Sept. 30, 1952 H. R. HOUTMAN 2,612,086

CELLULAR CARTON ERECTING MACHINE

Filed Dec. 4, 1950 3 Sheets-Sheet 1

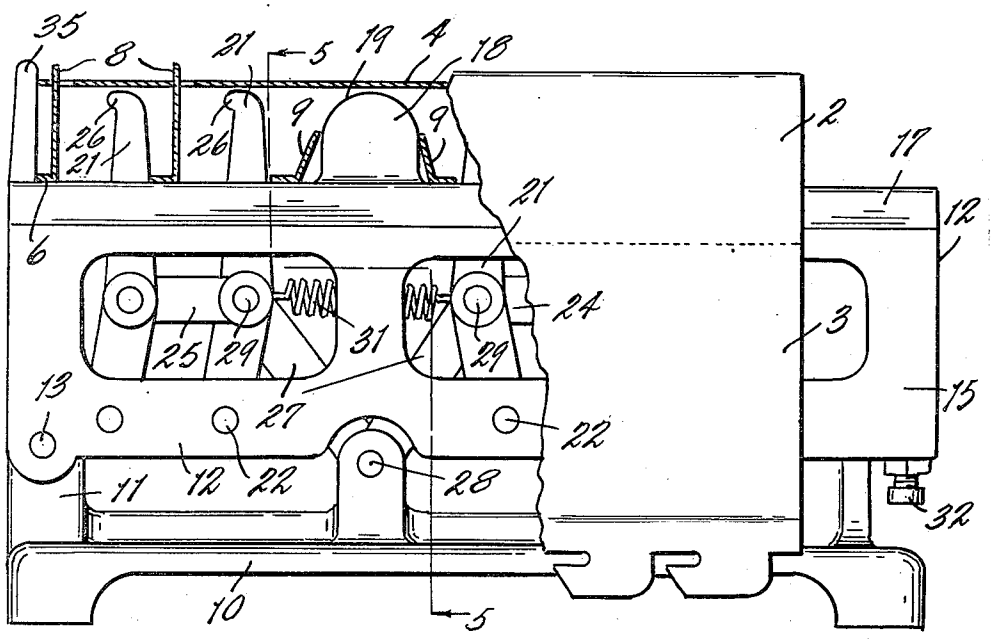


FIG. 1

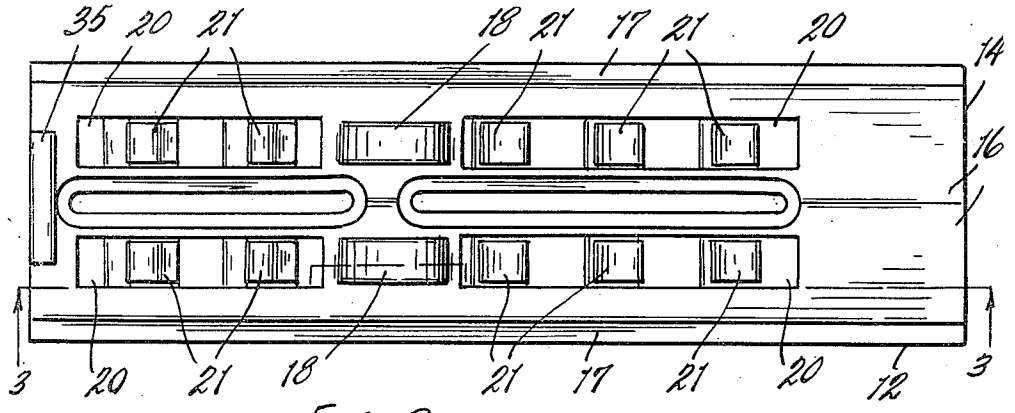


FIG. 2

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CELLULAR CARTON ERECTING MACHINE

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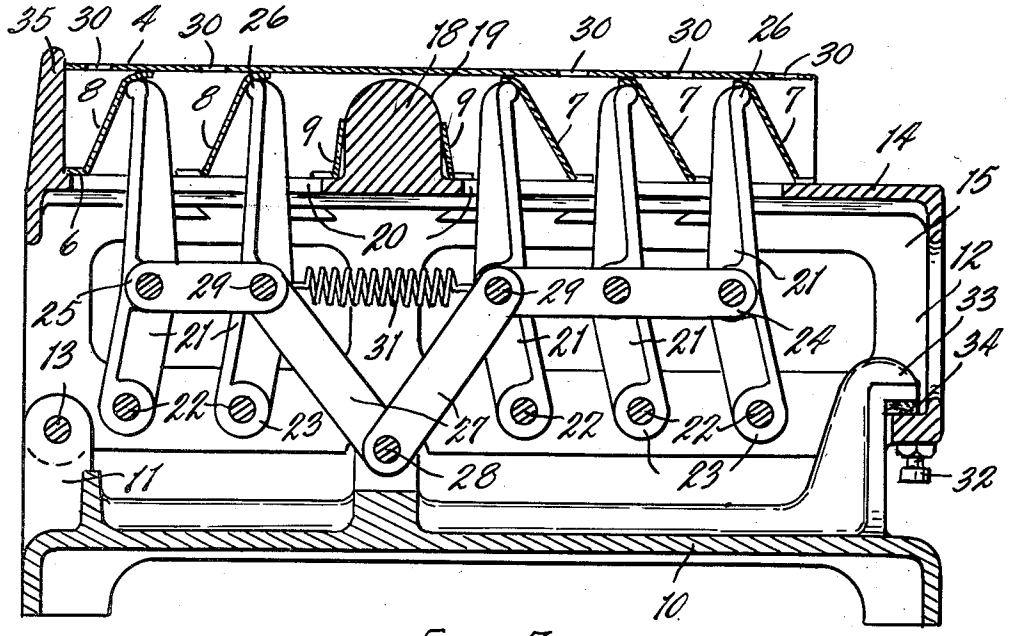


FIG. 3

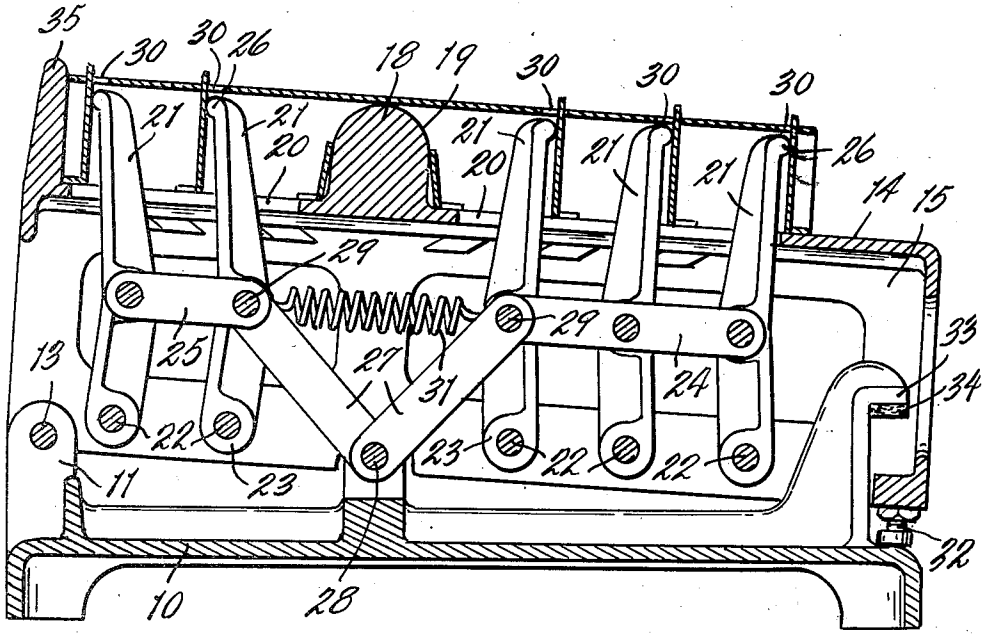


FIG. 4

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CELLULAR CARTON ERECTING MACHINE

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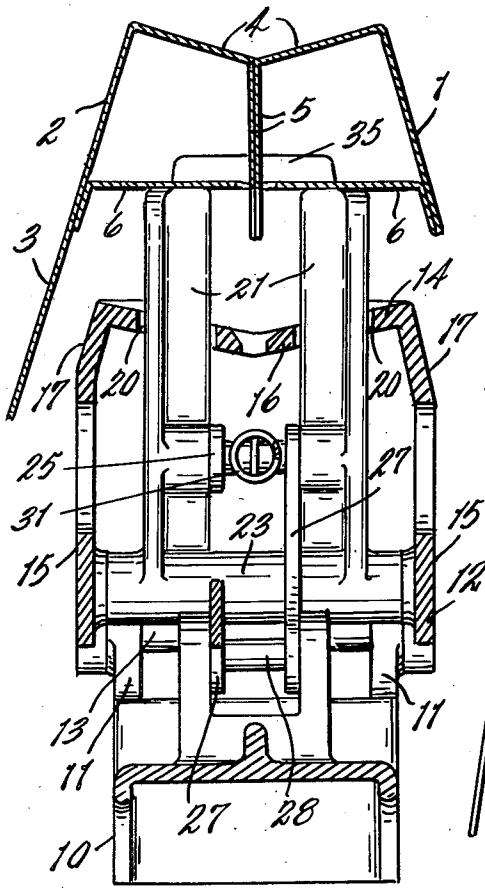


FIG. 5

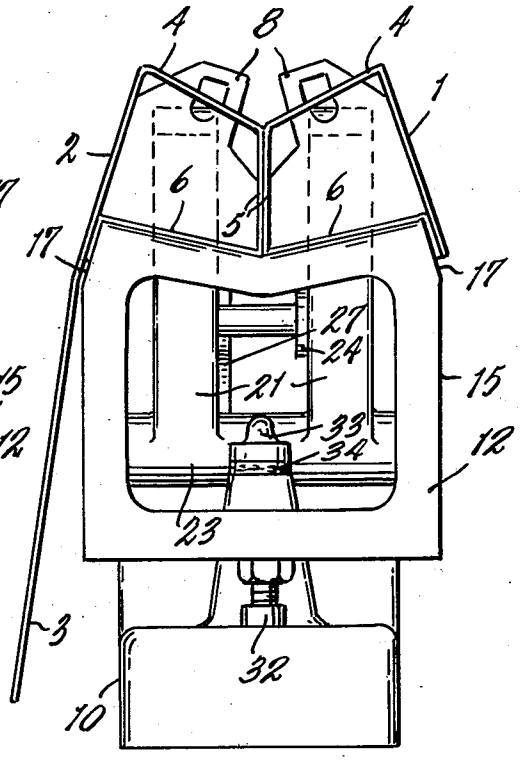


FIG. 6

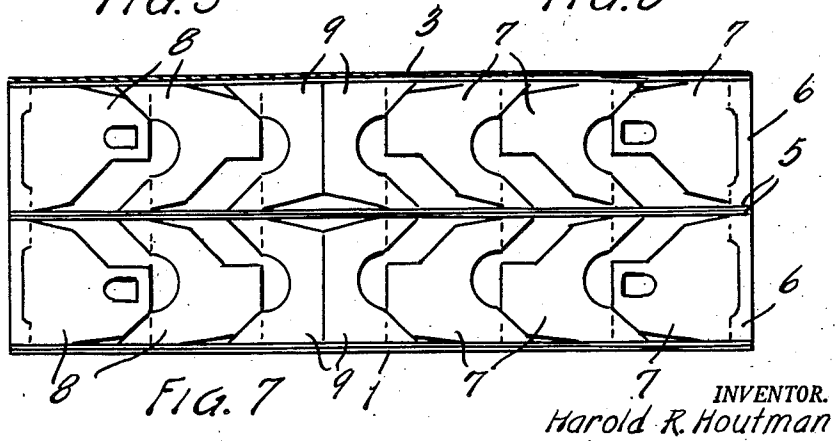


FIG. 7

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2,612,086

CELLULAR CARTON ERECTING MACHINE

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Application December 4, 1950, Serial No. 199,060

15 Claims. (Cl. 93—37)

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This invention relates to improvements in cellular carton erecting machines.

The main objects of this invention are:

First, to provide a machine for use in erecting the partitions in egg cartons and like cartons which is highly efficient and at the same time simple in operation.

Second, to provide a carton erecting machine which is well adapted for the erecting of the partitions of cartons in which a part of the transverse partitions must be swung in one direction and a part in the opposite direction to erect them.

Third, to provide a machine of this character which insures the complete erection of the transverse partitions on a single operating stroke.

Objects relating to details and economies of the invention will appear from the description to follow. The invention is defined and pointed out in the claims.

A preferred embodiment of the invention is illustrated in the accompanying drawings, in which:

Fig. 1 is a fragmentary side elevational view of a machine embodying my invention with a carton in erected position thereon, the carton being broken away and partially in longitudinal section.

Fig. 2 is a plan view of the machine of my invention.

Fig. 3 is a longitudinal section on a line corresponding to broken line 3—3 of Fig. 2 with a carton in position thereon and with the carton support member and partition erecting fingers in their normal or initial position.

Fig. 4 is a view corresponding to that of Fig. 3 with the machine in actuated position.

Fig. 5 is a transverse section on a line corresponding to broken line 5—5 of Fig. 1 illustrating the initial positioning of the carton on the carton holder or support member.

Fig. 6 is an end elevational view with the parts in actuated position and the carton completely erected.

Fig. 7 is a view of the partially erected carton, the cover being cut away.

The embodiment of my invention illustrated is particularly designed for the erection of a carton comprising front and rear side walls 1 and 2, the rear side wall being provided with a cover extension 3. The bottom comprises upwardly inclined bottom sections 4. The longitudinal partition 5 is formed integrally with the bottom. The top member 6 is slit to provide sets of transverse partitions 7 and 8 and intermediate partitions 9. The partitions 7 are swung in one direction when they are brought to erected position, and the partitions 8 are swung in the opposite direction, as is illustrated in the drawing. The partitions 9, intermediate the sets, are swung oppositely relative to each other. The machine is designed to receive the cartons in partially erected inverted position; that is, the walls are adjusted to partially erected position as shown in Fig. 5.

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The embodiment of my invention illustrated comprises a portable base 10 having an upwardly projecting post 11 at one end thereof and on which the carton support member designated generally by the numeral 12 is pivotally mounted at 13. This support member comprises a top generally designated by the numeral 14 and sides generally designated by the numeral 15. The top comprises inwardly inclined portions 16, while the sides have upper downwardly diverging portions 17 which merge with the top. The top is provided with a pair of laterally spaced fixed partition erecting members 18, which in the embodiment illustrated, have rounded ends 19. The inclined portions 16 of the top have longitudinal slots 20 therein aligned with these fixed partition erecting members 18.

Partition erecting fingers 21 are pivotally mounted between the side walls of the support members at 22. These fingers are desirably formed in connected pairs, the pairs being provided with integral bearing members 23 receiving the pivots 22. The fingers are arranged in oppositely facing sets, the sets of fingers being connected by the links 24 and 25 so that all of the fingers of a set are simultaneously operated. The fingers project through the slots 20 in the top of the support member and are provided with rounded noses 26 adapted to engage the transverse partition members. When the partially erected carton is positioned as in Fig. 5 and pushed downwardly, the fixed erecting members 18 engage the partition members 9 and deflect or force them to erected position, as shown in Fig. 3. This downward movement also swings the partitions 7 and 8 to partially erected position, as shown in Fig. 3.

The sets of fingers are connected by the links 27 to the base, the links being disposed in diverging relation and their lower ends mounted on the pivots 28. Their upper ends are engaged with the pivots 29 on the adjacent fingers of the sets. When the support member is swung downwardly on its pivot to the position indicated in Fig. 4, the sets of fingers are actuated in opposite directions, and the tips of the partitions 7 and 8 are snapped through holes 30 provided therefor in the bottom of the carton, as is illustrated in Figs. 1, 4 and 6.

To return the carton support member and the partition erecting fingers to their initial position, I provide a coiled extension spring 31, which is connected to the adjacent fingers of the sets so that the single spring serves the double function of returning the fingers to initial position and also returning the support member to initial position. The support member is provided with

an adjustable stop 32 limiting its work stroke and with a stop 33 limiting its return stroke, the stop 33 being provided with a buffer 34.

To facilitate positioning of the partially erected carton, the support member is provided with an upwardly projecting positioning member 35 at its pivoted end. After the support has been actuated, the carton is lifted off and another partially erected carton placed thereon. The erecting stroke is in effect a continuation of the movement placing the partially erected carton on the carton support.

With the aid of the machine of my invention, cartons may be very rapidly and efficiently erected. The machine illustrated is designed for erecting cartons having partitions which are swung in opposite directions. This disclosure will enable those skilled in the art to readily embody or adapt my invention for use in erecting cartons where the partitions are all swung in one direction. The structure illustrated is a highly practical commercial embodiment of my invention. I have not illustrated or described various modifications and adaptations which I contemplate or such as may be desirable for particular cartons, as it is believed that this disclosure will enable those skilled in the art to embody or adapt my invention as may be desired.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In a structure of the class described, the combination of a base, a carton support member pivotally mounted at one end thereof on said base for vertical swinging movement, said support member being adapted to receive a partially erected carton in inverted position and comprising transverse partitions, said support member having a top comprising inwardly inclined portions and having downwardly diverging side portions adjacent the said top portion, an upwardly projecting carton positioning member at the pivoted end of the support member, laterally spaced transversely aligned fixed partition erecting members having rounded ends projecting from the top portions intermediate the ends thereof, the top having longitudinal slots therein aligned with said partition erecting members, pairs of partition erecting fingers pivotally mounted on said support member below the top thereof to project through said slots, said fingers having rounded partition engaging noses, said pairs of fingers being arranged in oppositely facing sets, links connecting the fingers of the sets, oppositely inclined links pivotally connected to said base and to the adjacent pairs of fingers of the sets whereby the sets of fingers are simultaneously actuated in opposite directions when the support member is actuated on its pivots, and a coil spring connecting said sets of fingers and acting to return them and the support member to initial position.

2. In a structure of the class described, the combination of a base, a carton support member pivotally mounted at one end thereof on said base for vertical swinging movement, said support member being adapted to receive a partially erected carton in inverted position and comprising transverse partitions, said support member having a top comprising inwardly inclined portions and having downwardly diverging side portions adjacent the said top portion, an upwardly projecting carton positioning member at the pivoted end of the support member, laterally spaced transversely aligned fixed partition erecting members projecting from the top portions intermediate the ends thereof, the top having longitudinal slots therein aligned with said partition erecting members, pairs of partition erecting fingers pivotally mounted on said support member below the top thereof to project through said slots, said pairs of fingers being arranged in oppositely facing sets, links connecting the fingers of the sets, oppositely inclined links pivotally connected to said base and to the adjacent pairs of fingers of the sets whereby the sets of fingers are simultaneously actuated in opposite directions when the support member is actuated on its pivots, and means acting to return the fingers and the support member to initial position.

3. In a structure of the class described, the combination of a base, a carton support member pivotally mounted at one end thereof on said base for vertical swinging movement and adapted to receive a partially erected carton in inverted position, a carton positioning member at the pivoted end of the support member, said support having laterally spaced transversely aligned fixed partition erecting members intermediate the ends thereof and longitudinal slots aligned with said partition erecting members, pairs of partition erecting fingers pivotally mounted on said support member in oppositely facing sets to project through said slots, links connecting the fingers of the sets, links pivotally connected to said base and to the sets of fingers whereby the sets of fingers are simultaneously actuated in opposite directions when the support member is actuated on its pivots, a spring connecting said sets of fingers and acting to return them and the support member to initial position, and an adjustable stop on said support member coacting with said base to limit the return stroke of the support member.

4. In a structure of the class described, the combination of a base, a carton support member pivotally mounted at one end thereof on said base for vertical swinging movement and adapted to receive a partially erected carton in inverted position, a carton positioning member at the pivoted end of the support member, said support having laterally spaced transversely aligned fixed partition erecting members intermediate the ends thereof and longitudinal slots aligned with said partition erecting members, pairs of partition erecting fingers pivotally mounted on said support member in oppositely facing sets to project through said slots, links connecting the fingers of the sets, links pivotally connected to said base and to the sets of fingers whereby the sets of fingers are simultaneously actuated in opposite directions when the support member is actuated on its pivots, and a spring connecting said sets of fingers and acting to return them and the support member to initial position.

5. In a structure of the class described, the combination of a base, a carton support member pivotally mounted on said base for vertical swinging movement and being adapted to receive a partially erected carton in inverted position, said support member having laterally spaced transversely aligned partition erecting members and longitudinal slots aligned with said partition erecting members, partition erecting fingers pivotally mounted on said support member to project through said slots, links connecting said fingers in sets, links pivotally connected to said base and to the sets of fingers whereby the fingers of the sets are simultaneously actuated when the

support member is actuated on its pivot, and spring means acting to return the support and fingers to initial position, and a stop limiting the return stroke of the support member.

6. In a structure of the class described, the combination of a base, a carton support member pivotally mounted on said base for vertical swinging movement and being adapted to receive a partially erected carton in inverted position, partition erecting fingers pivotally mounted on said support member to project above the top thereof, links connecting said fingers in sets, links pivotally connected to said base and to the sets of fingers whereby the fingers of the sets are simultaneously actuated when the support member is actuated on its pivot.

7. In a structure of the class described, the combination of a base, a carton support member swingably mounted on said base and adapted to receive a partially erected carton in inverted position, said support member having a fixed partition erecting member, sets of partition erecting fingers pivotally mounted on said support member in aligned relation to said fixed member, the fingers of the sets being connected for simultaneous operation, operating connections for the sets to the base whereby the sets of fingers are simultaneously actuated when the support member is swung in one direction on its mounting, and means for automatically returning the support member and fingers to initial position.

8. In a structure of the class described, the combination of a base, a carton support member swingably mounted on said base and adapted to receive a partially erected carton in inverted position, sets of partition erecting fingers pivotally mounted on said support member, the fingers of the sets being connected for simultaneous operation, and operating connections for the sets to the base whereby the sets of fingers are simultaneously actuated when the support member is swung in one direction on its mounting.

9. In a structure of the class described, the combination of a base, a carton support member pivotally mounted on said base for vertical swinging movement, said support member being adapted to receive a partially erected carton in inverted position, an upwardly projecting carton positioning member at the pivoted end of the support member, a fixed partition erecting member projecting from the top of the support member intermediate its ends, partition erecting fingers arranged in oppositely facing sets pivotally mounted on said support member to project above the top thereof, links connecting the fingers of the sets, and links pivotally connected to said base and to the sets of fingers whereby the sets of fingers are simultaneously actuated in opposite directions when the support member is actuated on its pivots.

10. In a structure of the class described, the combination of a base, a carton support member pivotally mounted on said base for vertical swinging movement, said support member being adapted to receive a partially erected carton in inverted position, sets of partition erecting fingers pivotally mounted on said support member to project above the top thereof, means connecting the fingers of the sets, and links pivotally connected to said base and to the sets of fingers whereby they are simultaneously actuated when the support member is actuated on its pivots.

11. In a structure of the class described, the combination of a base, a carton support member swingably mounted on said base and adapted to receive a partially erected carton in inverted position, partition erecting fingers pivotally mounted on said support member, a connecting link for said fingers, and a link connecting the fingers to the base whereby the fingers are actuated when the support member is swung in one direction.

12. In a structure of the class described, the combination of a portable base, a carton support member mounted thereon for swinging movement relative thereto, said support member being adapted to receive a carton in inverted position and being provided with a carton positioning member at one end thereof, partition erecting fingers arranged in oppositely facing sets pivotally mounted on said support member to project therefrom, means connecting the fingers of the sets for simultaneous operation, links connecting the sets of fingers to the base whereby the fingers are actuated when the support member is actuated on its work stroke, and means for automatically returning the carton support member and said fingers to initial position when the support member is released.

13. In a structure of the class described, the combination of a portable base, a carton support member mounted thereon for swinging movement relative thereto, said support member being adapted to receive a carton in inverted position and being provided with a carton positioning member at one end thereof, sets of partition erecting fingers pivotally mounted on said support member to project therefrom, means connecting the fingers of the sets for simultaneous operation, and connections for operating said fingers to said base for actuating the sets of fingers when the support member is actuated on its work stroke.

14. In a structure of the class described, the combination of a base, a carton support member swingably mounted on said base and adapted to receive a partially erected carton in inverted position, partition erecting fingers pivotally mounted on said carton support member to project from the top thereof, a link connecting said fingers for simultaneous operation, connections for the fingers to the base whereby the swinging movement of the carton support in one direction actuates said fingers, and spring means for returning said carton support member and fingers to their initial position when the support member is released.

15. In a structure of the class described, the combination of a base, a carton support member swingably mounted on said base and adapted to receive a partially erected carton in inverted position, partition erecting fingers pivotally mounted on said carton support member to project from the top thereof, a link connecting said fingers for simultaneous operation, and connections for the fingers to the base whereby the swinging movement of the carton support in one direction actuates said fingers.

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The following references are of record in the file of this patent:

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