Jan. 3, 1967 P. A. MARCHANT 3,295,710

MULTIPLE CONTAINER PACKAGE

Filed June 25, 1963 2 Sheets-Sheet 1

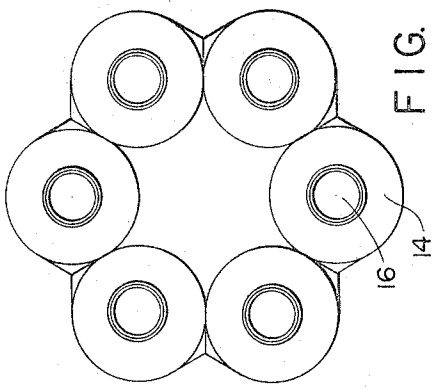


FIG. 4

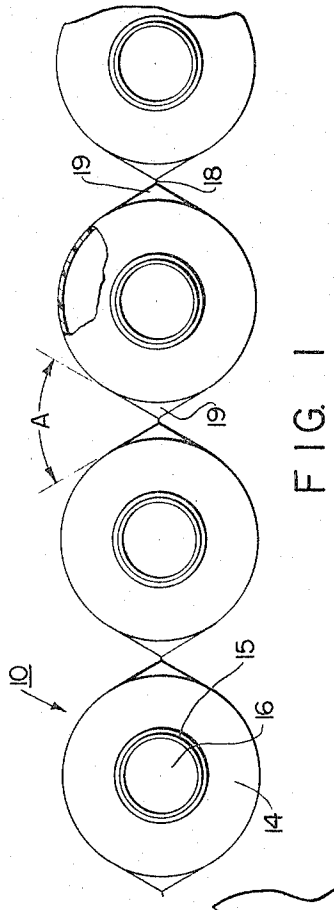


FIG. 1

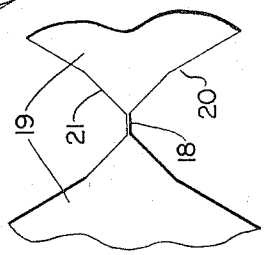


FIG. 3

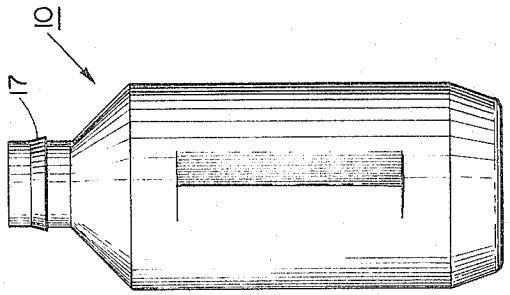


FIG. 2A

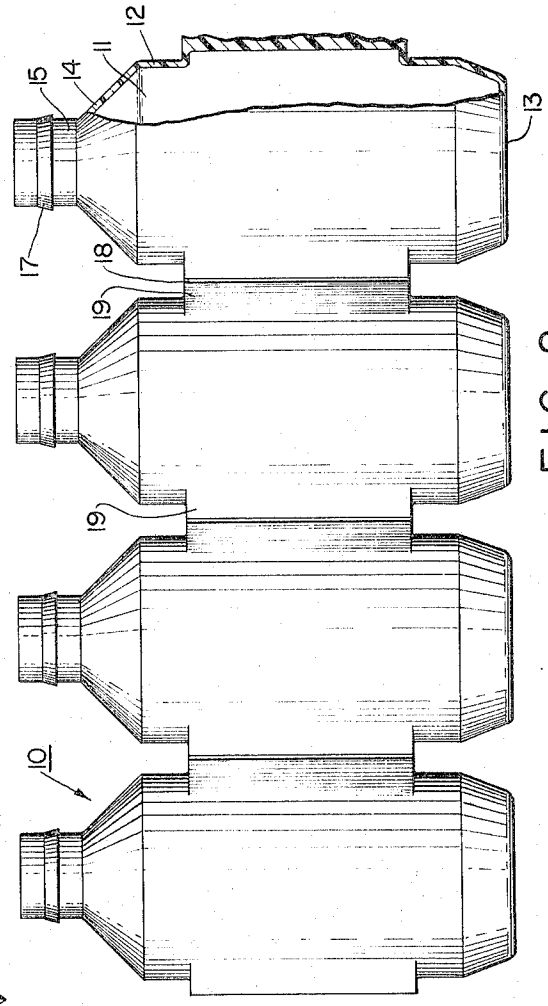


FIG. 2

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MULTIPLE CONTAINER PACKAGE

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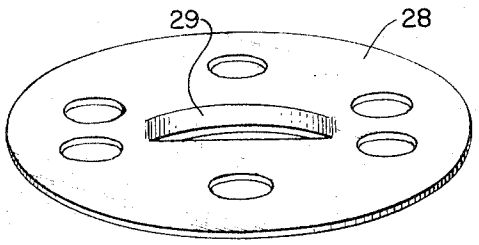


FIG. 7

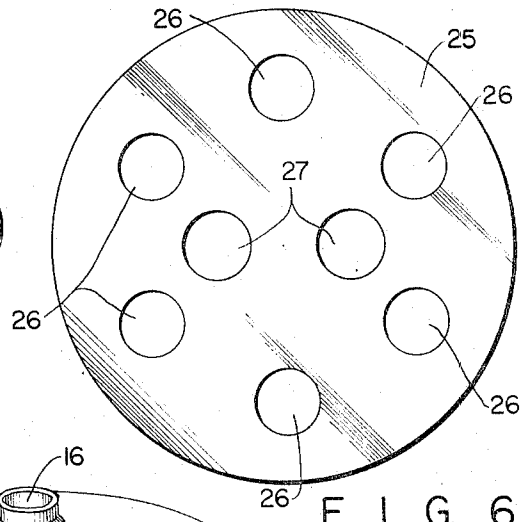


FIG. 6

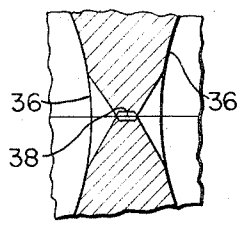


FIG. 10

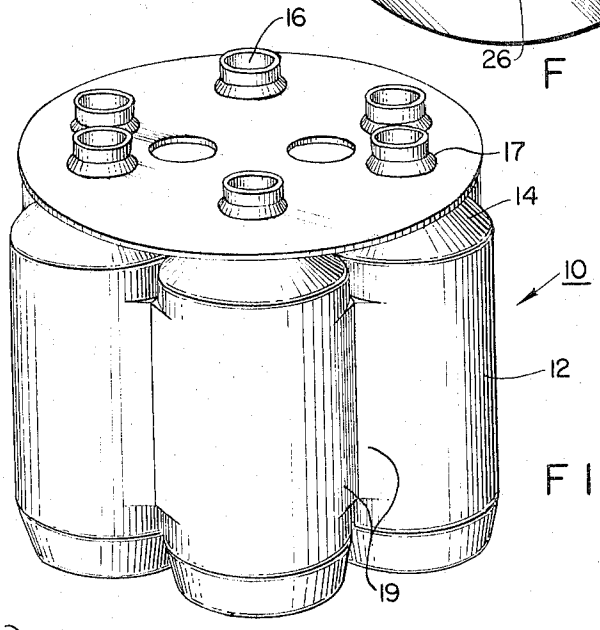


FIG. 5

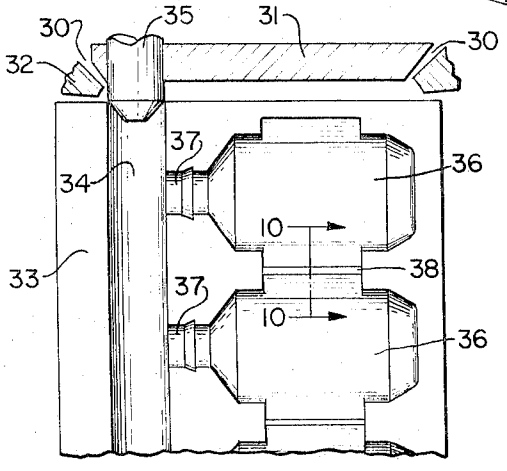


FIG. 9

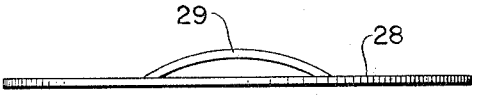


FIG. 8

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3,295,710

MULTIPLE CONTAINER PACKAGE

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Filed June 25, 1963, Ser. No. 290,394
1 Claim. (Cl. 220—23.8)

The emphasis today is on multiple container packaging, that is, a unitary package which contains a plurality of containers of the commodity being sold. It has been found that the consumer will increase his purchases of a commodity if the commodity is packaged in a multiple container package. Specific examples of such packaging is the conventional "six-pack" of beer and soda beverages. These commodities are packaged in individual containers and a subsequent operation is performed to unite a plurality of the containers into a unitary package. My invention involves molding the containers in an integrally joined relationship so that a minimum of subsequent operations are necessary to form a multiple container package.

My invention is also directed to a package, and the method and apparatus for making the package, for merchandising throw-away containers containing a pre-measured quantity of a commodity. For example, it is desirable to mechandise soap powder or liquid in individual containers which may be opened and placed in the user's wash machine and which contain the exact pre-measured quantity of soap necessary for a single load of laundry being washed. It is not necessary to reclose the container but rather it is thrown away.

In the drawings I have shown the present preferred embodiment of my invention in which:

FIGURE 1 is a top plan view of the containers prior to assembly into a package;

FIGURE 2 is a front elevation view of the containers of FIGURE 1;

FIGURE 2*a* is a side elevation view of the containers of FIGURE 1;

FIGURE 3 is an enlarged top plan view of a flexible connector between the containers;

FIGURE 4 is a top plan view of the containers positioned in a circular configuration prior to forming the package;

FIGURE 5 shows my preferred embodiment of my package with the containers formed in a circular configuration joined by a connector and handle;

FIGURE 6 is a top plan view of the connector and handle;

FIGURE 7 is a perspective of a modified form of the connector and handle;

FIGURE 8 is a side elevation view of the modified connector and handle shown in FIGURE 7;

FIGURE 9 is a view of the molding apparatus for forming the connected containers; and,

FIGURE 10 is a cross section taken on 10—10 of FIGURE 9.

Briefly the present invention is directed to a multiple container package having a plurality of individual containers joined by flexible connectors, each container has walls enclosing a chamber to hold a commodity, and an opening into the container to permit dispensing the commodity therefrom; the flexible connector is integrally molded at its ends to the adjacent containers to permit swinging movement of each container relative to adjacent containers. Preferably, portions of the side walls of the container include vertically disposed planes engageable with corresponding planes on adjacent containers when the containers are swung on the flexible connectors. The side planes on the containers permit a circular packaging

of a plurality of the containers in rigid relationship. The flexible connectors are easily severable so that the user can remove a single container from the package by severing the connectors holding the container within the package.

My invention is also directed to a unique method for molding the above described multiple container package and includes: providing a mold having a plurality of mold cavities in the shape of the individual containers, each cavity being adjacent to each other with additional mold cavity portions spanning the area between the container cavities and providing areas for forming the flexible connectors between the containers; extruding a tubular thermoplastic parison into the mold; and, introducing a pressurized fluid into the parison within the mold cavities to expand the parison into engagement with the mold cavities to form a plurality of containers flexibly and severably connected by connectors between the containers.

My invention is also directed to a unique apparatus for molding the multiple container package described above and includes a separable mold having a plurality of container shaped cavities, an elongated cavity extending from the edge of the mold to each of the container-shaped cavities, extrusion means operatively related to the mold to extrude a hollow thermoplastic parison having one dimension sufficiently large to encompass all of the cavities in the mold, means to open and close the mold on the plastic parison, and means to introduce pressurized fluid into the plastic parison, when it is within the mold, to form the connected containers.

Referring specifically to the drawings, the individual containers, generally designated **10**, have a hollow inner chamber **11** formed by side walls **12**, a bottom wall **13** and a top wall **14**. The top wall has an integral neck portion **15** terminating at its upper end to form a top opening **16**. Preferably the neck portion **15** has an outwardly extending peripheral rim **17** having a flat lower face and a sloped outer peripheral face.

The open top **16** of the container may be closed in any conventional manner such as a snap on cap, a thin sheet of polyethylene heat sealed across the top, or any of the well known procedures to close the top and maintain the commodity within the container. Since the container is not reused, the closure for the top **16** may be very inexpensive and destructible upon a single opening of the container.

Each container is connected to the adjacent container by a flexible and severable connector **18** integrally joined at its vertically disposed ends to adjacent containers. Each container has a pair of diametrically opposed projecting areas **19** formed integral with the side wall **12** of the container and forming part thereof. Preferably the projecting portion has triangular flat top and bottom walls and flat sides **20** and **21** converging toward each other to form an apex at their juncture. The projecting portion **19** is shown in enlarged view in FIGURE 3 with the apex of the projecting portion integrally joined with the flexible connector **18**. The connector **18** is a thin plastic strip, easily severable by twisting one container relative to the adjacent containers, but sufficiently yieldable and flexible to permit swinging a container transversely relative to adjacent containers.

In FIGURE 4 I have shown by preferred embodiment in which six containers are positioned to form a circular package. I have found that when I position the containers in a circular configuration of the type shown in FIGURE 4, and the distance between the flexible connectors **18** on opposite sides of the containers are an equal distance, the angle A (the included angle between the points of tangential contact between the containers

and the center point of the flexible connector **18**) is equal to

$$180° - \left(\frac{n-2}{n}\right)180°$$

where n=the numbers of containers.

Thus in my preferred embodiment the slope of the faces **20** or **21** on the projecting portion **19** are equal to ½ angle A when measured with the containers in a continuous string as shown in FIGURE 1, that is, when measured from the normal passing through the flexible connector **18** and to a plane passing through the axis of rotation of the containers **10**.

The relationship expressed above is applicable for an assembly of containers from three containers to an infinite number so long as they are assembled in a tangentially abutting relationship to the adjacent containers and the distance between the pivot points on the containers are all equal.

In FIGURES 5 through 8 I have shown the preferred manner in which I maintain the circular configuration of the containers in the ultimate package. However, I have not shown in FIGURE 5 the manner in which the tops of the containers are closed since any type of closure may be used.

Preferably I provide a rigid or flexible disc **25** having a plurality of equally spaced openings **26** of a sufficient size to receive the neck portion **15** of the individual containers but slightly smaller than the projecting rim **17** on the neck of the container. Thus with the containers positioned in the configuration of FIGURE 4, the disc **25** is pushed downwardly with the necks **15** positioned in the openings **26**. The disc is pushed downwardly until the openings **26** slightly enlarge to snap over the projecting rim **17**.

I have also provided a pair of spaced finger holes **27** for use in picking up the package by placing the thumb and index finger of the user in the adjacent holes as finger grip holes.

In FIGURE 7 I have shown a similar disc **28** which is used in a like manner and has a central handle **29** for lifting the package. The disc **28** is assembled to the containers in the same manner described hereinbefore with respect to the disc **25**.

Preferably the containers **10** are fabricated from a thermoplastic material such as polyethylene or polypropylene. Likewise, the discs **25** and **28** are fabricated from a similar material having a yieldability and flexibility sufficient to permit the openings **26** to snap over the outstanding ridges **17** of each container neck. The discs may also be fabricated from cardboard.

The consumer purchases a package as shown in FIGURE 5 with the containers filled with the desired commodity such as soap powder or soap liquid and easily removes the closure from one of the openings **16** on the top of the containers, and the user then removes one of the containers from the package by snapping the disc **25** up over the neck of the desired container (here again the opening **26** will expand to pass over the outstanding ridge **17**) and the container is pulled outwardly to sever the connectors **18** between the desired container and the adjacent containers. The commodity is then used in the desired manner, and the container thrown away.

In FIGURES 9 and 10 I have shown views of the apparatus for fabricating the package of the present invention. FIGURE 9 shows the inside face of one mold half and FIGURE 10 shows the pinch-off portion between the two mold halves for forming the connectors **18**. As shown in FIGURE 9 the apparatus includes means for supplying plasticized plastic to extrusion openings **30** which extrude a tubular parison downwardly between the central core **31** and a ring die **32**. This type of extrusion apparatus is of a well known type and it is known as a parison extruding machine. Immediately below the parison extruding machine is a separable mold, of which I

have shown an inside view in FIGURE 9. The mold consists of a metallic base material **33** having a central cylindrical channel **34** connectable to a blow tube **35** which supplies pressurized fluid, preferably air, to the channel **34**. The channel **34** opens into a plurality of cavities **36** of a shape for the desired containers and includes a portion **37** for forming the neck portion of the containers. Between the container cavities **36** is provided a pinch-off portion **38** which forms the connector **18**. This type of pinch-off portion is well known in the art and provides a connection between adjacent containers which is flexible and easily severable from the containers. Suitable pinch-off mold parts are provided around channel **34** and cavities **36** and **37** in the manner well-known in the art.

To form the package of the present invention: a parison, preferably of tubular or oval cross section, is extruded through the extrusion openings **30** between two halves of a mold having identical reverse configurations as shown in FIGURE 9. The mold is then closed on the parison, which has a dimension suffciently great to extend completely across the channel **34** to the right hand extremity of the cavities **36**. The mold simultaneously closes on the blow pipe **35** and air is automatically introduced through the blow pipe to expand the plastic parison which is in the channel **34** and the cavities **36** and **37**, thus forming the containers in a continuous line as shown in FIGURES 1, 2 and 2*a* with a connecting plastic tube formed in the channel **34**. The connecting tube **34** is easily removed by a well-known cutting process which severs the tube from the top surface of the neck **15** formed in the cavity **37**. The containers are then ready for filling, closing, and assembling into the package shown in FIGURE 5.

While I have shown a present preferred embodiment of my invention, it may be otherwise embodied within the scope of the following claim.

I claim:

A one-piece multiple-container package having a plurality of individual containers joined by flexible connectors and positioned in a circular configuration, each container having walls defining a chamber to hold a commodity, an opening into said chamber to permit dispensing said commodity from the chamber, a flexible connector integrally molded at its ends to join the sides of adjacent containers to permit swinging movement of one container relative to the other, each of said containers having an integral side wall portion which includes a vertically disposed abutment area engageable with a corresponding abutment area on an adjacent container when said containers are positioned in said circular configuration, and said abutment areas on adjacent containers being disposed at an angle A relative to each other, wherein

$$A = 180° - 180°\frac{n-2}{n}$$

when n is the number of identical containers in said package and is greater in number than two containers.

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