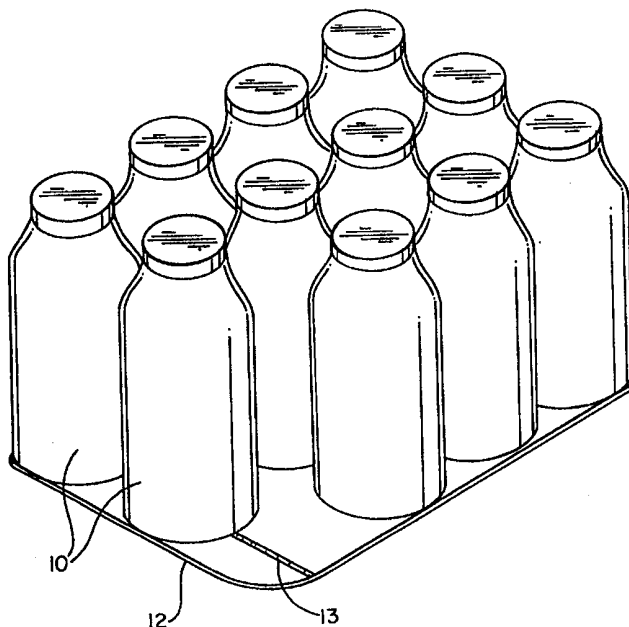




INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁶ : B65B 15/00, 21/24	A1	(11) International Publication Number: WO 99/59873 (43) International Publication Date: 25 November 1999 (25.11.99)
<p>(21) International Application Number: PCT/US99/10324</p> <p>(22) International Filing Date: 11 May 1999 (11.05.99)</p> <p>(30) Priority Data: 09/080,609 18 May 1998 (18.05.98) US</p> <p>(71) Applicant: DELKOR SYSTEMS, INC. [US/US]; 9641 Naples Street N.E., Minneapolis, MN 55449 (US).</p> <p>(72) Inventors: ANDERSEN, Dale, C.; 367-66th Avenue N.E., Fridley, MN 55432 (US). LASECKE, Donald, J.; 4100 Gale Circle, Arden Hills, MN 55112 (US).</p> <p>(74) Agents: GRAD, Jonathan et al.; Vidas, Arrett & Steinkraus, Suite 2000, 6109 Blue Circle Drive, Minnetonka, MN 55343-9131 (US).</p>		<p>(81) Designated States: AU, BR, CA, CN, JP, MX, European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE).</p> <p>Published <i>With international search report.</i></p>

(54) Title: TEMPORARY PACKAGE AND METHOD FOR ITS MANUFACTURE



(57) Abstract

A temporary packaging method and a resultant package are provided for comprising temporarily bonding containers on a flat base member to stabilize the containers for further packaging, the method comprising the steps of providing a base member, providing containers, temporarily bonding the containers to the base member with a hot melt adhesive, advancing the base member with containers through the packaging or handling system so that further processing of the containers may optionally be effected, encapsulating the base member and bonded containers with a plastic shrink film to complete the package, followed by release of the containers from the bond to base member within minutes after shrink wrapping, with the adhesive remaining bonded to the base member.

FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AL	Albania	ES	Spain	LS	Lesotho	SI	Slovenia
AM	Armenia	FI	Finland	LT	Lithuania	SK	Slovakia
AT	Austria	FR	France	LU	Luxembourg	SN	Senegal
AU	Australia	GA	Gabon	LV	Latvia	SZ	Swaziland
AZ	Azerbaijan	GB	United Kingdom	MC	Monaco	TD	Chad
BA	Bosnia and Herzegovina	GE	Georgia	MD	Republic of Moldova	TG	Togo
BB	Barbados	GH	Ghana	MG	Madagascar	TJ	Tajikistan
BE	Belgium	GN	Guinea	MK	The former Yugoslav Republic of Macedonia	TM	Turkmenistan
BF	Burkina Faso	GR	Greece			TR	Turkey
BG	Bulgaria	HU	Hungary	ML	Mali	TT	Trinidad and Tobago
BJ	Benin	IE	Ireland	MN	Mongolia	UA	Ukraine
BR	Brazil	IL	Israel	MR	Mauritania	UG	Uganda
BY	Belarus	IS	Iceland	MW	Malawi	US	United States of America
CA	Canada	IT	Italy	MX	Mexico	UZ	Uzbekistan
CF	Central African Republic	JP	Japan	NE	Niger	VN	Viet Nam
CG	Congo	KE	Kenya	NL	Netherlands	YU	Yugoslavia
CH	Switzerland	KG	Kyrgyzstan	NO	Norway	ZW	Zimbabwe
CI	Côte d'Ivoire	KP	Democratic People's Republic of Korea	NZ	New Zealand		
CM	Cameroon		Republic of Korea	PL	Poland		
CN	China	KR	Republic of Korea	PT	Portugal		
CU	Cuba	KZ	Kazakstan	RO	Romania		
CZ	Czech Republic	LC	Saint Lucia	RU	Russian Federation		
DE	Germany	LI	Liechtenstein	SD	Sudan		
DK	Denmark	LK	Sri Lanka	SE	Sweden		
EE	Estonia	LR	Liberia	SG	Singapore		

TEMPORARY PACKAGE AND METHOD FOR ITS MANUFACTURE

Background Of the Invention**Field Of The Invention**

5 This invention relates to a method for package assembly, and more particularly to a method for briefly stabilizing containers on a flat base member by temporarily bonding the containers to the base member with a hot melt adhesive that releases the container from its bond to the base member soon after the handling and packaging process is complete, and a package which consists of a rigid base member,
10 containers temporarily bonded with hot melt adhesive to the base member, and a plastic shrink film encapsulating the base member and containers.

Description Of The Related Art

 Prior art packaging methods and packages do not address the special need of
15 stabilizing containers on a flat base member during the brief period of package assembly by forming a temporary adhesive bond between the containers and the base member.

 Placement of a group or pack pattern of containers on a flat base member poses a stability problem as the base member with containers is transported through a packaging or handling process. This is particularly a problem for intermittent motion
20 packaging or handling systems, but is also a concern for continuous motion equipment. Even the machine vibration on a continuous motion machine can result in movement of containers on the flat base member, which can negatively effect the completed package, or the effectiveness of the packaging or handling system.

 To avoid this instability with containers on a flat base member, many
25 packaging or handling systems use a corrugated box or tray with four side walls. The box or tray forms a containment boundary so that movement of the containers during the handling or packaging process minimizes the stability problem.

 A need exists for a temporary packaging method and package so that containers are restricted from movement when placed on a flat base member during the
30 packaging or handling process, yet upon completion of the packaging or handling, the

containers are free of this movement restriction.

Summary Of The Invention

Accordingly, the present invention provides a temporary packaging method
5 and package which briefly bonds a group or pack pattern of containers to a flat base member
to stabilize the containers during the handling or packaging process, and these containers
release from this adhesive bond soon after the handling or packaging process is completed
by plastic shrink film encapsulation of the base member and containers. The method
comprises the steps of providing a base member, providing adhesive to the base member,
10 placement of containers to base member resulting in a temporary bond, advancing the base
member with bonded containers through the handling or packaging process, encapsulation
of base member and containers with plastic shrink film, and release of containers from bond
to base member within minutes after the encapsulation by shrink film, with adhesive
remaining bonded to base member.

15 The method of the present invention eliminates the instability of the
containers on a flat base member during the handling or packaging process, thereby
permitting a wide range of movement and handling to occur. The present invention permits
the group of containers which are bonded to the flat base member to be aggressively handled
by inclines, declines, side transfers, abrupt starting and stopping, equipment vibration,
20 stacking, etc.

The temporary bond effectively locks the containers in place during the
handling or packaging process. This temporary bond is defined herein as a bond that
releases by itself over time. It is required to hold the containers in place during the handling
or packaging process, and within minutes after the base member and containers are
25 encapsulated by film, the container releases from the base member with the adhesive residue
remaining on the base member.

This novel packaging method dramatically simplifies the packaging and
handling process for packaging containers on a flat base member. By temporarily
stabilizing the group or pack pattern on the base member during the packaging or handling
30 process, this invention offers an effective alternative to the traditional corrugated box or tray

with four side walls.

This invention utilizes less packaging materials than boxes or trays, is more cost efficient, and because there is no need to form boxes or trays, which generate both corrugated dust and spores, it is more sanitary. This invention also offers greater efficiency than current methods of packaging containers on flat base members because of the increased stability of containers on the base member during package assembly.

Brief Description Of The Drawings

Figure 1 is a perspective view of a grouping of containers of the present invention showing a base member with containers adhered thereto;

Figure 2 is a plan view of a base member with continuous strips of a temporary adhesive applied thereto;

Figure 3 is a plan view of a base member with intermittent strips of a temporary adhesive applied thereto;

Figure 4 is a diagram of the apparatus and method for assembling the package assembly of the present invention;

Figure 5 is a perspective view of a base member with containers adhered thereto and having a cover member;

Figure 6 is a perspective view of a base member with containers adhered thereto and having a divider insert;

Figure 7 is a perspective view of a grouping of containers of the present invention temporarily bonded to a base member and traveling up an incline prior to encapsulation by shrink film, and

Figure 8 is a perspective view of a grouping of containers of the present invention showing a base member with containers encapsulated with shrink film.

Description Of The Preferred Embodiments

While this invention may be embodied in many different forms, there are shown in the drawings and described in detail herein specific preferred embodiments of the invention. The present disclosure is an exemplification of the principles of the invention

and is not intended to limit the invention to the particular embodiments illustrated.

The present invention provides a temporary packaging method and package which briefly bonds a group or pack pattern of containers to a flat base member during the handling or packaging process and releases this bond once the handling or packaging
5 process is completed. The method comprises the steps of providing a base member, providing adhesive to the base member, placement of containers on base member to form a temporary bond, optionally adding a top cover member or divider, advancing the base member with bonded containers through the handling or packaging process so that further processing of the containers may optionally be effected, encapsulation of the base member
10 with bonded containers by a plastic shrink film, followed by release of containers from base member soon after encapsulation of the shrink film, with adhesive remaining bonded to base member.

The method of the present invention provides a means for briefly bonding containers to a base member so containers can be effectively controlled during the handling
15 or packaging process. The optional top cover member adds extra strength and protection for certain container types such as those having foil or paper lids or a bottle with a sport cap, the optional divider insert adds extra protection for certain container types such as glass bottles or jars to avoid glass on glass contact.

Referring to Figure 1, an assembly of containers of the present invention is
20 shown generally at 10 and comprises a flat base member 12, onto which containers are adhered to temporary bonding adhesive strips 13.

Base member 12 may be made of any suitable material such as chip board, paper board or corrugated board depending on the dimensions of the package and intermediate steps which accompany the packaging method. Chip board, however,
25 possesses the minimum desired degree of stiffness according to the present invention.

By means of appropriate adhesive dispensing equipment the nature of which will be readily apparent to those familiar with the art, strips of adhesive 20 are placed on the upper surface 21 of base member 12, as shown in Figure 2, adhesive strips 20 being disposed parallel to ends 22 and 24 of base member 12. The adhesive is a hot melt adhesive
30 which may be applied by applicators situated above a conveyor (not shown) along which

base member 12 is traveling during the packaging process. Both the application temperature and depth of adhesive strip should be consistent with the strips of adhesive 20 on base member 12.

The timing between application of adhesive strips and placement of
5 containers should be substantially consistent, generally 2 to 3 seconds between placement of adhesive strips on base member and placement of containers on base member.

In order to form a temporary bond, the hot melt adhesive should have an open time of approximately 30 to 45 seconds. The open time is defined as the period between application of adhesive on base member and solidification of adhesive. During the
10 open time the elasticity of the semi-solid hot melt adhesive permits aggressive movement of the base member without movement of the containers from their position on the base member. As the adhesive begins to solidify the bond weakens and within minutes the container totally releases from the bond to base member, with all adhesive remaining on the base member.

15 An adhesive with this characteristic is commercially available from H.B. Fuller as Product No. H.L. 7674. Depending upon the type of handling contemplated, however, the specific open time may vary. In general, an open time of between 20 seconds to 1 minute is particularly well suited for the present invention.

The specific bonding strength between base member and container is
20 controlled by varying the application temperature of the adhesive, and the depth of the adhesive strips (generally 1/16 to 1/8" depth). A higher application temperature and deeper adhesive strips will increase the bonding, and a lower temperature and thinner adhesive strips will decrease bonding. In general, the hot melt adhesive is preferably applied within a temperature range of 270 degrees F to 340 degrees F.

25 Adhesive strips 20 hold containers 14 firmly in place on base member 12, as shown in Figure 1. The adhesive is such that it will adhere to containers 14 to the extent that containers 14 are secured to base member 12 firmly enough to resist movement relative thereto and provide stability during normal handling.

Figure 3 shows an alternative embodiment of the invention, in which
30 adhesive strips 20a are intermittent, so that the adhesive strips extend only beneath the

individual containers and not between them.

Soon after the adhesive is applied to base member 12 (generally 2 to 3 seconds), containers are placed in an adjacent side by side relationship on adhesive strips 20 on base member 12, as shown in Figure 1. Containers 14 may be positioned on base member 12 by equipment which feeds containers 14 in a direction perpendicularly to the direction in which base member is traveling, and then positions a pre-arranged set of containers 14 on base member 12 within a consistently short period of time (generally 2 to 3 seconds). Containers 14 preferably touch the adhesive strip at two contact points, or at four contact points, as shown in Figure 2 at 26, 28, 30 and 32, in which strips of adhesive, after a container has been affixed thereto and removed, are shown for purposes of illustration.

The advantage of automatic loading of containers into a pack pattern and bonding same to a base member is that a stable unitized assembly is placed on the adhesive strips at the same time. The time interval between application of adhesive and placement of containers should remain substantially constant to replicate the bonding characteristics of container to base member. For this reason, automatic loading equipment is the most preferred method.

Figure 4 is a diagram of the apparatus for assembling the package assembly and temporary packaging method of the present invention. Containers enter this apparatus on a single lane conveyor (A) and are channeled through lane dividers (B) which separate the containers into the appropriate number of lanes. A pack pattern of containers is released to collation area (C). Simultaneously a base member is picked from the base member magazine (D) and placed on the conveyor bed (F). As the base member indexes forward on the conveyor bed the adhesive unit (E) and adhesive applicator (G) place strips of the temporary bonding hot melt adhesive on the base member.

The adhesive unit and applicator apply a consistent strip or strips of adhesive to the base member (generally 1/16" to 1/8" depth) at a consistent application temperature (generally 270 degrees F to 340 degrees F).

Within a consistent time period after application of adhesive to base member (generally 2 to 3 seconds), the pack pattern of containers (C) are transferred by the apparatus for placement on the base member with temporary bonding adhesive.

Once containers have been loaded onto the base member, the package assembly is moved by a conveyor through a series of optional applications such as placement of cover member or divider insert (J), conveying on inclines, declines or angled turns (K), abrupt stopping and starting (L), and transfer into the apparatus for encapsulating the base member and containers with plastic shrink film (M), and ending with the final package with shrink wrap encapsulation (N). Within minutes after shrink wrapping, the containers will release from the bond to base member with adhesive remaining bonded to base member.

As shown in Figure 5, a flat cover member 40 may optionally be applied over the containers. The cover member provides added strength to package and offers top layer protection for certain container types such as containers with paper or foil lids, or bottles with sport caps. Once cover member is in position, the package assembly is encapsulated with shrink film such as commercially available from Armin Plastics as Product No. 2304B. The tight film encapsulation thus provided keeps the top pad tightly pressed to the tops of the containers which increases package strength and protects the top layer of containers.

An alternative embodiment of a temporary package assembly according to the present invention is shown at Figure 6. A divider has been added to avoid container to container contact within package assembly. This has application for such containers as glass jars, bottles, vials, etc., in which container to container contact can result in damage during distribution. The divider (usually corrugated or chipboard) is placed between containers after containers are bonded to base member and prior to shrink film encapsulation.

Referring to Figure 7, a schematic drawing of the temporary package assembly according to the present invention is shown. Use of the flat base member and temporary adhesive bonding of containers to base member locks product containers in place and prevents individual movement of the containers until after the package assembly has been shrink wrapped. Within minutes the adhesive releases the containers from the bond to base member with the adhesive remaining on the base member. This temporary package assembly uses less packaging material than either a box or tray with four side walls, is more cost efficient, and because there is no need to form boxes or trays, which generate both

corrugated dust and spores, it is more sanitary.

The present invention provides a method for temporarily bonding containers to a flat base member to restrict movement of containers on the base member during the handling or packaging process. This method of bonding the containers permits a wide range of movement and handling to occur without concern for container stability on the flat base member.

The present invention permits the group or pack pattern of containers to be aggressively handled by inclines as shown in Figure 7, declines, side transfers, abrupt starting and stopping, equipment vibrations, stacking, etc., without individual movement of container, and within minutes after the group or pack pattern of containers and base member has been encapsulated with plastic shrink film, the adhesive bond releases the containers from the base member with the adhesive residue remaining on the base member. The completed package assembly of the present invention is shown in Figure 8.

Other advantages of the method of the present invention are as follows. The temporary bond effectively eliminates individual movement of the container on a flat base member during package assembly or handling, thereby greatly enhancing stability of the package assembly, which results in greater packaging efficiency. This improved stability increases the range of containers which are candidates for packaging by means of a flat base member, and it reduces the need for the packaging or handling equipment to maintain control of container movement after the container has been placed on the flat base member, thereby reducing equipment costs.

Additionally, for containers that are placed into boxes or trays for conveying through a heat transfer process, the present invention offers greater heat transfer due to the flat base member. The present invention permits greater airflow than a box or tray, thereby improving heat transfer.

This completes the description of the preferred and alternate embodiments of the invention. Those skilled in the art may recognize other equivalents to the specific embodiment described herein which equivalents are intended to be encompassed by the claims attached hereto.

WHAT IS CLAIMED IS:

1. A packaging method for handling package containers during the packaging procedure, comprising the steps of:
 - providing a base member;
 - 5 providing a plurality of containers;
 - applying strips of adhesive to base member with substantially consistent application temperature and adhesive strip depth;
 - providing the plurality of containers to the base member within a substantially consistently short time period after application of adhesive to base member for
 - 10 temporary bonding of containers to base member during handling in the packaging method.
2. The packaging method of claim 1 including the further steps of:
 - placing a cover member over the containers, and
 - encapsulating the base member, the cover member and the containers with a plastic shrink
 - film.
- 15 3. The packaging method of claim 1 including the further step of:
 - placing a divider(s) between the containers.
4. The packaging method of claim 1 including the further step of:
 - advancing the base member with bonded containers through a handling
 - system, and
 - 20 encapsulating base member and bonded containers with a plastic shrink film.
5. The packaging method of claim 1 including the further step of:
 - stacking multiple layers of base members with bonded containers.
6. The packaging method of claim 4 wherein, as the base member is advanced through a handling system, the containers are subjected to an intermediate step selected
- 25 from a group consisting of: placing a cover member over the containers, placing a divider between the containers, heating, cooling, further handling, a manufacturing process, or combinations thereof.
7. The packaging method of claim 4 including the step of removing the containers from the base member prior to shrink film encapsulation.
- 30 8. The packaging method of claim 1 wherein the rigid base member is made of

corrugated board.

9. The packaging method of claim 1 wherein the adhesive releases the containers soon after the shrink film encapsulation of base member and containers with substantially all of the adhesive remaining adhered to the base member.

5 10. The packaging method of claim 1 wherein there is a plurality of rows of containers and the base member has a plurality of strips of temporary adhesive, each adhesive strip extending beneath a respective row of containers.

11. The packaging method of claim 10 wherein the adhesive strips are continuous.

10 12. The packaging method of claim 10 wherein the adhesive strips are intermittent, such that each strip extends substantially beneath only one container.

13. The packaging method of claim 12 wherein the base member is generally rectangular and has four rounded corners.

15 14. The packaging method of claim 1 wherein the base member is circular and the temporary package has a plurality of containers and at least one strip of adhesive.

15. A package comprising a continuous, substantially rigid planar base member having at least one row of containers, and a quantity of hot melt adhesive which forms a temporary bond between the containers and the base member, and plastic shrink film encapsulating the base member and containers.

20 16. A package of claim 15 including a member selected from the group consisting of:

a flat cover member over the top of the containers;

a corrugated or shipboard divider placed between the containers;

a multiple layer arrangement of base members with bonded containers;

25 a rigid base member wherein it is generally rectangular and has four rounded corners;

a rigid base member wherein it is generally rectangular and has four clipped corners, and

any combination of the foregoing members of the group.

30

Fig. 1

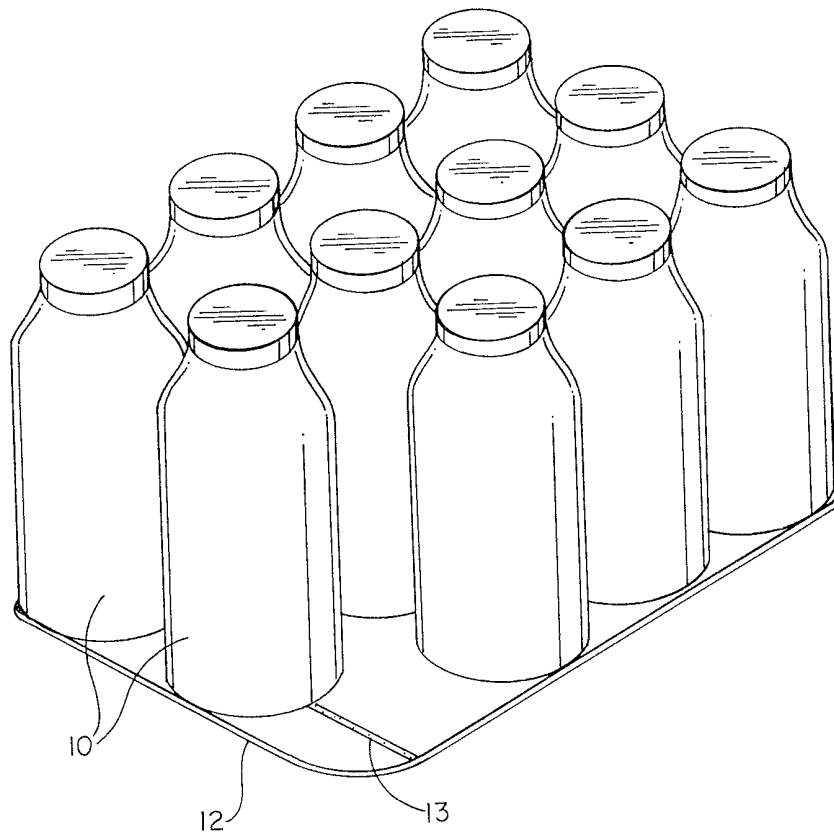


Fig. 3

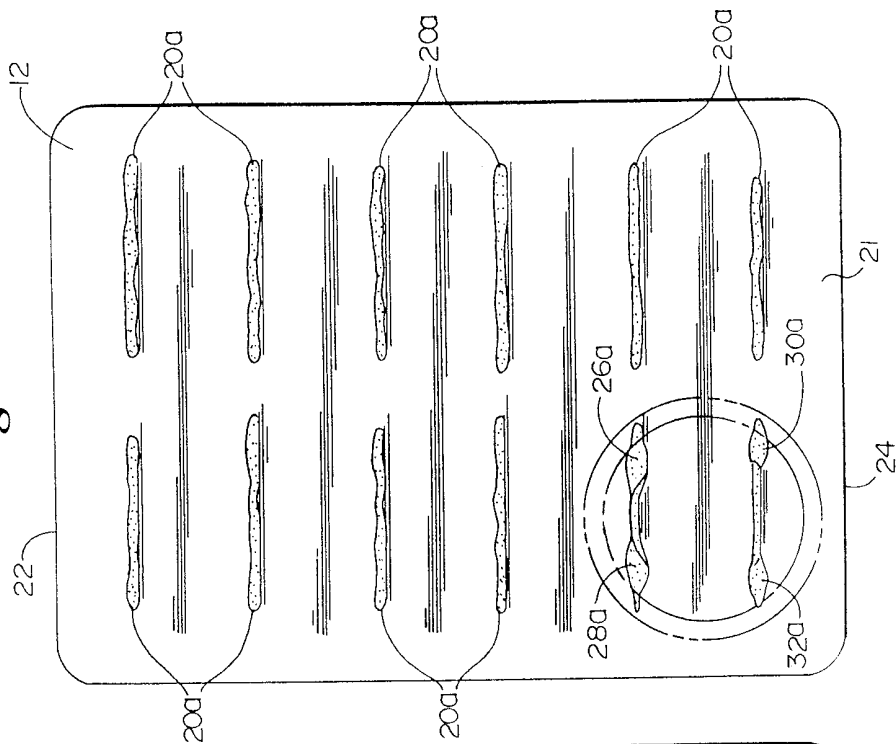
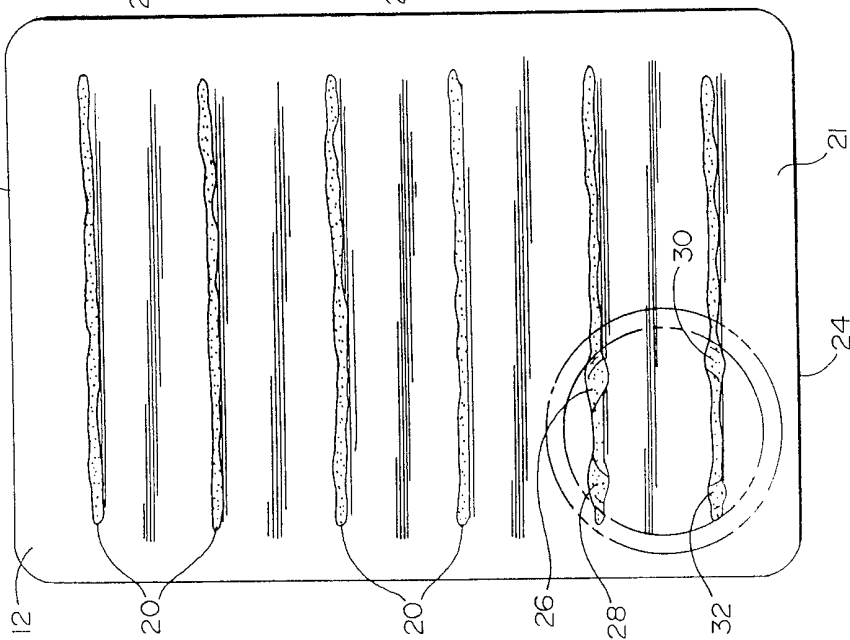


Fig. 2



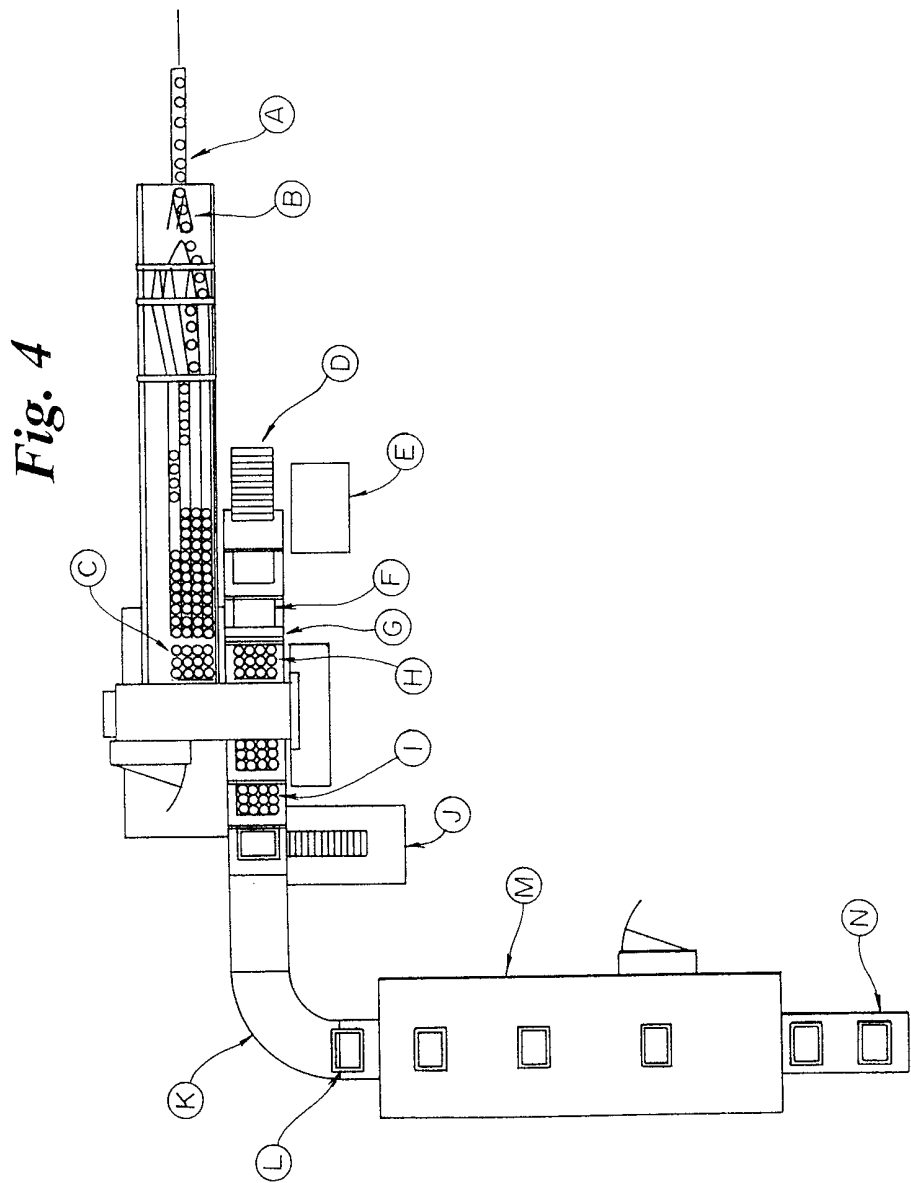


Fig. 5

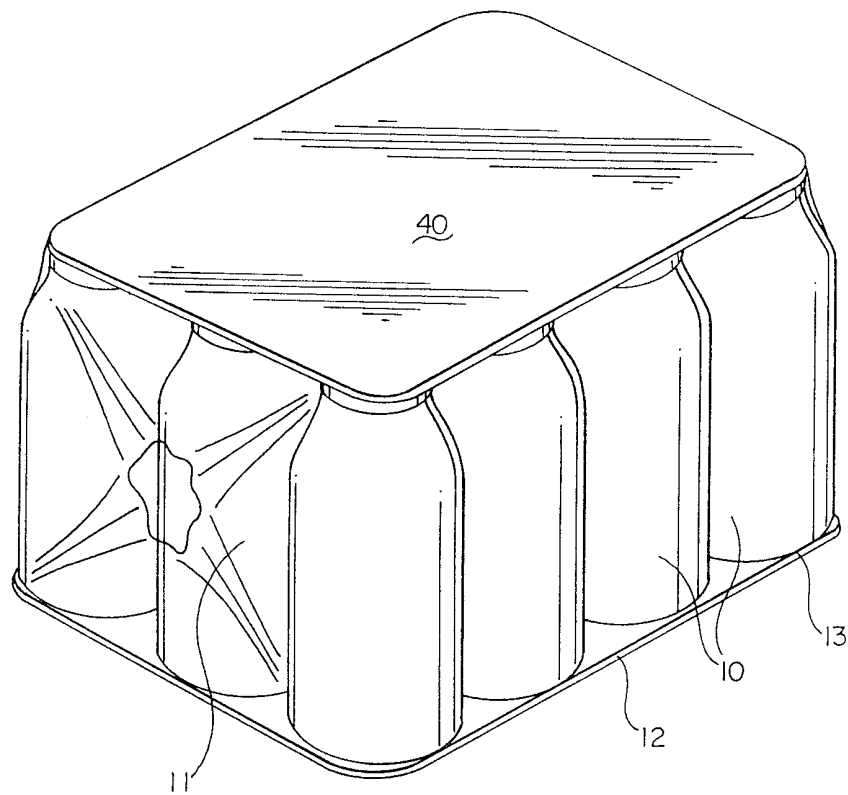


Fig. 6

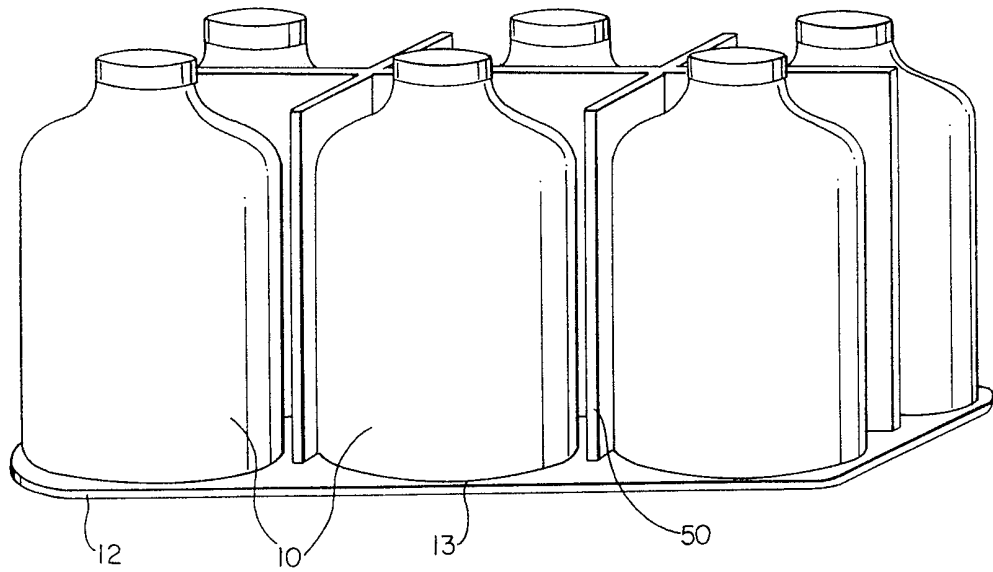


Fig. 7

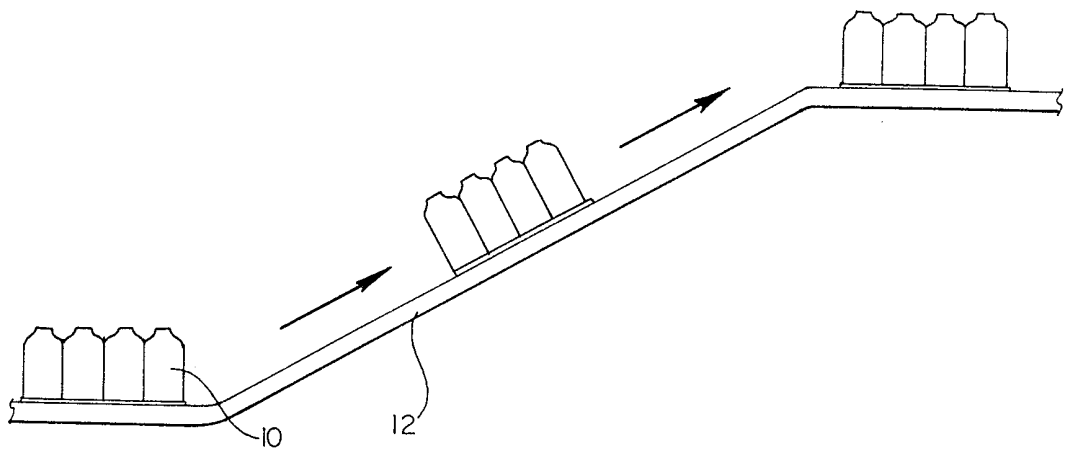
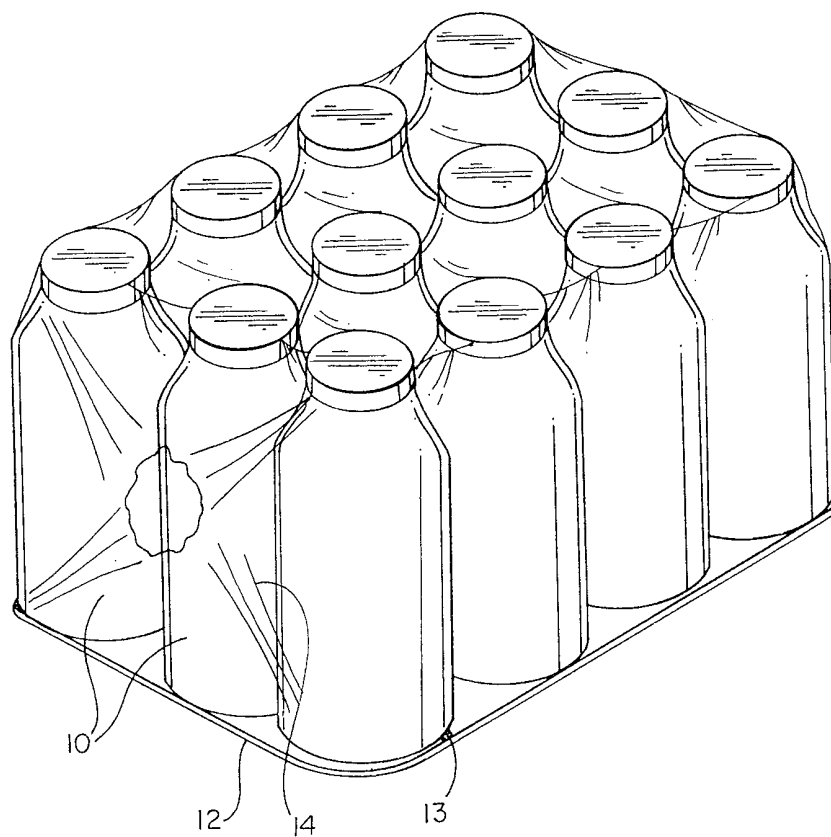


Fig. 8



INTERNATIONAL SEARCH REPORT

Inte. onal Application No
PCT/US 99/10324

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 B65B15/00 B65B21/24

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 6 B65B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A X	WO 96 17791 A (DELKOR SYSTEMS) 13 June 1996 (1996-06-13) the whole document -----	1,2,8, 10-14 15

Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

* Special categories of cited documents :

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

- "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- "&" document member of the same patent family

Date of the actual completion of the international search

6 August 1999

Date of mailing of the international search report

13/08/1999

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
 NL - 2280 HV Rijswijk
 Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
 Fax: (+31-70) 340-3016

Authorized officer

Claeys, H

INTERNATIONAL SEARCH REPORT

information on patent family members

International Application No

PCT/US 99/10324

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9617791 A	13-06-1996	AU 4154296 A	26-06-1996
		US 5887717 A	30-03-1999
