

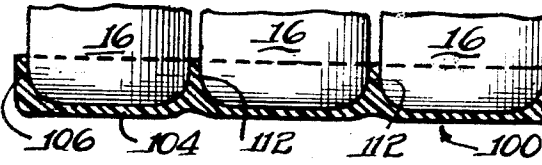
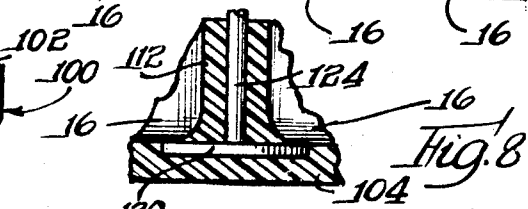
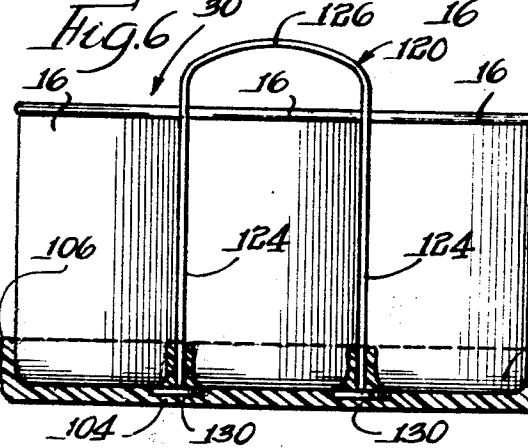
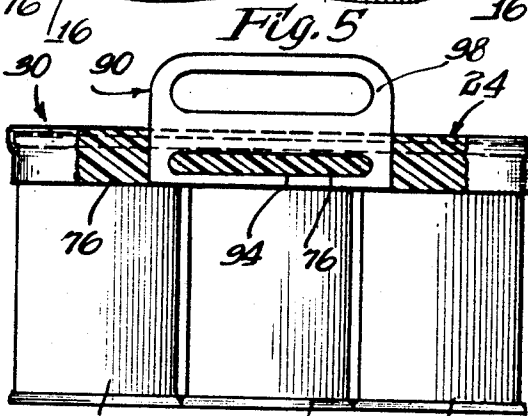
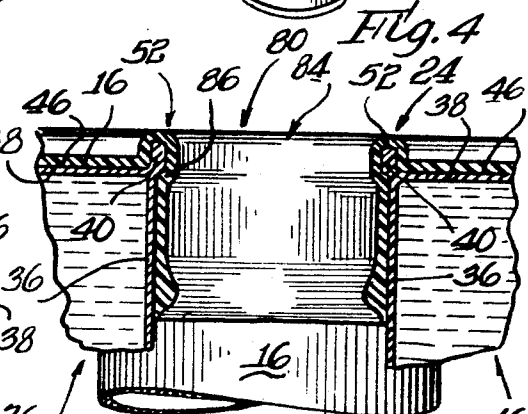
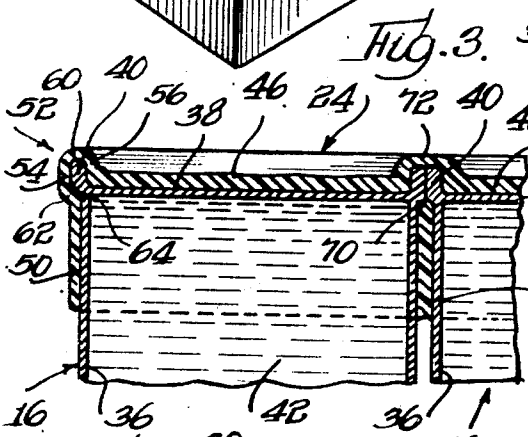
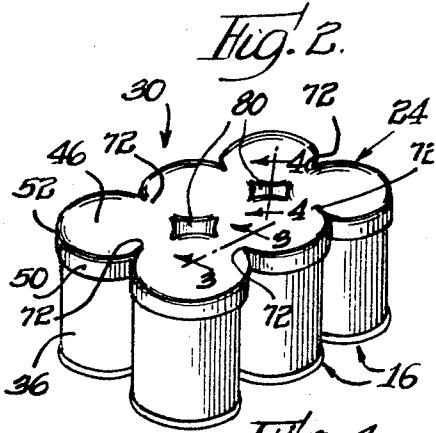
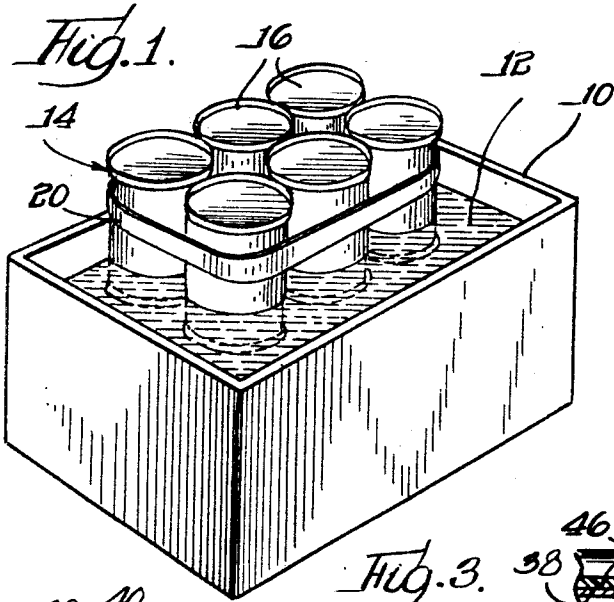
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PACKAGE OF CANS

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**PACKAGE OF CANS**

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9 Claims

**ABSTRACT OF THE DISCLOSURE**

A method and apparatus for packaging a group of containers. The ends of the containers, as a unit, are dipped into a bath of molten plastic material. When removed, the plastic, conforming to the contours of the container ends, solidifies to form plastic carrier structure. A handle may be imbedded between the containers prior to dipping so that it will be affixed to the plastic upon the solidification thereof.

This invention relates generally to a packaging method and apparatus and more particularly to a method and apparatus for packaging a plurality of separate containers.

A plurality of cans and other containers are commonly packaged in cardboard cartons referred to as six-packs. The cardboard carton holds the containers together as a unitary package and greatly facilitates handling of the containers. Although cartons are widely used by industry for packaging a plurality of containers, there are several problems encountered in the use of cartons for packaging containers. The cartons are often difficult to open when a container is to be withdrawn from the carton. Also, once the containers have been withdrawn from the carton, the carton must be disposed of separately from the containers. Perhaps the most serious problem encountered in using prior art cartons for packaging a plurality of containers is the cost of the cartons and manufacturing difficulties which are experienced when packaging the containers in the cartons.

The manufacturing difficulties encountered when using cardboard cartons for holding a plurality of containers become apparent from a consideration of the steps involved in such a packaging operation. First a sheet of cardboard which has been cut to predetermined dimensions must be fed or conveyed to a packaging station with printed material on the cardboard sheet facing downwardly. Then, a plurality of aligned containers are positioned on an upper surface of the cardboard sheet. After the containers have been positioned on the cardboard sheet, the cardboard sheet is folded several times to enclose the containers. Finally, after the sheet has been folded, the cardboard sheet is sealed along mating or overlapping edges to form a unitary package. It should be noted that if the containers are not precisely aligned relative to each other and relative to the cardboard sheet, the folded cardboard sheet will not overlap properly at its edges to enable a solid seal to be formed at the edges to close the package.

In addition to requiring relatively precise and complex packaging operations, the equipment for packaging a plurality of containers in a cardboard carton is relatively expensive and requires a large amount of floor space. Packaging machines which will precisely position a plurality of containers relative both to each other and to a cardboard sheet must be built to close tolerances and require extensive maintenance. Of course, the complexity and cost of the machines is increased by the folding and sealing operations which the machine must perform. In addition to requiring a relatively large initial investment of capital, prior art packaging machines require a relatively large amount of valuable floor space in a manu-

facturing plant. Floor space must be allotted for storing and conveying both the containers and the cardboard sheets.

Therefore, it is a general object of the present invention to provide an improved packaging method and apparatus which overcomes the aforementioned limitations of the prior art methods and apparatus. Specifically, it is an object of this invention to provide a method and apparatus for inexpensively packaging a plurality of containers in a group from which the individual containers can be readily removed.

Another object of this invention is to provide a method which requires relatively inexpensive and compact machinery for packaging a plurality of containers in a group.

Another object of this invention is to provide an inexpensive and easily practiced method for forming a container carrier for a plurality of containers.

Another object of this invention is to provide a unitary container carrier structure which securely engages a plurality of containers to hold the containers in a package to facilitate handling the containers and provide a container carrier structure from which the containers can be readily removed.

These and other objects and features of the invention will become apparent upon a reading of the following detailed description, taken in connection with the accompanying drawings wherein:

FIG. 1 is a perspective view of a tank into which a group or cluster of containers is being dipped to coat an end portion of the containers with a liquid which solidifies to interconnect the containers to form a unitary package;

FIG. 2 is a perspective view of the package formed by solidification of the liquid, with the containers being shown inverted from the position illustrated in FIG. 1;

FIG. 3 is an enlarged sectional view, taken along the line 3—3 of FIG. 2, illustrating the engagement of a container carrier structure formed by the solidification of the liquid and an end portion of the containers;

FIG. 4 is an enlarged sectional view, taken along the line 4—4 of FIG. 2, illustrating the structure of a bridge section of the container carrier which interconnects a plurality of containers to form a unitary package;

FIG. 5 is an enlarged sectional view of a second embodiment of the invention wherein a handle assembly is imbedded in the container carrier structure of FIG. 2;

FIG. 6 is an enlarged sectional view of still another embodiment of the invention wherein the carrier structure is mounted in an abutting relationship with lower or bottom surfaces or walls of a plurality of containers;

FIG. 7 is an enlarged sectional view of the container structure of FIG. 6, illustrating the relationship of a plurality of containers having rounded end portions to the container carrier structure; and

FIG. 8 is an enlarged sectional view illustrating the mounting of an end portion of a handle in the container carrier structure of FIG. 6.

Referring now to the drawings in greater detail, FIG. 1 is a perspective view of a tank or other receptacle 10 in which a body or pool 12 of a liquid bonding material is contained. A group or cluster 14 of filled containers 16 are held in a predetermined relationship relative to each other by a suitable clamp or band 20 which engages the sides of the containers. The group or cluster of containers 14 is partially immersed or dipped into the pool or body of molten liquid 12 to wet an end portion of the containers with the liquid 12. When the containers are withdrawn from the liquid 12, the liquid solidifies to form a unitary container carrier or connector structure 24, see FIG. 2, which encases the end portions of the containers 16 to form a unitary package 30. As is apparent from a consideration of FIG. 1, the equipment and space required

to form the package 30 is considerably less than has heretofore been used by packagers using cartons to form a unitary package.

The liquid 12 is a substance characterized by its ability to solidify from a liquid state to a solid state and to form during the solidification of the substance the unitary carrier structure 24 which at least partially bridges the gaps between the containers 16 and adheres to the containers to form a carrier which interconnects the containers. By experimentation it has been determined that a wax compound which is commercially available under the trade name Cereplax, having a ten percent polyester or plastic content, has the required characteristics. However, it will be apparent to those skilled in the art that many polymeric materials, such as the commercially available urethane elastomer compounds, can be used. It is only necessary that the substance 12 have the necessary bridging characteristics to interconnect the containers 16. Of course the substance when solidified must have sufficient strength to support the filled containers.

In the preferred embodiment of the invention the wax compound is heated in the tank 10 to provide a molten fluid into which the filled containers 16 are dipped by moving the cluster 14 of containers downwardly toward the tank. As the end portion of the containers is dipped into the liquid 12, a coating of the liquid forms on the surface of the relatively cool containers 16. After the cluster 14 has been left in the liquid 12 for a short period of time, the cluster is withdrawn from the liquid and the liquid coating is solidified to interconnect the containers 16 by forming the carrier structure 24. It should be noted that this process for packaging the containers 16 does not require that the containers be precisely positioned or arranged relative to each other as is required with prior art packaging machines. If the containers are slightly off center from a predetermined relationship relative to each other, the molten liquid 12 still forms a carrier 24 which encases the end portions of the containers 16.

Referring now to FIG. 3, the containers 16 include a generally cylindrical side wall 36 and an end wall 38. The side wall 36 and end wall 38 are connected together at an axially and radially outwardly projecting flange or rim 40 to form a container in which a beverage or other contents 42 is held. The containers 16 are positioned with their rim sections 40 in abutting engagement so that longitudinal axes of the containers 16 are substantially parallel when the containers are positioned in the package 30 (see FIG. 2).

The carrier 24 includes an end wall or section 46 which adheres to the end wall 36 of the container 16. A side wall or section 50 of the carrier 24 adheres to the side wall 36 of the container 16 and is connected to the end section 46 of the carrier 24 by a radially and axially outwardly extending pocket or protuberance 52. The pocket or protuberance encloses the flange section 40 of the container. The pocket 52 includes a pair of substantially parallel axially outwardly extending sides 54 and 56 which engage opposite sides of the rim section 40. The sides 54 and 56 are integrally formed with an arcuate outer wall or connector section 60 which covers an axially outermost end section of the rim 40. A radially inwardly extending lifting or locking section 62 engages a radially outwardly projecting surface 64 of the rim 40 to securely retain the container 16 in the carrier 24.

The containers 16 are positioned with their rim sections 40 in abutting engagement, as shown at 70 in FIG. 3. Where the containers are positioned in abutting engagement the end sections 46 of the carrier 24 are interconnected by a transversely or radially extending bridge or connector section 72 which spans the rims 40 of the containers 16 and adheres to the axially outer surface of the rims 40. A common side section 76 adheres to the cylindrical side walls of the adjacent containers 16 in an area where the side walls are relatively close together. The common side section 76 extends transversely of the con-

tainers and is integrally formed with the side sections 50 to further lock the containers in the carrier 24. Thus, by means of the retaining section 62, of the pockets 52, and the common side section 76 the containers 16 are securely retained in the carrier structure 24. It should also be noted that the wax compound or other suitable substance 12 tends to adhere to the sides 36 and ends 38 of the containers 16 to further interlock the containers 16 with the carrier 24.

Referring now to FIG. 4 taken in conjunction with FIG. 2, due to the cylindrical shape of the containers 16 there are relatively large gaps or apertures 80 between the containers 16. These gaps or apertures 80, as is best seen in FIG. 2, are not entirely spanned by the wax compound 12 when it solidifies. When six containers are interconnected to form a six-pack, there are two gaps or apertures 80 between the containers. The gaps or apertures 80 are particularly well adapted for engagement by the thumb or forefinger of a person carrying the package. As is perhaps best seen in FIG. 4, the aperture 80 is defined by a continuous four-sided arcuate wall section 84 which engages the arcuate sides 36 of the four adjacent cylindrical containers 16. The wall section 84 includes a radially inwardly extending retaining section 86 which engages a radially outwardly extending outer surface of the rims 40 of the containers 16, in much the same manner as the retaining section 62 of the pocket 52 engages the rim 40 (see FIG. 3). Although portions of the containers 16 are spaced apart from each other as seen in FIG. 4, it will be apparent from a consideration of FIG. 2 that the containers are securely interconnected to form an integral package by the bridging sections 72.

When a container is to be removed from the package 30 it is merely necessary to firmly grasp the desired container in one hand and pull outwardly to break the interconnection formed by the bridging section 72 between the containers to free the desired container from the package. The containers are interconnected or joined together by a plurality of bridging sections 72 and the breaking loose of any one container still leaves bridging sections 72 intact to interconnect the remaining containers. After a selected container has been removed from the package 30, the end of the container opposite from the carrier end wall 46 is opened and the contents of the container are removed. The container and the section of the carrier 24 associated with the container are then disposed of at the same time by discarding the container. If the contents of the container are to be consumed directly from the container, the section of the carrier 24 on the end of the container functions as a coaster or shield to prevent the container from marring a surface upon which it is placed.

In order to enhance the understanding of the invention, several modified forms of the invention are shown in FIGS. 5 through 8. In these modified forms of the invention, like numerals have been used to designate elements similar to those of the embodiment of FIGS. 1 to 4. In the embodiment of FIG. 5, a plurality of containers 16 are interconnected by a container carrier 24. A handle assembly 90 has been imbedded in the carrier structure intermediate the containers 16 so that the common side wall 76, which is intermediate adjacent containers, extends through the aperture 94 to securely attach the handle assembly 90 to the container carrier structure 24. A second, somewhat larger, elongated aperture 98 is provided in the upper portion of the handle assembly 90 for grasping engagement by the hand of a person carrying the package 30. In one method of practicing the invention the handle assembly 90 is positioned between the containers 16 immediately after the containers are removed from the tank 10. However, it has been found to be advantageous to position the handle assembly 90 intermediate the containers 16 before the containers are dipped into the tank 10 so that the handle assembly is coated with the wax compound 12 which solidifies to form an integral container carrier unit 24.

Referring now to FIGS. 6 and 7, in which a third embodiment of the invention is shown, the containers 16 are mounted in a container carrier or support tray 100 which engages a lower end portion 102 of the containers 16. The carrier 100 is formed in the same way as is the container carrier 24, that is by dipping the containers 16 in the molten wax compound 12. The carrier 100 includes a base section 104 and an axially upwardly extending side wall section 106. A plurality of bridging or interior wall sections 112 are formed between the containers by the solidification of the molten wax compound 12 into which the end portion 102 of the containers were immersed.

The handle assembly 120 is imbedded in the carrier 100 to facilitate the carrying or handling of the package 30. The handle assembly 120 includes a pair of flexible substantially parallel leg sections or columns 124 which are interconnected by a handle or connector section 126 to form a generally U-shaped handle assembly. The outer end portions of the leg sections 124 are imbedded in the base wall 104 of the carrier 100, as is best seen in FIG. 8. A foot section 130 is connected to the leg section 124 to securely interconnect the handle assembly 122 and the carrier or tray 100. It should be noted that the foot section 130 extends transversely outwardly beneath the containers 16 to provide additional support for the containers.

The manner in which the present invention may be practiced and the purpose to which it may be put are evident from the foregoing description. Generally speaking the invention relates to a method of forming a package 30 for a plurality of containers 16. The containers 16 are interconnected by a carrier structure 24 which securely engages the outer surface of the containers to interconnect the containers. In one embodiment of the invention the carrier structure encases or engages an upper end portion of the containers 16, as shown in FIG. 2, to interconnect the containers. In another embodiment of the invention the carrier structure engages a lower end portion of the containers to provide a support structure beneath the containers 16. The second embodiment of the invention has been found to be particularly advantageous for use with containers having narrow upper end portions, such as is commonly the case with soft drink bottles, or with containers having rounded surfaces which are not readily engaged by a container carrier structure. The advantageous use of the carrier 100 with the aforementioned types of containers results from the fact that the carrier structure 100 supports the containers from underneath.

When a carrier of either of the embodiments is to be used for packaging the containers 16, the carrier is formed by wetting an end portion of the containers to form a coating of a substance 12 which solidifies to interconnect the containers. Although in a preferred embodiment of the invention the containers are moved downwardly into the stationary tank 10 to dip a cluster 14 of the containers 16 into the liquid 12, the containers could be coated with the liquid 12 by moving the tank upwardly toward the containers 16. It is also contemplated that when relatively high strength polymeric substances are used for the liquid 12, the containers 16 may be individually dipped in the liquid to form a coating on an end portion of the containers. The coated containers would then be moved into abutting engagement with each other in a cluster, similar to the cluster 14, while the coating is still wet. As the coating solidifies the containers which have been moved into a cluster after being coated will be interconnected by the solidification of the coating. The individual dipping and subsequent clustering or grouping of the containers 16 will decrease, to some extent, the strength of the bridging interconnection between the containers to facilitate the removal of a single container from the package even though a high strength polymeric substance is used to coat the containers.

In view of the preceding remarks, it will be apparent that the method disclosed herein can be practiced in several different ways without departing from the spirit

of the invention. Therefore, while particular embodiments of the invention have been shown, it should be understood, of course, that the invention is not limited thereto since many modifications may be made.

What is claimed is:

1. A container carrier comprising: an integral coating of solidified plastic material adheringly formed about and between at least a portion of each of a plurality of said containers by bathing said portions of said containers as a unit in a liquid plastic, said coating conforming to the contours of said containers, thereby to provide a one-piece plastic structure interconnecting the latter, said one-piece plastic structure including a plurality of end sections formed to be in abutting engagement with end surfaces of said containers; a plurality of side sections integrally formed with said end sections and extending in abutting engagement with side surfaces of said containers; and a plurality of bridge sections integrally formed with said end sections and extending radially outwardly from said end sections to interconnect said end sections.

2. A carrier structure as set forth in claim 1 further including a plurality of outwardly extending pocket sections integrally formed with and interconnecting said base sections and said side sections, said pocket sections being shaped for mating engagement with an outer surface of a rim of said containers.

3. A carrier structure as set forth in claim 2 wherein: said pocket sections include a pair of spaced apart substantially outwardly extending side walls interconnected by an arcuate end wall; and wherein said pocket sections further include a radially extending retaining surface integrally formed with and interconnecting one of said side walls and one of said side sections for engagement with a radially outwardly extending surface of the rim of a container to securely interconnect the carrier structure and the container.

4. A carrier structure as set forth in claim 1 further including handle means having a first outer portion adapted to be grasped when transporting said containers and a second inner portion imbedded between said containers in said coating of plastic material prior to the solidification thereof so as to become firmly secured thereto after such solidification.

5. A package comprising: a plurality of containers; and a one-piece connector structure interconnecting said plurality of containers, said connector structure comprising an integral coating of solidified plastic material adheringly formed about and between first ends of said plurality of containers by bathing said container ends simultaneously in a liquid plastic, said coating conforming to the contours of said container ends and including bridge sections extending across outer rims of the containers, and end wall sections integrally formed with said bridging sections and adhering to end walls of the containers to form a unitary package.

6. A package as set forth in claim 5 wherein: said connector structure further includes side wall sections integrally formed with said bridging sections and end wall sections and adhering to side walls of the containers to securely interconnect the containers and the connector structure to form a unitary package.

7. A package as set forth in claim 6 further including: handle means imbedded between said containers in said coating of plastic prior to the solidification thereof so as to become firmly secured thereto after such solidification, to facilitate carrying of the package.

8. A package comprising: a plurality of cans each including a generally cylindrically shaped side wall and a pair of circular end walls, at least one end thereof including a radially outwardly projecting rim, said cans being grouped together with the rims thereof being in abutting relation with adjacent cans thereof, and a one-piece carrier structure interconnecting said group of cans at first ends thereof and being formed simultaneously with said package; said carrier structure including an integral non-uniform coating of solidified plastic mate-

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rial adheringly formed about and between said first ends of said cans by bathing said can ends in a liquid plastic which conforms to the contours of said can ends and includes side wall sections adhering to the side walls of said cans, end wall sections adhering to the end walls of said cans and being interconnected with said side wall sections, and bridging sections for interconnecting respective end and side wall sections of certain ones of said group of cans.

9. A package as claimed in claim 8 wherein said connector structure interconnects said group of cans at said rimmed ends thereof and wherein said side and end wall sections of said plastic connector structure are interconnected by integrally formed, radially outwardly extending protuberances enclosing respective rims of said cans.

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