Dec. 29, 1964 A. SCHMERMUND 3,163,348

BOXES

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Fig. 1.

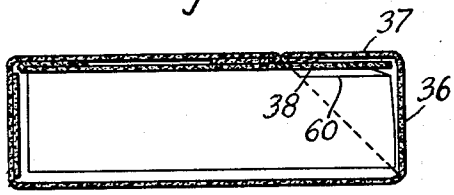


Fig. 2.

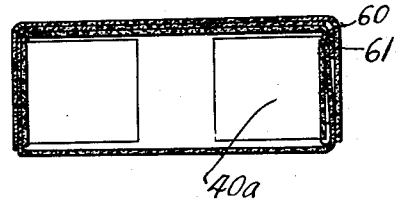


Fig. 3.

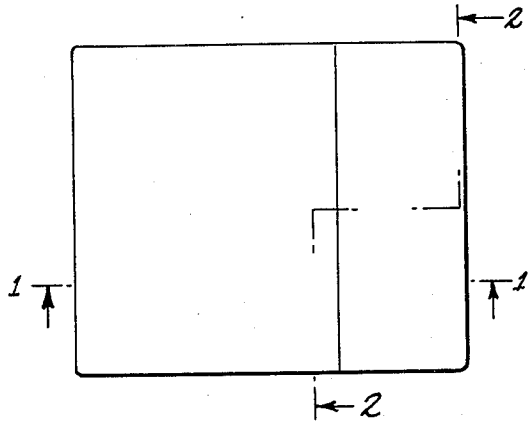


Fig. 4.

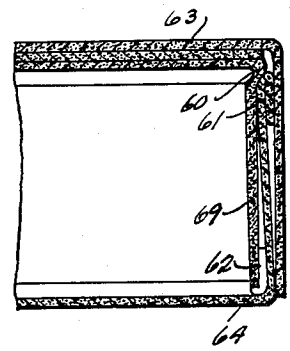


Fig. 6.

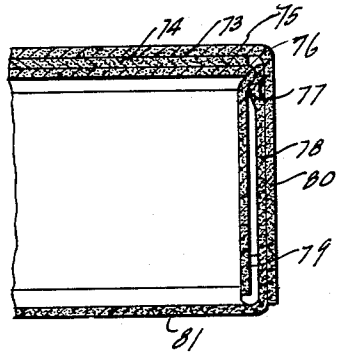
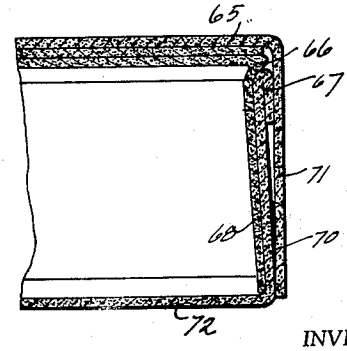


Fig. 5.



INVENTOR

ALFRED SCHMERMUND

BY Rommel, Allwine & Rommel

ATTORNEYS

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BOXES

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Fig. 7.

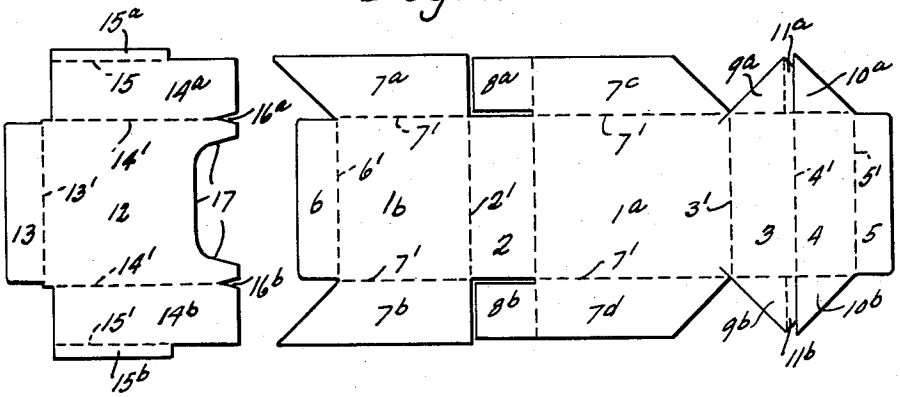


Fig. 8.

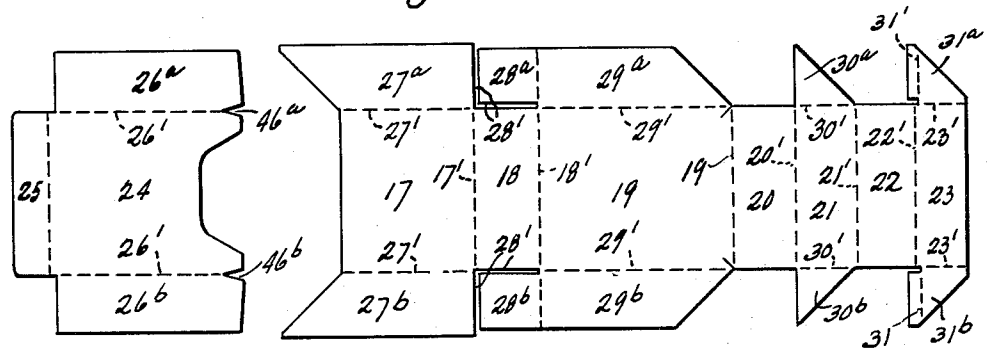
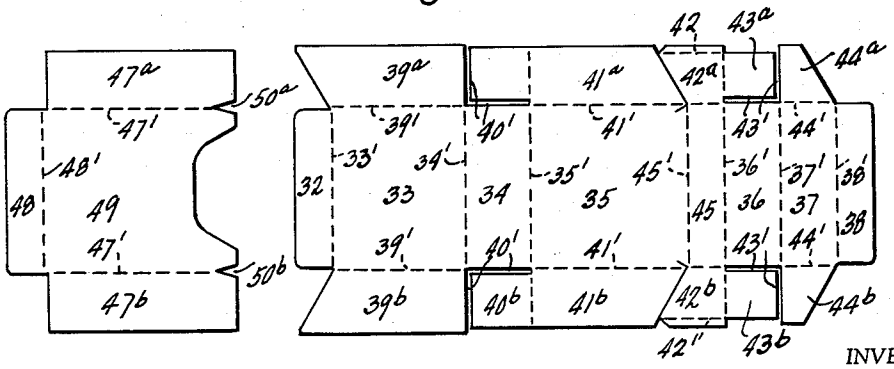


Fig. 9.



INVENTOR

ALFRED SCHMERMUND.

BY Rommel, Allwine & Rommel

ATTORNEYS

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BOXES

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Fig. 15.

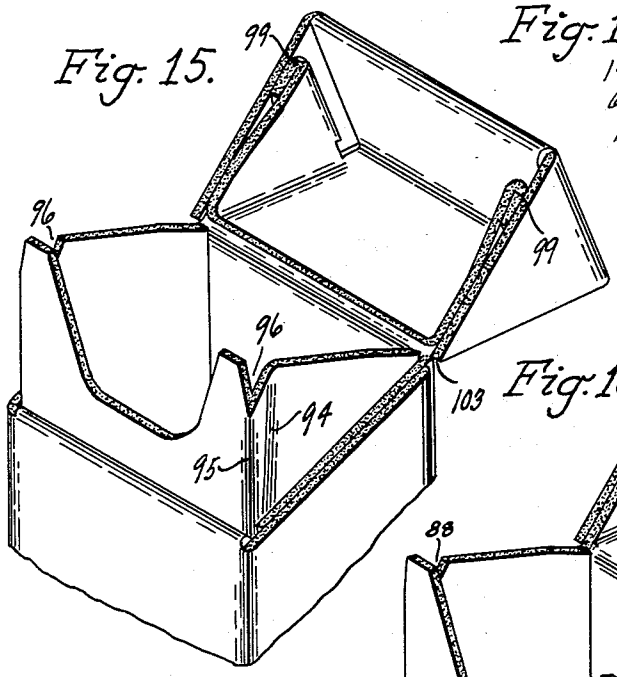


Fig. 10.

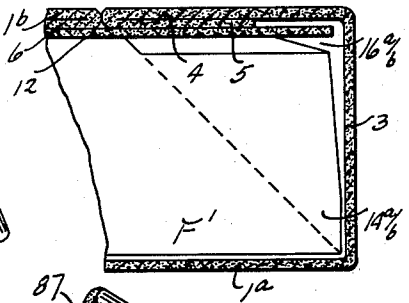


Fig. 16.

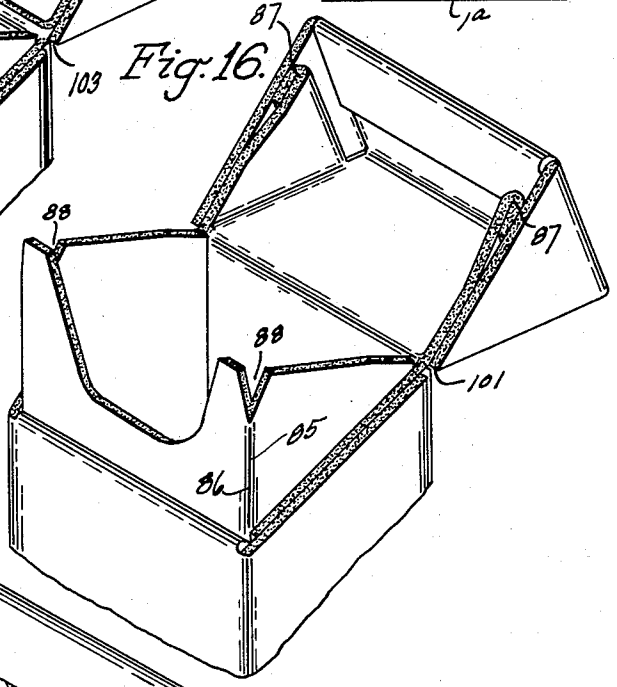
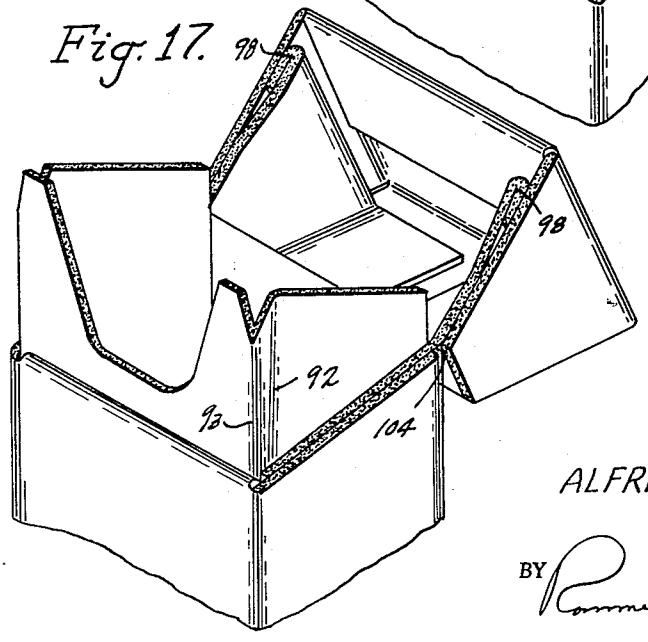


Fig. 17.



INVENTOR

ALFRED SCHMERMUND

BY Rommel, Allen & Rommel

ATTORNEYS

Dec. 29, 1964 A. SCHMERMUND 3,163,348

BOXES

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Fig. 12.

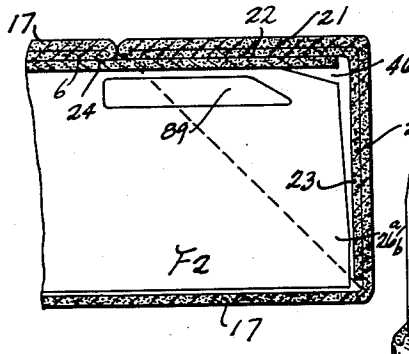


Fig. 18.

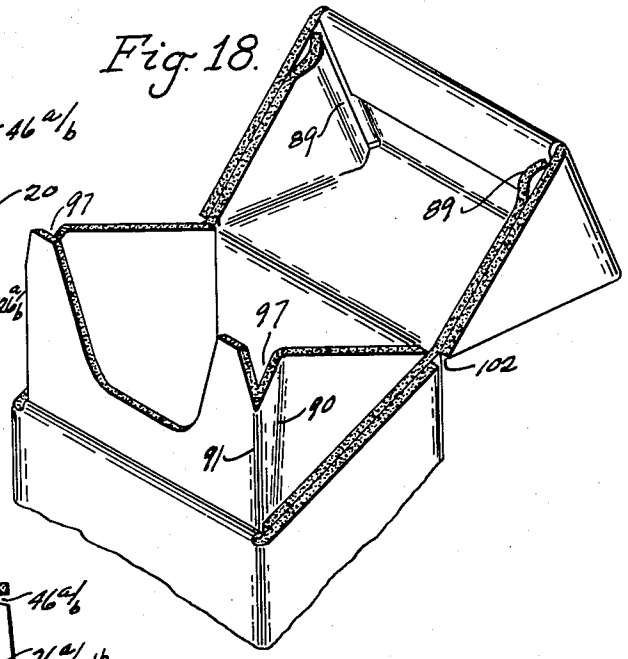
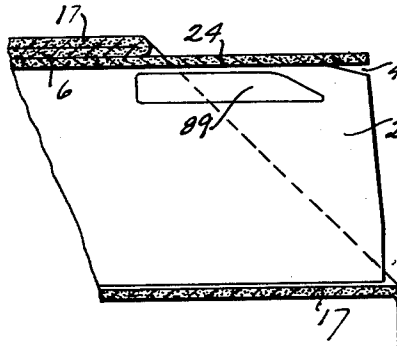


Fig. 13.



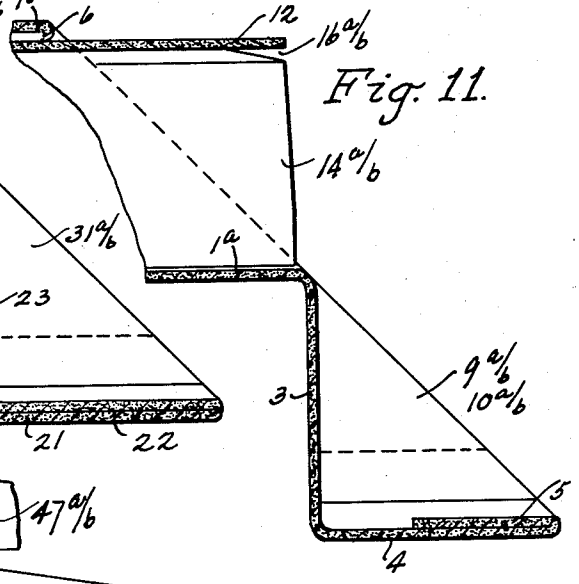
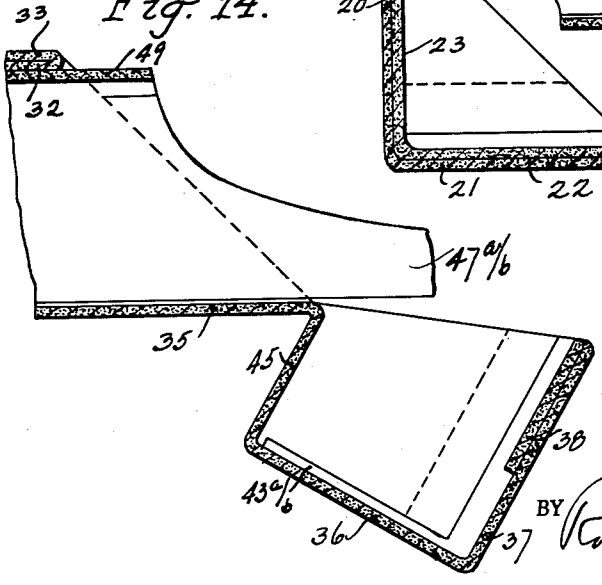


Fig. 11.

Fig. 14.



INVENTOR
ALFRED SCHMERMUND

BY Rommel, Allen and Rommel
ATTORNEYS

United States Patent Office 3,163,348 Patented Dec. 29, 1964

3,163,348

BOXES

Alfred Schmermund, % Maschinenfabrik Alfred Schmermund, Gevelsberg, Westphalia, Germany

Filed Mar. 21, 1960, Ser. No. 16,437
7 Claims. (Cl. 229—44)

The invention relates to boxes as are used in the cigarette or cigar industry for making retail packets which are ready for sale. It is known to sell cigarettes and the like in soft containers made of paper, preferably of a plurality of paper layers. However, for various reasons, especially owing to the increasing use of filter cigarettes which are sensitive against bending, hard containers are preferred, which are made of thin cardboard.

Cardboard boxes comprising flap-like lids are known for packing cigarettes; such boxes are usually made of one or more suitably cut blanks on fully automatic packing machines.

A cardboard box for cigarettes and the like and comprising a flap-like lid and a body portion has been proposed, wherein the lid is rotatable about an axis having a distance from the adjacent edge of the open end of the body portion which is smaller than the distance of the said axis from the opposite wall of the body portion, whereby when the lid is turned about the axis for opening or closing the box a point of the lid opposite the said axis describes an arc which intersects the edge at the open end of the body portion and opposite the said axis, whereby a snap action of the lid is intended to be obtained.

However, only an imperfect snap action is obtained since on closing the lid the snap action occurs too early and terminates too early. Thus before the lid is completely closed, snap action is not present, with the result that a gap is likely to form between the lid and the body portion. To avoid this disadvantage, it has been suggested to provide small punched out tongues at the inside of the body part for wedging laterally against portions of the lid. However, this arrangement does not fully overcome the disadvantage referred to since the small tongues after a short time become bent and frayed and then only act as brakes but do not lead, as intended to an improved snap action.

Other proposed embodiments do not provide a rotatable lid.

One such embodiment uses exclusively small punched out tongues for holding the lid in closed position; in another embodiment a small punched out tongue slides under a correspondingly punched out recess. This last embodiment can no longer be operated by one hand only of a user of the box. Also the punched out recess interrupts the front face of the box and thus disturbs the smooth appearance of the box.

The present invention consists in a box comprising a body portion and a lid attached thereto, the lid being rotatable about an axis for closing and opening the box, the lid and the body portion having a complementary groove and ridge non-parallel to the said axis, the arrangement being such that when the box has been closed the said groove and ridge engage each other and hold the box closed, while on rotation of the lid about the said axis for closing and opening the box the said groove and ridge approach each other or recede from each while inclined relatively to each other.

Preferably, two sets of ridges and grooves are provided, one set in adjacent side walls of the lid and the body portion. Recesses may be provided in the body portion which extend from the open end of the body portion for enabling a rotation of the lid substantially unimpeded by the edges of the body portion. Preferably, the ridge is provided in the lid and the groove is provided

in the body portion. The ridge or each ridge may be formed by turning over an extended layer of material or embossing a layer of material of the lid. The body portion may comprise an outer layer and an inner layer protruding beyond the outer layer, the groove or each groove being formed by identing the said inner layer. The box is advantageously made of cardboard.

It will be seen that the lid of this invention is completely locked in its closing position, the locking becoming fully effective shortly before the lid reaches its end position and remains locked in the end closed position of the lid.

The locking is effected by two elements which during rotation of the lid into its closing position more and more converge so as finally to effect the locking by a snap action while yet allowing the box to be easily opened.

To make the invention clearly understood reference will now be made to the accompanying drawings, which are given by way of example and in which:

FIGURE 1 is a section through a cardboard cigarette box, the section being taken along the line I—I of FIGURE 3;

FIGURE 2 is a section along the line II—II of FIGURE 3;

FIGURE 3 is a plan view of the box of FIGURES 1 and 2;

FIGURE 4 illustrates the locking mechanism of the box of FIGURE 2 on a larger scale taken at the location of the circle E of FIGURE 2;

FIGURE 5 illustrates a modified locking mechanism;

FIGURE 6 illustrates a further modified locking mechanism;

FIGURE 7 illustrates a blank for making a cardboard cigarette box;

FIGURE 8 illustrates a modified blank;

FIGURE 9 illustrates a further modified blank;

FIGURE 10 illustrates a part of a box made of the blank of FIGURE 7, the box being closed;

FIGURE 11 illustrates a part of the box of FIG. 10, the box being open;

FIGURE 12 illustrates a part of a box made of the blank of FIGURE 8, the box being closed;

FIGURE 13 illustrates a part of the box of FIGURE 12, the box being open;

FIGURE 14 illustrates a part of a box made of the blank of FIGURE 9, the box being open;

FIGURE 15 is a perspective view of a part of an open box;

FIGURE 16 is a similar view of a modified box;

FIGURE 17 is a similar view of a further modified box; and

FIGURE 18 is a similar view of a still further modified box.

The lid of each of the boxes of FIGURES 15, 16, 17 and 18 is rotatable about an axis passing through the point 103, 101, 104 or 102 respectively. The side walls of the lid may be triangular or quadrangular; in each case the axis of rotation passes through, or close to, a corner of the side wall. Care has been taken that the corners of the body of the box which lie remote from the axis of rotation do not interfere on rotation of the lid with the wall of the lid remote from the said axis. For this purpose, the body of the box at the said corners has recesses, such as 96, 88 and 97. However, if desired, these recesses could be omitted. Blanks for making these or similar boxes may be arranged in different ways. Some such blanks are illustrated in FIGS. 7, 8 and 9. For example, the blanks of FIGS. 7 and 8 are suitable for boxes the lids of which have triangular side walls as in FIGURES 15, 16 and 18.

In FIGURES 7, 8 and 9, dashed lines indicate lines along which the blank is to be bent and thus corresponds

to edges of the box. The surfaces 8*a*/*b*; 28*a*/*b*; *and* 40*a*/*b* and 43*a*/*b* may be employed for stiffening purposes or alternatively may be removed as waste. The blank portions 12, 24 and 49 form inserts for the boxes. The recesses 16*a*/*b*; 46*a*/*b*; and 50*a*/*b* in the insert blanks correspond to recesses such as the recesses 96; 88; and 97 of the boxes shown in FIGURES 15, 16 and 18 for facilitating an unimpeded closing movement of the lids.

Within the lid of each box, ridges 99; 87; 98 or 89 respectively are provided (see FIGURES 15, 16, 17 and 18), the ridges lying against the side walls of the lid. The ridges co-operate with complementary insert grooves formed by identations in the parts 94/95; 85/86; 92/93; or 90/91 respectively.

Completed boxes are illustrated in FIGURES 1, 2, 3, 4, 5 and 6 in which the ridges at the interior of the flap are indicated by reference numerals 61, 67 and 77 and the complementary grooves by reference numerals 60, 66, 76.

The embodiment of FIGURES 13 and 17 has a particularly stiff lid since the side walls of the lid are quadrangular. A blank for making a box with a lid of this kind is shown in FIGURE 9. Certain portions of the blank of FIGURE 9, such as 43*a*/*b* and 40*a*/*b* may be utilized or removed.

In the embodiment of FIGURE 18, the ridges 89 are formed by arcuating or bulging an inner layer of the lid while in the embodiment of FIGURES 15, 16 and 17 the ridges are formed by turning over an extended inner layer of the lid.

From FIGURES 4, 5 and 6 it can be recognized by considering the parts 60, 61, 66, 67 and 76, 77 respectively that on moving the lid into its closing poistion a snap action occurs owing to the curvature of the parts at 60, 66 and 76, and the seating of the ridges or bulges 61, 67, and 77 in the grooves which correspond to the grooves such as shown at 94, 85, 92 and 90 in FIGURES 15, 16, 17 and 18 respectively whereby the box can be securely kept closed, while the box can easily be opened since after a slight movement of the lid in the opening direction the locking of the lid is removed.

In FIGURE 7 the insert shown at the left comprises a body wall 12 having side flaps 14^a and 14^b secured thereto at fold lines 14′ and having attaching tabs 15^a and 15^b secured to the flaps 14^a and 14^b by fold lines 15′. An under tab 13 is secured to wall 12 by fold line 13′. The wall 12 is recessed at 17, and the walls 12, 14^a and 14^b are notched at 16^a and 16^b similar to the recesses 96, 88 and 97 above described. The front and back walls 1^b and 1^a of the main body are connected together by a bottom wall 2 folded at 1′ and 2′. Front wall 1^b has side flaps 7^a and 7^b secured thereto along fold lines 7′, and at its top the front wall 1^b has a reinforcing flap 6 connected on fold line 6′. The back wall 1^a has side flaps 7^c and 7^d connected along fold line 7′ to which are secured tabs 8^a and 8^b. The cover or lid of the blank of FIGURE 7 comprises a top flap 3 connected on fold line 3′ to body wall 1^a, and a front flap 4 is connected on fold line 4′ to flap 3. A reinforcing flap 5 is connected at 5′ to flap 4. The flaps 3 and 4 have triangular end flaps 9^a and 9^b and 10^a and 10^b respectively, and the small flaps 11^b provide the ridges or bulges 87, 98 and 99 above described.

In FIGURE 8 the insert has a body wall 24 connected to side flaps 26^a and 26^b by fold lines 26′ and an under tab 25 is secured to wall 24. The body wall 24 and the side flaps 26^a and 26^b are notched or recessed at 46^a and 46^b corresponding to the recesses 16^a and 16^b above described and the top portion of the body wall 24 is recessed similar to that at 17 at FIGURE 7. The main portion of the carton shown in FIGURE 8 comprises front and back walls 17^a and 19 which are connected together by a bottom wall 18 on fold lines 17′ and 18′. Front wall 17^a is provided with side flaps 27^a and 27^b at fold lines 27′ and the back wall 19 is provided with flaps 29^a and

29^b at fold lines 29′. Tabs 29^a and 29^b are provided with stiffener tabs 28^a and 28^b spaced at 28′ from the other flaps. The cover of the blank of FIGURE 8 comprises flaps 20, 21, 22 and 23 and triangular shaped end flaps 30^a–30^b secured to flap 21 and triangular flaps 31^a and 31^b secured to flap 23. The end folding of the small strips or flaps 31 and 31′ provide the ridges or bulges 87, 98 and 99 above described.

Referring to the form of invention shown in FIGURE 9, the insert portion to the left is identical to the insert described and shown in FIGURE 8 and comprises a body wall 49 with flaps 47^a, 47^b and 48 secured along fold lines 47′ and 48′; the recesses 50^a and 50^b corresponding to the recesses 16^a and 16^b of FIGURE 7. The main body front and back walls 33 and 35 are provided with flaps and tabs similar to the body portion of the form of invention shown in FIGURE 8 and comprise flaps 39^a and 39^b connected along fold lines 39′ to wall 33 and reinforcing flap 32 connected along fold line 33′. The bottom wall 34 is connected along fold lines 34′ and 35′ to walls 33 and 35 and the latter is provided with side flaps 41^a and 41^b connected along fold lines 41′. Flaps 41^a and 41^b at their lower ends have stiffener flaps 40^a and 40^b spaced at 40′. The closure portion of the form of invention in FIGURE 9 comprises a lid back wall 45 connected along fold line 45′ to the wall 35 which is provided at its ends with flaps 42^a and 42^b connected along fold lines to the back wall 45 and which are provided with ridge flaps 42 and 42′ connected along fold lines as shown in FIGURE 9; these ridge flaps providing the ridges corresponding to the bulges 87, 98 and 99 above described. Flaps 43^a and 43^b are also provided, adapted to be secured, when the cover is assembled, to the under side of what constitutes the top wall 36 of the cover when assembled. This top wall 36 of the covers is connected along fold line 37′ to what constitutes the front wall 37 of the closure. The wall 37 has end flaps 44^a and 44^b connected along fold lines 44′ and which receive the tabs 42^a and 42^b at the inner side thereof so that the ridge tabs 42 and 42′ will be properly positioned. The tabs 43^a and 43^b are glued to the under surface of the top wall 36. A reinforcing tab 38 is provided on the front wall 37 secured along fold line 38′ thereto.

It will be noted from the assemblages shown in the different views, and particularly FIGURES 13, 14, 17 and 18 that when the insert portions shown in FIGURES 7, 8 and 9 at the left are inserted in the wall structure of the main body of the forms, the side and front walls of the main body terminate short of the upper portions of the side walls and front wall of the insert portions, so that when the closures are in a shut position the side walls, rear wall and front wall of the closure lie flush with the rear, front and side walls of the main body portion of the container.

In FIGURES 4 and 5, 61 and 67 correspond to the ridges 42 in FIGURE 9 and ridges 87, 98 and 99 of FIGURES 16, 17 and 15 respectively. The grooves caused by curvature at 60, 66 and 67 of FIGURES 4, 5 and 6 correspond to the structure which forms the grooves at 94, 85, 92 and 90 of FIGURES 15, 16, 17 and 18. The walls 69, 68 and 79 of FIGURES 4, 5 and 6 correspond to the flaps 42^a and 42^b of FIGURE 9; the walls 63, 65 and 73 correspond to the front flaps 37 of FIGURE 9, and the end flaps 71 and 80 of FIGURES 5 and 6 correspond to the flaps 44^a and 44^b of FIGURE 9. The flaps 69, 68 and 79 of FIGURES 4, 5 and 6 correspond to the flaps 47^a and 47^b of FIGURE 9 and the walls 64, 72 and 81 of FIGURES 4, 5 and 6 correspond to the back wall 35 of FIGURE 9.

The snap action and locking features of this invention are very important. It will be noted that as the closure or cover is brought initially to a closing position, the bulges or ridges 61, 67 and 77 as shown in FIGURES 4, 5 and 6 and the ridges as shown in FIGURES 15 and 16 will override the curved portions 60, 66, 76, 86 and 95,

and as the closure is brought to a still further closing position the front flap or wall of the closure, due to the recessing at 16a and 16b; 46a and 46b; 96 and 33 of the various forms of the invention, will enable the upwardly extending prongs of the front wall of the insert to bend inwardly slightly. As the closure is brought to a still further closing position and only when the same is almost fully closed will the ridges or bulges 61, 67, 77, 87 and 98 snap into position in the grooves formed by the arcuate portions at the corners of the insert, thus completing the snap action and effective locking of the closure in fully closed position. The locking is effective just prior to the lid reaching its end closed position and remains in locked position completely closed against accidental opening to any degree whatsoever until the user opens the lid or closure. As a matter of fact the ridges or bulges push against the portions 69, 66 and 76 in this position.

What I claim is:

1. A box construction for receiving cigarettes or like articles comprising a body portion including front, rear, side and bottom walls and a chamber with an open top, the upper ends of said side walls of the body portion being provided with external vertical grooves inset from the normal plane thereof, a closure hingedly connected to the back wall of the body portion including top, side and front walls, and side walls which at the inner surfaces thereof are provided with inwardly projecting ridges, means adapted to snap into said grooves as the closure is being brought to about a finally shut position on said box with a locking action in said grooves tending to urge the projecting means against the edges of said grooves to prevent any accidental opening of the closure upon the body portion.

2. A box as described in claim 1 in which the front wall of the body portion at the top thereof is yieldably flexible in a plane forwardly of said grooves whereby as the closure is hingedly moved to an initial closed position upon the body portion the said flexible portion will engage the inner surface of the front wall of the closure and be flexed inwardly in frictional engagement with the closure.

3. A box of relatively stiff material comprising a polygonal shaped main body portion provided with a chamber therein having a top opening thereto and including a back wall, bottom wall, side walls and a front wall, the upper end of the front wall being yieldably flexible inwardly so that it can return to normal position, a polygonal shaped closure cap hingedly connected to the body portion back wall and including a top wall, side walls and a front wall, a side wall of the body portion adjacent the opening thereof being provided with an exterior facing upright elongated groove, and a side wall of the closure being provided with an elongated upright projecting ridge at the inner side thereof adapted to lock in the groove of said side wall when the closure is completely shut upon said body portion whereby the closure cannot be accidentally opened and can only be opened through the use of some manual lifting force.

4. The box as described in claim 3 in which both side walls of the body portion are provided with the said exterior grooves and in which both side walls of the closure are provided with elongated ridges inwardly projecting and adapted to lock respectively in said grooves when the closure is completely shut upon the body portion.

5. The box of claim 4 in which the upper end of the front wall of the body portion is laterally disconnected from the upper ends of the adjacent body side walls to enable inward flexible bending of the top wall of the body portion as the front wall of the cap engages and rides over the upper end of the front wall of the body portion when the cap is moved to a closing position, the grooves in the side walls of the body portion being constructed and arranged with respect to the ridges of the side walls of the closure so that as the closure is brought to an initial closing position it will ride over the connected corners of the side walls and front wall of the body portion and then as the closure is brought to a final closing position said ridges will snap into position into the grooves of the side walls of the body portion inwardly from the connected corners of the front wall and side walls of the body portion to lock the closure in completely shut position against accidental opening.

6. A box of relatively stiff material adapted to contain cigarettes and the like comprising a polygonal shaped main body portion provided with a chamber therein and having a top opening thereto, said body portion including a back wall, side walls, a front wall and a bottom wall, the upper portion of the front wall being flexible inwardly so that it can spring back into normal position, a closure cap hingedly connected to the body portion back wall and including a top wall, side walls and a front wall, said side and front walls being constructed to exteriorly overlie the side and front walls of the body portion, the side walls of the body portion at the opening at the top wall being provided with upright elongated grooves facing outwardly and located immediately adjacent to the front wall but slightly spaced from the plane of the body front wall, and the side walls of the closure being provided with upright internally projecting ridges spaced slightly from the inner surface of front wall of the closure and in such relative position that as the closure is moved to a closing position upon the body portion said ridges will ride in complementary relation over the corners of the side walls of the body and snap into the grooves of the side walls of the body portion as said closure is moved to a completely shut position, the front walls of the body and closure bearing such a relation to each other that as the closure is being shut the front wall thereof will inwardly flex the upper portion of the front wall of the body portion.

7. A box of relatively stiff material adapted to contain cigarettes and the like comprising a polygonal shaped main body portion provided with a chamber therein and having a top opening thereto, said body portion including a back wall, side walls, a front wall and a bottom wall, a closure cap hingedly connected to the body portion back wall and including a top wall, side walls and a front wall, said side and front walls being constructed to exteriorly overlie the side and front walls of the body portion, the side walls of the body portion at the opening at the top wall being provided with upright elongated grooves facing outwardly and located immediately adjacent to the front wall but slightly spaced from the plane of the body front wall, and the side walls of the closure being provided with upright internally projecting ridges spaced slightly from the inner surface of front wall of the closure and in such relative position that as the closure is moved to a closing position upon the body portion said ridges will ride in complementary relation over the corners of the side walls of the body and snap into the grooves of the side walls of the body portion as said closure is moved to a completely shut position.

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FRANKLIN T. GARRETT, *Primary Examiner.*

EARLE J. DRUMMOND, THERON E. CONDON, *Examiners.*