Dec. 18, 1962 D. R. BEBOUT ET AL 3,069,065

DOUBLE ACTION TAB LOCK FOR HINGED CARTON CLOSURES

Filed Feb. 16, 1961

2 Sheets-Sheet 1

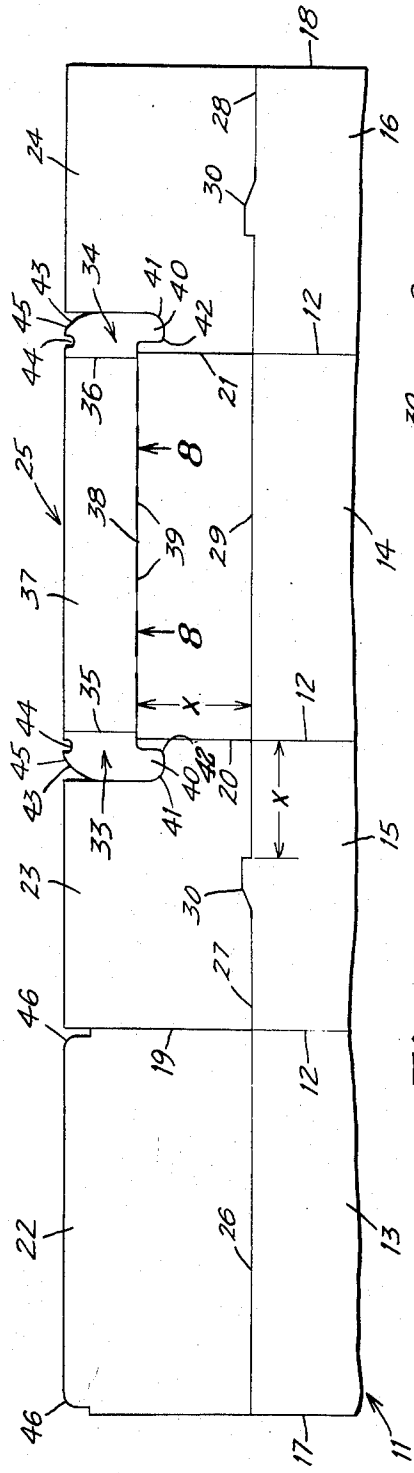


Fig. 2

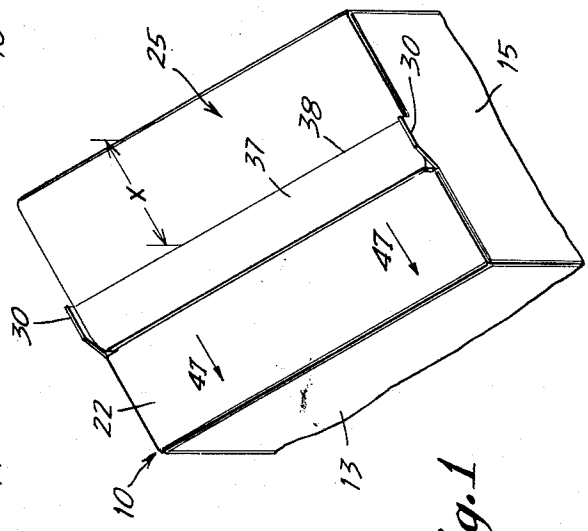


Fig. 1

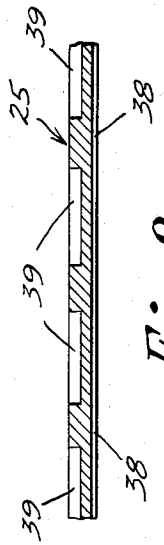


Fig. 8

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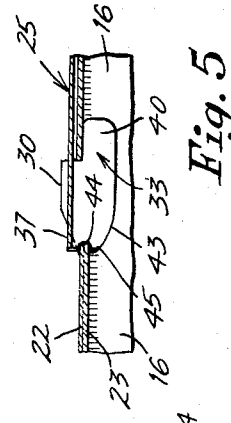


Fig. 5

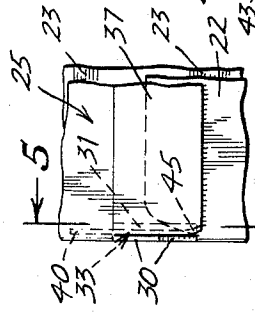


Fig. 6

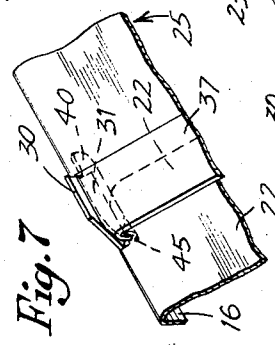


Fig. 7

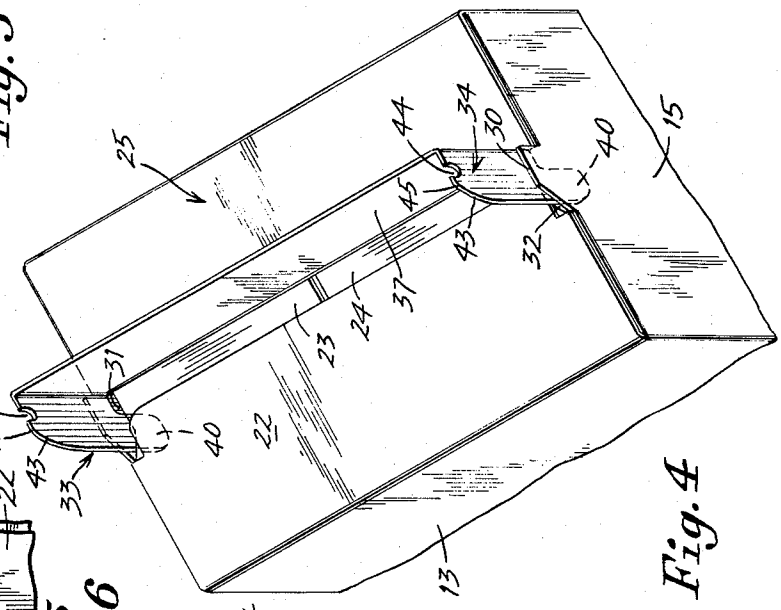


Fig. 4

Fig. 3

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DOUBLE ACTION TAB LOCK FOR HINGED CARTON CLOSURES

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9 Claims. (Cl. 229—45)

This invention relates to a reusable double action tab lock for hinged carton closures.

Generally, there is provided a carton formed usually from a single simultaneously die cut and scored blank of cardboard, sheet plastic or other flexible and somewhat resilient material. The carton has a row of panels hingedly joined by scored lines and conventionally joined at its free ends to form the circumferentially continuous side and end walls of the container. The top closure of the carton (the bottom being conventional and, therefore, not shown) comprises a pair of inwardly foldable end flaps, a single panel front flap and a rear flap scored and perforated to divide the same into two parallel hinged sections, the freer one of which has integrally joined downturned locking tabs at its ends.

The novel locking tabs have heel portions adapted to lock under the end flaps after swinging through slots therein adjacent the hinges thereof. The locking tabs have curved front ends that cam downwardly past the forwardly constricted ends of their receiving slots, and the curved front ends are notched to "snap" over the end flaps at the constricted ends of the slots therein. This action provides secondary locks or latches for preventing inadvertent unlocking of the primary locks formed by the heel portions of the locking tabs.

It is accordingly an object of this invention to provide a container having a closure including inwardly folding overlappig flaps and locking tabs on the ends of at least one flap, said tabs each having a locking proturberance at one end thereof and a locking-securing latching notch at the other end, both being engageable under aother flap at the ends of a tab-receiving slot therein.

It is another object to provide such a device in which the tab-carrying flap is scored parallel to its base hinge to define an articulated tab for facilitating insertion and locking of the locking tabs in their cooperating slots.

It is a further object of the invention to provide a double locked reusable locking tab structure for folded blank cartons which is simple in construction, inexpensive to manufacture and yet effective and efficient in use.

Other and further objects of the invention will become apparent from a reading of the following specification taken in conjunction with the drawings, in which:

FIGURE 1 is a perspective view of a closed carton embodying the invention;

FIGURE 2 is a plan view of the closure portion of the blank, die cut and scored, prior to assemblage;

FIGURE 3 is a perspective view of the carton showing three of the closure flaps closed;

FIGURE 4 is a perspective view showing the fourth closure flap moved to the position at which the locking operation begins;

FIGURE 5 is a fragmentary elevational view of a locking assemblage, in section, taken on line 5—5 of FIGURE 6;

FIGURE 6 is a fragmentary plan view of the lock of FIGURE 5;

FIGURE 7 is a fragmentary, perspective view of the showing of FIGURE 5; and,

FIGURE 8 is an enlarged fragmentary, elevational view in section, taken on line 8—8 of FIGURE 2.

With reference now to the drawings, numeral 10 generally designates the carton as a whole and numeral 11 the blank (paperboard, sheet plastic, etc.) from which the carton is formed. Blank 11 is divided by score lines 12 into front and rear panels 13 and 14 respectively and end panels 15 and 16. The free vertical edges 17 and 18 of panels 13 and 16 are conventionally joined, as by adhesive tape, not shown, to form the circumferentially continuous side walls of carton 10.

Slits 19, 20 and 21 divide the upper portion of blank 11 into four closure flaps: a front flap 22, side flaps 23 and 24 and rear flap 25. Closure flaps 22—25 are integrally and hingedly joined to the upper edges of wall panels 13, 15, 16 and 14, respectively, along score lines 26—29.

Score lines 27 and 28 are centrally interrupted where the die cuts 30 are made to form similarly shaped slots 31 and 32 in the hinged margins of closure panels 23 and 24, respectively. Slots 31 and 32 lockingly receive the locking tabs 33 and 34 die cut as integral extensions from the lateral extremities of rear closure panel 25.

Locking tabs 33 and 34 are integrally and hingedly joined along score lines 35 and 36 to lock tab mounting flap portion 37. Flap portion 37 is hingedly and integrally joined to the remainder of the closure flap 25 along score line 38 which is made more flexible than the other score lines of the carton by the spaced die cuts 39 (FIGURES 2 and 8). Die cuts 39 extend only partway through blank 11 toward score line 38 and are preferably omitted toward the extremities of score line 38 to prevent tearing of flap portion 37 away from the base portion of closure flap 25.

Each of the downwardly bendable locking tabs 33 and 34 has a primary locking portion or heel 40 which lockingly engages under the margin of one of the end flaps 23 and 24 adjacent its score line hinge 26 or 28 beyond the wide end of slot 31 or 32, as best seen in FIGURE 5. Heel portions 40 are rounded at 41 and 42 to facilitate insertion of portions 40 into slots 31 and 32.

The other ends of locking tabs 33 and 34 are rounded at 43 to provide cam-like surfaces which facilitate full insertion of said tabs into the slots 31 and 32, especially at the progressively narrowing or tapered ends of said slots. Vertical end edges of tabs 33 and 34 opposite the heels 40 are notched at 44 to provide small latch tongues 45 which squeeze through the narrow ends of slots 31 and 32 and engage under the inner margins thereof, as best shown in FIGURES 5 and 6, to provide secondary latches or locks for preventing unlocking swinging of the tabs upwardly through slots 31 and 32 which would permit unlocking movement of the primary locking heels 40 out from their closure locking engagement under closure flaps 23 and 24.

The corners of closure flap 22 are rounded at 46 to prevent catching of tabs 33 and 34 thereon as they are swung downwardly through slots 31 and 32.

When the carton is assembled, as shown in FIGURE 3, and end closure flaps 23 and 24 are folded inwardly thus toward each other and partially covered by front closure flap 22, the rear closure flap 25 is bent about its scored and partially cut fold line 38—39 so that its two sections are approximately at right angles to each other, as shown. With the sections held in this angular relationship, flap 25 is moved to the position thereof shown in FIGURE 4, which movement and relative positions of the sections cause the heels or primary locking portions 40 to pass freely through locking slots 31 and 32.

Downward and forward pressure on tabs 33 and 34 (preferably simultaneously applied at their junctions with flap section 37) causes said flaps to wedgingly and cammingly squeeze through slots 31 and 32 until the ends of said slots snap into the notches 44 to bring the latching detents 45 under the end and/or lateral margins of the pointed ends of slots 31 and 32, as best seen in FIG-

URES 5 and 6. Rearward pressures exerted in the directions of arrows **47** in FIGURE 1 will unlatch the secondary locking detents or latch tongues **45** to permit swinging of section **37** of flap **25** to its FIGURE 4 position in which the primary locking heels **49** are disengaged from under the margins of slots **31** and **32** in end flaps **23** and **24** to permit opening of the carton. The opening and closing cycles can be repeated as often as the durability of the carton material makes possible.

While the foregoing presents a preferred embodiment of the present invention, it is obvious that other modifications and/or equivalents may be employed without departing from the scope of the invention, which is defined in the appended claims.

What is claimed is:

1. In a carton comprising edge-joined panels defining circumferentially continuous carton walls, closure flaps inwardly swingably hinged to certain of said panels in overlapping closure forming relationships, certain of said flaps having elongated slots therein adjacent the hinged margins thereof, the improvement comprising locking tabs fixed to opposite end edges of at least one of said closure flaps remote from the hinged edge thereof, said locking tabs having primary locking detent fingers at one end of each tab engageable through said slots and under said certain flaps adjacent ends of said slots, the opposite ends of said tabs having secondary locking detent fingers engageable under said certain flaps adjacent the other ends of said slots, said at least one flap being bendable about an axis substantially parallel to and remote from the hinged margin thereof to provide a fulcrum about which said tabs pivot in the locking and unlocking movements thereof and to permit insertion of said primary locking tab portions into said slots and then being straightenable to provide, successively, locking engagement of said tab portions under said certain flaps, next substantially full insertion of said tabs into said slots and finally engagement of said secondary locking detent fingers under said certain flaps, said fulcrums being much closer to said primary detent fingers than to said secondary detent fingers whereby the holding forces exerted by said primary detent fingers are several times those exerted by said secondary detent fingers.

2. Structure according to claim 1, said certain flap having a score line substantially parallel to its free edge for providing said axis of bendability thereof utilized in insertion and removal of said locking tabs from said slots.

3. Structure according to claim 2, the hinge formed by said last-mentioned score line being rendered more flexible by a series of breaks in at least one face of said certain flap along said score line.

4. Structure according to claim 3, said breaks being confined to the central portions of said score line to minimize likelihood of breaking of said hinge at the ends thereof.

5. Structure according to claim 1, said locking tabs being die cut from adjacent corners of adjacent closure flaps whereby the blank for said carton will not require material wasting areas from which said tabs are cut.

6. Structure according to claim 1, said slots being constrictedly tapered toward one end thereof for more positive engagement of said secondary locking detent fingers under the margins of said slot.

7. Structure according to claim 6, said locking tabs having curved edges for facilitating camming of said tabs through said slots in completing the locking action.

8. Structure according to claim 1, said locking tabs having rounded corners to facilitate insertion and locking movements of said tabs into and through said slots.

9. Structure according to claim 1, said primary locking portions of said locking tabs extending toward the hinged edge of said at least one closure flap in the locking positions thereof whereby any bowing of said closure flap will tend to produce a firmer locking engagement of said locking portions thereof under said certain flaps.

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