United States Patent [19]

Knowles

[11] **3,764,059**

[45] **Oct. 9, 1973**

[54] **STUD LOCK**

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[22] Filed: **Oct. 3, 1972**

[21] Appl. No.: **287,106**

[52] **U.S. Cl.** ..... **229/23,** 229/34 R, 312/258

[51] **Int. Cl.** **B65d 13/00**

[58] **Field of Search** ..... 229/31 I, 34 HW, 229/34, 23 R, 48 R; 312/259, 261

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Primary Examiner—Davis T. Moorhead

[57] **ABSTRACT**

This invention, a system of closure, relates to a knock-down box or container, and not only locks the box in an erected, finished position or attitude, but because of its design characteristics also adds to the container performance. Corrugated paper board or fibreboard paper may be used in the manufacture of the box, however, other suitable materials or combination of materials could be used.

5 Claims, 6 Drawing Figures

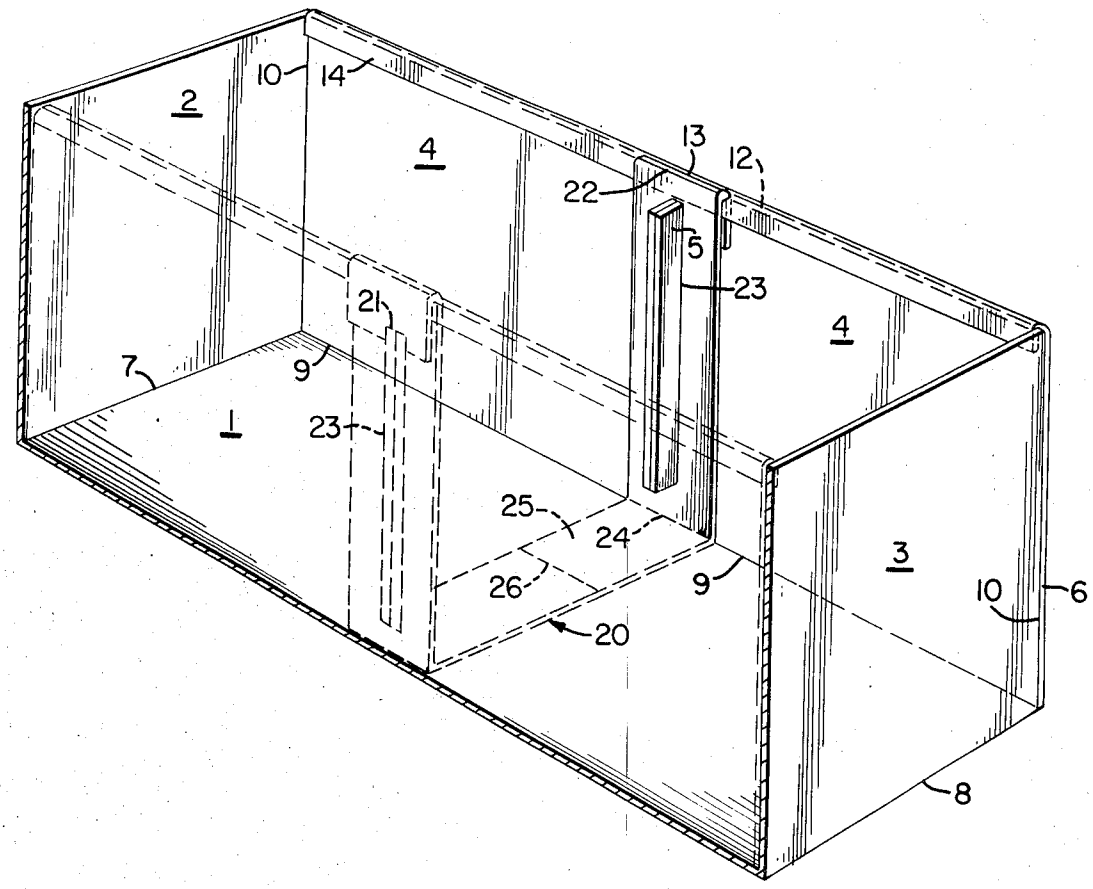
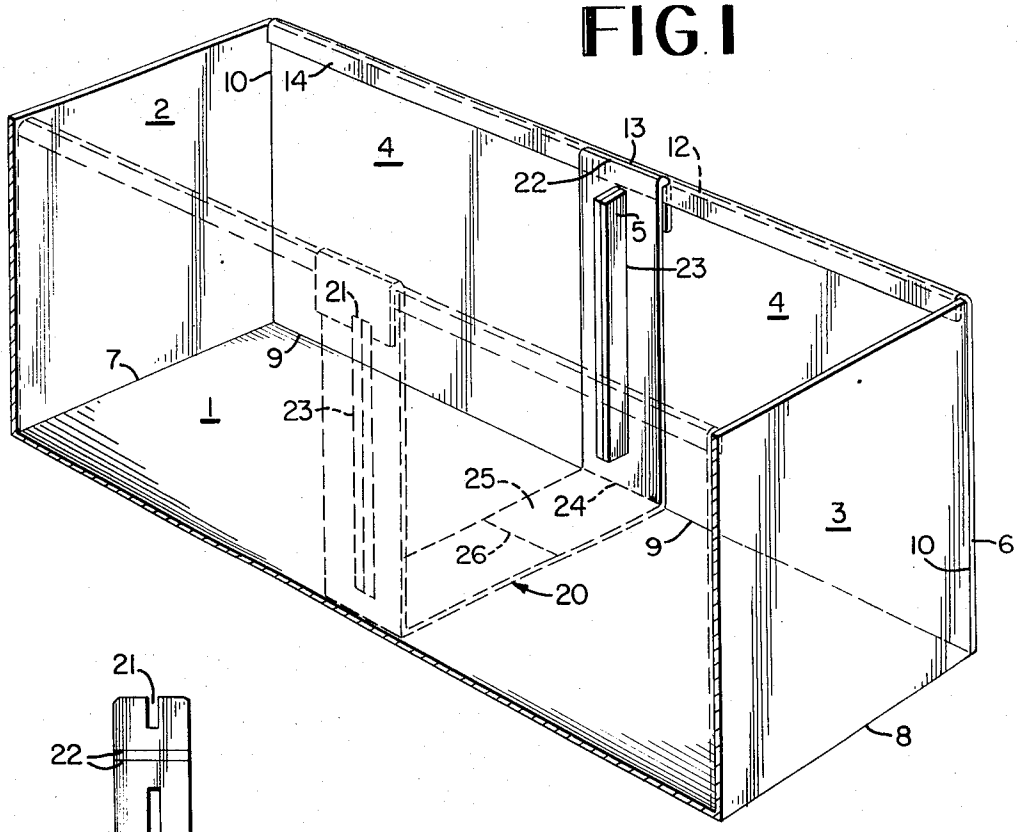


FIG. 1



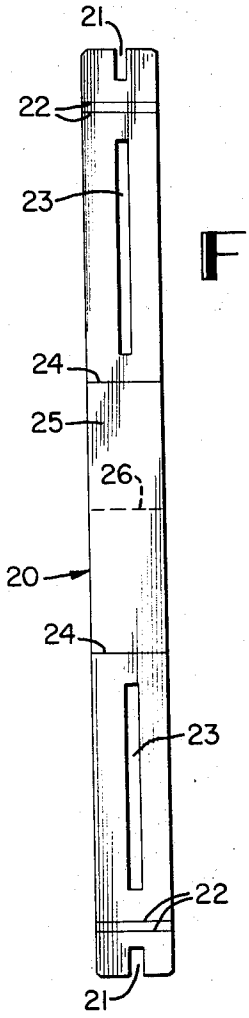


FIG. 2

FIG. 3

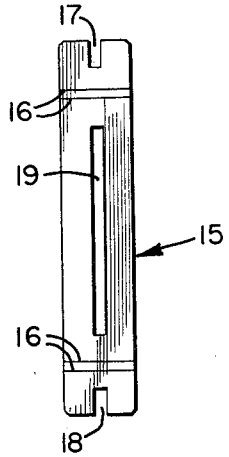


FIG. 4

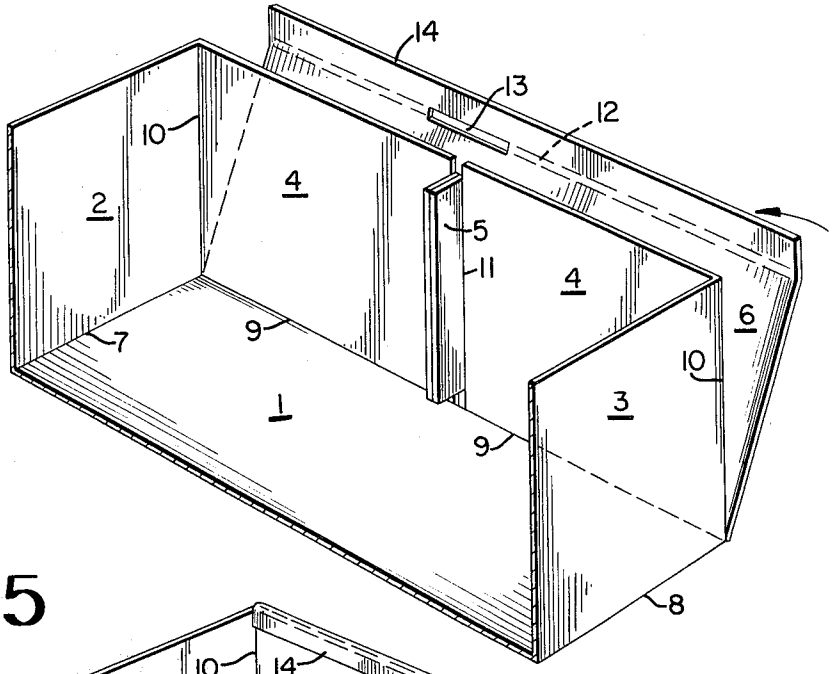


FIG. 5

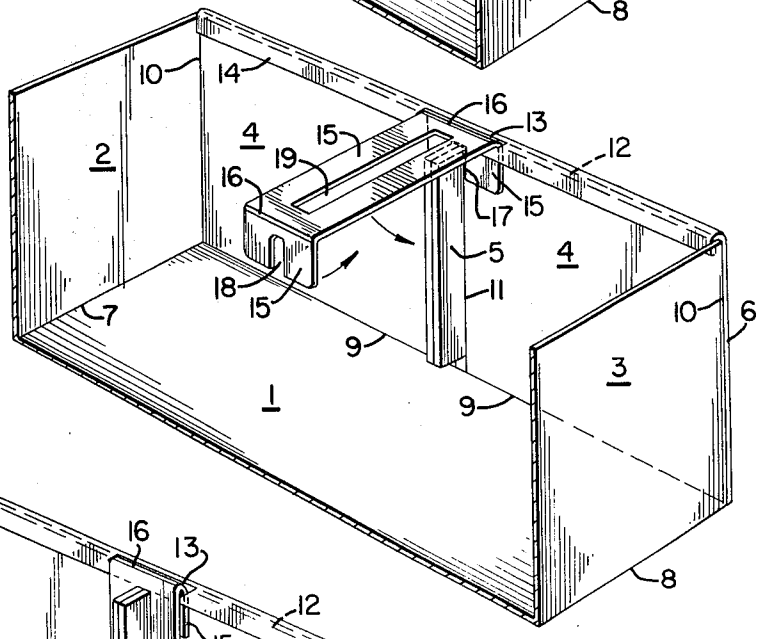
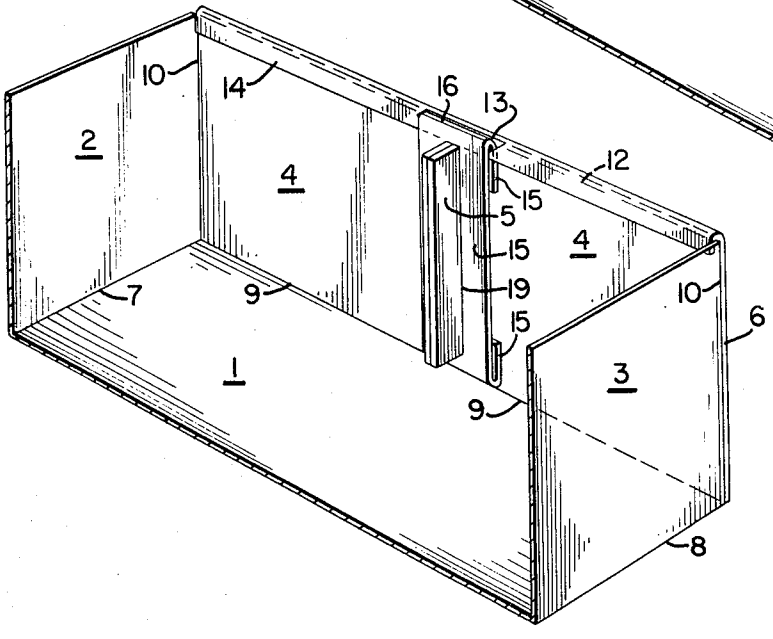


FIG. 6



STUD LOCK

One object of the invention is to produce a box that can be easily and rapidly erected without use of tools.

In bulk type packs, especially in rectangular shaped boxes, the weight of the product tends to exert most pressure to the center of the long expanse of the container. Therefore, it is another object of the invention to strengthen that section of the box through the use of the long slotted locking strap or through the use of the short slotted locking straps, in combination with the tab formed studs. Either combination increases the stacking strength of the erected box, and when using the long slotted locking strap in the closure mechanism, added resistance to upward pressure on the outside surface of the bottom wall is established. Again, when using the long slotted locking strap in the closure mechanism, the downward pressure, of the weight of the product on the center section of the strap, is utilized by transference of this pressure along the strap to the top of the tab formed stud, this downward pull adding stability to the side lateral flaps.

A further object of the invention is to use the downward and outward push of the weight of the product to improve the positiveness of the closure mechanism to stay locked.

One more object of the invention is to produce the type of box described which is manufactured from a single blank, that is, a single cutting and scoring operation. The long slotted locking strap or the short slotted locking straps may be part of the body blank, only tacked to it lightly, detached by hand and used in the box erection.

Aspects of the invention will be understood from the following specification and drawings in which;

FIG. 1 is a perspective view of the erected and assembled blank, incorporating the use of the long slotted locking strap, producing a box that embodies the invention. (Some parts shown in phantom.)

FIG. 2 is a top plan view of the long slotted locking strap that secures the flaps and tabs on both sides of the box, plus reinforcing the bottom wall of the box.

FIG. 3 is a top plan view of the short slotted locking strap which secures the flaps and tabs on each side of the container.

FIG. 4 is a perspective view showing the first steps in erecting the box of FIG. 1.

FIG. 5 and FIG. 6 are perspective views showing the appli of the short slotted locking strap of FIG. 3, the last steps in erecting the container.

Since the right and left sides of the blank are identical and illustrate the novel locking means of the invention, I have chosen to describe in detail those parts and actions on one side of the box only, starting with FIG. 4.

In FIG. 4 end walls 2 and 3 are hingedly connected to bottom wall 1 by score lines 7 and 8 and are rotatable relative to bottom wall 1. Side lateral flaps 4 are hingedly connected to end walls 2 and 3 by score lines 10 and are rotatable relative to end walls 2 and 3. Tabs 5, that form the stud, are hingedly connected to side lateral flaps 4 by score lines 11 and are rotatable relative to side lateral flaps 4. Side wall 6 is hingedly connected to bottom wall 1 by score line 9 and is rotatable relative to bottom wall 1. Also, side wall 6 is scored across its top from a horizontal locking tab 14 by double score lines 12. The horizontal locking tab 14 is rotatable relative to the side wall 6 about double score lines 12. A locking slot 13 is centered, from right to left, in the horizontal locking tab 14.

In FIG. 5 side lateral flaps 4 and tabs 5 are held in position of FIG. 4 until side wall 6 abuts the outside surfaces of side lateral flaps 4. Horizontal locking tab 14 is bent over, inwardly and downwardly from double score lines 12 until it abuts the upper portions of the inner surfaces of side lateral flaps 4. The end tabs of the short slotted locking strap 15 are rotatable relative to the center section of the strap about double scorelines 16. Next, the end of the short slotted locking strap 15 is inserted down through the locking slot 13 until its end slot 17 is tightly engaged over and around the top portions of tabs 5 that form the stud. The short slotted locking strap 15 is now pressed downwardly and inwardly.

In FIG. 6 the short slotted locking strap 15 has been pressed downwardly and inwardly, during which action its end tab has been turned inwardly and up, about double score lines 16, until it abuts the inner surface of the center section of said strap, slots 18 and 19 now fully engaged over, around and under tabs 5 that form the stud, which is now secure and the box in a finished position of erection.

In FIG. 1 the blank has been erected into the attitude of FIG. 5, only this time using the long slotted locking strap 20 of FIG. 2 instead of the short slotted locking strap 15 of FIG. 3. End tabs of the long slotted locking strap 20 are connected to the sections incorporating slots 23 by double score lines 22 and are rotatable relative to these sections. The sections incorporating the slots 23 are connected by score lines 24 to a section 25 and are rotatable relative to section 25. Centered in section 25, a broken line 26 depicts a reverse score.

Next, the end tab of the long slotted locking strap 20 has been inserted down through the locking slot 13 until its end slot 21 tightly engaged the top portions of the tabs 5 that form the stud. The long slotted locking strap was then pushed downwardly and inwardly until the slot 23 was engaged over, around and under the tabs 5 that form the stud. To keep the remaining slot 23 from prematurely engaging the bottoms of tabs 5 that form the remaining stud, the center section 25 was bent upwardly at reverse score line 26. Now, the remaining end tab was inserted down through the locking slot 13 until its end slot 21 tightly engaged the top portions of the tabs 5 that form the stud. Said long slotted locking strap was then pushed downwardly and inwardly until the slot 23 was engaged over, around and under tabs 5 that form the stud. The center section 25 of the said strap was then pressed flat against the bottom wall 1, the container now in a finished position of erection.

To knock the box down, pull in and up on the bottom of the short slotted locking strap of FIG. 6, removing it from the tabs 5 that form the stud and the locking slot 13. To knock the box down, when using the long slotted locking strap 20 of FIG. 1 and FIG. 2, pull straight up at the reverse score line 26 in center section 25, disengaging the strap from the bottoms of the tabs 5 that form the studs on both sides of the container and also in the same upward movement removing the end tabs of said long slotted locking strap from locking slots 13. Slight inside out pressure on side lateral flaps 4 will cause side walls 6 and side lateral flaps 4 to fall away into a nearly flattened position.

Also, the box illustrated and described in FIG. 1 and FIG. 6 might include short, temporary locking tabs on the ends of the horizontal locking tab **14** and which would engage locking slots or slits in the adjacent end wall **2** and adjacent end wall **3.** This would not increase the board usage; these temporary locking tabs could be gotten from the material cut from the tops and bottoms of the tabs **5** that form the stud. Possibly, the use of the temporary locking tabs could make the placement of the long slotted locking strap **20** and the short slotted locking straps **15** easier and faster.

What I claim is:

1. A knock down box construction, including a bottom wall, side walls and end walls hingedly connected to said bottom wall, and side lateral flaps rotatable relative to the end walls, all movable to a first position in which they are in a vertical plane to said bottom wall,

locking mechanisms for detachably securing each said side wall to the contiguous side lateral flaps to retain said side walls and end walls and side lateral flaps in their first position, each of said locking mechinisms including

tabs hingedly connected to the ends of said side lateral flaps and movable to a first position in which they are at right angles with their respective side lateral flaps and side walls when said side lateral flaps and side walls are in their first position, and

locking slots centered in the horizontal locking tabs which are hingedly connected to the top of said side walls, and

a detachable long slotted locking strap, movable to a first position, pressed down through the locking slots in said horizontal locking tabs to a second position fully engaged over, around and under said tabs that form the studs, these tabs hingedly connected and at right angles to the side lateral flaps, to lock said side walls and said side lateral flaps in their finished position of erection.

2. The structure recited in claim **1,** there being slots in said horizontal locking tabs, adjacent to said locking strap, and end tabs on said locking strap that are engageable with said slots that are centered over the tabs that form the studs.

3. The structure recited in claim **1,** there being tabs on the ends of said side lateral flaps and at right angles to said side lateral flaps, forming the stud.

4. The structure recited in claim **1,** there being a long slotted locking strap, its slotted end tabs engageable with said locking slots in the adjacent said horizontal locking tabs and engageable with the tops of the tabs that form the studs, the long slotted strap's second section from each end engageable over, around and under said tabs that form the studs, the said strap's center section contiguous with the inside surface of the bottom wall.

5. The structure recited in claim **1,** there being short slotted locking straps, their slotted end tabs engageable with said locking slots in the adjacent said horizontal locking tabs and engageable with the tops of the tabs that form the studs, the short slotted strap's center section engageable over, around and under said tabs that form the studs.

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