

May 23, 1944.

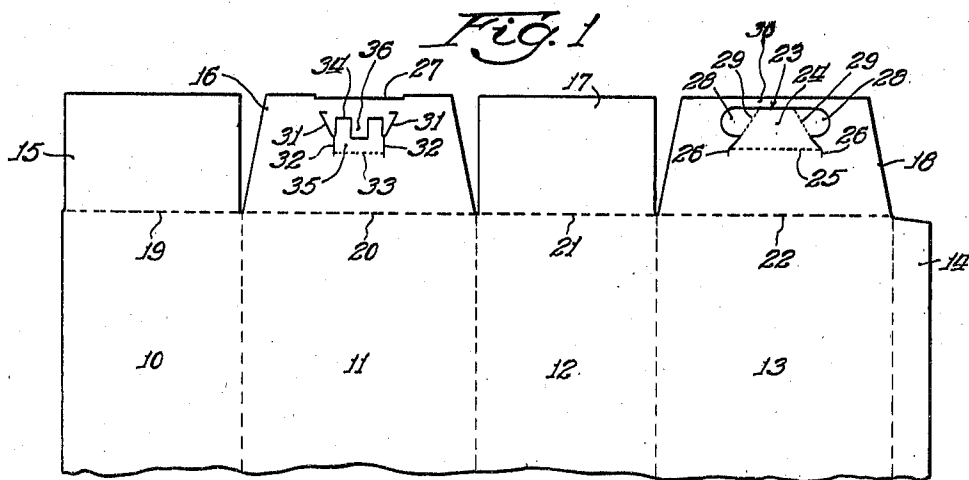
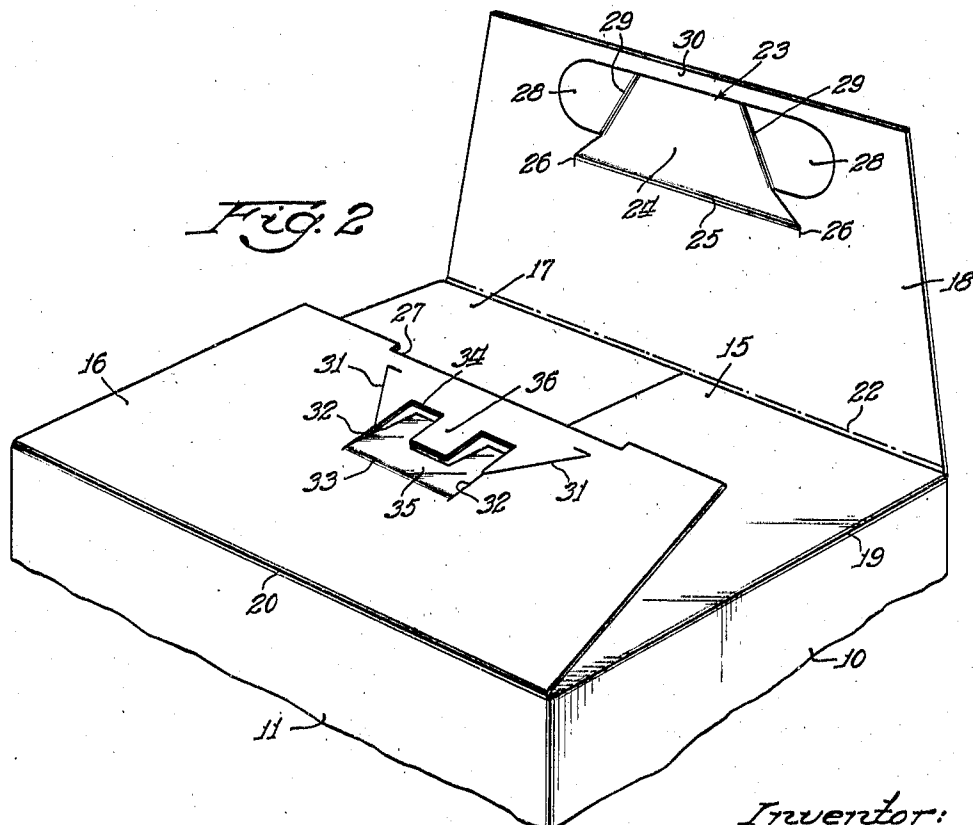
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2,349,707

CONTAINER LOCK

Filed Sept. 19, 1942

3 Sheets-Sheet 1



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Fig. 3

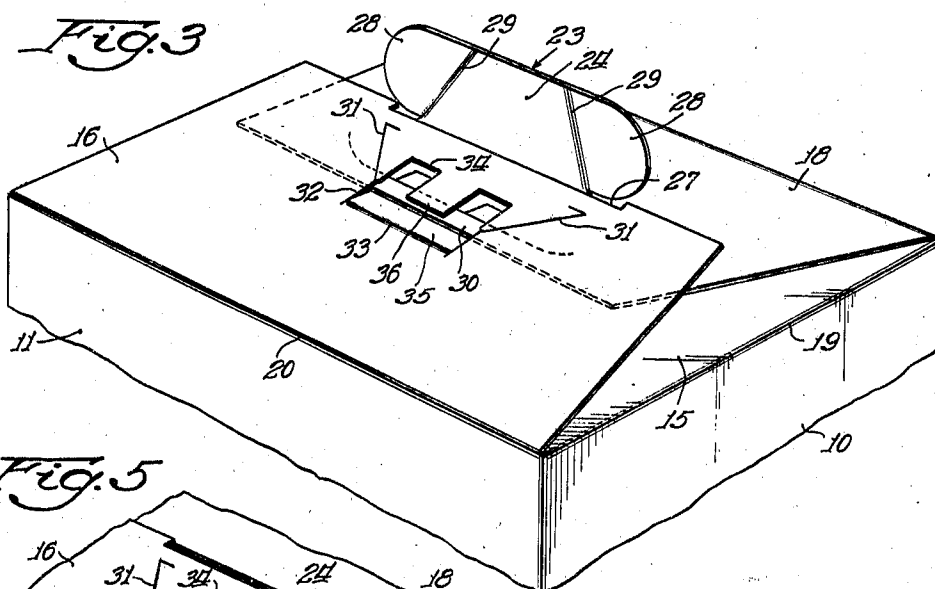


Fig. 5

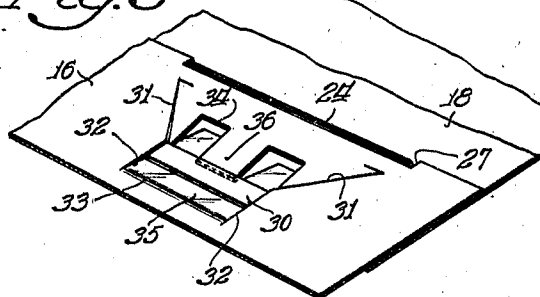
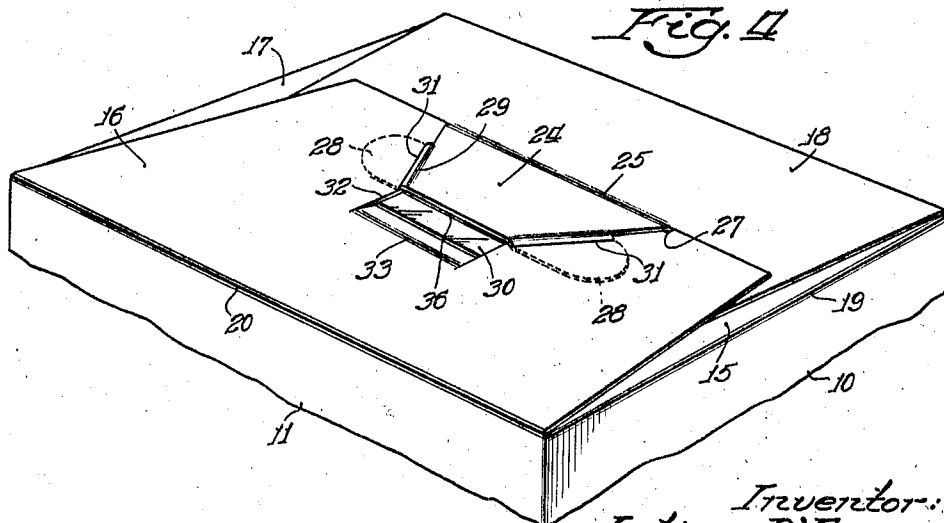


Fig. 4



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Fig. 6

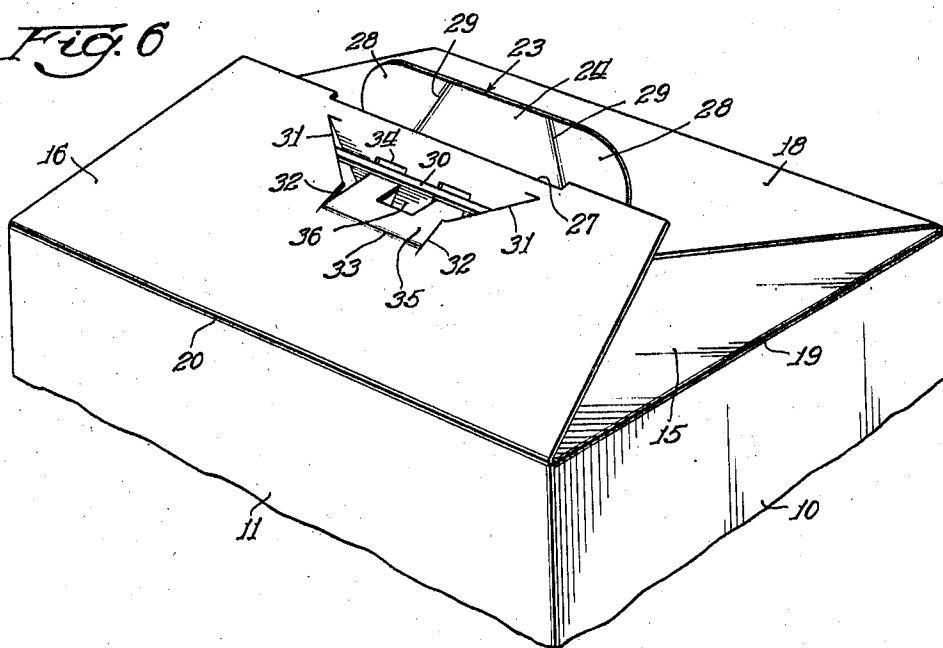
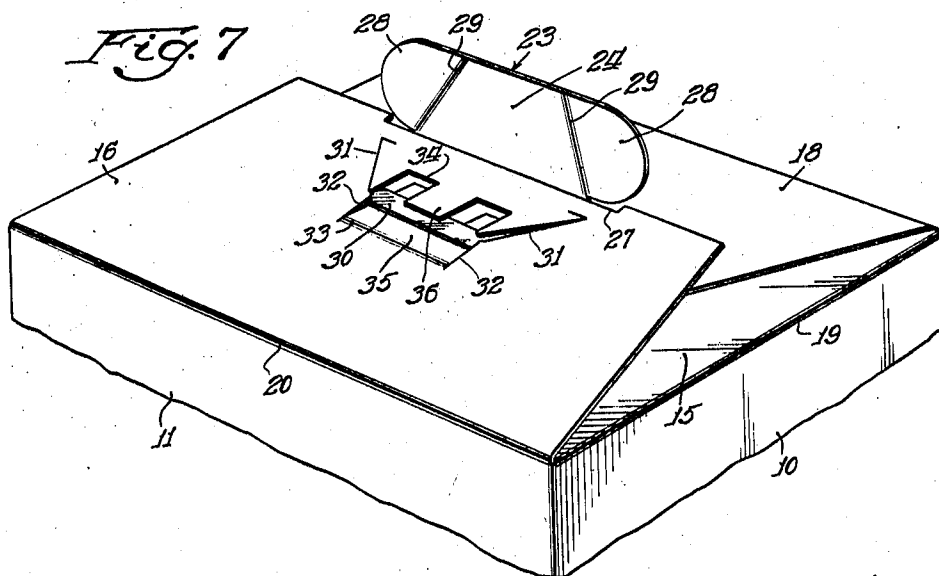


Fig. 7



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UNITED STATES PATENT OFFICE

2,349,707

CONTAINER LOCK

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6 Claims. (Cl. 229-39)

This invention relates to devices for securing two plies of sheet material, such as relatively stiff paperboard, fiberboard, etc., in partially overlapping relationship in such a manner that they are capable of being detached from one another, but will not become completely disengaged except under exceptional stress. More particularly, it relates to a locking device especially adapted for use with paperboard containers, such as relatively heavy folding cartons and solid fibre shipping containers, which includes a safety feature such that the container will not open completely even if the primary locking element fails or becomes accidentally displaced.

The locking device of my invention may be used in connection with any type of container closure involving the partial overlapping of two plies of paperboard or similar material. Examples of such closures are those using tuck flaps or tongues on cover panels or end flaps, and those in which at least two partially overlapping flaps are provided which are hingedly joined to opposite wall panels. Numerous types of locks have, of course, been used or proposed in connection with these and similar types of container closures, and a number of them are fairly adequate as long as they do not become dislodged from their locking position. In many instances, however, they do become so dislodged or weakened in handling or shipment that the contents are exposed or lost. One of the primary advantages of my invention is that the closure will retain a large measure of its effectiveness, even though the principal locking element is accidentally removed from its operative position, while the container can, nevertheless, be opened easily and expeditiously when it is desired to do so without disturbing its usefulness for future use.

It is an object of my invention to provide a locking arrangement for use in connection with paperboard containers and the like, which can be used to secure the closures of such containers quickly and easily, but which will prevent the accidental opening of such container closures. Another object is to provide a lock for paperboard containers and the like which is formed by suitably cutting and scoring the material of the container, involves no extra operations in manufacture, and is exceptionally efficient in preventing accidental opening of the closure in connection with which it is used. Further objects, advantages and uses of my invention will be apparent from the following detailed description thereof, read in conjunction with the drawings, in which:

Fig. 1 illustrates one end of a blank suitable for the production of a conventional carton or container of the tubular type in which two of the end closure flaps are cut and scored in accordance with a preferred embodiment of my invention;

Fig. 2 shows a perspective view of the containers of Fig. 1 in set-up condition with the end closure partially made;

Fig. 3 is similar to Fig. 2, but illustrates the next step in completing the closure;

Fig. 4 represents the same container with the end closure completed and all of the locking elements in operative position;

Fig. 5 is a partial view showing the relationship of the underlying locking elements when the container is closed;

Fig. 6 illustrates the relationship of the locking elements when the principal locking element has been removed from its operative position; and

Fig. 7 illustrates the manner in which the lock is completely disengaged so that the container may be opened.

While my invention is adapted to be used in a variety of situations, it can best be understood from the description of a specific example, and the particular one chosen for this purpose is that illustrated in the drawings.

Fig. 1 shows one end of a container blank cut and scored to provide four side wall panels 10, 11, 12 and 13, an attaching strip 14 and four end closure flaps 15, 16, 17 and 18, hingedly attached to panels 10, 11, 12 and 13 along score lines 19, 20, 21 and 22, respectively. This blank is adapted to be made into a conventional tubular container by securing attaching strip 14 to panel 10 by means of an adhesive, staples or the like, and the end flaps are adapted to be folded into the usual manner to form an end closure, flaps 15 and 17 being folded first, followed by flap 18 and finally by flap 16.

In the container of this example, it is desired to secure flaps 16 and 18 together in partially overlapping relationship, and this is accomplished by means of a locking arrangement according to the present invention. The primary locking element 23 is formed from the material of flap 18 and includes a tab 24 joined to flap 18 along score line 25, which is parallel to score line 22 and separated therefrom by a distance such that when the container is set-up and flaps 16 and 18 are overlapped, it will lie substantially in register with indent 27 in the outer free edge of flap 16. Extending from the ends of score line 25 and substantially perpendicularly thereto in the direction of score line 22 are short cuts 26

which serve to allow score line 25 to be raised slightly above the plane of flap 18. Indent 27 is slightly longer than the distance between cuts 26, so that the base portion of tab 24 will enter and fit rather snugly in indent 27 when the container is set up, as shown best in Figs. 4 and 5. This arrangement effectively interlocks flaps 16 and 18 against weaving motion, materially increases the effectiveness of the primary locking element 23 by holding it always centered, and also strengthens the container itself against deformation from loads on its edges and corners.

Tab 24 is substantially in the form of an isosceles trapezoid with its sides converging toward the free end of flap 18 and is provided along its outer side edges with a pair of tongues 28 defined therefrom by angular score lines 29. The over-all length of tab 24 and tongues 28 is such that a strip of material 30 which is integral with flap 18 remains immediately adjacent the outer free end of the latter. The function of strip 30 will be fully brought out as the description proceeds.

Flap 16 is provided with a pair of angular cuts 31 diverging in the direction of its outer free ends and so located as to receive the tongues 28 and cooperate therewith to provide the primary container lock. Extending toward, and perpendicular to score line 20 from the inner ends of cuts 31, are two cuts 32 which terminate at points slightly beyond the free end of flap 18 when flaps 16 and 18 are overlapped, and a score line 33 is also provided between cuts 32 somewhat short of the ends thereof and also slightly beyond the end of flap 18. An additional cut 34, extending between cuts 31 at approximately their points of closest approach, defines a tab member 35, formed from the material of flap 16, which is hingedly joined thereto along score line 33. Cut 34 is non-rectilinear and is arranged so that tab 35 has a notch in its free edge whereby a tab 36 is formed which is integral with flap 16 and extends toward score line 20. Tab 36 in this particular embodiment of the invention, is rectangular in shape and it constitutes one of the secondary locking elements. For this reason, it is of such length that its free end extends slightly beyond the inner edge of strip 30 when flaps 16 and 18 are overlapped, for reasons which will be discussed more fully.

In utilizing my invention as illustrated by the presently preferred form thereof shown in the drawings, the blank of Fig. 1 is formed into a tubular container by attaching strip 14 to wall panel 13 in any conventional manner such as by gluing or stapling. If we assume that flaps 15, 16, 17, and 18 are top closure flaps, the bottom of the container which can be but is not necessarily of conventional construction, is closed and the container filled with the desired product. Flaps 15 and 17 are then folded toward each other substantially at right angles to their respective side walls 10 and 12, and flap 16 is partially folded in the same manner, while tab 35 is pressed slightly downward so that its free ends lie somewhat below the plane of flap 16. In this stage, the container appears as shown in Fig. 2.

The next step is to bend tab 24 with its associated tongue elements upwardly along score line 25 while folding flap 18 upwardly toward flap 16, and flaps 16 and 18 are then moved toward each other in such a way that strip 30 slides below the lower surface of flap 16 and above the upper surface of the tab 35. Folding

of flaps 16 and 18 is then continued until they are in partially overlapped condition and substantially parallel to flaps 15 and 17. The appearance of the top closure, just before the folding last mentioned is completed, is illustrated in Fig. 3. Finally, tongues 28 are bent inwardly along score lines 29, and are inserted into the slits 31 as tab 24 is brought substantially into the plane of flap 16, a slight pressure then being exerted upon tab 24 adjacent the center portion of its free end. The completely closed container is illustrated in Fig. 4.

Some of the advantages of this form of lock have already been mentioned, the primary locking elements including tab 24, tongues 28 and slits 31 being, of course, old in the art. It will be noted, however, that the cooperation between the base of tab 24 adjacent score line 25 and the indent 27 substantially prevents relative motion of flaps 16 and 18 in a direction parallel to score line 20, and thus materially strengthens the top closure and the container itself. Furthermore, the fact that tab 35 is held beneath its normal level provides a separation space between flap 16 and the underlying flaps 15 and 17, so that tongues 28 can be much more easily inserted in slits 31.

One of the major advantages, however, arises from the secondary locking arrangement involving strip 30 and tab 36. As stated above, tab 36 is of such length that it extends slightly beyond the inner edge of strip 30, so that when pressure is applied to tab 24 adjacent the middle of its free edge in making the closure, this pressure is transmitted to tab 36 and the latter is caused to snap into position below strip 30. The relationship of these parts when the completed closure has been made is clearly shown in Fig. 5. The arrangement just described provides a lock which is effective even though tongues 28 should be accidentally dislodged for some reason, or if the primary lock should be defective and fail. If one of these eventualities occurs and flaps 16 and 18 should tend to open, strip 30 will ride up upon tab 36 as shown in Fig. 6 and these flaps will be able to open only a limited distance before they are held in substantially the position shown in that figure. Due to the fact that the angle of movement through which flaps 16 and 18 may go is quite limited, flaps 15 and 17 will be retained in substantially their completely closed position and danger of the loss of the contents is thereby minimized.

In order to open the container when it is desired to do so, it is only necessary to bend tab 24 upwardly so that tongues 28 are withdrawn from slits 31 and press down upon strip 30 so that tab 36 snaps to a position above it as shown in Fig. 7. Thereafter, flaps 16 and 18 may be swung upwardly without hindrance, followed by flaps 15 and 17.

It will be apparent from the above that I have devised a novel form of container lock which has many advantages and which is extremely useful in many situations, and it is equally obvious that many modifications may be made therein by those skilled in the art without departing from the spirit of my invention. While the invention has been described by way of example in connection with a single embodiment thereof, it is not desired to be limited thereto, but by only the scope of the appended claims.

I claim:

1. In a container made of sheet material such as paperboard or the like and having a closure in-

cluding two plies of said material, at least one of said plies being arranged to swing about a score line or the like so that in closed position said plies overlap each other by a substantial amount, the improved locking arrangement for said closure which comprises a tab having laterally extending tongue portions partially cut from the material of the lower ply and integrally joined thereto along a hinge line substantially parallel to said score line, said cut being spaced from the free edge of said lower ply so as to leave a strip of said material adjacent said edge and said tab being adapted to overlie the upper ply of said material, a pair of elongated openings in said upper ply adapted to receive said tongue portions, and additional tab means formed from said upper ply including at least one tab having its free end extending toward and one tab having its free end extending away from the free end of said upper ply, said last-mentioned tabs being defined by a non-rectilinear cut extending between said elongated openings and being arranged so that during the closing operation said strip may pass over said tab having its free end extending toward the edge of said upper ply and will thereafter be engaged by said tab extending in the opposite direction if said tongue portions should become accidentally dislodged from said openings.

2. The improvement according to claim 1 wherein said elongated openings in said upper ply diverge in the direction of the free end thereof.

3. The improvement according to claim 1 including a recess in the free edge of said upper ply adapted to receive said locking tab substantially at its base portion adjacent said hinge line, whereby relative lateral movement of said plies is prevented.

4. An improved locking arrangement for a container of paperboard or the like having a pair of oppositely disposed side walls and a closure flap hingedly joined to each of said side walls at one end of said container and wherein said closure flaps are adapted to overlap over a substantial area adjacent their free ends comprising a locking tab formed from the material of the lower of said overlapping flaps hinged thereto along a score line substantially in register with the free end of the upper of said flaps and being adapted to be folded to lie above said upper flap, said locking tab having laterally extending tongue portions defined by a pair of inclined fold lines converging toward its end and being substantially shorter than the distance between said score line and the free end of said lower flap, whereby

a strip of material remains adjacent the free end of said lower flap, a pair of slits in said upper flap substantially parallel to and slightly laterally spaced from said fold lines adapted to receive said tongue portions to hold said flaps in closed position, and a pair of secondary tabs formed from that portion of the material of said upper flap lying between said slits, one of said secondary tabs being hingedly joined to said upper flap along a score line substantially parallel to but slightly beyond the free end of said lower flap when said flaps are in closed position and being adapted to be depressed so that said strip can be passed thereover in closing said flaps, and the other of said secondary tabs extending away from the free end of said upper flap to a point slightly beyond the inner edge of said strip, whereby slight pressure on said locking tab after said tongue portions have been inserted in said slits will cause the free end of last-mentioned secondary tab to assume a position below said strip.

5. An improved locking arrangement according to claim 4 including a recess in the free edge of said upper flap adapted to receive said locking tab adjacent its hinge line, whereby lateral movement of said flaps with respect to each other is minimized.

6. An improved locking arrangement for a container of paperboard or the like having a pair of oppositely disposed side walls and a closure flap hingedly joined to each of said side walls at one end of said container and wherein said closure flaps are adapted to overlap over a substantial area adjacent their free ends comprising a locking tab formed from the material of the lower of said overlapping flaps hinged thereto along a score line substantially in register with the free end of the upper of said flaps and being adapted to be folded to lie above said upper flap, said locking tab having laterally extending tongue portions defined by a pair of inclined fold lines converging toward its end and being substantially shorter than the distance between said score line and the free end of said lower flap, whereby a strip of material remains adjacent the free end of said lower flap, a pair of slits in said upper flap substantially parallel to and slightly laterally spaced from said fold lines adapted to receive said tongue portions to hold said flaps in closed position, and a recess in the free edge of said upper flap adapted to receive said locking tab adjacent its hinge line, whereby lateral movement of said flaps with respect to each other is minimized.

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