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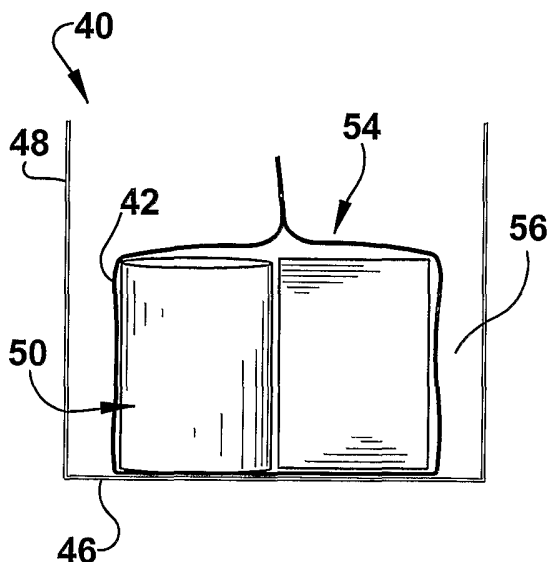
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(54) Title: COHESIVE PACKAGING MATERIAL IN A SHIPPING CONTAINER AND METHOD



(57) Abstract: A method of making a package for shipping an article comprises the step of attaching to a shipping container a flexible material with a cohesive on at least a portion thereof, such that a portion of the flexible material having the cohesive material can be pressed to a cohesive on a surface of at least one of another portion of a flexible material and the shipping container. Thus the flexible material is connected to the container such that the cohesive portion can be readily secured to another cohesive portion to hold an article in a desired position in the container.

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COHESIVE PACKAGING MATERIAL IN A SHIPPING CONTAINER AND METHOD

This application claims the benefit of U.S. Provisional Patent Application No. 60/647,304, filed January 26, 2005, which is hereby incorporated herein.

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FIELD OF THE INVENTION

This invention relates generally to a packaging system and method, and more particularly to a packaging system and method using a flexible material to hold an article in a container for shipment.

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BACKGROUND

In general, it is desirable to securely position an article in a container to keep it from moving about in the container during shipment, which could lead to damage. One method of securing an article in a container is to fill the void in the container around the article with a dunnage material, such as that produced by a dunnage conversion machine. Exemplary dunnage conversion machines that convert a stock material into a relatively less dense dunnage product are disclosed in U.S. Patent Nos. 4,968,291; 5,123,889; and 6,676,589. The entire disclosures of these patents are hereby incorporated herein by reference.

Another method of securing an article in a container includes placing a heat-shrinkable plastic over the article in the container, securing the plastic relative to the container, and applying heat to shrink the plastic against the article or the container to hold the article in place.

25

SUMMARY

The present invention provides a packaging system and method characterized by a flexible material with a cohesive portion on a surface thereof. The flexible material is connected to a container such that the cohesive portion can be readily secured to another cohesive portion to hold an article in a desired position in the container.

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More particularly, a packaging system in accordance with the present invention includes a shipping container and a flexible material connected to the

shipping container, where the flexible material has a connecting portion connected to the container and a securing portion extending from a wall of the shipping container. The securing portion has a cohesive on a surface thereof for adhering to a cohesive at a different location on the connecting portion, the securing
5 portion, some other part of the flexible material or some other part of the packaging system to hold an article relative to the shipping container.

A method of making a package for shipping an article includes the step of attaching to a shipping container a flexible material with a cohesive on at least a portion thereof such that a portion of the flexible material having the cohesive on a
10 surface thereof can be pressed to a cohesive on a surface of at least one of another portion of a flexible material and the shipping container.

A method of securing an article in a container for shipment includes the steps of placing the article in the shipping container, and securing the article in the shipping container by pressing a portion of a flexible material having a cohesive
15 on a surface thereof to a cohesive on a surface of at least one of another portion of a flexible material and the shipping container, where the flexible material is connected to the container before the securing step.

The foregoing and other features of the invention are hereinafter fully described and particularly pointed out in the claims, the following description and
20 the annexed drawings setting forth in detail plural illustrative embodiments of the invention, such being indicative, however, of but a few of the various ways in which the principles of the invention may be employed.

BRIEF DESCRIPTION OF THE DRAWINGS

25 FIG. 1 is a schematic representation of a system in accordance with the present invention.

FIG. 2 is a side elevation view of an embodiment of a system in accordance with the present invention with a side wall of a container in which an article has been placed for packaging removed to show a flexible material having
30 a cohesive thereon for securing the article in the container.

FIG. 3 is a side elevation view of the embodiment of FIG. 2 in a ready-to-ship configuration.

FIG. 4 is a side elevation view of another embodiment of a system in accordance with the present invention with a side wall of a container in which an article has been placed for packaging removed to show a flexible material having a cohesive thereon for securing the article in the container.

5 FIG. 5 is a side elevation view of the embodiment of FIG. 4 in a ready-to-ship configuration.

FIG. 6 is a side elevation view of another embodiment of a system in accordance with the present invention with a side wall of a container in which an article has been placed for packaging removed to show a flexible material having
10 a cohesive thereon for securing the article in the container.

FIG. 7 is a side elevation view of the embodiment of FIG. 6 in a ready-to-ship configuration.

FIG. 8 is a side elevation view of yet another embodiment of a system in accordance with the present invention with a side wall of a container in which an
15 article has been placed for packaging removed to show a flexible material supporting the article in the container.

FIG. 9 is a side elevation view of the embodiment of FIG. 8 in a ready-to-ship configuration.

FIG. 10 is a schematic perspective view of a frame for use in a container in
20 another embodiment in accordance with the invention, a portion of the frame being partially broken away.

FIG. 11 is another view of FIG. 10 with the addition of an article to be packaged.

FIG. 12 is a schematic cross-sectional view of a container with a wall
25 thereof removed to show an article supported on the frame of FIGS. 10 and 11 in a ready-to-ship configuration.

FIG. 13 is a perspective view of yet another system in accordance with the present invention.

FIG. 14 is a side elevation view of another embodiment of a system in
30 accordance with the present invention with a side wall of a container in which an article has been placed for packaging removed.

DETAILED DESCRIPTION

Referring now to the drawings in detail, and initially to the schematic FIG. 1, a packaging system 20 in accordance with the present invention includes a shipping container 22 and a flexible material 24 connected to the shipping container 22. The flexible material 24 has a cohesive on a surface thereof that can be readily secured to another cohesive portion to hold an article in a desired position in the container for shipping. Specifically, the flexible material 24 has a connecting portion 26 connected to the container 22 and a securing portion 28 spaced therefrom. The securing portion 28 has a cohesive 30 on a surface thereof for adhering to a cohesive 32 at a different location on the connecting portion 26 or the securing portion 28 or some other part of the flexible material or some other part of the packaging system to hold the article relative to the shipping container 22.

A cohesive, unlike an adhesive, only attaches to itself and generally will not stick to other items, such as non-cohesive portions of the flexible material or the container. Notably, heat or supplementary closure materials, such as glue, mechanical staples, tape or other bonding strips, for example, are not necessary in view of the cohesive.

The flexible material 24, on a surface of which the cohesive material is supplied, can include a sheet material, such as plastic or paper, kraft paper being an exemplary sheet material. The flexible material can include a plurality of superimposed sheets with a cohesive on an exposed surface of at least one sheet. The flexible material also can include a crumpled sheet material or a crumpled sheet material and an uncrumpled sheet material. The crumpled material can act as a cushioning layer to further protect the article. Other types of cushioning products can be used in place of or in addition to the crumpled sheet material, such as air pillows, foam padding or bubble pack.

The container 22 to which the flexible material is connected is typically a cardboard box. The container is not limited to a container made of cardboard, however, and can be made of metal, wood, other types of paper or plastic. In addition, the container does not need to be a rectangular box, but may have other shapes, such as spherical, tubular, octagonal or a bag-shape, for example. The

container does not necessarily define a closed volume, and could have one or more openings. Moreover, the container to which the flexible material is connected is not necessarily rigid and could be made of a flexible substance.

The flexible material 24 can be connected to the container 22 in a variety of configurations. The connecting portion 26 of the flexible material 24 can be affixed to a side wall of the shipping container or a bottom wall of a shipping container, for example. The flexible material can have multiple segments, each of which has a connecting portion connected to the container and a securing portion extending therefrom. Furthermore, the connecting portion 26 of the flexible material 24 can be proximate an end of the flexible material or proximate a central region of the flexible material, as will be seen in the following examples.

In addition, the flexible material 24 can be connected to the container 22 directly or indirectly, and the connecting portion can 26 be fixed in place with a variety of connecting means, including adhesive, mechanical fasteners, tapes, or even corresponding cohesive portions.

Turning now to several specific examples of ways in which the concepts provided by the present invention can be employed, FIG. 2 shows a packaging system 40 with a flexible material 42 having a central portion 44 thereof affixed to a bottom wall 46 of a container 48, and an article 50 placed in the container 48 and on the central portion 44 of the flexible material 42 for packaging. The central portion 44 thus embodies the connecting portion 26 of FIG. 1. The illustrated article includes two objects, which should make it clear that the term "article" is not limited to a single object. In this embodiment the flexible material 42 is a flexible sheet, such as kraft paper, having a cohesive on at least a portion 52 of an inner surface thereof, particularly on the distal portions thereof.

As shown in FIG. 3, when the distal portions of the flexible material 42 having the cohesive thereon are brought together, the cohesive portions adhere to one another and cooperate to wrap around, hold and secure the article 50 as a package 54 relative to the container 48. The cohesive portions 52 thus embody the cohesive portions 30 and 32 of FIG. 1. The flexible material 42, once secure in its ready-to-ship configuration, can prevent or minimize movement of the article 50 relative to the container 48 during shipment. As is apparent, a greater or

smaller amount of void 56 may remain in the container 48 and that void 56 does not necessarily have to be filled with a void fill material to protect the article 50 during shipment.

Although in FIG. 2 the article 50 appears to be placed in the center of the flexible material 42 such that relatively equal lengths of flexible material 42 cooperate to wrap around the article 50, the connecting portion of the flexible material can be at one side of the flexible material such that after this portion is affixed to the container, the securing portion can wrap around the article from one side more than another. In addition, the flexible material can include multiple segments, each of which has a connecting portion secured to the container and a securing portion that can extend around an article. Each of the securing portions can have a cohesive portion for connecting to a respective cohesive portion on another portion of the packaging system.

The cohesive typically is provided at the distal ends of the flexible material so that the ends of the flexible material can be brought together to hold the article therein. The flexible material can have a cohesive spread across an entire surface, which could be beneficial in providing cohesive portions that can be attached together when the article to be packed is relatively small as well as to accommodate relatively large articles for shipment in a common container. Other arrangements of cohesive on the stock material also are possible. The cohesive can be provided in regularly or irregularly spaced, sized, oriented or shaped strips or patterns of cohesive on one or more surfaces of the stock material.

Turning now to FIGS. 4 and 5, another system 60 in accordance with the present invention includes a multi-layer flexible material 62 to secure an article 64 in a container 66 for shipment. The flexible material 62 in this example includes an uncrumpled sheet material 68 secured to the bottom wall 70 of the container 66, and a cushioning layer 72 superimposed on and affixed to the uncrumpled sheet material 68. This cushioning layer can be formed by crumpled paper or plastic air pillows or bubble-pack-type cushioning material, for example. The exposed surface 74 of the cushioning layer 72 has a cohesive thereon such that distal ends of the multi-layer flexible material 62 can be brought together, as shown in FIG. 5, to wrap around and secure the article 64 in the container 66.

Sometimes, it is desirable to space the article to be packaged from a wall of the container. One way of accomplishing this is to provide a dunnage product between the article and a portion of the flexible material, as shown in FIGS. 6 and 7. As shown in the system 80 of FIG. 6, a flexible material 82 is affixed to a container 84, and a rigid material 86, such as a section of cardboard, plastic or other relatively stiff material is placed on the flexible material 82. The container 84 has multiple flaps 87 and 88 that help to define the bottom of the container 84, and one or more sections of the flexible material 82 can have portions interlaced between the flaps and secured therein to hold the flexible material 82 to the bottom of the container. Finally, a section of dunnage 90 or other material, such as the cushioning dunnage product disclosed in U.S. Patent No. 5,123,889, the entire disclosure of which is hereby incorporated by reference, is placed on the relatively stiff material to support and space the article 92 from the bottom wall 94 of the container 84. A cushioning dunnage product also provides increased cushioning. Each of these components can be attached to each other or one or more can be loosely associated with one or more other components. For example, the dunnage product 90 can be secured to the relatively stiff material 86 to form a spacing unit 96 that is not attached to the flexible material 82, a central portion of which is affixed to the shipping container 84. After an article 92 is placed on the dunnage product 90 and the flexible material 82 is wrapped around the article 92, cohesive portions of the flexible material are joined together to hold both the article 92 and the spacing unit 96 within the container 84. As a result, the article 92 is spaced from a wall of the container 84 and thereby further protected from damage during shipment.

Another packaging method for spacing an article from a wall of the container can be referred to as hammocking. Referring now to FIGS. 8 and 9, another system 100 uses a first flexible material 102 that connects opposing side walls 104 and 106 of a container 110 to define a hammock-like support surface for an article 112 that is spaced from a bottom wall 114 of the container 110. The ends of the flexible material 102 can be secured to the walls 104 and 106 of the container through respective cohesive portions, an adhesive or any other connecting means.

As shown in FIG. 9, a second flexible material 116 extendable over at least a portion of the first flexible material 102 and the article 112 is used to hold the article 112 to the first flexible material 102 and thereby suspend the article 112 in the container 110 at a location spaced from at least one of the walls of the container, in this case the bottom wall 114. This second flexible material 116 has a connecting portion 120 attached to the container 110 or is connected to the container 110 through its attachment to the first flexible material 102. The second flexible material 116 also has a securing portion 122 with a cohesive thereon. The securing portion 122 extends over the article 112 and its cohesive portion is attached to a cohesive on a surface of the first flexible material 102 or the container 110 or combinations thereof. The connecting portion also can be attached with a cohesive, as suggested above. In FIG. 9 the second flexible material 116 is attached to the first flexible material 102 on at least two sides of the article 112 to be shipped using cohesive portions on at least one side thereof. The second sheet 116 can be attached on two or more sides of the article 112 to be shipped, to form a pouch or a closed volume to hold the article 112 securely therein.

Yet another method of supporting an article at a location spaced from a wall of a container is to use a relatively inflexible frame fitted inside the container. Such a frame 120 is shown in FIGS. 10-12. The frame typically is formed of cardboard, however, it can be formed of plastic or other materials. The frame 120 shown in FIG. 10 has spaced-apart support legs 122 and uprights 124 extending in opposing directions from a platform 126 extending therebetween. The platform has an opening 128 in a central portion thereof across which a first flexible material 130 is secured to form a hammock-like support surface. The first flexible material 130 can be secured with an adhesive, a cohesive or via other connecting means. Alternatively, the article to be shipped can be supported on the platform. In FIG. 11, an article 132 is placed on the first flexible material 130 and is partially bounded by the sides of the opening 128 in the platform 126. An assembled packaging system 134 is shown in FIG. 12 with the frame 130 set in a container 136. A second flexible material 140 is placed over the article 132 and secured thereto on at least one side thereof with a cohesive portion that engages a

confronting cohesive portion on the frame 120, the first flexible material 130 or the container 136. The second flexible material 140 also has a connecting portion that is connected to the container 136 with a connecting means. The result is similar to the hammocking packaging method described above with respect to
5 FIGS. 8 and 9, as is readily apparent from a comparison of FIGS. 9 and 12.

Still another packaging system 150 in accordance with the present invention is shown in FIG. 13. In this system 150, the flexible material includes a plurality of dunnage strips 152 formed of a sheet stock material. Each strip has a cohesive on an exposed surface thereof. The strips 152 are placed in a container
10 154 such that an article can be placed on the dunnage strips 152. The strips can then be wrapped around the article and secured in place by cohesive portions on the respective strips engaging other cohesive portions on other strips, other portions of one strip, or the container 154. The strips 152 are secured to the container 154 by a connecting means and can be secured to other strips or
15 separately secured to the container 154.

As is apparent from the above description, a method of making a package for shipping an article in accordance with the invention includes the step of attaching to a shipping container a flexible material with a cohesive on at least a portion thereof such that a portion of the flexible material having a cohesive on the
20 surface thereof can be pressed to a cohesive on a surface of at least one of another portion of the flexible material and the shipping container itself. This can include crumpling a sheet material before attaching the crumpled sheet material to the shipping container. This can also include the step of attaching the crumpled sheet material to an uncrumpled sheet material before attaching the assembled
25 multi-layered flexible material to the shipping container.

From an operator's standpoint, a method of securing an article in a container for shipment using such a package in accordance with the present invention includes the step of placing an article in the shipping container and securing the article in the shipping material by pressing a portion of a flexible
30 material having a cohesive on a surface thereof to a cohesive on a surface of at least one of another portion of a flexible material, the shipping container or other component of the packaging system, such as the frame described above.

Typically, at least one portion of the flexible material is connected to the container at the start and the operator simply has to place the article in the container and secure the article by pressing the cohesive portions together.

Referring now to yet another embodiment in accordance with the present invention, FIG. 14, like FIG. 2, shows a packaging system 170 with a flexible material 172 having a central portion 174 thereof affixed to a bottom wall 176 of a container 178, and an article 180 placed in the container 178 for packaging. The flexible material 172 is a flexible sheet having a cohesive on at least a portion 182 of an inner surface thereof, particularly on the distal portions thereof. As discussed above, the cohesive portions can bind together when they come into contact with one another. To further minimize the possibility that the cohesive portions could come together before they are intended to, this embodiment includes a releasable adhesive material 184 applied between the flexible material 172 and a portion of the container 178, such as the illustrated flaps 186 of the container 178.

In use, the flexible material 172 is temporarily secured to the container 178 with the releasable adhesive 184. The article 180 to be packaged is placed in the container 178 on the flexible material 172. The distal ends of the flexible material 172 are then pulled free of the releasable adhesive 184, and the cohesive portions 182 are brought together to bind to one another and hold the article 180 in the container 178. The releasable adhesive 184 can be removed from the container 178 if desired.

Although the invention has been shown and described with respect to certain illustrated embodiments, equivalent alterations and modifications will occur to others skilled in the art upon reading and understanding the specification and the annexed drawings. In particular regard to the various functions performed by the above described integers (components, assemblies, devices, compositions, etc.), the terms (including a reference to a "means") used to describe such integers are intended to correspond, unless otherwise indicated, to any integer that performs the specified function (i.e., that is functionally equivalent), even though not structurally equivalent to the disclosed structure that performs the function in the herein illustrated embodiments of the invention. In addition, while a

particular feature of the invention might have been described above with respect to only one of several illustrated embodiments, such a feature can be combined with one or more other features of another embodiment, as might be desired and advantageous for any given or particular application.

What is claimed:

1. A packaging system comprising a shipping container and a flexible material connected to the shipping container, the flexible material having a
5 connecting portion connected to the container and a securing portion extending from a wall of the shipping container, the securing portion having a cohesive on a surface thereof for adhering to a cohesive at a different location on another part of the flexible material or some other part of the packaging system to hold an article relative to the shipping container.
10
2. A packaging system as set forth in claim 1, wherein the connecting portion of the flexible material is affixed to a side wall of the shipping container.
3. A packaging system as set forth in claim 1, wherein the connecting
15 portion of the flexible material is affixed to a bottom wall of the shipping container.
4. A packaging system as set forth in any previous claim, wherein the connecting portion of the flexible material is proximate an end of the flexible material.
20
5. A packaging material as set forth in any of claims 1 to 3, wherein the connecting portion is between a pair of securing portions.
6. A packaging system as set forth in any previous claim, wherein the
25 flexible material includes a sheet material.
7. A packaging system as set forth in any previous claim, wherein the flexible material includes a crumpled sheet material.
- 30 8. A packaging system as set forth in any previous claim, wherein the flexible material includes a plurality of sheets.

9. A packaging system as set forth in any previous claim, wherein the flexible material includes a plurality of superimposed sheets.

10. A packaging system as set forth in any previous claim, wherein the flexible material includes a crumpled sheet material and an uncrumpled sheet material.

11. A packaging system as set forth in any previous claim, wherein the flexible material has a cohesive at a distal end thereof.

12. A packaging system as set forth in any previous claim, wherein the flexible material includes paper or plastic.

13. A packaging system as set forth in any previous claim, wherein the flexible material is kraft paper.

14. A packaging system as set forth in any previous claim, wherein the container is metal, wood, paper or plastic.

15. A packaging system as set forth in any previous claim, further including a frame within the container to space a support surface for an article from a wall of the container.

16. A packaging system as set forth in claim 15, wherein the connecting portion of the flexible material is affixed to the frame.

17. A packaging system as set forth in any previous claim, wherein the flexible material includes a first sheet connecting opposing side walls to define a support surface for an article and a second sheet extendable over at least a portion of the first sheet, the second sheet having a cohesive portion that is connectable to a cohesive portion on at least one of the first sheet, another location on the second sheet and another portion of the system.

18. A packaging system as set forth in any previous claim, further including a dunnage product connected to the flexible material to space an article to be secured from a wall of the container.

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19. A packaging system as set forth in claim 18, further comprising a relatively stiff material connected to the flexible material or the dunnage product.

20. A method of securing an article in a container for shipment
10 comprising the steps of placing the article in the shipping container; and securing the article in the shipping container by pressing a portion of a flexible material having a cohesive on a surface thereof to a cohesive on a surface of at least one of another portion of a flexible material and the shipping container, where the flexible material is connected to the container before the securing step.

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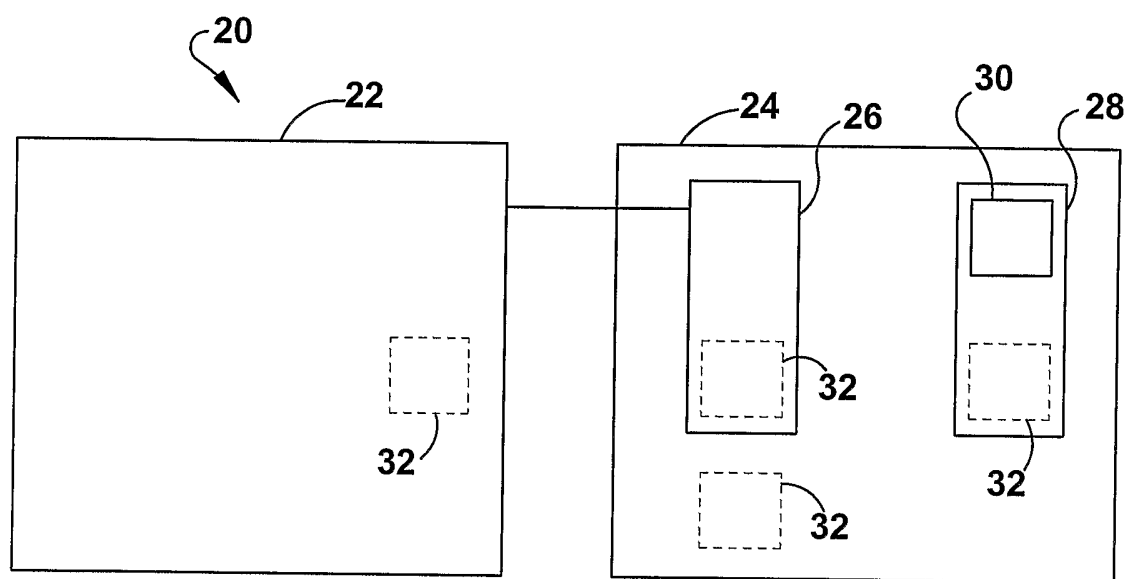
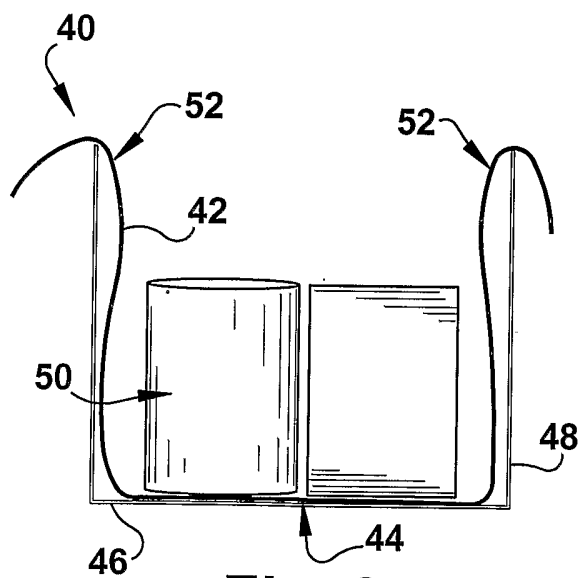
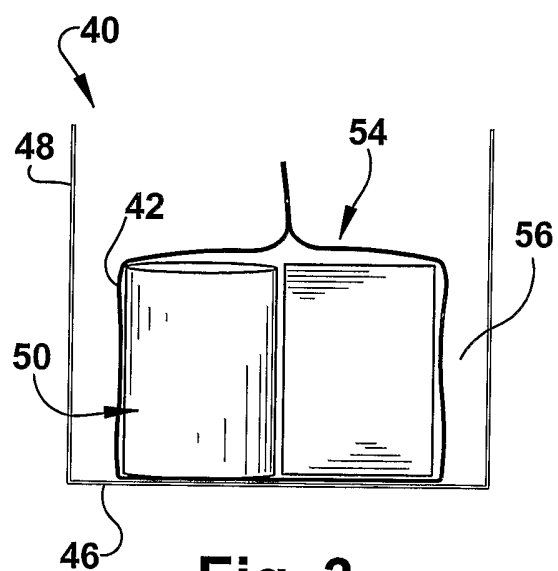
21. A method of making a package for shipping an article comprising the step of attaching to a shipping container a flexible material with a cohesive on at least a portion thereof such that a portion of the flexible material having the cohesive on a surface thereof can be pressed to a cohesive on a surface of at
20 least one of another portion of a flexible material and the shipping container.

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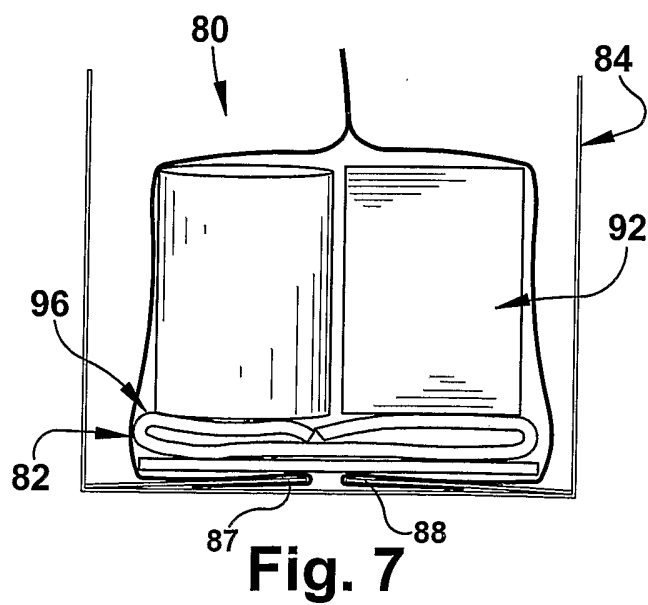
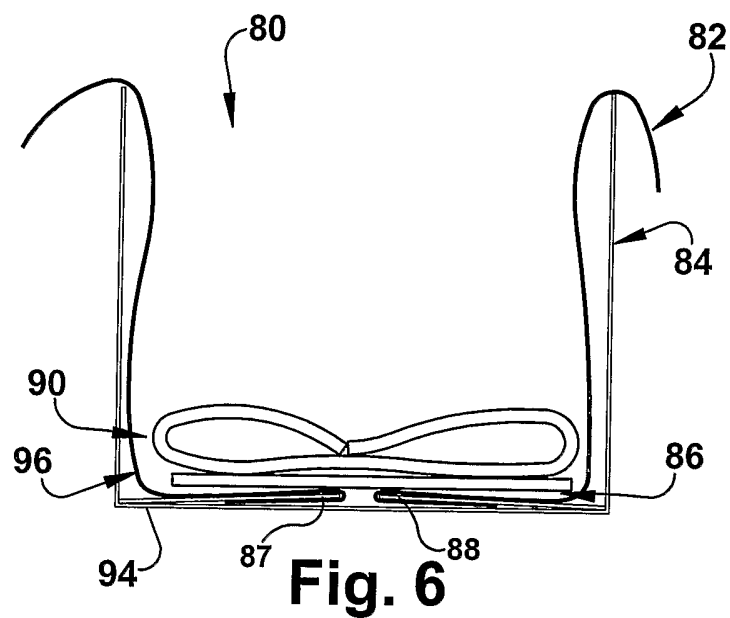
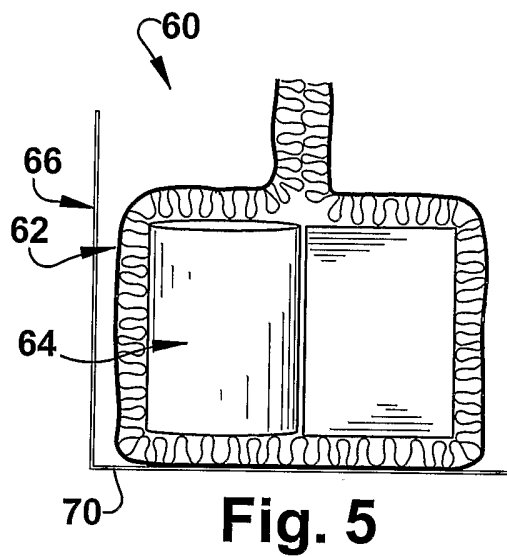
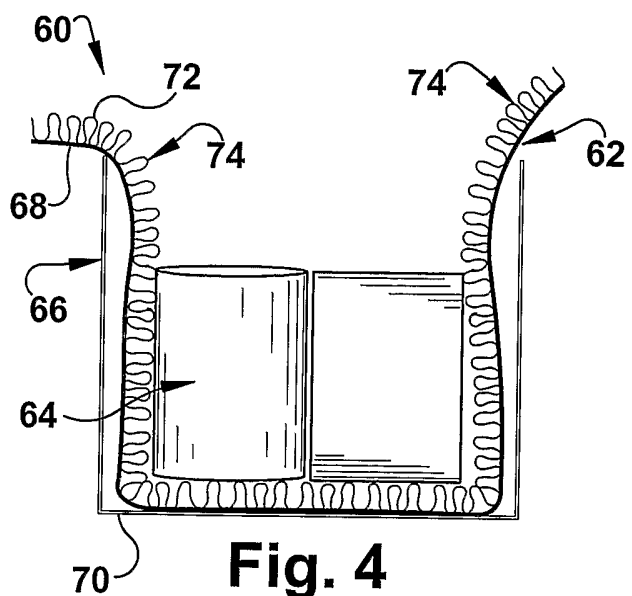
22. A method as set forth in claim 21, further comprising the step of crumpling the flexible material before attaching the crumpled sheet material to the shipping container.

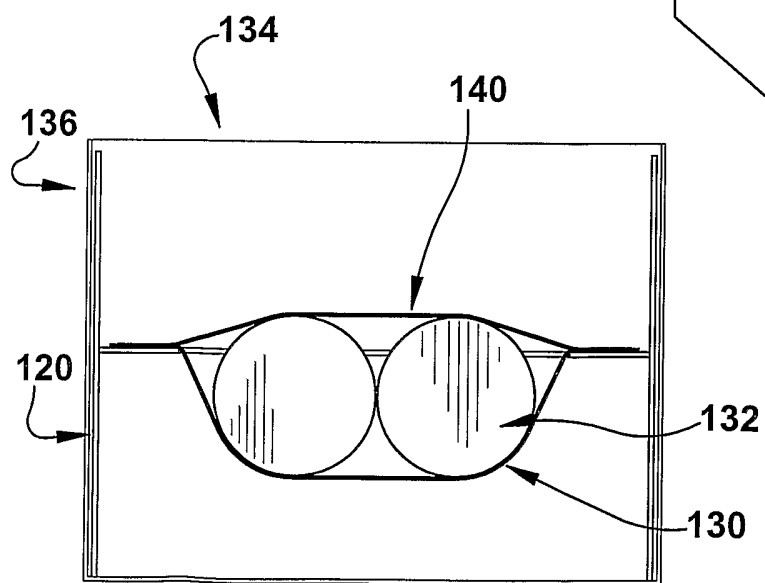
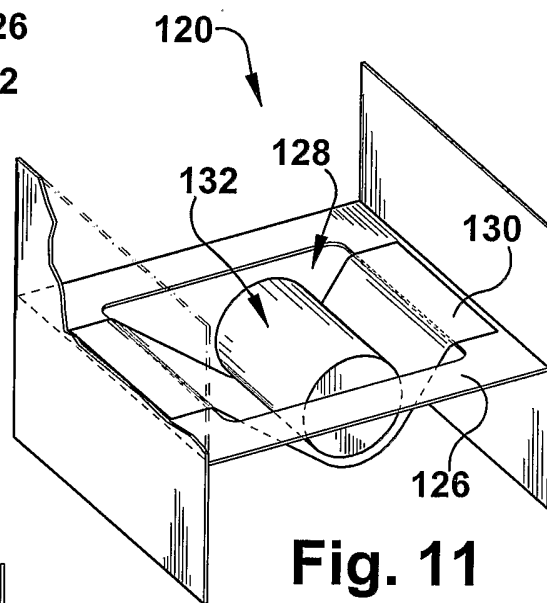
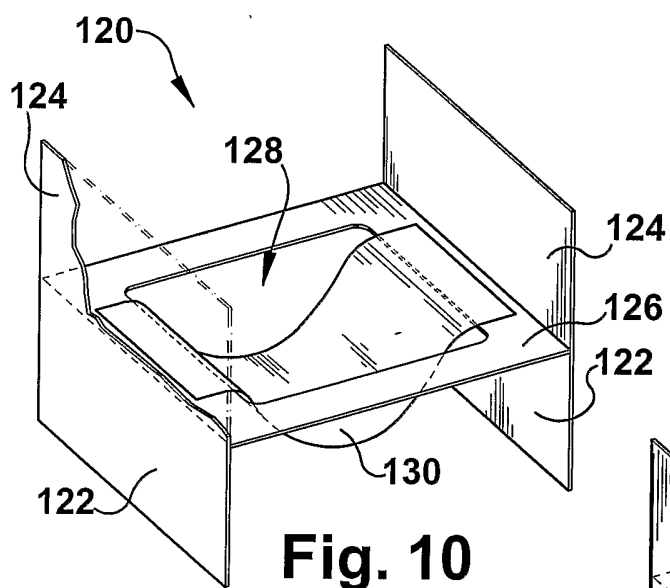
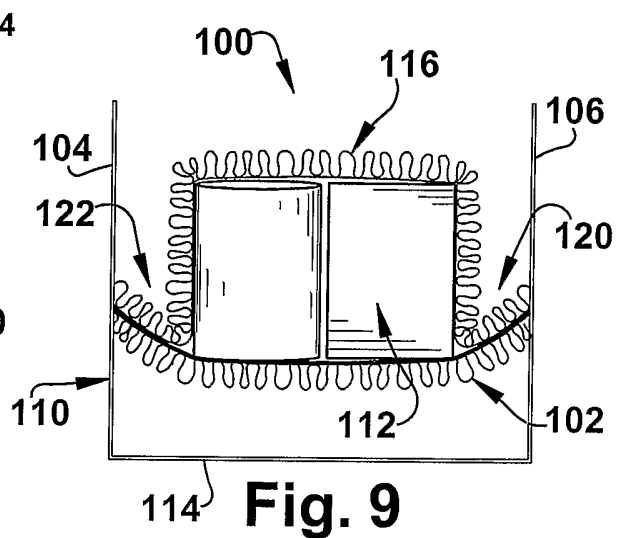
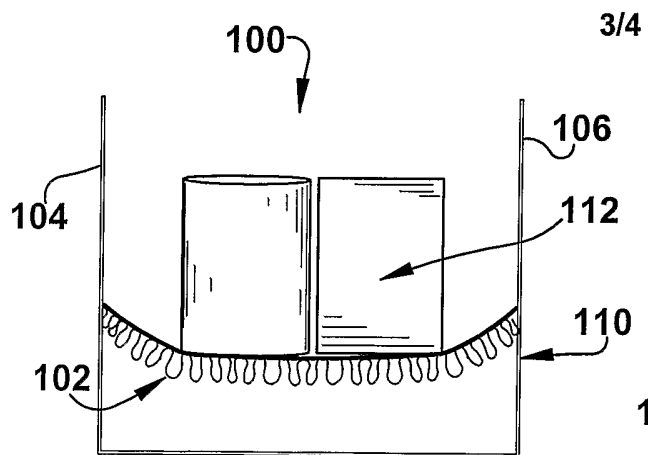
23. A method as set forth in claim 22, further comprising the step of attaching the crumpled sheet material to an uncrumpled sheet material before attaching the assembled sheet material to the shipping container.

30 24. A method as set forth in claim 21, further comprising the step of detaching a portion of the flexible material from a releasable adhesive or the container before pressing cohesive portions of the flexible material together.

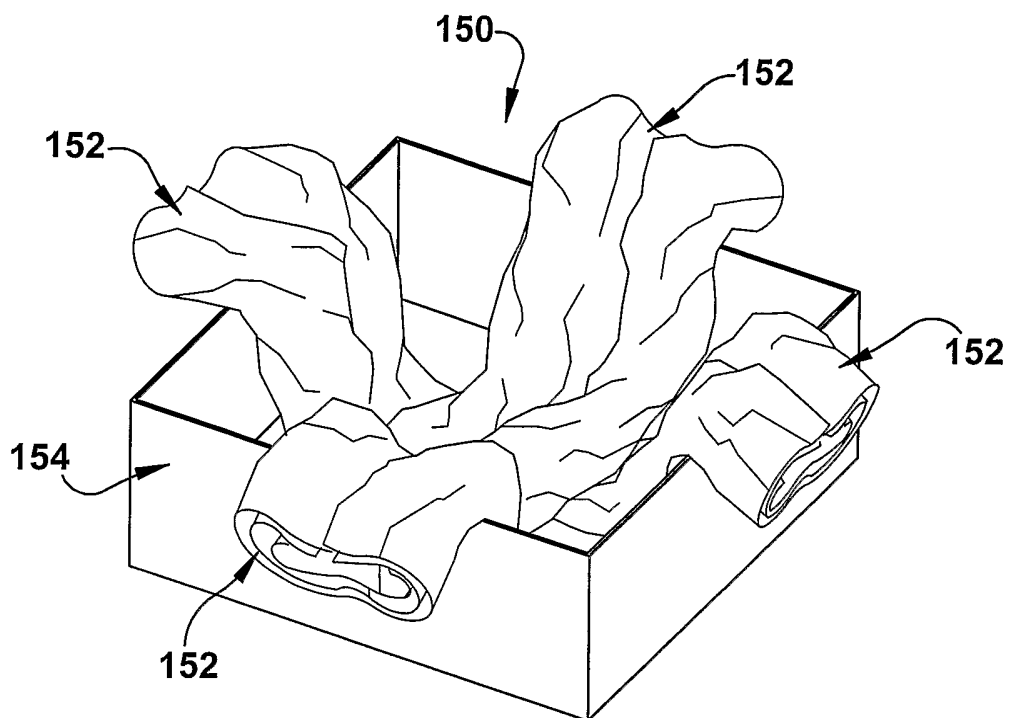
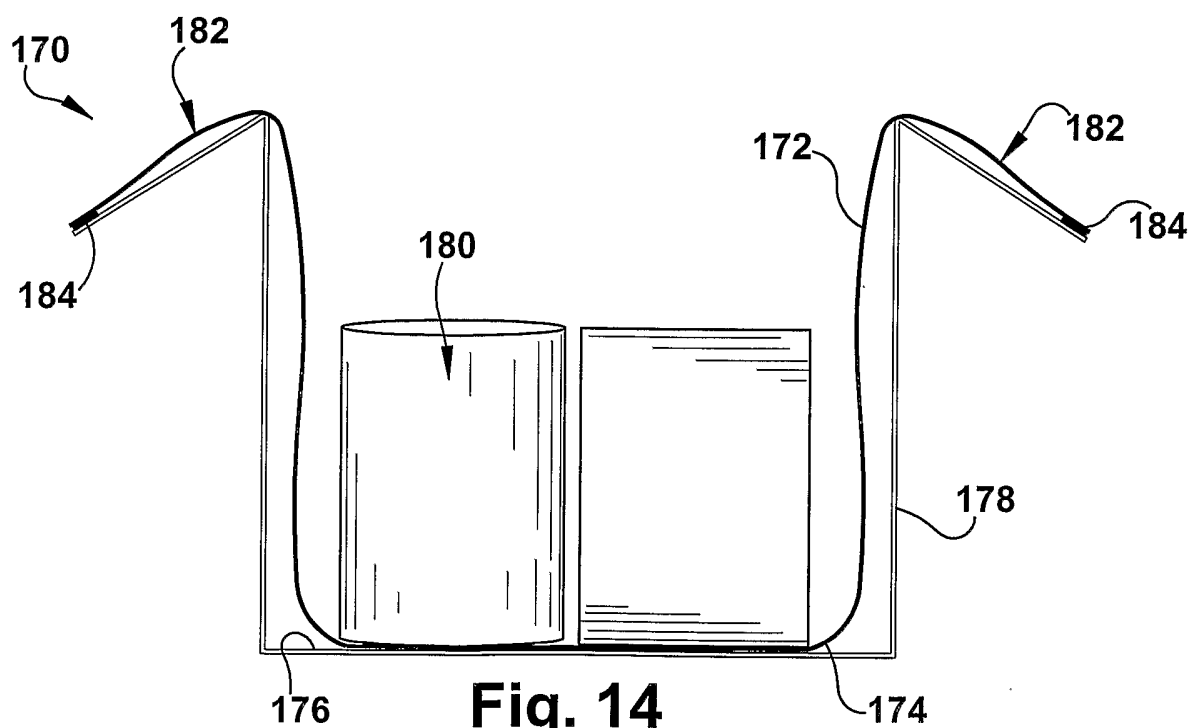
**Fig. 1****Fig. 2****Fig. 3**

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**Fig. 13****Fig. 14**