Nov. 26, 1968 V. C. REKOW 3,412,921

SELF-LOCKING TRAY

Filed Oct. 26, 1967

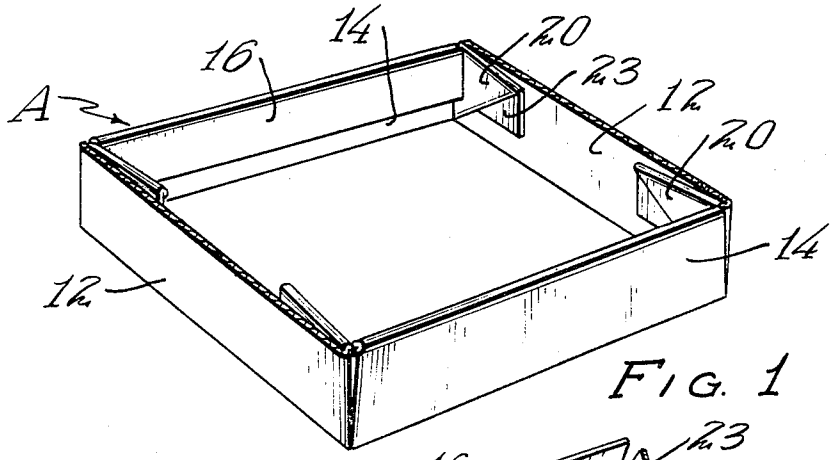


FIG. 1

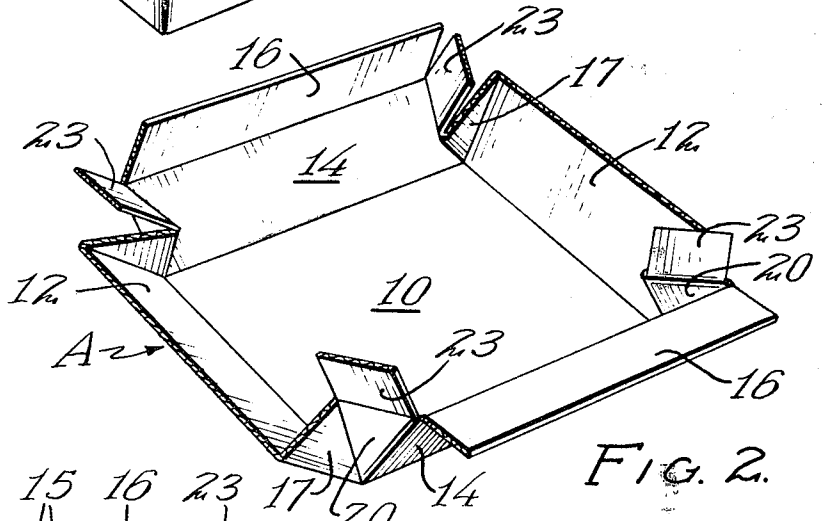


FIG. 2.

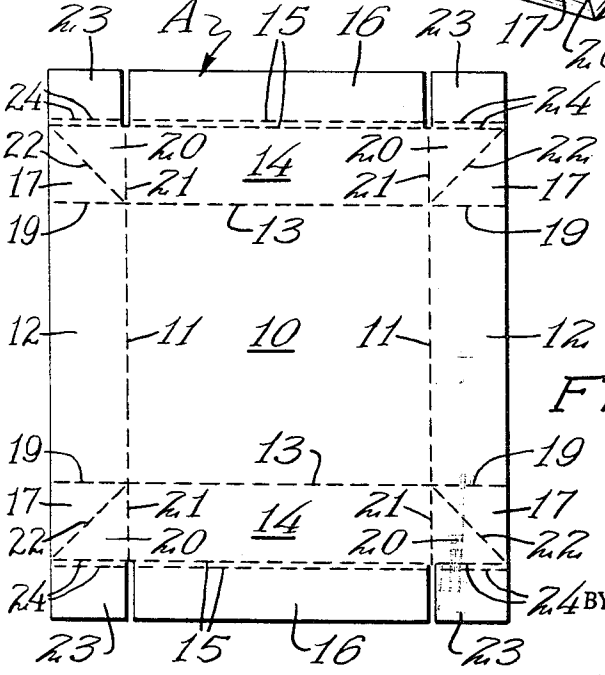


FIG. 3

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United States Patent Office 3,412,921 Patented Nov. 26, 1968

3,412,921

SELF-LOCKING TRAY

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Filed Oct. 26, 1967, Ser. No. 678,388
2 Claims. (Cl. 229—31)

ABSTRACT OF THE DISCLOSURE

This invention relates to a tray which may be locked in set up form without the use of staples, adhesives or other such means. The tray includes a rectangular bottom panel having side walls hinged to two opposed parallel edges and end walls hinged to the remaining opposed parallel edges. Triangular gusset flaps are hinged to the sides of the end walls and to the ends of the side walls, the gusset flaps at each corner being connected along fold lines which extend diagonally outwardly from the corners of the bottom panel. The gusset flaps hinged to the side walls include a flap hinged to the upper edge and folded between the end wall gusset flaps and the end wall panels. Liner flanges are hinged to the upper edges of the side walls and are folded between the parallel gusset flap structures to hold the tray from unfolding.

This invention relates to an improvement in self-locking trays and deals particularly with a tray of paperboard which may be erected into tray formation without the use of staples, adhesives or other means for securing the corners of the tray connected.

Various types of trays have been produced which may be erected from a flat blank and locked in erected form. This is most commonly done by providing corner flaps on the ends of two opposed walls designed to fold into face contact with the inner surfaces of the other opposed walls, and folding a lining panel hinged to the upper edges of the other opposed walls inwardly of the corner flanges and locking the lining panels in this position. The trays thus formed cannot be liquid tight due to the slots separating the corner flaps from the other opposed walls. Furthermore, it is usually necessary to have the lining panels to full height of the walls to which they are hinged in order to lock in place.

An object of the present invention resides in the provision of a tray which can be water-proof if it is so desired, and which is held erect by lining panels or flanges which extend only a portion of the height of the walls to which they are hinged. This arrangement results in a saving of paperboard, and a consequent saving in cost.

A feature of the present invention resides in the provision of a tray having a pair of triangular gusset flaps connected together along a diagonal fold line forming the corners of the tray. A flap is hinged to the upper edge of the gusset flap which will be innermost and is designed to fold over the upper edge of the adjoining gusset flap to hold the gusset flaps in face contact. The flap is folded between the two gusset flaps and two opposed walls of the tray. Liner flanges are provided hinged to the upper edges of the remaining two opposed tray side walls and the liner flanges are designed to fold between the gusset flaps at opposite ends of the tray to hold the tray erect.

These and other objects and novel features of the present invention will be more clearly and fully set forth in the following specification and claims.

In the drawings forming a part of the specification,

FIGURE 1 is a perspective view of the tray in erected position,

FIGURE 2 is a perspective view of the tray in partially folded position.

FIGURE 3 is a diagrammatic view of the blank from which the tray is formed.

The tray which is indicated in general by the letter A is formed of the blank illustrated in FIGURE 3. As shown, the blank includes a bottom panel **10** of rectangular form connected along parallel fold lines **11** to end walls **12**. The bottom panel **10** is foldably connected to side wall panels **14** along parallel fold lines **13** which are in right angular relation to the fold lines **11**. The side walls **14** are connected along double lines of fold **15** to liner flanges **16**.

Triangular gusset flaps **17** are foldably connected to the sides of the end walls **12** along fold lines **19** which are substantially extensions of the fold lines **13**. Similar triangular gusset flaps **20** are foldably connected to the ends of the side walls **14** along fold lines **21** which are substantially extensions of the fold lines **11**. The gusset flaps **17** and **20** at each corner of the blank are foldably connected along fold lines **22** which extend diagonally outwardly from the four corners of the bottom panel **10**. Locking flaps **23** are hingedly connected to the gusset flaps **20** along double fold lines **24** which are substantially aligned with the double fold lines **15**.

In erecting the tray, the gusset flaps **17** and **20** are folded along the diagonal fold lines **22**, the side walls **14** and end walls **12** being simultaneously folded upwardly along the fold lines **13** and **11**. When the gusset flaps **17** and **20** are in face contact, they are first folded against the side walls **14**, the gusset flaps **20** which are hinged to the side walls being folded substantially into face contact with the side walls **14**. When in this position, the locking flaps **23** are folded over the upper edges of the gusset flaps **17** and folded downwardly of the gusset flaps **17**. Each gusset flap structure is then folded through an angle of 90° so that the gusset flaps **17** are in parallel relation with the end wall panels **12** to which they are hinged. This action causes the locking flaps **23** to be sandwiched between the gusset flaps **17** and the end walls **12**. The linear flanges **16** are then folded inwardly and downwardly between the gusset flap structures at opposite ends of the tray, holding the gusset flap structures against the end walls and thereby preventing the tray from unfolding. In other words, instead of folding the liner flanges over the gusset flap structures to enclose them, the ends of the liner flanges engage between the gusset flap structures to hold them against the end walls **12**. In this way the liner flanges need not extend the full height of the side walls to which they are hinged. The terms "side wall panels" and "end wall panels" are merely for reference and not to indicate the relative length of these panels.

I claim:

1. A tray including:

a rectangular bottom panel,

end walls hinged to opposite parallel edges of said bottom panel,

side walls hinged to opposite sides of said bottom panel,

said side and end walls extending upwardly from said bottom panel,

triangular gusset flaps hinged to the end edges of said side walls,

triangular gusset flaps hinged to the side edges of said end walls,

said triangular gusset flaps of said side walls being connected to the gusset flaps of said end walls along diagonal fold lines and folded in face contact,

locking flaps hinged to the upper edges of the gusset flaps hinged to said side walls and folded over the upper edges of the adjoining end wall panel gusset

flaps and between the end wall panel gusset flaps and the end walls, and

liner flanges hinged to the upper edges of said side wall panels and folded between the gusset flaps folded parallel to the end walls to hold the tray assembled.

2. The structure of claim 1 and in which the locking flaps and liner flanges are of equal length.

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DAVID M. BOCKENEK, *Primary Examiner.*