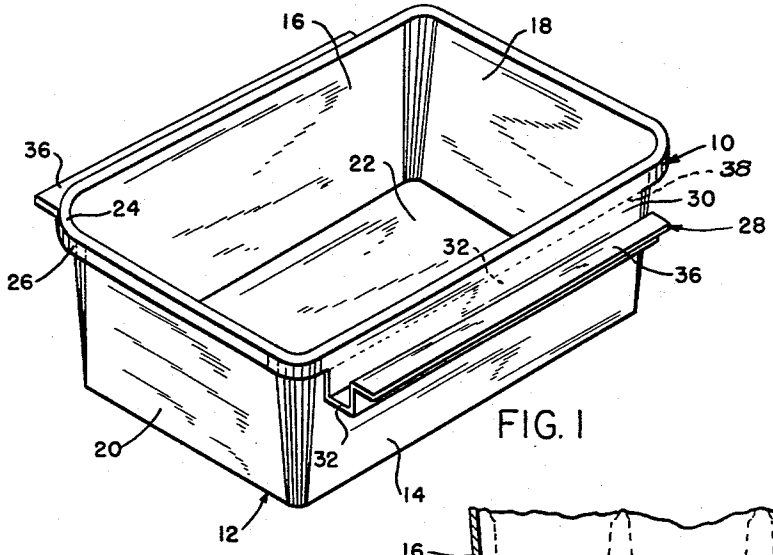


FIG. 1

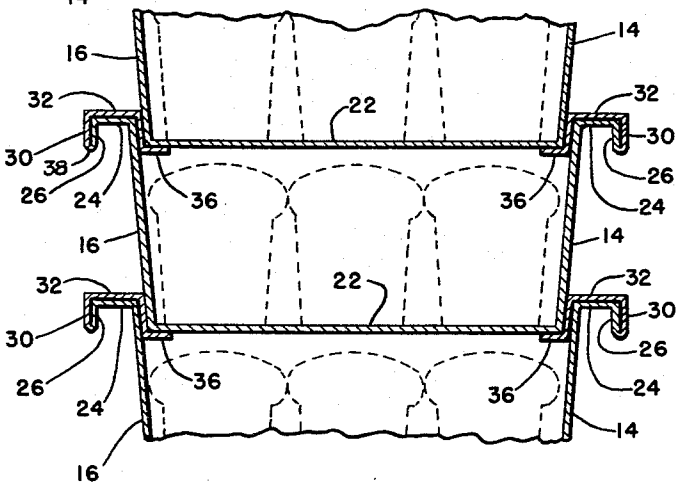


FIG. 2

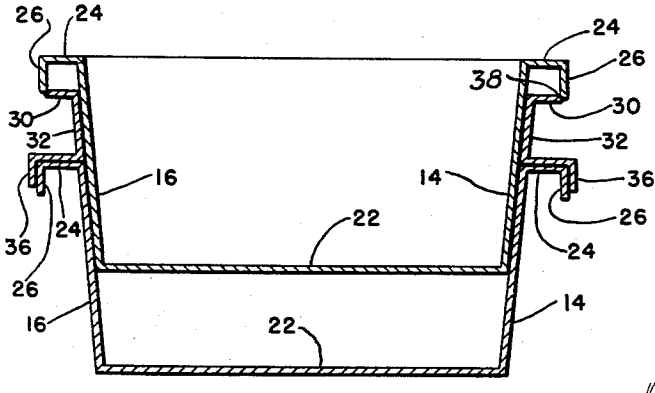


FIG. 3

INVENTOR.
FRED N. BLACKMORE
BY
Watson D. Harbaugh
ATT'Y.

Feb. 16, 1965 F. N. BLACKMORE 3,169,659

RECEPTACLE

Filed Dec. 31, 1962 2 Sheets-Sheet 2

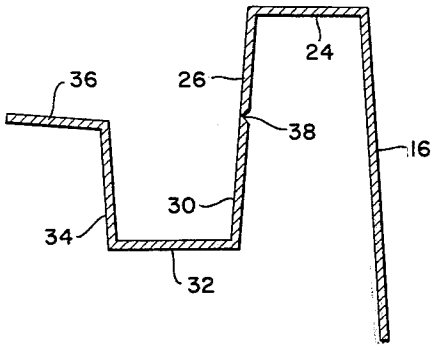


FIG. 4

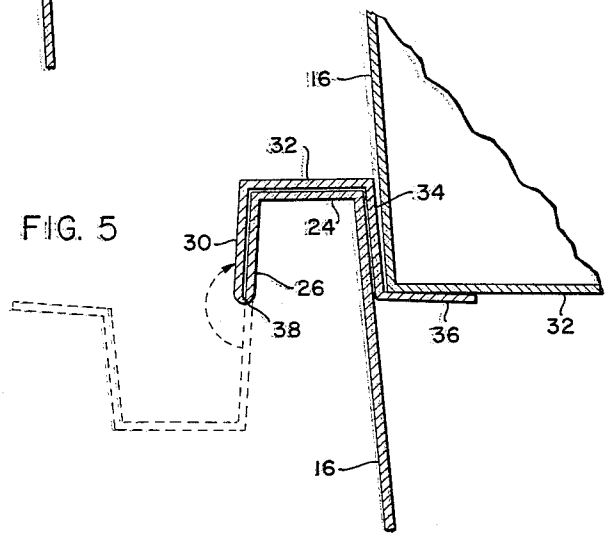


FIG. 5

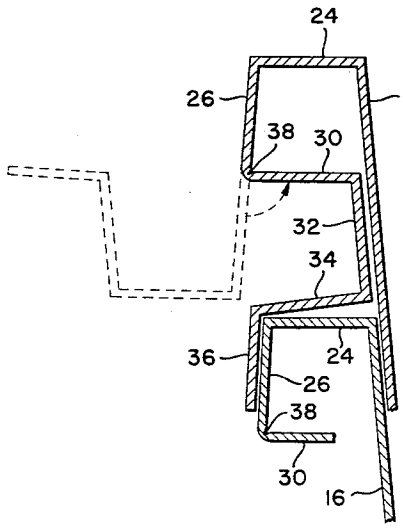


FIG. 6

INVENTOR
FRED N. BLACKMORE

BY Graham D. Harbaugh
ATTORNEY

United States Patent Office 3,169,659 Patented Feb. 16, 1965

3,169,659

RECEPTACLE

Fred N. Blackmore, Ann Arbor, Mich., assignor to Lus-Trus Corporation, Ypsilanti, Mich., a corporation of Michigan

Filed Dec. 31, 1962, Ser. No. 248,583
9 Claims. (Cl. 220—97)

This invention relates in general to open top receptacles and in particular to tote boxes embodying an improved upper flange portion at the top which permits partial telescoping of one receptacle within another in supported relationship when the flange is in one position for stacking loaded receptacles and deep nesting of one receptacle within another without binding when in an alternate position for storing the receptacles.

Receptacles of the open type are generally formed with an inverse truncated configuration. Stable stacking of one receptacle on top of another necessitates either a cover or the telescoping of the narrower lower portion of one receptacle into the wider, open upper portion of another receptacle. In order to prevent the telescoping receptacles from frictionally binding with one another when nested for storage either the bottom of one is offset upwardly to support the bottom of the upper with irregular patterns or the side walls of the receptacles are conventionally offset at spaced intervals to provide a plurality of support pilasters for engagement by the upper or entering receptacle. Under these circumstances when loaded, the bottoms of upper trays rest on the load in the lower trays.

On the other hand if the pilasters are tall enough to relieve lower loads of the weight of upper loads when loaded receptacles are stacked, then the boxes do not telescope any more when unloaded than when loaded because in order to attain maximum volume of the receptacles for storage of articles, the pilaster shoulders are usually adjacent the upper periphery of the receptacle, allowing the entering receptacle to telescope only enough to attain the desired stability for stacking.

The support shoulders prevent the entering receptacle from contacting the articles stored in the lower receptacle, but when the receptacles are not in use, these shoulders prevent the receptacles from telescoping fully one inside of another for compact storage and ease of handling.

In this connection it is interesting to note that if the receptacles are vacuum formed from polypropylene sheets, a miscellany of shapes would have to be provided or even the pilasters would telescope also and weight would still bear upon the loads themselves and not the receptacles.

Furthermore, when the receptacles are to be used for handling and storage of food, medicine and other articles requiring sanitary conditions, the upset shoulders in the side walls provide grooves and ridges which are difficult to clean and maintain in a sanitary condition.

Accordingly, it is the primary object of this invention to provide a receptacle having an improved flange at the upper edge thereof wherein a plurality of receptacles may be stacked one on top of another without contact with the articles within the receptacles yet may be fully telescoped one inside of another more deeply when the receptacles are empty and not in use.

Another object of this invention is to provide an improved receptacle having a pivotal flange integrally formed at the upper periphery of the receptacle which not only enables plural depths of telescoping but also makes it easier to handle the receptacles separately or in stacked arrangements.

Another object of this invention is to provide an improved, open type receptacle having an inverse truncated configuration, wherein the entire surface area of the side walls thereof can be smooth both inside and out.

A further object of this invention is to provide a receptacle having an improved easily managed strengthening flange adjacent the periphery thereof wherein a portion of the flange controls the depths of telescoping of one receptacle within another.

A still further object of this invention is to provide an improved pivotal flange at the periphery of a receptacle wherein movement of the flange assures release of the receptacle from any frictional engagement with another when in a stored telescoped position.

Yet another object of this invention is to provide an improved unitary plastic receptacle wherein portions of a peripheral flange are pivoted, yet once put into operation do not take up any more space than the width of the receptacle body itself.

Other objects and advantages of the invention will become apparent as the description proceeds in accordance with the drawings, in which:

FIG. 1 is a perspective diagrammatical view of a receptacle embodying the present invention, the pivoted portion of the flange being in a straight out position as normally formed;

FIG. 2 is a fragmentary, sectioned end view illustrating a plurality of receptacles of this invention with the pivoted flanges in an up position for stacking one loaded receptacle upon another;

FIG. 3 is a fragmentary, sectioned end view illustrating the receptacles of this invention with the pivoted flanges in a down position for nesting one receptacle within another for storage;

FIG. 4 is an enlarged fragmentary sectioned view of the pivoted portion of the flange in a straight out position;

FIG. 5 is an enlarged fragmentary sectioned view of the pivoted portion of the flange in an up or stacking position; and

FIG. 6 is an enlarged fragmentary sectioned view of the pivoted portion of the flange in a down or nesting position.

Referring now to FIG. 1, the receptacle is shown for purposes of drawing clarity with walls that are much thicker than actually is the case, namely, between .020 and .100" as made from polypropylene. The receptacle, according to the invention, comprises a flange section 10 and an article container section 12. The container section 12 has an inverse trucated configuration formed by side walls 14 and 16, end walls 18 and 20 and a bottom wall 22. The juncture of the side walls, end walls and bottom wall of the container section 12 are preferably of rounded contour for ease of telescoping one within another, ease of cleaning and handling and overall reinforcement of the receptacle. The entire receptacle is preferably formed from the plastic, polyproylene, but it is to be understood that any suitable plastic or metal may be used in forming the receptacle and flange configuration according to this invention.

The flange section 10 is formed about the upper periphery of the receptacle integral with the side and end walls of the container section 12. The flange section 10 comprises an outwardly extending leg 24, substantially parallel with the plane of the bottom wall 22 and a lip portion 26 depending at right angles a short distance from the extended edge of the leg 24. The U-shape of the flange section just described reinforces the upper periphery of the receptacle, provides a convenient and comfortable gripping area for the fingers to lift and carry the receptacle and provides a base for a pivoted flap portion which functions as a limit stop when nesting one receptacle within another, as will be clearly understood as the description continues.

The depending lip portion 26, along the length of the side walls 14 and 16, provides an extending pivoted depth control flap, indicated generally by the numeral 28.

Referring now to FIGS. 2, 3, 4, 5 and 6, and more

specifically to FIGS. 4, 5 and 6, where the thickness is more realistically shown by one broad line the depth control flap 28, is formed by four web portions preferably integral with one another and pivoted to the lip 26. Referring specifically to FIG. 4, a web member 30 is pivotally integral with the depending lip 26 as an extension of equal width therewith. A second web member 32 extends outwardly at right angles from the lower edge of web 30 of a width equal to the width of the flange leg 24. A third web member 34 extends upwardly from the edge of member 32 of substantially the same width or slightly wider than said leg 24 and preferably parallel to member 16 so that the space between the member 30 and 34 of the U-shape just described is substantially greater than the width of the leg 24 to permit positioning thereon as shown in FIG. 5 and the member 34 can rest on another leg 24 as a nesting stop for storage as shown in FIG. 6. A fourth web member 36 extends outwardly from the upper end of member 34 to serve as a telescoping stop as shown in FIGS. 2 and 5 when receptacles are loaded and stacked.

The juncture of the extending web member 30 with the depending lip 26 is defined by an angular notch 38 or thinning of thickness, formed in the material the full length of the receptacle. The notch 38 has an included angle of 90° leaving only a thin cross-sectional portion 40 joining the lip 26 with the leg portion 30. It is at this point that the flap 28 pivots relative to the flange section 10 and container section 12 of the receptacle and with polypropylene the parts can pivot 270° thousands and thousands of times without weakening or severing.

FIGS. 2 and 5 illustrate the position of the flap 28 when it is desirable to stack several receptacles, one on top of another. The notch 38, being on the inner side of the lip 26, permits the depth control flap 28 to pivot 180°. Once in the up or stack position, the flap 28 reinforces the upper periphery of the receptacle and the web member 36, extending within the receptacle, engages the bottom wall 22 of the receptacle stacked on top, preventing it from coming into contact with the articles in the container section 12.

FIGS. 3 and 6 illustrate the position of the depth control flap 28 when it is desirable to nest one receptacle within another in compact fashion for transport or storage. When in this position, the sides of the notch 38 are forced into surface to surface contact with the web 32 abutting the outer surface of side walls 14 and 16. The web 34 engages the upper surface of the leg 24 of the receptacle below with web 36 extending downwardly parallel to the lip 26. In this position a person's fingers contact the web 30 when unstacking after which web 36 is employed to pivot the flap 28 270° to locate the web 36 into working position to receive the bottom of another receptacle thereon. The faces 34 and 24 may be so shaped or grooved that they also nest in a relationship interlocked against disassociation in a horizontal direction.

The unique and inherent structural properties of the preferred plastic polypropylene, permits orientation of the molecular lattice along the pivot line of the flap 28 wherein flexibility of 180° in one direction and 90° in the other direction does not affect the overall structural strength and effectiveness of the flange. Furthermore, polypropylene, like most of the plastics, is easily formed into the desired configuration, is extremely durable, dimensionally stable and easily maintained in a sanitary condition.

The construction herewith described and disclosed may be utilized in numerous applications and in a variety of specific structures. Its ease of fabrication, its clean, smooth and attractive lines and ability to be totally nested or stacked, makes it particularly useful throughout all industry.

Although we have herein set forth and described our invention with respect to certain principles, a specific material and details thereof, it will be understood by those skilled in the art that these may be varied without departing from the spirit and scope of the invention as set forth in the hereunto appended claims.

What is claimed is:

1. A flange for the edge of an open receptacle comprising:
- a leg portion secured and extending outwardly from the upper edge of said receptacle,
- a lip portion secured and depending from said leg portion,
- a first web member of substantially the same width as the lip portion pivotally secured and extending downwardly from said lip portion,
- a second web member of substantially the same width as said leg portion secured and extending outwardly from said first web member,
- a third web member of substantially the same width as said leg portion secured and extending upwardly from the second web member, and
- a fourth web member secured and extending outwardly from the third web member,
- said web members pivoting to a position on top of the lip and leg portion in one direction wherein the fourth web member engages the bottom wall of a mating receptacle when stacking one receptacle on top of another during use and in the other direction beneath the lip and leg portions to engage the lip and leg portions of a mating receptacle below when nesting one receptacle within another when not in use.

2. The invention as set forth in claim 1 wherein said flange is of unitary construction integral with the receptacle and formed from plastic.

3. The invention as set forth in claim 2 wherein the plastic is polypropylene.

4. An open receptacle of unitary construction comprising:
- an article container section formed from plastic sheet material including contiguous side walls angularly secured to a bottom wall forming an inverse truncated configuration,
- a reinforcing flange section integrally formed on the upper peripheral edge of the side walls and extending outwardly and downwardly therefrom defining a depending marginal edge, and
- a U-shaped contoured flap member pivotally secured along marginal edge of said flange section laterally outside of the confines of said side walls and nesting over and against said reinforcing flange section throughout its length in one pivotal position to strengthen said flange section and having in said one position a weight-bearing horizontal web below the top of said upper peripheral edge for controlling the depth of penetration of one receptacle within another when positioning receptacles one on top of another.

5. The invention as set forth in claim 4 wherein said plastic sheet material is polypropylene.

6. An integral receptacle of plastic comprising:
- an article container section,
- an inverted U-shaped flange section integrally secured to the upper marginal edges of the container section and having a depending outer leg portion,
- a flap member of like U-shaped contour pivotally secured integrally at the marginal edge of one of its leg portions to the lower marginal edge of said outer leg portion and movable to nest along its length on said flange section and reinforce said flange section in stacked relationship, and
- means carried by the marginal edge of the other leg portion of said flap member and disposed below the top of said flange section when said flap member is in nesting relationship therewith for controlling the depth of penetration of one receptacle within

another when stacking one receptacle loaded on top of another.

7. An open receptacle of unitary construction comprising:

an article container section including continuous side walls secured to a bottom wall,

an outwardly extending flange section formed along the upper peripheral edge of each of the side walls and peripherally having a depending leg portion,

a flap member pivotally secured to the lower edge of said depending leg portion and shaped to nest with and throughout the length of said flange section and the upper portion of said side walls in one position of its pivotal movement, and

a horizontally extending web member carried by said flap member substantially below the top of said flange section in said one position and engaged by the bottom of another receptacle for controlling the depth of penetration of the other receptacle within said open receptacle when positioning receptacles one on top of another.

8. A flange for the upper peripheral edge of an open receptacle having contiguous side walls and a bottom wall secured together forming an inverse truncated configuration comprising:

a flange portion extending outwardly from said receptacle about the periphery thereof,

a leg portion depending from the outer edge of the flange portion along two opposite side walls and

a contoured flap member for nesting over said leg and flange portions comprising

a web portion having two legs marginally connected thereto along opposite edges thereof disposed at substantially right angles thereto, said web portion having approximately the same width as said flange portion,

one of said legs being appreciably wider than said leg portion and pivotally secured along its other marginal edge to the lower edge of said leg portion,

the other of said legs being adapted to rest against the top portion of one of said side walls and having along its other marginal edge a web member disposed horizontally below the level of the flange for engaging the bottom wall of a like receptacle stacked on top thereof,

said other leg engaging the flange portion of a like receptacle therebelow when moved to an alternate position when nesting one receptacle within another.

9. A flange for the edge of an open receptacle having side walls, end walls and a bottom wall secured together in contiguous relationship comprising:

a horizontal leg portion secured to and extending from and bordering the end walls and side walls,

a depending lip portion secured to said leg portion and extending parallel to the side walls, and

a U-shaped contoured flap of sheet material pivotally secured integrally to the edge of the depending lip portion parallel to the side walls nesting over said leg and lip portions in one position to reinforce them and having

a web extending horizontally inwardly from each of said side walls below the level of the horizontal leg portion for engagement by the bottom of a second receptacle for limiting the depth of penetration of an upper receptacle within a lower receptacle when stacking loaded receptacles one on top of another.

References Cited in the file of this patent

UNITED STATES PATENTS

2,244,841 Johnson ---------- June 10, 1961