

May 16, 1961

M. W. KUCHENBECKER

2,984,400

CARTON LOCK

Filed June 10, 1959

2 Sheets-Sheet 1

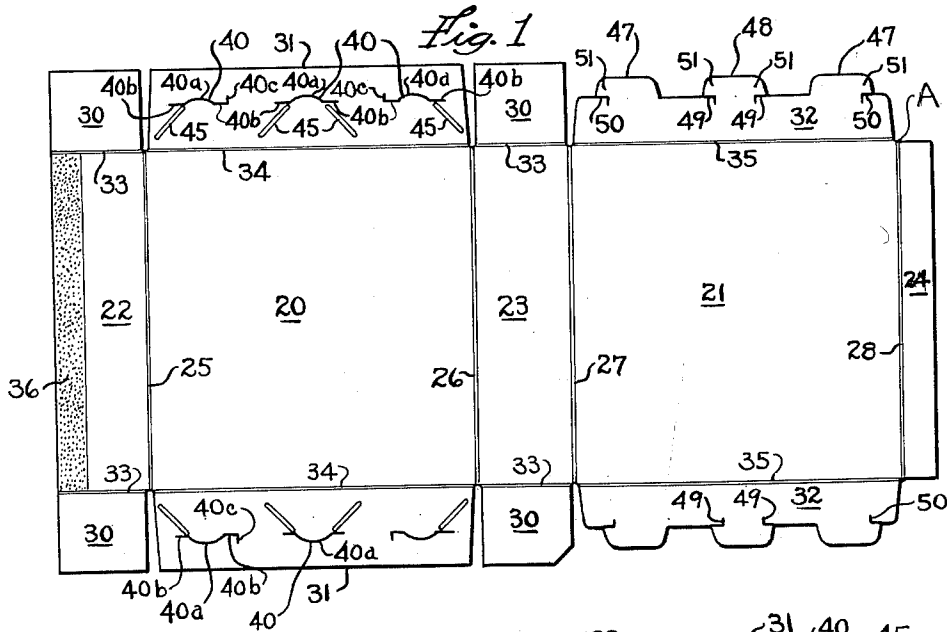


Fig. 2

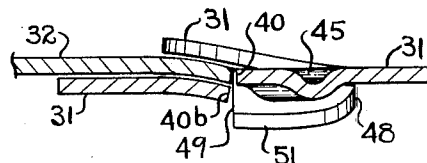
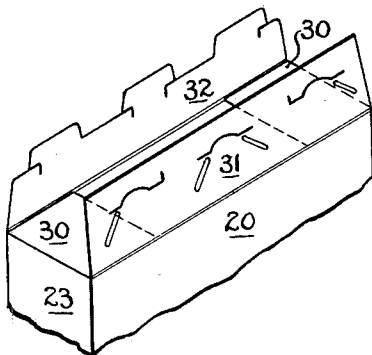


Fig. 5

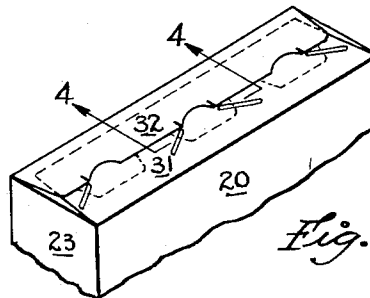
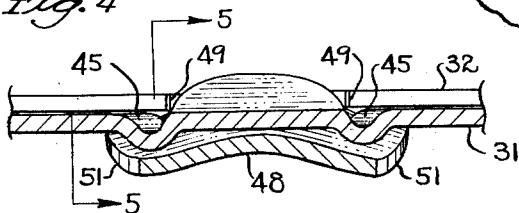


Fig. 3

Fig. 4



INVENTOR.  
MORRIS W. KUCHENBECKER  
BY *Morris W. Kuchenbecker*  
*G. L. K. K. K.*  
ATTORNEYS

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M. W. KUCHENBECKER

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2 Sheets-Sheet 2

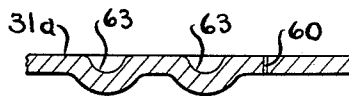
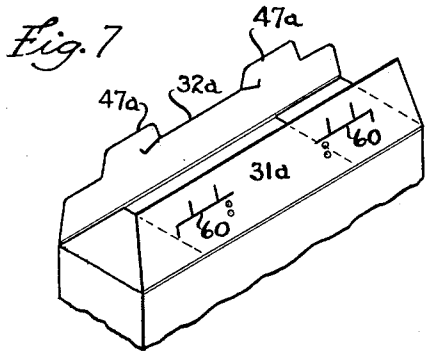
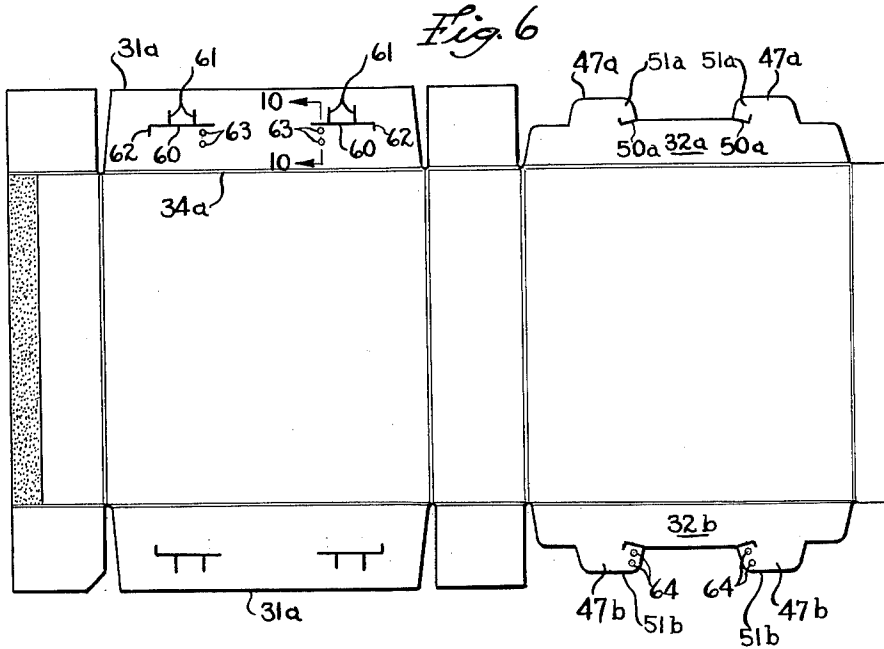


Fig. 10

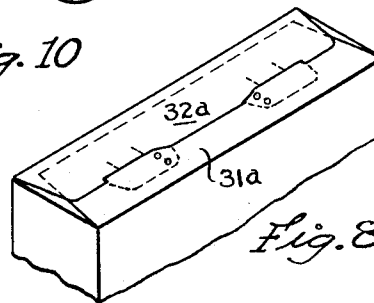


Fig. 8

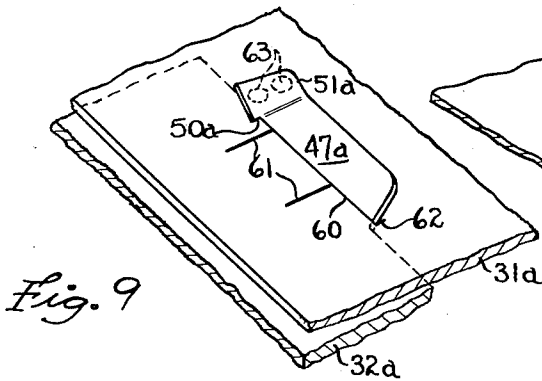


Fig. 9

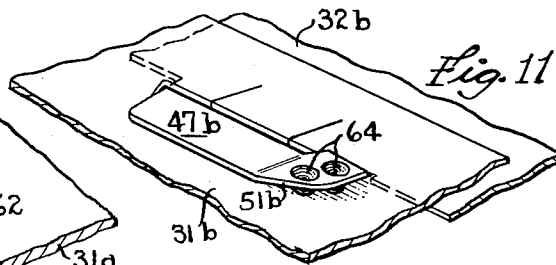


Fig. 11

INVENTOR.  
 MORRIS W. KUCHENBECKER  
 BY  
*Henry S. Verhagen*  
*George R. Koster*  
 ATTORNEYS

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2,984,400

**CARTON LOCK**

Morris W. Kuchenbecker, Neenah, Wis., assignor to American Can Company, New York, N.Y., a corporation of New Jersey

Filed June 10, 1959, Ser. No. 819,350

5 Claims. (Cl. 229—39)

This invention relates to receptacles and particularly to means whereby the ends of receptacles are locked and maintained in a closed condition. The invention is particularly advantageous in connection with paperboard cartons employing what is commonly known as an "arrow" lock, the aptness of the term being based upon the appearance of one element of this particular type of locking construction.

Basically, locking constructions of the general type here concerned are well known in the art and have achieved a wide-spread use in commerce. However, in most of the variations of this basic locking construction, there is a hazard that the lock will disengage, thus allowing the container to open and the contents to spill.

The construction of the present invention not only eliminates the possibility that the lock will automatically disengage during the course of normal handling, but substantially assures that the lock cannot, even intentionally, be disengaged without such distortion of the carton material as to make obvious the fact that the locking construction has been tampered with. Thus, what for practical purposes amounts to a tamperproof construction is in fact achieved by this invention, yet there is required no additional amount of carton material and no additional manufacturing operations.

Other particular objects and advantages of the invention will become apparent from the following description in connection with the appended drawings, in which:

Figure 1 is a plan view of a carton blank incorporating a preferred embodiment of the present invention,

Figure 2 is a perspective view, partially cut away, of the end of a carton made from the blank of Figure 1 in an intermediate stage of closure of the carton end,

Figure 3 is a perspective view, similar to Figure 2, showing the end of the carton in closed and locked condition,

Figure 4 is an enlarged cross-sectional view, taken along the line 4—4 of Figure 3,

Figure 5 is an enlarged cross-sectional view, partially cut away, taken along the line 5—5 of Figure 4,

Figure 6 is a plan view of a carton blank incorporating second and third embodiments of the invention,

Figure 7 is a perspective view, partially cut away, of one end of a carton made from the blank of Figure 6, in an intermediate stage of closure of the carton end,

Figure 8 is a perspective view, similar to Figure 7, showing the carton end in completely closed and locked condition,

Figure 9 is an enlarged interior perspective view of the end closure of Figure 8, partially cut away,

Figure 10 is an enlarged cross-sectional view, partially cut away, taken along the line 10—10 of Figure 6, and

Figure 11 is an enlarged interior perspective view, similar to Figure 9, of the third embodiment of the invention.

Referring first to Figure 1, the carton is formed from a blank A made of paperboard, plastic or other suitable

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material, which is divided by a series of cut and score lines into a number of panels and flaps incorporating various operational elements. Particularly, the carton blank includes opposed pairs of side walls 20—21 and 22—23 and a connecting glue flap 24, consecutively connected together along hinge score lines 25, 26, 27 and 28. To the ends of these walls dust flaps 30 and end closure flaps 31 and 32 are connected along score lines 33, 34 and 35. A suitable glue, or pressure sensitive or other adhesive, may be applied to an area 36 of wall 22, for adhesive connection to flap 24 in the formation of a carton sleeve from the blank A.

End closure flaps 31 are provided with a series of three female locking slits 40, comprising curved portions 40a, lateral portions 40b and terminal slits or cuts 40c. Extending from adjacent the end two outermost of slit portions 40b and from both ends of centrally located slit portion 40a and terminating intermediate the slits and adjacent hinge score line 34, is a deformation 45 in the carton material. As seen in Figures 1 to 5, deformations 45 are in the form of score lines impressed into the carton material from the surface which will become the exterior of the carton, the protrusions therefrom thus extending into the carton which is formed from blank A.

Similarly formed on the remote ends of end closure flap 32 are an outer pair of male locking elements 47 and a centrally disposed element 48. It will be seen that by virtue of cuts 49 element 48 has the general appearance of an arrow and in fact such a locking element is commonly referred to as an arrow lock. Similarly, by virtue of cuts 50 elements 47 take on substantially the appearance of a half-arrow.

Referring also to Figure 2, the formation of a carton from the blank A is in the common manner initiated by folding wall 21 and flap 24 about hinging score line 27 to overlie walls 20 and 23, and wall 22 is then folded to overlie wall 20, bringing glue area 36 into superimposed position relative to flap 24. The adhesive connection resulting between wall 22 and flap 24 thus provides an adhered carton shell or sleeve. It is in this flat sleeve condition that the carton is normally shipped and stored.

For filling of the carton with the desired contents the flat shell is squared up in the position shown in Figures 2 and 3, and closing of an end of the carton is initiated by enfolding of one pair of dust flaps 30. End closure flaps 31 and 32 are then inclined inwardly over the end of the carton, with locking elements 47 and 48 being inserted into oppositely-positioned slits 40, to provide the locking engagement by which the end of the carton is closed. This operation is conventional and accordingly need not be further detailed.

Referring also to Figures 4 and 5, it is seen that scores 45 are in a portion of flaps 31 interiorly of which are positioned the remote lateral portions or extensions 51 of male elements 47 and 48. The protrusions of scores 45 create an inward deflection or depression of extensions 51, which results in a definite locking of the edge of portions 51 formed by cuts 49 and 50 behind the corresponding edges of slit portions 40b. Thus, a firm and tamperproof lock is provided with elimination of all possibility that the male locking elements can accidentally be disengaged, and in fact the construction cannot be unlocked and access gained to the carton contents without such mutilation of the construction as will make this fact evident.

Figure 6 shows a carton blank of a second preferred embodiment of the invention. In this embodiment, the slits in end closure flaps 31a include a lateral portion 60, a pair of longitudinal portions 61 and a terminal cut 62. Positioned between upper hinge score line 34a and the inward ends of cuts 60 in the upper flap 31a are pairs

of longitudinally disposed scored dimples 63. The male scoring elements 47a are formed as half-arrows, facing inwardly or toward each other, the arrow configuration being provided by cut lines 50a.

The lower portion of the blank of Figure 6 illustrates a third embodiment of the invention in which flap 31b has no dimples or protrusions formed therein, but rather the male locking elements 47b on lower closure flap 32b have scored dimples or protrusions 64 formed therein. Protrusions 64 are formed to impress or deflect the lateral engaging portions 51b of elements 47b inwardly of the surface which will become the interior of the carton, the converse of the direction of protrusion of the dimples 63.

As shown in Figures 7 to 11, the carton is erected as described in connection with the previous embodiment. The dimples 63, or 64, perform the same function as score lines 45; that is, they provide an inward bending or deflection of the locking portions 51a and 51b of elements 47a and 47b respectively, so that a firm, tamperproof engagement of the cooperating edges of the male and female locking elements results. As particularly seen in Figure 9, terminal cuts 50a of the male locking elements provide a hook-like portion which further aids in the permanent nature of the locking engagement.

It is obvious that the greater the degree of deformation in protrusions 45, 63 or 64, the greater the degree of deflection of extensions 51, 51a or 51b, respectively, and the greater the security of the resulting lock. However, it has been found that a very satisfactory lock results from protrusions formed by the normal scoring rules conventionally employed in making paper board cartons.

While certain preferred embodiments of this invention have been particularly described, it is recognized that obvious variations and modifications will be apparent to those skilled in the art. Accordingly, limitations on the invention are intended only as specifically set forth in the appended claims.

I claim:

1. A locking construction for a carton, the carton including a pair of opposed side walls and a pair of end closure flaps each hinged to an end edge of one of said walls, said construction including an arrow-shaped locking element on one of said flaps and an interiorly-situated locking slit in the other flap disposed oppositely to and for cooperative interlocking engagement with said element, said locking element having a lateral extension which in such interlocking engagement is located interiorly of a portion of said other flap between the slit and the connection of the other flap to a side wall, one of said lateral extensions and said portion of said other flap having a protrusion therefrom to provide a portion impressed toward the other thereof to deflect said lateral extension away from the other flap.

2. A locking construction according to claim 1, in which said protrusion comprises a score line impressed into said portion of said other flap from the surface which will be exteriorly of the carton.

3. A locking construction according to claim 1, in which said protrusion comprises a plurality of scored dimples.

4. A locking construction according to claim 3, in which said scoring dimples are impressed into said portion of said other flap from the surface which will be exteriorly of the carton.

5. A locking construction according to claim 1, in which said protrusion comprises a plurality of scored dimples impressed into said extension from the surface thereof which will be interiorly of the carton.

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