Nov. 22, 1955 L. K. BROWN 2,724,308

EGG CARTON OPENER

Filed April 1, 1952 3 Sheets-Sheet 1

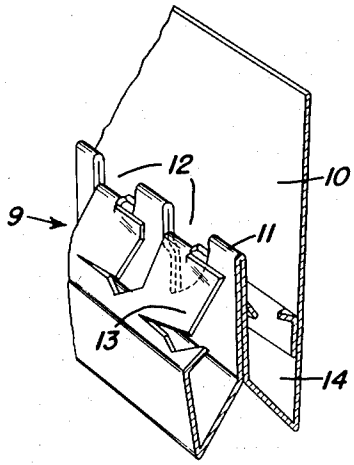


FIG. 1.

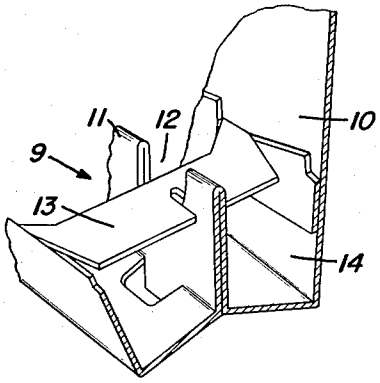


FIG. 2.

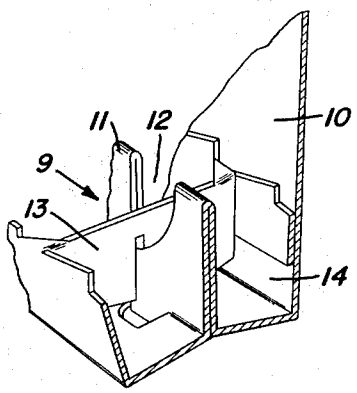


FIG. 3.

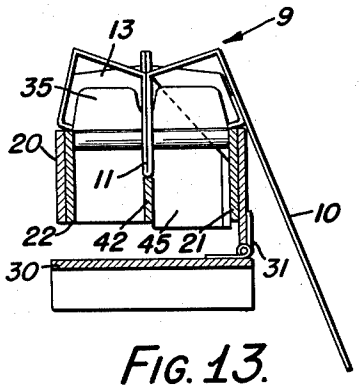


FIG. 13.

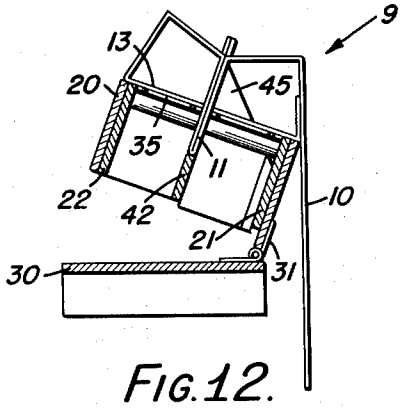


FIG. 12.

INVENTOR.
LLOYD K. BROWN

BY

Edward H. Crumpton

HIS ATTORNEY

Nov. 22, 1955 L. K. BROWN 2,724,308

EGG CARTON OPENER

Filed April 1, 1952 3 Sheets-Sheet 2

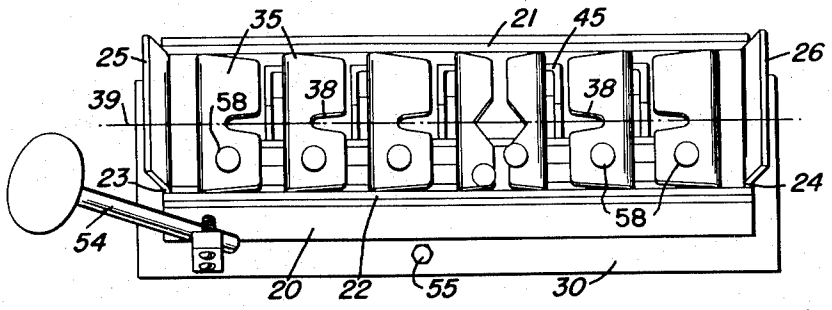


FIG. 4.

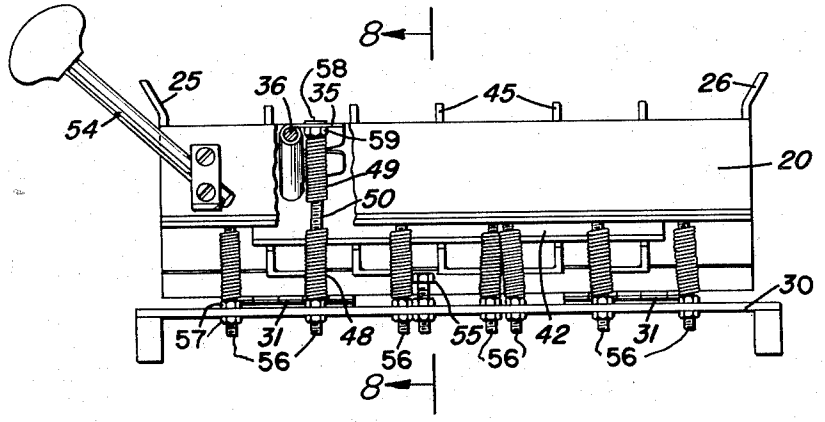


FIG. 5.

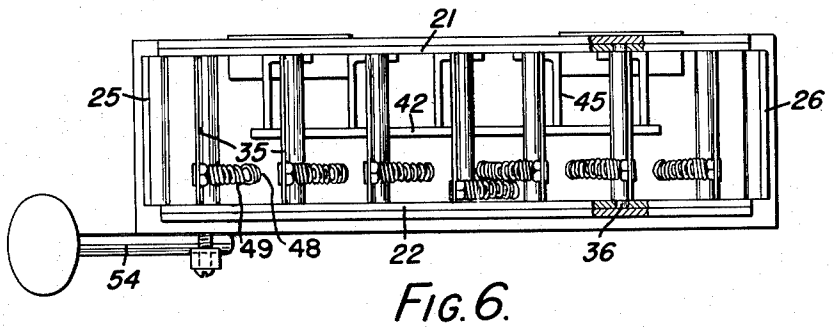


FIG. 6.

INVENTOR.
LLOYD K. BROWN

BY

HIS ATTORNEY

Nov. 22, 1955 L. K. BROWN 2,724,308

EGG CARTON OPENER

Filed April 1, 1952 3 Sheets-Sheet 3

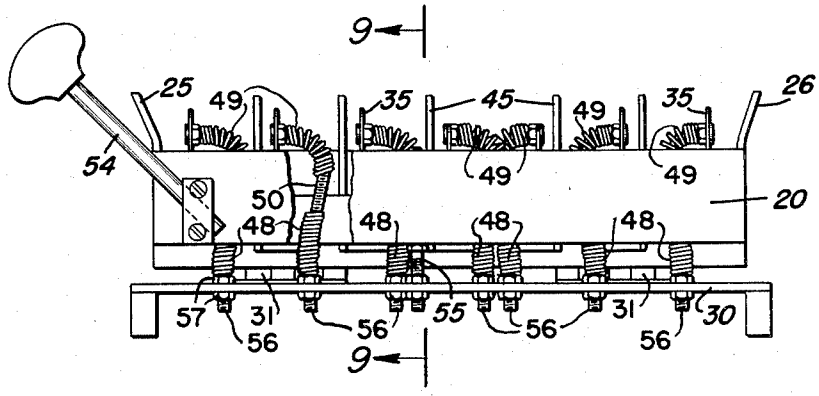


FIG. 7.

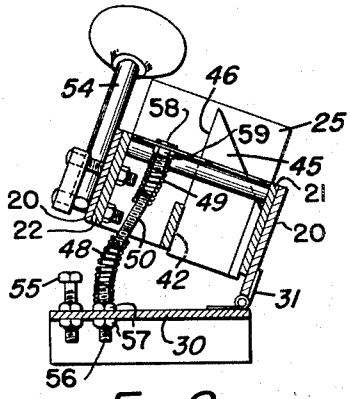


FIG. 8.

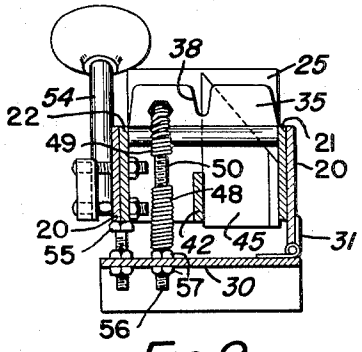


FIG. 9.

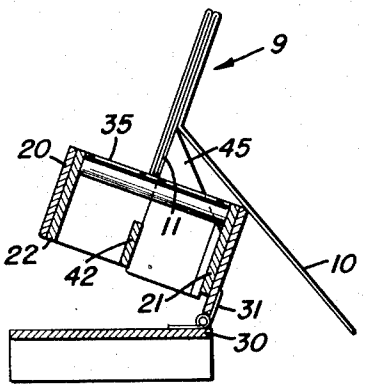


FIG. 10.

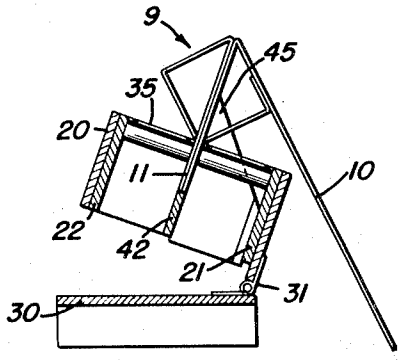


FIG. 11.

INVENTOR.
LLOYD K. BROWN

BY

Edward H. Rumpf

HIS ATTORNEY

United States Patent Office 2,724,308 Patented Nov. 22, 1955

2,724,308

EGG CARTON OPENER

Lloyd Kalmon Brown, Vancouver, British Columbia, Canada, assignor to Bloomer Bros. Company, Newark, N. Y., a corporation of New York

Application April 1, 1952, Serial No. 279,810

Claims priority, application Canada October 9, 1951

9 Claims. (Cl. 93—37)

This invention relates to a machine for assisting in the opening or erection of a collaspible egg carton. The machine is intended for use in connection with an egg carton of the collapsible cellular type including a plurality of partitions lying in a common plane when the carton is collapsed or partially open and each partition must be bent into a plane substantially at right angles to the common plane in order to form cells or pockets for the eggs. Such cartons are commonly stored and transported in a compact folded state and in many instances, particularly when used in smaller quantities, they are commonly opened or erected by hand which is a monotonous and time-consuming type of operation.

One object of the invention, therefore, is to make it possible for an operator to open up such a carton and bend all of the partitions into their final erected positions at substantially the same time so as to greatly expedite and facilitate the opening of the carton ready for reception of the eggs.

To these and other ends the invention resides in certain improvements and combinations of parts, all as will be hereinafter more fully described, the novel features being pointed out in the claims at the end of the specification.

In the drawings:

Fig. 1 is a fragmentary, perspective view, partly in section, showing a carton in substantially collapsed condition;

Fig. 2 is a similar view but showing the carton partially erected;

Fig. 3 is a similar view but showing the carton and its partitions in fully erected condition;

Fig. 4 is a top plan view of a carton opening machine embodying the present invention;

Fig. 5 is a side elevation of the machine, partly broken away, ready for the reception of a carton to be opened;

Fig. 6 is a top plan view of the machine partly in section after being operated but with the carton omitted;

Fig. 7 is a side elevation of the machine, partly broken away, as in Fig. 5, but showing the parts operated to open a carton, with the carton omitted;

Fig. 8 is a sectional elevation substantially on the line 8—8 in Fig. 5;

Fig. 9 is a sectional elevation substantially on the line 9—9 in Fig. 7, and

Figs. 10 to 13, inclusive, illustrate in a photographic way four successive stages of the unfolding or erection of the carton by the machine.

The machine is adapted, in the present instance, for unfolding and erecting a carton of the type illustrated in Figs. 1 to 3 of the drawings comprising a carton indicated generally at 9, comprising a cover 10, a central longitudinal partition 11 having relatively large notches 12 in the upper edge thereof, and a plurality of cross partitions 13 which are normally parallel with the cover 10 when the box is in its collapsed position. When the box has been unfolded into almost its final position, the partitions

13 lie substantially in a common plane as shown in Fig. 2. These partitions have to be bent downwardly from the common plane approximately at right angles thereto, as clearly shown in Fig. 3, in order to form pockets 14 for the eggs. The present machine assists in the opening up of the carton and it folds the partitions into their final position as shown in Fig. 3.

The preferred embodiment of the invention, herein disclosed by way of illustration, comprises, preferably, an elongated frame 20, Figs. 4 to 9, inclusive, having approximately the size of an egg carton. This frame has spaced parallel sides 21 and 22 and ends 23 and 24. These ends may be extended above the frame and flared outwardly to form the guides, 25 and 26, respectively. The frame may be mounted in any suitable manner, but it preferably is mounted on a base 30 by means of one or more hinges 31 extending along one side of the base and the frame. The frame normally lies at an angle to the base, as shown in Fig. 8.

A plurality of flaps 35 are pivotally mounted on the frame and normally lie in substantially the same plane, as shown in Fig. 4. Each flap is secured along one edge to a shaft 36 which is journalled at its opposite ends in the sides 21 and 22 and it will be noted that some of these flaps extend from their shafts in one direction and the others in the opposite direction. Each flap has a central notch 38 in the free edge thereof which extends along the center line 39 of the frame.

A stop 42 extends longitudinally of the frame near the bottom thereof along the center line 39. The flaps 35 are preferably spaced apart and guides 45 extend upwardly through the spaces along the frame center line. Each guide has a vertical edge 46, Fig. 8, which substantially coincides with the center line.

Suitable means is provided for tilting the flaps out of their normal plane into approximately parallel planes, each lying at an angle to said normal plane. One convenient way of doing this is to provide a spring extending from the base to each flap. This may be one continuous spring, or as illustrated in Fig. 5, it may consist of springs 48 and 49 connected by a short shaft 50. The lower end of spring 48 is connected to the base 30 by a vertically-extending stud 56 (Fig. 8) which is secured to base 30 by a pair of nuts 57, as shown in Fig. 8. The upper end of spring 49 is connected to a flap 35 at a point spaced from the shaft 36 thereof by a suitable bolt 58 (Fig. 8) and nut 59, as shown in Fig. 8. When the frame is in its normal position, as shown in Fig. 8, the springs stand in a vertical line and the flaps lie at an angle thereto, as shown in Fig. 5.

The frame is preferably provided with a handle 54 by means of which it may be moved toward the base, and an adjustable stop 55 is provided on the latter to limit the downward movement on the frame.

The operation of the machine is clearly seen by reference to Figs. 10 to 13, inclusive. As stated above, the frame 20 normally lies at an angle to the base 30, the spring arrangements for the flaps 35 retaining it in this position. The carton 9 is placed against the guides 45 with its central partition 11 extending along the flaps, as shown in Fig. 10. The cover 10 is drawn down over the side of the frame and the carton pressed downwardly until the free edge of its central partition rests on the stop 42, as shown in Fig. 11. The notches 12 of the partition fit over the flaps to make this movement possible. In Fig. 12, the carton has been moved into substantially its final position at which time the cross partitions 13 lie substantially in a common plane and overlap the flaps 35. Each of these flaps must be bent upwardly towards the bottom of the inverted carton along one edge thereof and each of these edges lies over the pivot edge of a flap.

The carton is retained firmly in this position and the frame moved towards its base as shown in Fig. 13. This movement results in each of the flaps swinging upwardly to bend a cross partition 13 into a position substantially at right angles to the partition common plane. Thus, when the carton is lifted off the machine, the cross partitions are in the positions clearly illustrated in Fig. 3. The frame returns to its normal angular position when it is released. The unfolding action is actually a very simple matter. Actually, it merely amounts to inserting the carton into the machine and pressing the carton downwardly while pulling its cover in the same direction. This downward movement unfolds the carton and it moves the frame relative to the base to cause the flaps to move out of their normal plane to unfold the carton partitions into their final position.

It will thus be seen that the invention accomplishes its objects and while it has been herein disclosed by reference to the details of a preferred embodiment, it is to be understood that such disclosure is intended in an illustrative, rather than a limiting sense, as it is contemplated that various modifications in the construction and arrangement of the parts will readily occur to those skilled in the art, within the spirit of the invention and the scope of the appended claims.

I claim:

1. An egg carton opener comprising an elongated frame, a plurality of spaced flaps pivotally mounted on the frame normally lying in substantially the same plane, guides projecting upwardly through the spaces between the flaps along a center line extending longitudinally of the frame, and means for tilting the flaps out of their normal plane into approximately parallel planes each lying at an angle to said normal plane.

2. An egg carton opener as claimed in claim 1 in which each flap is formed with a central notch in a free edge thereof which extends along the center line when the flap is in the normal plane.

3. An egg carton opener comprising a base, a frame hingedly mounted on the base, a plurality of flaps pivotally mounted on the frame normally lying in substantially the same plane, and means actuated by the pivotal movement of the frame relative to the base for tilting the flaps out of their normal plane into approximately parallel planes each lying at an angle to said normal plane as the frame is pivoted in relation to the base.

4. An egg carton opener as claimed in claim 3 in which the frame normally lies at an angle to the base.

5. An egg carton opener comprising a base, an elongated frame hingedly mounted on the base, a plurality of spaced flaps pivotally mounted on the frame normally lying in substantially the same plane, guides projecting upwardly through the spaces between the flaps along a center line extending longitudinally of the frame, and means actuated by the pivotal movement of the frame relative to the base for tilting the flaps out of their normal plane into approximately parallel planes each lying at an angle to said normal plane as the frame is pivoted in relation to the base.

6. An egg carton opener comprising an elongated base, an elongated frame hingedly mounted along one side on the base, a plurality of flaps each pivotally mounted at one edge on the frame and normally lying in substantially the same plane, the pivots of the flaps being parallel to each other, and means connected to the base and to each flap and actuated by the pivotal movement of the frame relative to the base for tilting each flap upwardly out of the normal plane into a plane lying at approximately right angles thereto as the frame is pivoted in relation to the base.

7. An egg carton opener comprising a base, a frame hingedly mounted on said base and normally lying at an angle thereto, a plurality of flaps pivotally mounted on the frame and normally lying in substantially the same plane, and means for tilting each flap comprising a spring extending from the base to the flap, said spring being in normal, released condition when the frame is in its normal position and being compressed and bent to move its flap out of the normal plane as the frame is swung towards the base.

8. An egg carton opener comprising an elongated base, an elongated frame hingedly mounted along one side on the base, a plurality of flaps each pivotally mounted at one edge on the frame and normally lying in substantially the same plane, the pivots of the flaps being parallel to each other, and resilient means connected to the base and to each flap and actuated by the pivotal movement of the frame relative to the base for tilting each flap upwardly out of the normal plane into a plane lying at approximately right angles thereto as the frame is pivoted in relation to the base.

9. An egg carton opener comprising an elongated base, an elongated frame hingedly mounted along one side on the base, a plurality of flaps each pivotally mounted at one edge on the frame and normally lying in substantially the same plane, the pivots of the flaps being parallel to each other, and a separate means connected to the base and to each flap and actuated by the pivotal movement of the frame relative to the base for tilting each flap upwardly out of the normal plane into a plane lying at approximately right angles thereto as the frame is pivoted in relation to the base.

References Cited in the file of this patent

UNITED STATES PATENTS

2,228,943	Bergstein	Jan. 14, 1941
2,263,286	Bray et al.	Nov. 18, 1941
2,398,872	Ullsmith	Apr. 23, 1946
2,612,086	Houtman	Sept. 30, 1952

FOREIGN PATENTS

47,443	Denmark	June 19, 1933