

July 28, 1970

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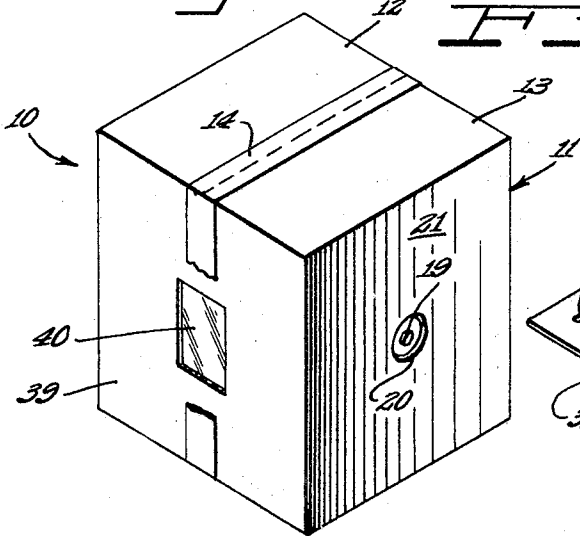
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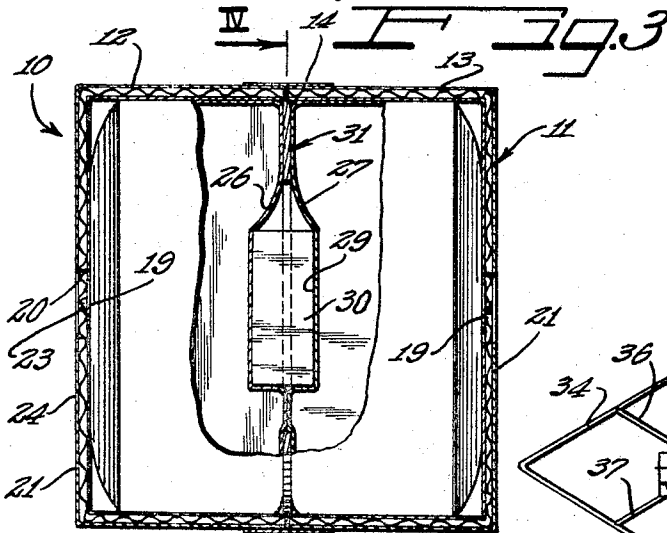
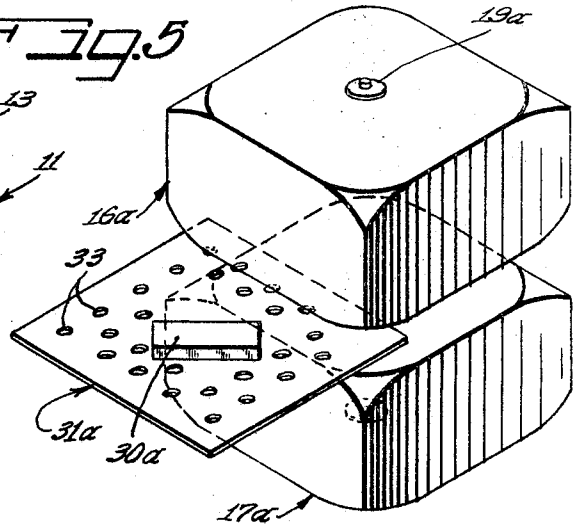
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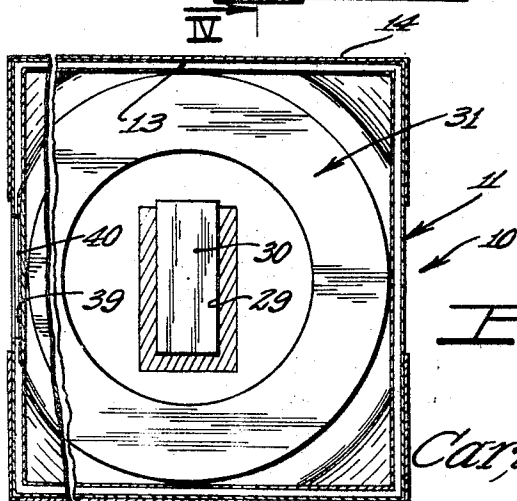
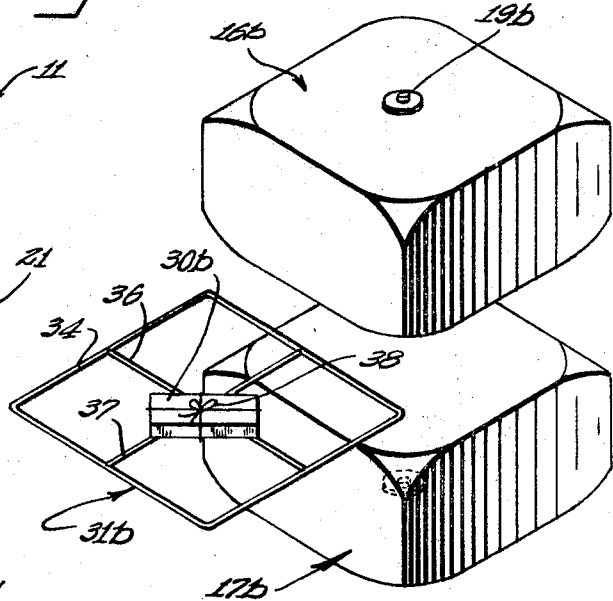
*F 39.1*



*F 39.5*



*F 39.3*



*F 39.4*

*F 39.6*

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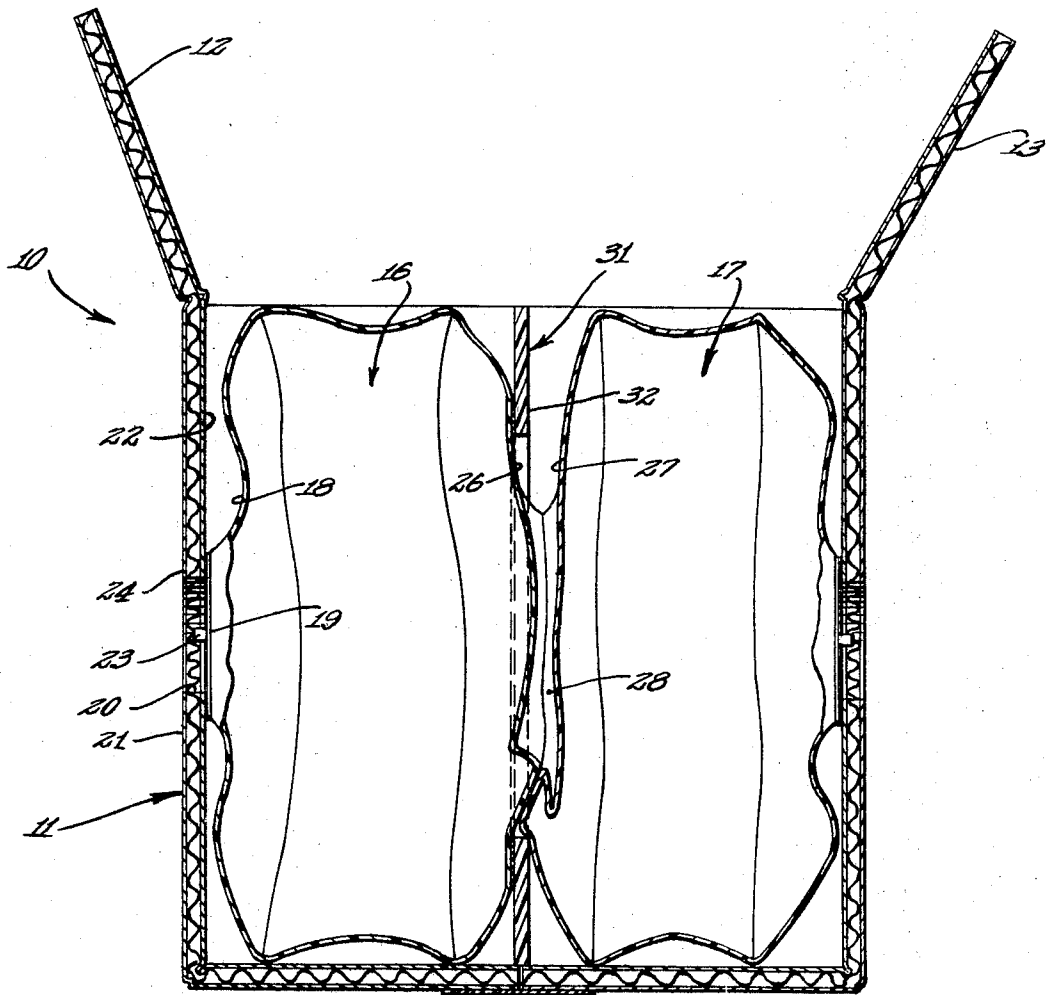
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FIG. 2



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**CUSHION PACKAGE**

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3 Claims

**ABSTRACT OF THE DISCLOSURE**

A cushioned package for frangible and the like goods including a closeable and sealable container in which is disposed a pair of inflatable pillows. The goods are placed between the pillows after which the container is closed and sealed. Air valves mounted on the sides of the pillows register with openings formed in the container to permit the pillows to be inflated from an external source of pressurized air after the container has been closed and sealed. A distance guard is employed within the container for securing the goods in a substantially central location between the pillows during inflation of the pillows.

**BACKGROUND OF THE INVENTION**

This invention relates generally to the field of packaging and more particularly to packages especially suitable for storing and transporting goods which, by the nature thereof, must be handled without substantial impact or within predetermined environmental control conditions.

Certain goods, such as extremely frangible items and reactive materials such as some explosives, must be handled in a manner so as to avoid sudden shock or impact forces to ensure safe transport without injury or undesirable reaction. Other goods, because of inherent characteristics, should desirably be handled and transported in closely controlled environmental conditions such as humidity, sterility, etc.

While many prior workers in the art have devised packaging structures for accommodating frangible goods or reactive materials or items requiring close environmental control, none of the packages of the prior art combines broad utility in the field of handling and transporting all three types of goods along with an inherent ability of the package to be re-used in succeeding packaging, transporting and storing operations.

It is an object of the present invention to provide a package structure which finds utility not only in the handling and transporting of frangible goods, reactive materials and items requiring close environmental control but which is inexpensive in manufacture, simple in use and capable of re-use.

**SUMMARY OF THE INVENTION**

In light of the foregoing the present invention may be summarized as comprising a closeable and sealable container such as a cardboard box or the like. A pair of inflatable cushions or pillows are disposed within the container in side-by-side relation and the goods to be handled or transported are interposed between the abutting wall portions of the two pillows. The pillows are equipped with air valves which register with apertures formed in the walls of the container and after the container has been closed and sealed, air is pumped into the pillows from outside the container. Means are provided for maintaining the goods in a relatively central position between the pillows as the pillows are being inflated but upon inflation the adjacent wall portions of the pillows form an air-tight pocket for the goods, which pocket is insulated against high impact and shock forces by the cushioning effect of the air within the pillows.

In one form of the invention the adjacent wall portions of the pillows are bonded together to form a generally U-shaped pocket for receiving the goods before the pillows are inflated and the goods centering means comprises a rigid annular member which is bonded to one of the pillows around the U-shaped pocket for maintaining the pocket in the center of the container as the pillows are being inflated.

In other forms of the invention the pillows are not bonded together but the goods are maintained in a central location within the container as the pillows are being inflated by virtue of a flat card-like distance guard or a wire-form distance guard to which the goods are secured.

Another object of the invention is to enable the goods to be visually inspected within the container and to this end the pillows are formed of transparent material such as clear plastic and a transparent window is formed in the wall of the container.

The walls of the pillows immediately surrounding the air valves may be bonded to the corresponding inner surfaces of the container to maintain registry of the air valves and the openings of the walls of the container for inflating the valves. The valves themselves are constructed and arranged so that, in the inflated state of the pillows, they do not protrude beyond the outer confines of the container.

Many other features, advantages and additional objects of the present invention will become manifest to those versed in the art upon making reference to the detailed description which follows and the accompanying sheets of drawings, in which preferred structural embodiments incorporating the principals of the present invention are shown by way of illustrative example only.

**BRIEF DESCRIPTION OF THE DRAWING**

FIG. 1 is an isometric view of a closed and sealed package constructed in accordance with the principals of the present invention.

FIG. 2 is an enlarged vertical sectional view of the package shown in FIG. 1 before the goods have been inserted into the container and before the pillows have been inflated and the lids of the container closed and sealed.

FIG. 3 is similar to FIG. 2 but discloses the relative disposition of parts after the goods have been inserted into the package, the container lids closed and sealed and the pillows inflated.

FIG. 4 is a sectional view taken along lines IV—IV of FIG. 3.

FIGS. 5 and 6 disclose other forms of the pillows and means for maintaining the goods in a central position therebetween.

**DESCRIPTION OF THE PREFERRED EMBODIMENTS**

Although the principles of the present invention are applicable in many packaging structures, they find particular utility in the field of packaging frangible goods, reactive material and items requiring close environmental control, and in the embodiment thereof indicated generally at reference numeral 10 in FIG. 1 comprise a container such as, for example, a cardboard box indicated at reference numeral 11 which is closed along the sides and bottom thereof and which comprises a pair of flaps or lids 12 and 13 at the top end thereof.

The appearance of the package 10 is that which obtains after the goods have been placed therein and the lids 12 and 13 have been turned in toward one another and sealed by suitable means such as a strip of adhesive tape or the like indicated at reference numeral 14.

The relative disposition of the parts of the container 10 which obtains before the goods have been placed

therein is shown in FIG. 2 and as noted therein the package 10 may be more particularly characterized as comprising a pair of inflatable pillows or cushions 16 and 17 housed within the confines of the container 11. The pillows 16 and 17 are preferably formed of relatively flexible material to the end that they may be inflated quite easily, may assume a configuration corresponding to the internal configuration of the container 11 most readily and may be wrapped about the outer confines of the goods therebetween quite closely.

Mounted on an end wall 18 of each of the pillows 16 and 17 is an air valve 19 arranged in registry with a corresponding aperture 20 formed in a side wall 21 of the container 11. In the form of the invention disclosed in FIG. 2, that portion of the pillow end wall 18 surrounding the air valve 19 is bonded to an inner surface 22 of the container end wall 21 to ensure proper registry of the air valve 19 and the aperture 20. The construction of the valves 19 is such that even in the inflated condition of the pillows 16 and 17 the outermost extremity of the valves does not protrude beyond the outer confines of the container 11, that is, beyond an outer surface 24 of each of the end walls 21.

The pillows 16 and 17 further comprise mutually adjacent or interfacing wall portions 26 and 27 which are bonded together by suitable means such as an adhesive connection, heat seal or the like in a central portion 28 of the pillows 16 and 17 to provide a generally U-shaped pocket as indicated at reference numeral 29 in FIG. 4, which pocket opens to the top end of the container 11. The open-ended pocket 29 is adapted to receive the goods which are to be handled or transported, and an exemplary illustration of such goods is indicated at reference numeral 30 in FIGS. 3 and 4.

As a result of the flexibility of the walls of the pillows 16 and 17 the pillows have a tendency to sag toward the bottom of the container 11 in the deflated state thereof as illustrated in FIG. 2. As a consequence of this sagging there would normally be a tendency for the pocket 29 which holds the goods 30 to maintain an off-center position with respect to the container 11 after the container is closed and the pillows 16 and 17 are inflated.

To preclude this off-center positioning of the goods an annular member or distance guard indicated at reference numeral 31 is interposed between the pillows 16 and 17 and is sized according to the inner dimensions of the container 11 after it has been closed and sealed.

In the embodiment shown in FIGS. 2-3 the distance guard 31 comprises a flat annularly-shaped member, the perimeter of which abuttingly engages the adjacent inner surfaces of the walls of the container 11 to the end that member 31 is precluded from movement other than axial movement by the inner walls of the container 11.

A radially inner portion 32 of the member 31 is bonded by suitable means to the wall portion 26 of the pillow 16. Since the member 31 is constrained in the closed condition of the container 11, likewise is the U-shaped pocket 29 and the goods 30 received therewithin.

In using the cushioned container 10 the flaps 12 and 13 of the container 11 are initially opened to the positions thereof shown in FIG. 2. The pillows 16 and 17 are in a deflated state, thus permitting easy access of the goods 30 into the pocket 29 formed between the pillows 16 and 17 from the top open end of the container 11.

After the goods 30 are placed within the pocket 29 the flaps 12 and 13 are folded over to the closed position thereof and are sealed by means of the adhesive tape or the like 14 in the usual manner.

The pillows 16 and 17 are then inflated by means of the air valves 19 and as a concomitant of such inflation, the pillows expand to substantially the size of the inner confines of the container 11.

This expansion also causes the adjacent wall portions 26 and 27 of the pillows 16 and 17 to wrap quite snugly around the goods 30 and to abut one another in a ring-

shaped pattern surrounding the pocket 29 to provide an air-tight seal completely around the goods 30.

The distance guard 31 performs the function of centering the pocket 29 and the goods 30 as the pillows 16 and 17 are being inflated, but once inflated, the pillows themselves, by snugly occupying the space within the container 11 and by being immobile with respect to the container 11, serve to maintain the goods 30 in a central position within the container 11 and therefore in spaced relation to the walls of the container.

In the inflated state of the pillows 16 and 17 as shown in FIGS. 3 and 4 the goods 30 are insulated from severe shock or impact forces by virtue of the air cushion which completely surrounds the goods. Furthermore, the abutting portions of the pillow walls 26 and 27 provide an air seal around the pocket 29, and thus if the goods 30 require a closely controlled environmental condition it is only necessary that the goods be placed into the package 10 in a satisfactory ambient condition, since upon inflation of the pillows 16 and 17 the environmental conditions will remain constant within the pocket 29.

Another arrangement of the pillows is illustrated in FIG. 5, wherein the reference numerals indicating parts similar to those shown in FIGS. 1-4 are indicated by similar reference numerals with the suffix "a" added. In the embodiment shown in FIG. 5 the pillows 16a and 17a are not bonded together at the interfaces thereof but are instead completely separate and independent members. The distance guard for maintaining the goods 30a in a central position relative to the container 11 comprises a flat planar rigid card-like member 31a which is perforated as indicated at reference numeral 33. In this embodiment the member 31a is rectangularly shaped to lightly abut the inner surfaces of the container 11 along its entire perimeter, but it will be understood that the member 31a can also be annularly-shaped in the manner of member 31.

The goods 30a are secured to the member 31a by any suitable fastening means such as a strip of adhesive tape or the like. The distance guard 31a maintains the goods 30a in a central position within the container 11 as the pillows 16a and 17a are being inflated.

While member 31a has been described as being constituted of rigid material, the degree of rigidity is only that which is required to maintain the goods 30a in a central position during inflation of the pillows 16a and 17a, and is sufficiently flexible and resilient to preclude the transmission of any substantial impact or shock force from the wall of the container to the goods 30a.

In the embodiment shown in FIG. 6 the pillows 16b and 17b are also separate and independent members and the distance guard interposed therebetween comprises a rectangularly-shaped wire-form frame 34 across which extend in transverse directions a pair of wire strands 36 and 37 which cross each other centrally of the frame 34. The goods 30b are secured to the strands at the intersection thereof by suitable fastening means such as a length of string or the like as indicated at reference numeral 38.

With respect to the embodiment shown in FIG. 6 it will be appreciated that the frame 34 is constructed of a wire-form element sufficient rigid to maintain a central position of the goods 30b during inflation of the pillows 16b and 17b but is not so rigid as to transmit any appreciable shock or impact forces from the sides of the container 11 to the goods 30b.

Although minor modifications might be suggested by those versed in the art, it should be understood that I wish to embody within the scope of the patent warranted hereon all such modifications as reasonably come within the scope of my contribution to the art.

In order to enable the goods to be visually inspected within the container 11 the pillows 16 and 17 may be formed of a clear flexible plastic material or other transparent material. The container 11 may then be provided

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with a clear window 40 as indicated in FIG. 1, the window also being constituted of clear plastic but having a degree of rigidity sufficient to enable the window to serve as a portion of the wall of the container.

What I claim is:

1. A cushioned package for frangible and the like goods comprising
- a closeable and sealable hollow container having a pair of apertures opening through the walls thereof, and
  - a pair of inflatable pillows made of flexible sheet-form material disposed within the container in side-by-side relation and having air valves mounted thereon in register with said apertures for inflating the pillows from outside the container after the container has been closed and sealed,
  - said pillows having wall portions situated adjacent one another in the assembled positions thereof within the container to receive the goods therebetween in the deflated state of the pillows and to abut one another in the inflated state of the pillows to provide a sealed pocket within which the goods are encapsulated,
  - said adjacent wall portions being bonded together to provide a substantially U-shaped pocket therebetween for receiving the goods and for maintaining the goods therein in a central location within the container during inflation of the pillows.
2. A cushioned package for frangible and the like goods comprising
- a closeable and sealable hollow container having a pair of apertures opening through the walls thereof, and
  - a pair of inflatable pillows made of flexible sheet-form material disposed within the container in side-by-side relation and having air valves mounted thereon

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in register with said apertures for inflating the pillows from outside the container after the container has been closed and sealed,

said pillows having wall portions situated adjacent one another in the assembled positions thereof within the container to receive the goods therebetween in the deflated state of the pillows and to abut one another in the inflated state of the pillows to provide a sealed pocket within which the goods are encapsulated, and

means for bonding said pillows to the walls of said container to maintain registry of said air valves and said apertures.

3. The cushioned package as defined in claim 1, and distance guard means comprising a rigid annularly shaped member permanently affixed to said adjacent wall portion of one of said pillows.

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U.S. Cl. X.R.

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