

[54] **CARTON WITH HINGE LATCH CLOSURE**
[75] Inventor: **Wayne Congleton, Whittier, Calif.**
[73] Assignee: **Dolco Packaging Corporation, North Hollywood, Calif.**
[22] Filed: **Dec. 22, 1971**
[21] Appl. No.: **210,995**

3,556,387 1/1971 Trimble 229/45
3,339,781 9/1967 Schurman et al. 220/31 S
2,744,650 5/1956 Woessner 220/4 E

Primary Examiner—George E. Lowrance
Assistant Examiner—Stephen Marcus
Attorney—Robert Berliner

[52] **U.S. Cl.** **229/45, 206/65 R, 220/4 B, 220/31 S, 220/60 R**
[51] **Int. Cl.** **B65d 45/20, B65d 43/00**
[58] **Field of Search** **229/44, 45; 220/31 R, 31 S, 55 R, 55 G, 59, 60 R, 4 B, 4 E; 206/65 R; 292/300, DIG. 38**

[56] **References Cited**
UNITED STATES PATENTS
3,536,251 10/1970 Edwards 229/45
3,298,594 1/1967 Makowski et al. 229/45
3,499,525 3/1970 Kanter 220/31 S

[57] **ABSTRACT**
A carton is disclosed including a pair of space-defining members, each with a closing edge and further including an integral hinge-latching structure. A tab or flap extends from one of the closing edges to pass beyond the edge of the other member, then extends normally or parallel to the edges, and is received in a locking well that is defined in the second member for mating surface engagement. Cartons are disclosed with the closure structure functioning both as a hinge and a latch.

8 Claims, 6 Drawing Figures

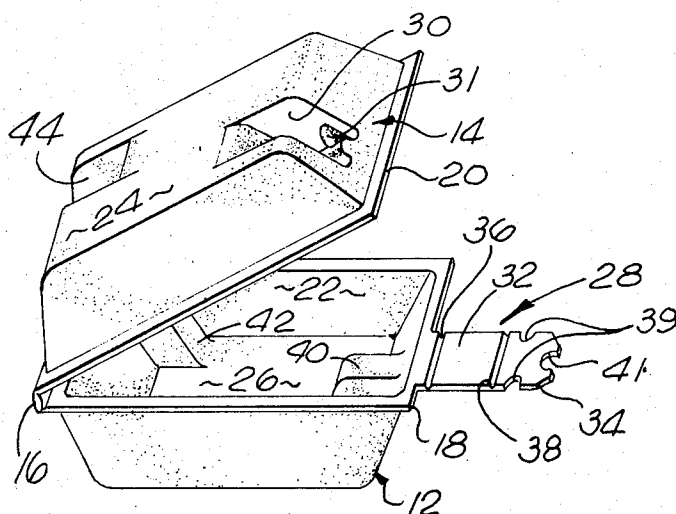


Fig. 1.

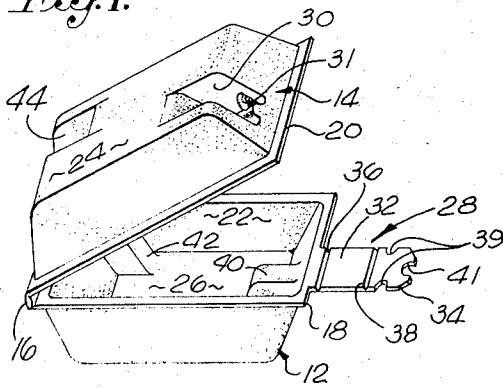


Fig. 2.

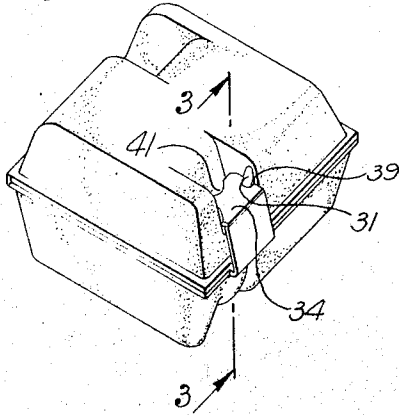


Fig. 4.

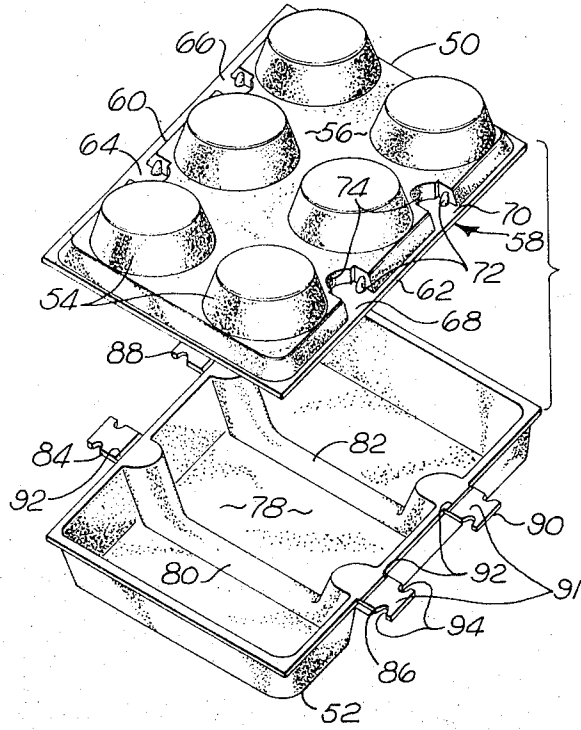


Fig. 5.

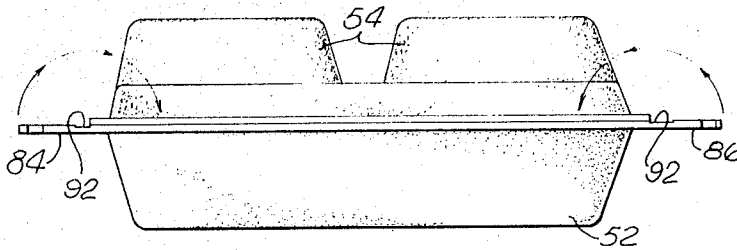


Fig. 3.

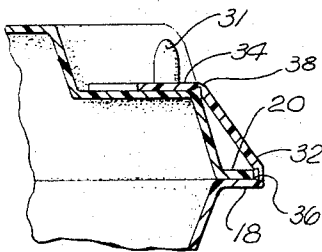
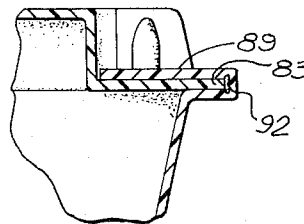


Fig. 6.



CARTON WITH HINGE LATCH CLOSURE

BACKGROUND AND SUMMARY OF THE INVENTION

The manufacture of disposable containers, as for various solid but delicate articles generally involves a highly-developed technology. As a consequence, relatively small or slight structural modifications may result in substantial improvements for such a carton or package, both with regard to economy and quality. That is, a relatively slight departure from prior structures may constitute an important and significant improvement in the art.

Recognizing the above considerations, it is significant that a multitude of cartons have been developed and used which incorporate closure latches and hinges that are integral with the actual carton. For example, various forms of cartons are in widespread use, in which two closing sections are folded together, with the fold line serving as a hinge so that the carton can be repeatedly opened and closed. Somewhat similarly, integral latch structures also have been included in cartons in many different specific forms.

One class of integral-carton latch structures employ a latch tab or flap extending from one part (top) of the carton for mating engagement with a retainer on the other section (bottom) of the carton. In some prior structures, such tabs are formed of resilient material to provide a spring action, as for more effective latching. Such a structure is disclosed in U.S. Pat. No. 3,536,251 (Edwards). Various structures in widespread use also involve positive locking engagement between latching members, as disclosed in U.S. Pat. No. 3,556,387 (Trimble) for example.

Generally, any integral-carton, latch structure requiring that a tab be inherently resilient imposes rather severe limitations upon the material that may be employed in the carton. As a consequence, cartons incorporating such structures are somewhat limited in application. Alternatively, various positive-locking structures often have latch posts or other members that are stressed in relation to the applied separating forces. The manner in which such members are stressed tends to determine the capacity of the closure. For example, a plane tab of carton material can offer small resistance to bending forces; however, tension forces are effectively resisted. As a result, the engagement between various members of conventional carton materials sometimes tends to be rather ineffective to resist forces that accidentally open the carton. Accordingly, a need exists for an improved carton incorporating an effective integral latching mechanism. More specifically, important features of such a mechanism reside in: ability to maintain a carton closed, economy of manufacture, ability to withstand vibration and shock and convenience of use. Generally, the present invention provides an improved structure in view of such considerations, and additionally with the capability to function as a hinge as well as a latch. In general, the present invention may be embodied in a carton, in which a flap extends from one carton segment and is bent at a substantial angle (usually 180°) to be matingly received in a locking well that is defined on another carton segment. A portion of the flap is provided in surface engagement with a locking well to accomplish frictional engagement to resist forces tending to open the carton,

until the flap deliberately is withdrawn from the locking well.

BRIEF DESCRIPTION OF THE DRAWING

In the drawing, which constitutes a part of this specification, exemplary embodiments exhibiting various objectives and features hereof are set forth, specifically:

FIG. 1 is a perspective view of a carton constructed in accordance herewith shown in an open configuration;

FIG. 2 is a perspective view of the carton of FIG. 1 in a closed configuration;

FIG. 3 is a vertical sectional view taken along line 3—3 of FIG. 2;

FIG. 4 is a perspective view of an alternate form of carton incorporating the structure hereof illustrated open and upside down;

FIG. 5 is a side elevational view of the structure of FIG. 4, shown partially closed; and

FIG. 6 is a sectional view through a fragment of the structure of FIG. 5 in a totally closed configuration.

DESCRIPTION OF THE ILLUSTRATIVE EMBODIMENTS

As required, detailed illustrative embodiments of the invention are disclosed herein. The embodiments exemplify the invention which may, of course, be embodied in other forms, some of which may be radically different from the illustrative embodiments. However, the specific structural and functional details disclosed herewith are representative and they provide a basis for the claims herein which define the scope of the invention.

Referring initially to FIG. 1, there is shown a carton for containing a pair of conventional light bulbs (not shown) which carton includes a bottom space-defining member 12 and a top space-defining member 14. The top and bottom members 12 and 14 are affixed together by an integral hinge 16 so that they may be opened and closed in aligned facing engagement.

A bottom flange or lip 18 extends outwardly from the peripheral edge of the member 12 (except along the hinge 16) and a similar flange or lip 20 extends radially from the member 14. Generally, the members 12 and 14 each define a space that is closed on five sides so as to provide a common chamber 22 therebetween when the members are closed with the lips 18 and 20 in surface engagement. That is, the lips 18 and 20 extend outwardly, substantially parallel to the top 24 (member 14) and the bottom 26 (member 12) to afford abutting surfaces when closed together.

As indicated, the members 12 and 14 comprise an integral unit, which may be formed, for example of expanded plastic such as expanded polystyrene with the hinge 16 simply comprising a line of weakness in the integrally-molded structure. Additionally, a flap 28 is integral with the bottom member 12 and extends in the plane of, and from the lip 18, to provide a latch for engagement with a locking well 30 which is defined in the upper member 14. Specifically, the flap includes a closure-holding portion 32 and a locking portion 34, which portions are defined by lines of weakness 36 and 38 to facilitate two folds, each of some ninety degrees.

The lower member 12, of the container, also defines an internal shelf 40 which is aligned to oppose the internal abutment formed by the well 30 in the upper

member 14. That is, the well 30 results in an abutment in the member 14 that is similar to the shelf 40, in view of the substantially-uniform wall thickness of the members 12 and 14. Accordingly, the interior shelves provide a clamp for nonuniform objects as light bulbs, that are received in the container. Diametrically opposed to the above shelves, similar shelves are defined by indentations 42 and 44 for the same holding purpose; however, without the cooperative latching structure.

The entire composite structure as considered above, may be formed as an integral unit in a single molding operation. Various molding techniques as pressure forming polystyrene sheet stock, for example, may be effectively employed to accomplish the desired form. Thereafter, die-cutting techniques may be employed to provide the structure substantially as disclosed above with the lines of weakness defined thereon. Match mold forming, vacuum forming or other forming and cutting techniques may also be used to produce the illustrative embodiment or various other embodiments hereof.

In the function of the specific illustrative embodiment, to hold a pair of light bulbs, such articles are seated in opposed alignment so that the sockets of the bulbs each lie on one of the shelves in the member 12, as considered above. Specifically, for example, the socket of one of the bulbs is placed to lie on the shelf 40 while the socket of the other bulb lies upon the shelf 42.

The upper member 14 is then simply lowered to close the space 22 with the lips 18 and 20 aligned in surface engagement and the shelves closed to engage the bulb sockets. Latching the members 12 and 14 together is then accomplished very simply by folding the flap 28 upwardly along the line 36 (FIG. 3) so that the closure-holding portion 32 of the flap extends across the lip 20. Next, the locking portion 34 of the flap 28 is folded inwardly along the line 36 to extend toward the container so as to be received in the locking well 30 (FIG. 2). In that position, the keyways 39 in the horizontal locking portion 34 matingly receive the vertical keys 31 which are defined by the upper member 14 in the locking well 30.

Thus, the locking portion 34 of the flap 28 is locked in surface engagement with the locking well 30 so that the portion 34 is substantially normal to the closure holding portion 32. Note the article (bulb) inside the carton supports the surface of the well 30. Consequently, any forces that are applied to the container, tending to separate the members 12 and 14, stress the portion 32 of the flap 28 in tension, and are relieved at the surface of the well 30. Such forces (within limits) simply tend to pull the locking portion 34 of the flap 28 downwardly (FIG. 3) into firmer seated engagement with the locking well 30 and are well resisted, maintaining the carton closed.

To open the container, it is simply necessary to lift the holding portion 34 (FIG. 2) of the flap 28 from the locking well 30 so that it swings up and out of the well 30. Thus, the keyways 39 are disengaged from the keys 31. This operation is facilitated by the lift notch 41 provided at the end of the flap 28 into which a person may force his finger to lift the flap.

From the above, it may be seen that a carton is provided embodying an effective closure which is relatively easy to release deliberately; however, which will withstand considerable forces without opening acci-

dentally. It is also to be noted that the provision of a locking well 30, as disclosed above in conjunction with an internal surface for engaging contained items affords considerable flexibility in structures embodying the concepts hereof. As another element of flexibility, of the structure, the closure may also be provided to function as a hinge as will now be considered with reference to FIGS. 4, 5 and 6 disclosing another embodiment of the present invention.

Generally, the second embodiment is in the form of a fruit carton, as for apples, and for purposes of greater clarity is depicted upside down in the FIGURES. Generally, a cup-defining member 50 constitutes the bottom while a flap-bearing member 52 serves as the top or cover. The member 50 defines a plurality of cups 54 to receive apples (or other objects) in the illustrative embodiment. The cups are connected by a web 56 which is coplanar with a flange or lip 58 extending transversely from the cups 54 and serving as the contact surface on closing.

Adjacent to the lip 58 at the opposed sides 60 and 62 of the member 50, pairs of spaced-apart locking wells are formed. Specifically, wells 64 and 66 are defined along the side 60 while wells 68 and 70 are defined along the side 62. Somewhat as described above, the wells 64, 66, 68 and 70 each include a pair of side keys 72 and additionally incorporate arcuate access spaces 74.

The lower member 52 (as shown) of the container as disclosed in the FIGURES defines a somewhat parallelepiped space 78 and incorporates a pair of reinforcing parallel ribs 80 and 82 extending between opposed pairs of flaps. Specifically, a rib 80 extends between flaps 84 and 86 while a rib 82 extends between flaps 88 and 90. The flaps 84, 86, 88 and 90 each have a locking portion 91, and a closure-holding portion 92 (comprising a line of weakness to accomplish two right-angle folds). Opposed keyways 94 are defined in each of the flaps for mating engagement with the keys 72.

Generally, the members 50 and 52 may be formed by similar techniques as those indicated for the formation of the previously-disclosed embodiment. Of course, the container of the embodiment of FIG. 4 is formed as two separate or independent integral members, i.e., the members 50 and 52. Generally, the closure structure hereof then accomplishes a locking and hinging relationship between the two members to afford a structure of considerable convenience.

In using the embodiment of FIG. 4, the members 50 and 52 are closed with the contained items therein, e.g., apples positioned in each of the cups 54. Next, with the peripheral lips 58 and 83 in facing engagement, each of the flaps 84, 86, 88 and 90 is folded through two right-angle turns so that the locking portions 91 are matingly received within the locking wells 64, 68, 66 and 70, respectively. That is, from the lateral extension of the flaps (FIG. 5), each is folded to extend upwardly and inwardly (FIG. 6) so that the closure-holding portions 92 extend across the lip 83 with the locking portions 89 received in an aligned locking well. Thus, the flaps are folded through an angle of 180°, so that the locking portions extend in substantially the same plane as the plane of separation for the container. As a result, the considerations regarding locking as disclosed above with reference to the initial embodiment are fully applicable. Furthermore, it is apparent that the portions 92 may serve as hinges. That is, with one

aligned pair of closure structures open and the other aligned pair engaged, a hinged arrangement is provided. In that sense, the engaged closures simply remain engaged with the portions 92 accommodating a swinging motion.

After closure, to release or open the closed structure (FIG. 5) the flaps along one edge (either 60 or 62) are lifted by use of the access spaces 74 disengaging one pair of flaps. The other pair of flaps then function as a hinge, as indicated above, enabling convenient access to the inside of the container. Thus, the latching structure as disclosed above is not only effective, convenient and economical, but it may be conveniently employed to accomplish a hinge as well as a latch.

Of course, many variations hereof are possible and, accordingly, in that regard the scope hereof is deemed to be in accordance with the claims as set forth below.

What is claimed is:

1. A carton comprising:

a first space-defining member including a first closing edge;

at least one somewhat flat flap extending from said first member at a location contiguous to said first closing edge, and including a closure holding portion and a locking portion said portions being separated by a hinge line and said locking portion defining at least one keyway;

a second space-defining member including a second closing edge for engagement with said first closing edge to define a chamber between said members, said second space-defining member defining a locking well including at least one key, for receiving said locking portion of said flap in locked surface facing engagement, whereby said keyway re-

ceives said key with said locking portion lying somewhat normal to said closure holding portion, said holding portion extending across said second closing edge to hold said space-defining members together.

2. A carton according to claim 1 wherein said second member defines a locking well having a surface for engagably receiving said locking portion of said flap, which surface is substantially coplanar with said closing edges.

3. A carton according to claim 1 wherein said locking portion of said flap defines keyways including two opposed arcuate indentations.

4. A carton according to claim 1 wherein a section of said first edge is connected to a section of said second edge to provide a hinge between said first and second closure members.

5. A carton according to claim 1 wherein said carton comprises expanded plastic material.

6. A carton according to claim 1 wherein said carton comprises expanded polystyrene.

7. A carton according to claim 1 wherein said flap is integral and co-extensive with said first closing edge.

8. A carton according to claim 7 wherein said second member defines a locking well having a surface for engagably receiving said locking portion of said flap, which surface is substantially coplanar with said closing edges; wherein said keyway in said locking portion of said flap comprises at least one indentation and wherein said key in said second closure member comprises an extension in said locking well to matingly engage said indentation; and wherein said carton comprises expanded plastic material.

* * * * *

35

40

45

50

55

60

65