



FIG1

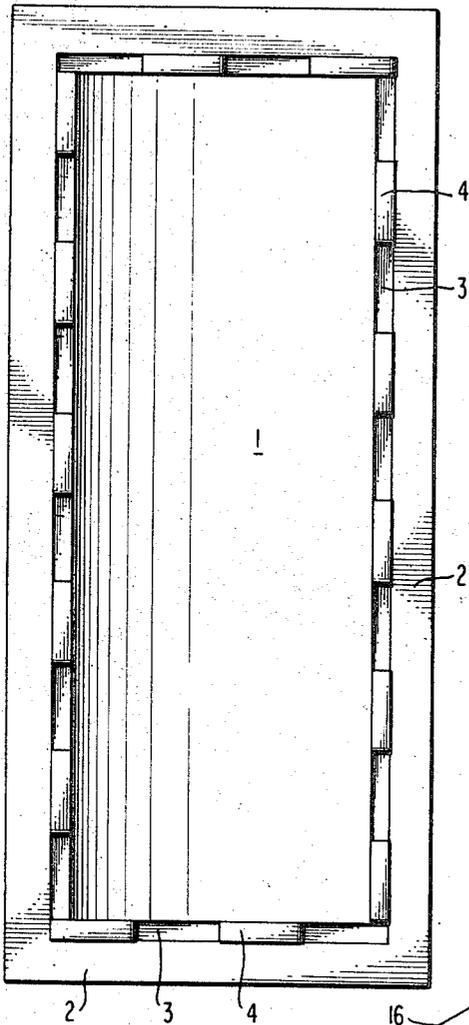


FIG2

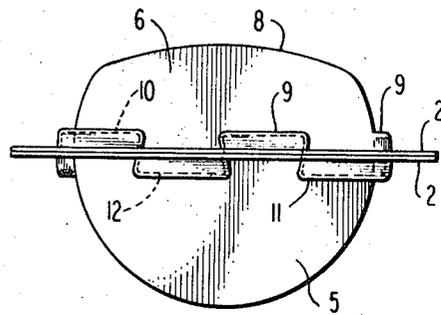


FIG3a

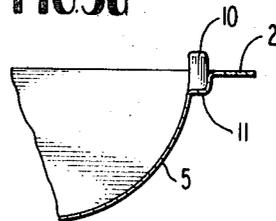


FIG3b

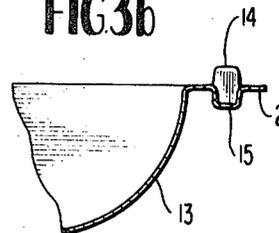
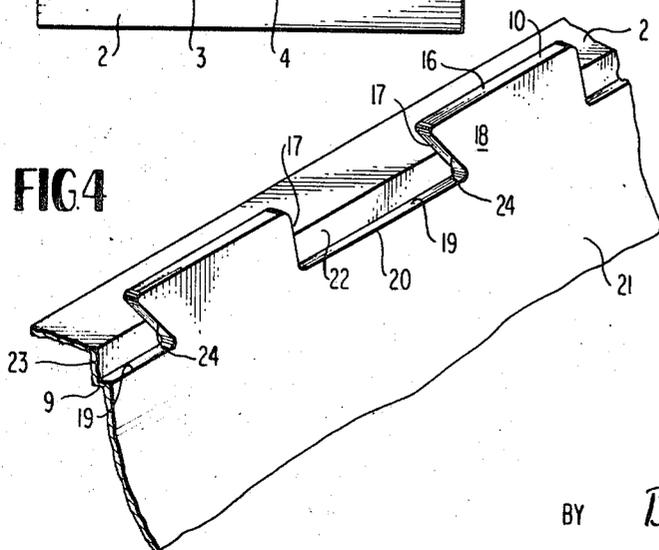


FIG4



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### RECLOSABLE RECEPTACLE

This invention relates to a tightly reclosable receptacle for various goods, particularly biscuits or sliced bread, consisting of two parts which are either integral or separable from one another and which, when joined together, surround a hollow space, the one part being a container with a flange and the other part being a cover which may be provided with one or more cavities.

In the following, the word flange means that part of the container sidewalls which extends outwardly from the edge bounding the opening zone of the container. The marginal zone of the cover substantially corresponding in its width to the width of the flange is designated, in the following, as the rim. When it is unnecessary to distinguish between the flange and the rim, both are designated as margins.

Receptacles are known which consist of two container parts connected by means of roll hinges, for example, or of two separate container parts which, when joined together with their flanges, form a hollow space for the goods. Closure of the known containers is performed either by means of a roll snap closure or by means of snap fasteners. The first method requires a second working step following the shaping of the container part or parts, in which the closing means must be produced separately. The second closure means is only a point-by-point closure means and thus is not tight. Other receptacles of the mentioned type are known in which the closure of the container parts is performed by means of rings rolled into the material like ears, but it is also a point-by-point closure, the production also requires a separate working step, and, furthermore, such a closure means does not permit repeated opening and closing of the container.

Other known containers of the mentioned type are closed by means of loop tongs. This closure type, however, requires an additional working step, does not guarantee tight closure since it has only a point-by-point effect and also is not reclosable. Receptacles with such a closure means, however, can be employed only up to a film thickness of  $150\mu$  since, above this film thickness, closure difficulties occur caused by the film stiffness.

In the case of still other receptacles of the mentioned type, closure is performed by means of wire clips or staples. Also in this case, it is a point-by-point closure which does not permit repeated closure and also requires an additional expenditure of material.

There also are known receptacles which consist of a container with a flange and a planar cover, closure between the container and the cover being performed in the zone of the flange of the container and the marginal zone of the cover by means of the mentioned known closing means. Such known receptacles have the above-mentioned disadvantages.

The present invention provides a repeatedly reopenable and again tightly closable receptacle which does not have the disadvantages of the known closable receptacles.

The novel receptacle is for various goods, particularly sliced bread or biscuits, and comprises a container having a flange and a cover integral therewith or separable therefrom and having at least one cavity. The zones of the container flange serving for the closure as well as the mating rim of the cover are provided with a plurality of corresponding protuberances of equal dimensions, which are positioned thereon similarly and substantially in the longitudinal direction of the flange of the container and the rim of the cover, formed from the planes of these margins and extending alternately upwardly and downwardly from these planes without a horizontal region of transition to the planes of the margins, with successive protuberances extending upwardly or downwardly from the marginal planes being undercut at least at the lateral surfaces opposite to one another.

The receptacle of the present invention preferably has a shape such that the container and the cover are separable from one another.

According to another embodiment, the receptacle comprises a container and a cover connected by means of a groove to enable the two parts of the receptacle to be opened and

closed. In this case, the tooth-shaped protuberances extending upwardly and downwardly from the plane of the flange of the container as well as from the plane of the rim of the cover are formed only in the marginal zones serving for closure.

In another variation of the receptacle, the container and the cover are connected along a margin of the same length by means of one or more roll hinges, the other margins serving for the closure of the receptacle and being provided with the described protuberances.

In cases in which firm closure of the receptacle is not absolutely necessary for packaging, it also is possible to employ the protuberances only on two parallel opposite margins of the container and the cover.

The protuberances may have different shapes, e.g. they may have quadratic surfaces. It is particularly advantageous that they have rectangular surfaces of which the longer lateral edges are two to four times as long as the shorter lateral edges. It is also advantageous that the linearly successively mounted protuberances have planar horizontal surfaces parallel to the marginal plane. The upper edges of the longer lateral surfaces of the protuberances extend parallel to the boundary edge of the opening zone of the container, the protuberances in the rim of the cover correspond in this arrangement to those of the flange of the container. Preferable is an embodiment of the container according to which the longer lateral surfaces of the protuberances projecting upwardly from the flange and plane extending towards the interior of the container are in alignment with the inner surface of the wall of the container. If the other characteristic features are maintained, it is not absolutely necessary that the surfaces of the upwardly or downwardly extending protuberances be planar.

Preferable is a receptacle according to the invention which comprises a container with a flange and a cover with at least one cavity which preferable is curved.

If the cover is provided with a cavity, the opening zone of the container and the opening zone of the cavity may be correspondingly angular or round opening zones, e.g. they may be quadratic, rectangular, triangular or polygonal, but they also may be circular or elliptical or kidney-shaped. Egg-shaped opening zones also are possible. The invention also includes those receptacles in which the boundary edge of the opening zone of the container or of the cavity of the cover and the line along which the protuberances in the flange or in the rim of the cover are positioned are not parallel to one another, e.g. when the opening zone is round or egg-shaped and the protuberances in the flange and in the rim of the cover are positioned in a line surrounding a square within which is the round or egg-shaped opening zone, and also those in which the arrangement of the closing zone formed by the protuberances succeeding in one line does not correspond to the arrangement of the outer boundary line of the flange, e.g. when the opening zone of the container is rectangular and the edge of the closing zone following the opening zone takes such a course that the outer boundary line of the flange is a circle.

When pressing the container and the cover with their margins together with the application of slight pressure, closure of these parts is effected whereby the protuberances extending upwardly from the marginal plane of the container fit into spaces between two successive protuberances extending upwardly from the marginal plane of the cover and, vice versa, the protuberances extending upwardly from the marginal plane of the cover engage into spaces between two successive protuberances extending upwardly from the flange plane of the container.

The special undercut shape of the protuberances, in which the shortest distance between two successive protuberances positioned on the margin and extending from the marginal plane in the same direction perpendicularly thereto always is smaller by once to twice the wall thickness of the protuberance than is the greatest length of the protuberance, results in form-closed interlocking of the protuberances of the container margin and of the cover margin and thus to tight closure of the receptacle.

For better understanding this closing procedure, it is also possible to so imagine the described arrangement of the protuberances in the flange of the container and in the rim of the cover that the protuberances extend upwardly only from a surface of the margin the plane of which is parallel to and below the margin plane. In this case, the depth of the protuberance part below the plane of the margin corresponds to the height of the protuberance projecting from the marginal plane.

The hollow space surrounded by the receptacle may have a cubic form or also bent edges and curved surfaces, e.g. when it is a hollow cylinder. It is also possible that the hollow space of the container is surrounded by curved surfaces, e.g. when the container is hemispherical and the cavity in the cover also has a hemispherical shape and extends outwardly.

When the shape and the dimensions of the opening zone of the container correspond to those of the cavity in the cover and when the shape and the dimensions of the flange of the container correspond to those of the rim of the cover, the shape of the cavity, however, and the shape of the container may be different. When the container has the same rectangular surface as has the cavity in the cover, the container may have a cubic shape, for example, and the cavity in the cover may have the shape of a longitudinally cut hollow cylinder.

The receptacle of the invention is manufactured from sufficiently rigid and sufficiently tough and elastic materials. It is of particular advantage to manufacture the receptacle from synthetic plastic material, more particularly from thermoplastic synthetic film of sufficient toughness, elasticity, and stiffness. Particularly suitable are films of polyolefins, more particularly polyethylene as well as polystyrene films. Especially suitable, however, are films of polyvinyl chloride. Impact-resistant transparent films of polyvinyl chloride have proved particularly suitable. Films of polyvinyl chloride also include copolymers and polymer mixtures thereof as well as graft polymers which contain at least 50 percent by weight of vinyl chloride or polyvinyl chloride and up to 50 percent by weight of toughening copolymers or high-polymer components.

Examples of such toughening constituents are chlorinated polyolefins, particularly chlorinated polyethylene, butadiene/acrylonitrile copolymers, butadiene/acrylonitrile/polyvinyl graft polymers and copolymers, polyacryl and polymethacryl polymers and acrylonitrile/butadiene/styrene polymers. It is advantageous to use films of thicknesses above 150 $\mu$ ; particularly suitable are films of thicknesses in the range from 200 to 500 $\mu$ .

It is also possible, of course, to use colored and/or printed films of the mentioned type.

The manufacture of the receptacle of the invention is performed particularly advantageously by thermoforming the films employed.

The accompanying drawings illustrate an example of a special container according to the invention and a receptacle composed of a container and of a cover provided with a cavity, in which drawings:

FIG. 1 is a plan view of a container part with a rectangular opening in the flange the outer boundary edge of which is parallel to the edge of the container opening and

FIG. 2 is a side elevation of a special receptacle according to the invention in which the container space has the shape of a longitudinally halved hollow cylinder whereas the cavity of the cover has a flattened top zone.

When the top zone of the cavity in the cover has such a shape that it has a sufficiently large planar zone parallel to the plane of the flange of the cover, this planar surface may be used as a contact surface.

FIG. 3a is a cross section of a preferred form of the edge of a special container part, in which the protuberance walls extending inwardly are in alignment with the inner shell surface of the hollow space of the container part. If the cover for such a container has a cavity, its margin may be shaped as that of the container or it may have such a margin as is shown in FIG. 3b for another container variation.

FIG. 3b shows another possible arrangement of the protuberances in the margin of a container part, the protuberances being positioned approximately in the middle of the margin. The lateral surfaces of the protuberances are substantially parallel to the inner edges of the flange.

FIG. 4 is a perspective view looking from the interior of the container and shows a section of a flange of a receptacle according to FIGS. 1 and 3a.

In FIG. 1, numeral 1 indicates the hollow space of the container, numeral 2 the flange of the container, and numeral 3 the planar upward surface of a protuberance which is parallel as well as above the plane of the flange; numeral 4 indicates a parallel surface below the plane of the flange. This surface represents the planar parallel surface below the marginal plane of a protuberance extending downwardly from the flange plane.

In FIG. 2, numeral 2 indicates the flange of the container part 5 and of the cover 6, numeral 8 indicates the flattened top zone of the cavity of the cover 6, numeral 9 indicates a protuberance extending from the plane of the flange 2 of the cover 6 and numeral 11 indicates a protuberance extending from the plane of the flange 2 of the container 5, both extending downwardly i.e. in the direction of the hollow space of the container 5 and of the cover 6, respectively, from the flange 2. Numerals 10 and 12 indicate protuberances in the flange 2 of the container 5 and of the cover 6, which extend upwardly from the plane of these margins, whereas the hollow spaces 5 and 6 extend downwardly from the plane of the flange and that of the rim.

In FIG. 3a, the wall of the container is indicated by 5 and numerals 10 and 11 have the meanings described with reference to FIG. 2. The upwardly extending protuberance 10 follows in the direction of view the protuberance 11 extending downwardly from the flange plane.

In FIG. 3b, the wall of the container is indicated by 13, numeral 2 indicates the flange, numeral 14 indicates a protuberance extending upwardly from the plane of the flange, and numeral 15 indicates a protuberance extending downwardly from the same plane.

In FIG. 4, numeral 2 indicates the flange of a container, numeral 10 indicates a protuberance extending upwardly from the flange plane, numeral 16 indicates the planar surface of this protuberance, which extends above and parallel to the flange plane, numeral 17 indicates the narrower lateral surface of the protuberance 10, numeral 18 the wider lateral surface of the protuberance 10, which extends towards the interior of the container part.

Below an imaginary line defined by the flange plane, this wall surface smoothly passes over into the inner wall surface 21 of the hollow space of the container. Numeral 9 indicates a protuberance extending downwardly from the flange plane, of which protuberance the surface 19 parallel to and below the rim plane has an edge 20 which is followed by the wall surface 21 running downwardly. Numeral 22 indicates the inner side of the lateral wall 23 of the downward protuberance 9, which side is substantially perpendicular to the surface of the flange and to the surface 19. Numeral 24 indicates the inner side of the narrower lateral surface of the protuberance 9. The surfaces 17 and 24 pass over into one another smoothly and as planes at the height of their imaginary separation line defined by the flange plane. The angle formed by surface 17 and the flange plane is identical to the angle between the surface 19 and the surface 24.

It will be obvious to those skilled in the art that many modifications may be made within the scope of the present invention without departing from the spirit thereof, and the invention includes all such modifications.

I claim:

1. A reclosable receptacle made of rigid elastic material and comprising a container having a flange, a cover having a rim and at least one cavity, the zones of the container flange serving for the closure as well as the mating rim of the cover being provided with a plurality of corresponding protuberances of

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equal dimensions, positioned thereon similarly and substantially in the longitudinal direction of the flange of the container and the rim of the cover, formed from the planes of said flange and said rim and extending alternately upwardly and downwardly from said planes without a horizontal region of transition to said planes, and successive protuberances extending upwardly or downwardly from said planes being undercut at least at the lateral surfaces opposite to one another.

2. A receptacle according to claim 1 in which the cover is separable and has an outwardly extending cavity, the opening zone of the container and that of the cavity in the cover being rectangular, both opening zones having the same dimensions, and a plurality of alternating protuberances in the flange of the container and in the rim of the cover surrounding the opening zones of the container and of the cavity in the cover in the form of a rectangle.

3. A receptacle according to claim 1 in which the cover has an outwardly extending cavity in the form of a longitudinally halved hollow cylinder and the container has a cavity of the

same shape, the container flange and the rim of the cover being in the plane of the opening zones of the container and the cavity in the cover.

4. A receptacle according to claim 1 in which the protuberances have planar surfaces substantially parallel to the plane of the flange and rim and are larger in the direction in which they are linearly successively arranged than in the direction normal thereto.

5. A receptacle according to claim 1 fabricated from rigid elastic thermoplastic synthetic film.

6. A receptacle according to claim 5 in which the film has a thickness in the range of 200 to 500 $\mu$ .

7. A receptacle according to claim 5 in which the film is transparent.

8. A receptacle according to claim 5 in which the film is transparent and impact-resistant.

9. A receptacle according to claim 5 in which the film is transparent, impact-resistant polyvinyl chloride film.

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