Nov. 17, 1931. R. H. STIMPSON 1,832,262

CARTON END CLOSING MEANS

Filed May 5, 1928 4 Sheets-Sheet 1

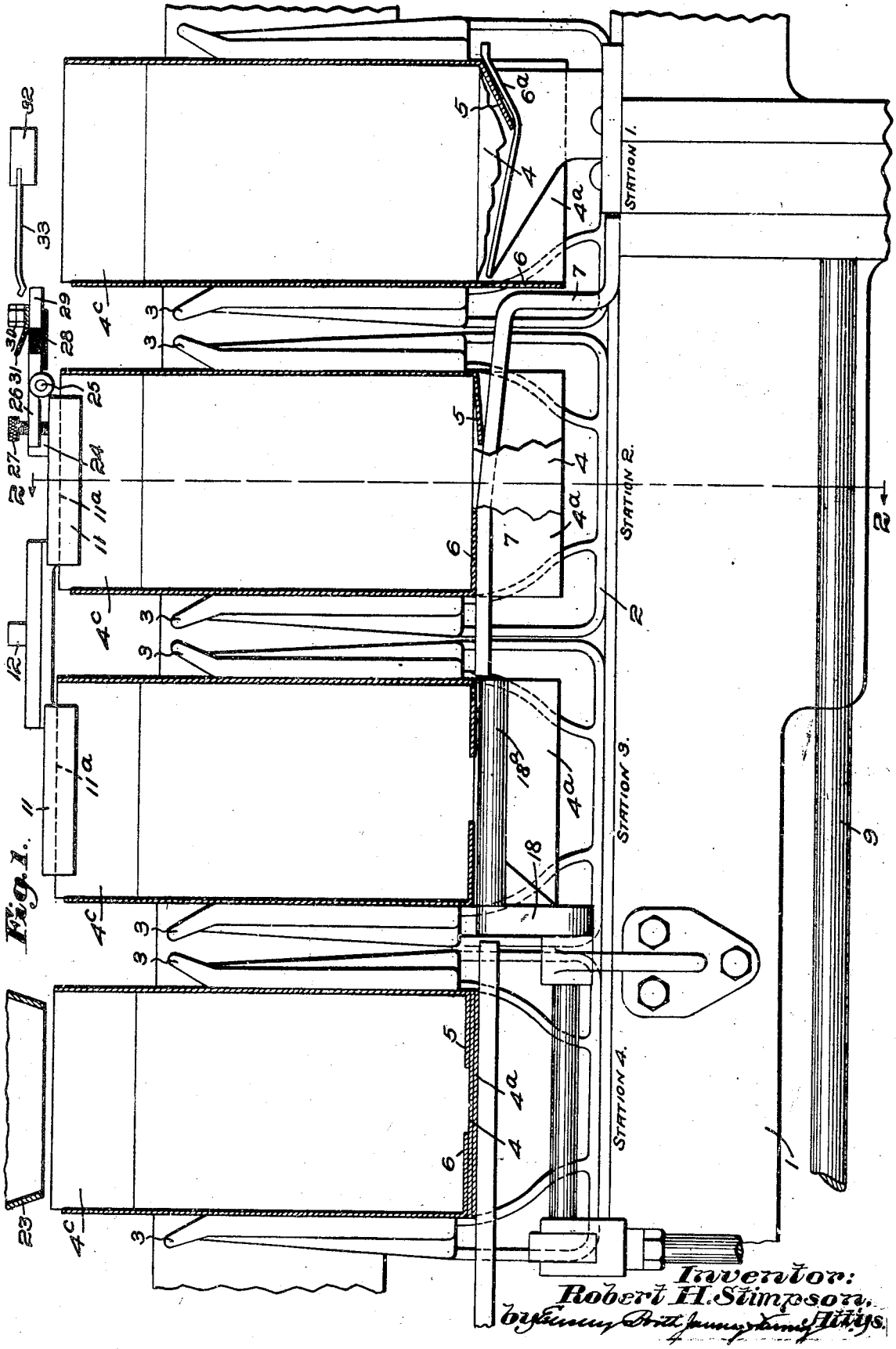



Fig. 1.

Inventor:
Robert H. Stimpson.
by Kenway Britt Kenway & Kenway Attys.

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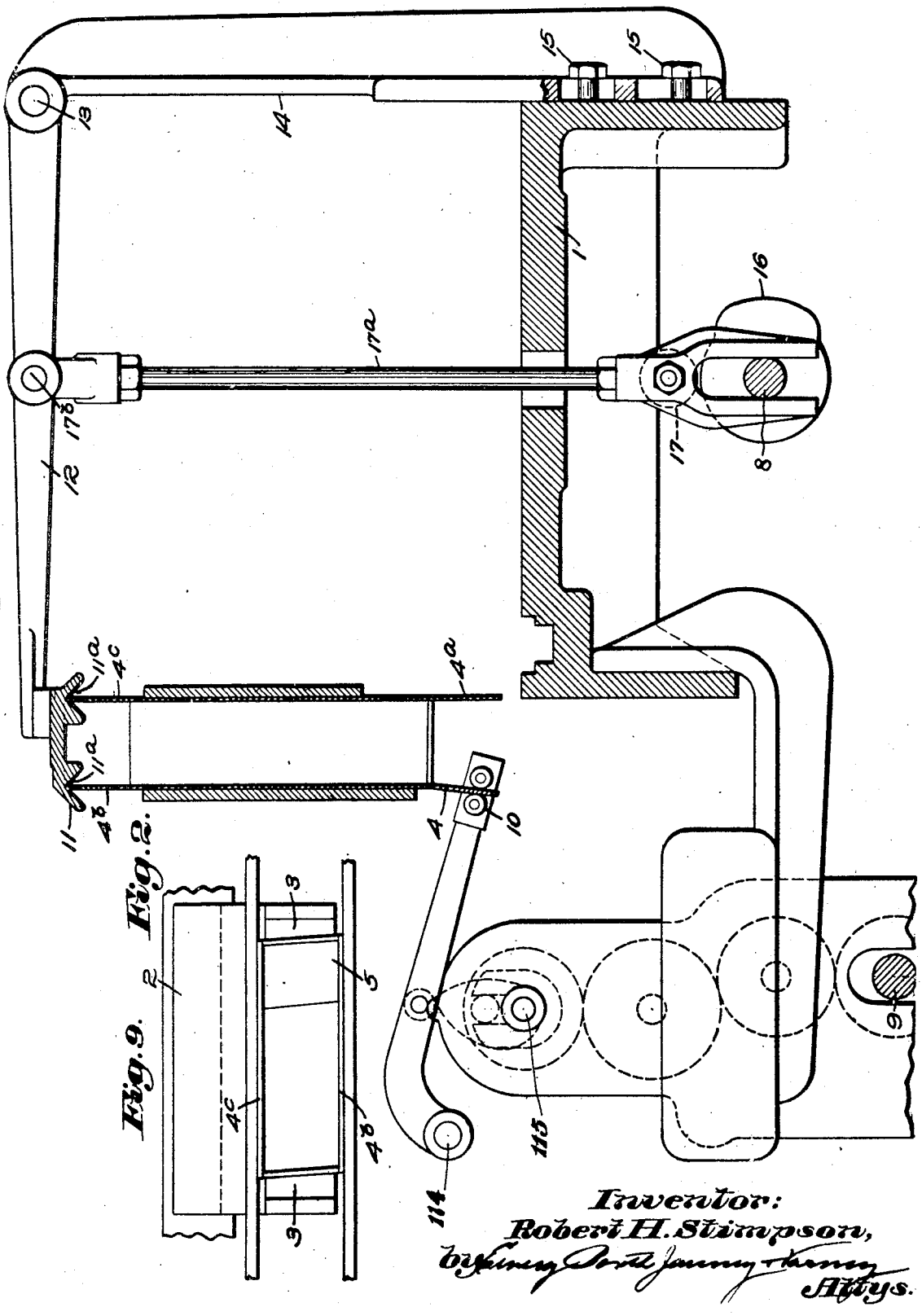



Fig. 9.




Fig. 9.

Inventor:
Robert H. Stimpson,
by Finney Pond Jaumy & Finney
Attys.

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Fig. 3.

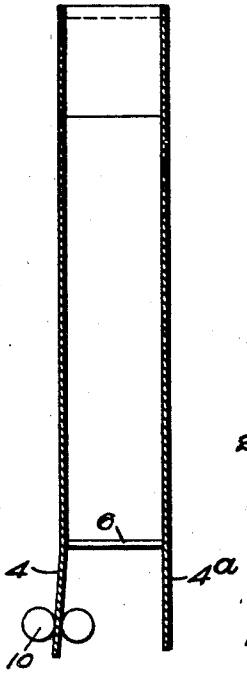



Fig. 4.

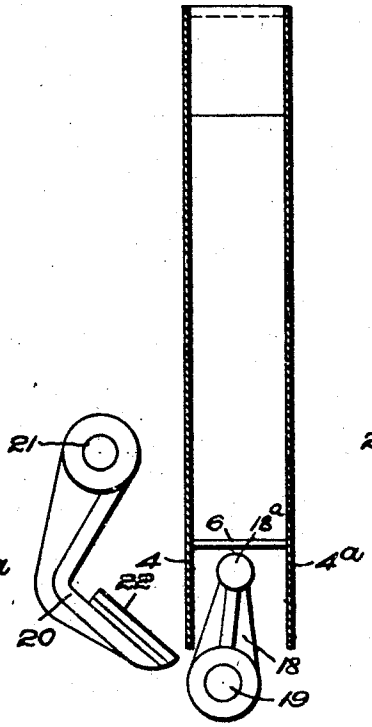



Fig. 5.

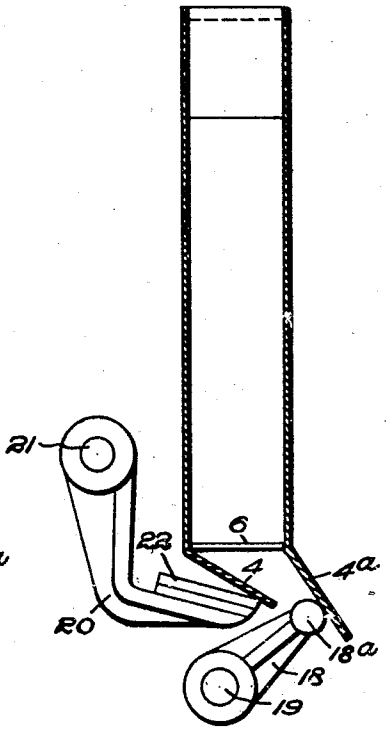



Fig. 6.

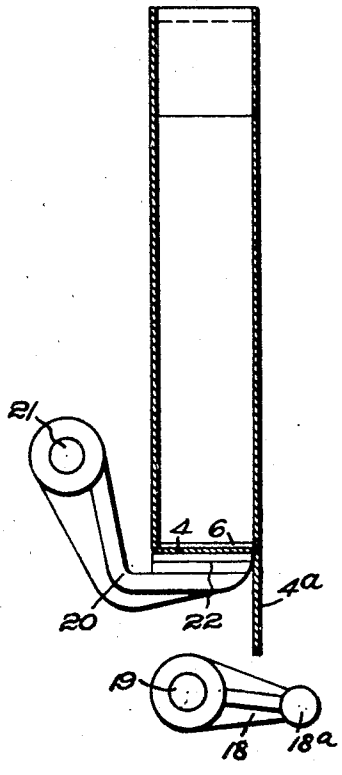



Fig. 7.

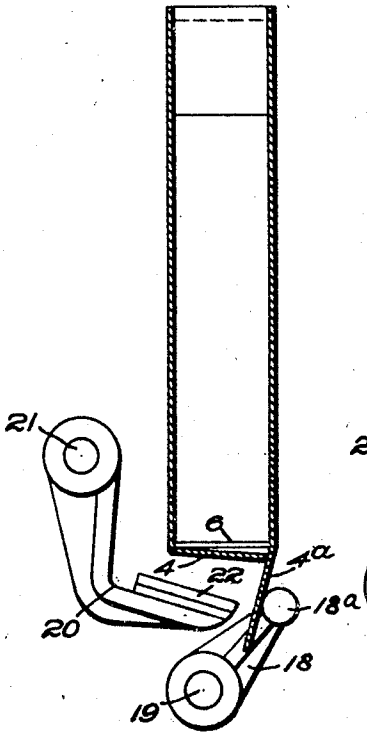
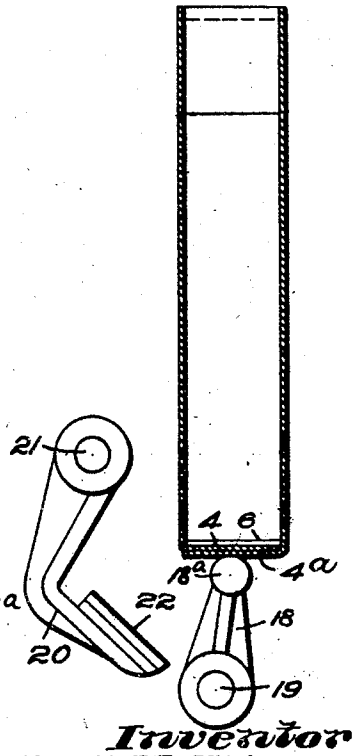



Fig. 8.




Inventor:
Robert H. Stimpson,
by Cushman, Darby & Cushman
Attys.

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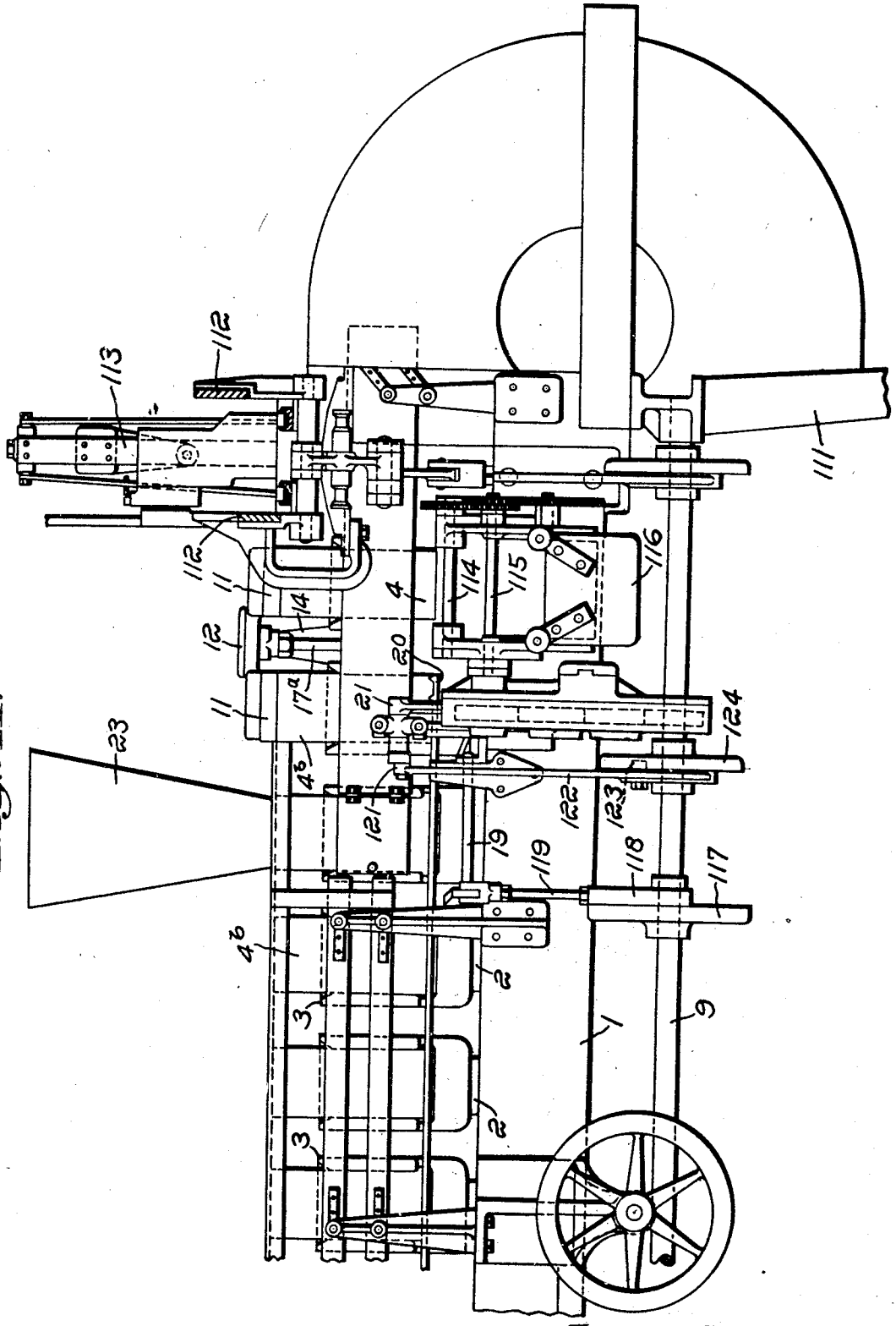



Fig. A1.

Inventor:
Robert H. Stimpson
by Fenning Bontz Jenning & Fenning Attys

Patented Nov. 17, 1931

1,832,262

# UNITED STATES PATENT OFFICE

ROBERT H. STIMPSON, OF NASHUA, NEW HAMPSHIRE, ASSIGNOR, BY MESNE ASSIGNMENTS, TO FREDERICK L. EMERY, OF BOSTON, MASSACHUSETTS

## CARTON END CLOSING MEANS

Application filed May 5, 1928. Serial No. 275,439.

This invention relates to packaging machines for filling cartons with material such as small pieces of candy, granulated, shredded or powdered material, and it aims particularly to provide an improved means for closing the carton end. Obviously its use is not restricted to the handling of the above recited material.

Cartons as used for the above purposes are usually rectangular in form, made of pasteboard, and include two relatively wide, front and back, or side walls, called the major walls and two narrower edge walls called minor walls; and flaps on the ends of the major and minor walls which are folded, or glued and folded inwardly to close the carton ends. This invention, as described herein, has particular reference to cartons that are to be glued and folded, at least on one end.

My novel carton end closing or flap folding means herein described may be used with different forms of packaging machines, and the embodiment of my invention described and illustrated herein will be found particularly serviceable in connection with such a machine.

In the drawings of the present embodiment of my invention showing so much of a machine of the above type as is necessary for the purpose,

Fig. 1 A is a side elevation of a packaging machine embodying my invention;

Fig. 1 is a side elevation on an enlarged scale of a portion of the base or bed plate, the endless carrier thereon with cartons in various stages of being closed;

Fig. 2, a partial vertical cross-section on the line 2—2, Fig. 1, from the right;

Figs. 3 to 8 illustrate the several steps of folding the major flaps; and

Fig. 9, a plan of one of the carton carriers.

Referring first to Figs. 1 A, 1, a machine of the above-mentioned type is shown in part as comprising a bed plate or base 1 having legs 111 or supports of any conventional kind, and any conventional form of carton magazine, means 112, 113 for opening the cartons and feeding them to the position shown at the right hand of the Fig. 1, which I have marked for convenience, station one, the magazine and carton opening and feeding means not being shown in detail, as they do not comprise any part of this invention.

In the top of the bed plate, Fig. 1, and longitudinally thereof runs an endless carrier 2 of any suitable type, with intermittent motion to the left, various functions or flap folding steps being performed at stated points of travel which may be conveniently identified as stations. The carrier, Figs. 1 A, 1, at convenient points thereon, is provided with arms 3, uprightly extended and arranged in pairs, each pair adapted to receive one carton at station one, as shown.

The carton is delivered from the carton magazine in a collapsed condition to the opening blade, not shown. When the blade opens the carton, the outer major wall of the carton and minor walls are swung to the right, Fig. 1 A, and, when the blade is withdrawn therefrom, have a tendency to swing to the left to return to their original positions. If allowed to do so, even to a small extent, such action would interfere with the subsequent folding of the end flaps.

Therefore, to counteract this tendency of the outer major and both minor flaps to assume their former positions and cause the opened carton to resemble a rhomboid rather than a rectangle, the inner faces of the arms 3, Fig. 9, are inclined in a direction opposite to that to which the minor walls tend to return, and the result is that, owing to these counteracting conditions, the carton is held in a preferably rectangular position which permits the folding steps of the flaps to be properly carried out.

The carton is delivered at station one, Figs. 1 A, 1, opened, see also Fig. 3, and with all the end flaps extended or unfolded. In Fig. 1. at stations one and two, the front major flap 4 is shown as partly broken away for clearness, the opposite major flap $4^a$ being fully extended.

In the act of delivering the carton downwardly to the carrier at station one, Fig. 1, the leading edge of the narrow flap 5 contacts with an inclined plate $6^a$, which acts to turn inwardly or fold the said flap, the opposite flap 6 dropping downwardly be-

tween the end of plate 6ª and the upwardly extended portion of rod or plate 7 adjacent thereto. As the carton moves to the left to station two, the flap 6 is folded inwardly by its contact with the plate 7 while the flap 5 rides along on plate 6ª, and then drops on to plate 7 which holds the two flaps 5, 6, in folded position. These two plates are of conventional construction.

The machine is provided, Fig. 2, beneath the rear bed plate 1, with a main longitudinally extended shaft 8, and, Figs. 1 A, 2, near the front side of the bed plate is a similarly extended front shaft 9, both connected by suitable gears, not shown, for operation of the latter by the former.

When the carton arrives at station two, Fig. 2, there is applied to both faces of the flap 4, by any suitable means, as a member 10, shown only conventionally, mounted, Figs. 1 A, 2, on shaft 114 and operated from shaft 115 a suitable quantity of glue from the pot 116.

Preparatory to the application of the glue, however, and to hold the carton in place during the action of the glue applying means, Figs. 1 A, 2, a stop or limit gauge 11, carried by a lever 12 pivoted, Fig. 2, at 13 to a post 14 adjustably secured as by bolts 15 to the bed plate 1, travels downward through the operation of a cam 16 and a roll 17 on a rod 17ª connected, Figs. 1 A, 2, to the lever 12 at 17ᵇ. This gauge 11 drops to a predetermined fixed position and if, for any reason, the carton has not been pushed downward by the carton delivering device at station one to the desired point, and has arrived at station two somewhat elevated, one gauge 11 will contact with the upper edge of the upper carton flap member and push the carton down to its proper place. The gauge, Fig. 2, is grooved at 11ª longitudinally, forming ribs hereafter referred to, the grooves being positioned so that they receive the upper ends of the flaps 4ᵇ, 4ᶜ, and hold them in line with the sides of the carton, thus utilizing the maximum strength of these flaps in their resistance to any upward movement of the carton itself, and thus holds the carton in position while the glue is applied by the member 10, as above stated. After the flap 4 has been glued, and to permit the carton to move to the next station freely, without danger of bending or tearing the flaps, the gauge 11. Fig. 2, is raised by action of the cam 16 and connections already described.

Fig. 3 illustrates the position of the several flaps as the carton leaves station two with glue applied to flap 4, and the flap bent outwardly a little. Heretofore, in machines of this type, the lower major flaps 4 and 4ª have been folded inwardly by fixed folding members. One serious disadvantage of this feature was that, as the glued flap 4 slid along upon the fixed folding members for the flap 4, the glue came into contact therewith and was to quite an extent wiped off, thereby leaving the flap insufficiently glued. The glue that adhered to the fixed folding members built up in lumps which caught on the following flap and caused it to drag and become twisted and distorted, and frequently torn.

The free movement of the opposite flap 14ª upon the cooperating fixed folding member for the opposite flap 4ª imparted a twisting strain to that unglued flap which caused it to tend to drag and lag behind the carton somewhat, so that when it was folded inwardly and upwardly on the flap 4, it did not register therewith or fold square, and it made a poor looking carton.

Again, there would be some leakage of glue from the glued flap which would accumulate on this folding member for the flap 4ª and as the carton moved to the next station, the printed carton end moved across this glue, smooching the printing, and leaving streaks of glue on the carton end. To obviate the foregoing difficulties, I have designed the novel means hereafter described.

As the carton moves to station three, Figs. 1 A, 1, the flaps 4, 4ª, leave the plate 7 and straddle a flap wiper rock arm or combined minor flap supporting and major flap pressing member 18 with a rounded nose 18ª carried by a shaft 19 operated by a cam 117, roll 118 and rod 119 from shaft 9, this arm 18 being at that time in position shown, Figs. 1 and 4, and acting to support the minor flaps 5, 6, in their folded positions, Fig. 1, station three. At this station the major flaps 4, 4ª, are then infolded by the several steps effected by the novel means referred to above, and as illustrated in Figs. 4 to 8 inclusive, the carton moving from the right, Fig. 1. Fig. 4, as stated, shows the carton arriving at station three. At this point, Fig. 5, the arm 18 turns slowly to the right, bending flap 4ª outwardly while a glued flap folder and presser arm 20, Figs. 1 A, 5, on a rock shaft 21 also operated from the front shaft 9 by a lever 121 on the shaft, a link 122 and a cam roll 123, and cam 124 on shaft 9, engages the outer face of the glued flap 4, folds it inwardly and, Fig. 6, presses its inner glued face up against the infolded flaps 5, 6, while the arm 18 has continued its travel downwardly, freeing itself from contact with the flap 4ª.

While the arm 20 is still holding the flap 4 against the folded minor flaps 5, 6, Fig. 6, the arm 18 starts to return to the position shown in Fig. 4, and when it contacts with the flap 4ª, Fig. 7, the latter is bent inwardly a little over the rounded end of the arm 20, and is bent sufficiently beneath the folded minor flaps 5, 6, to hold them in position while the arm 20 withdraws, as in Fig. 8, and arm 18 folds the flap 4ª upwardly against the other flaps and presses it there, closing the carton

end, and for a few seconds the arm 18 remains stationary.

The flap 4 being glued on both faces, it is desirable to disturb this glued flap face as little as possible, and also desirable to leave as little glue as possible on the flat face of the arm 20 as it folds the flap 4 inwardly and upwardly; hence this face is made as large as practicable and, Figs. 4–8, provided with flap contacting ribs 22 to reduce as much as possible the area that actually comes in contact with the glue, and therefore removes a minimum amount of glue from the flap.

After the withdrawal of the arm 20 from the flap 4, Fig. 1, the carton is advanced by the carrier to station four where it may be filled or charged from any suitable charging means 23, and then the carton is fed forwardly to have its upper flaps folded by any preferred means, not shown, and any other operations performed, and finally it is ejected by any suitable means, not shown.

Occasionally a carton will be found imperfectly made, and when it is fed to station one by the opening means, it will be bent and distorted, and sometimes will not be properly positioned, but it will stand up above the proper height.

In such case, it is desirable to stop the machine and remove the carton, and to that end I have designed novel means for the purpose. On the gauge 11 is a block 24, to the side of which is pivoted at 25 an arm 26, which by a spring about the pivot 25, not shown, tends to raise the arm 26 against the adjusting screw 27. The outer end of the arm 26 carries a fiber or other non-conducting section 28 which, in turn, carries an arm 29 with a terminal post 30 thereon for a wire 31 leading to any suitable relay switch, not shown, controlling the power operating circuit for the machine.

On any convenient moving part of the machine, as the head 32 carrying the carton opening blade, not shown, is a cooperating contact member 33 which, in its normal lower position, does not engage the contact 29.

When, however, a carton reaches station two, which carton has been thrust or fed into station one in an improper manner, for any reason, the carton, being above the proper height, will not permit gauge 11 carrying contact 29 to drop to proper position, but it will remain at such a height that when contact 33 comes down with the blade to open the next carton, contact 29 will engage contact 33, close the circuit, operate the relay and thus to open the power circuit to stop the machine.

Of course if the carton at station two has not been distorted, but is simply left a little higher than it should be, the gauge 11 will force it down into position, as already described.

The above described machine is most efficient, having many advantages over any other machine of similar nature known to me.

The lower flap folding function is particularly important and I know of no other means operating in the same way or doing the work so well.

My invention is not limited to the particular embodiment thereof described and illustrated herein.

Claims:

1. A packaging machine comprising, in combination, a base, an endless carrier thereon with carton receiving members, means adjacent the carrier to fold inwardly the minor carton flaps, a gluing roll to apply glue to one of the major flaps; a glued flap folding and pressing member, and a combined movable minor flap supporting and major flap pressing arm for folding and pressing the major flaps into position to close the carton end, and operating means therefor.

2. A packaging machine comprising, in combination, a base, an endless carrier thereon with carton receiving members, means adjacent the carrier to fold inwardly the minor carton flaps, a gluing roll to apply glue to one of the major flaps; a glued flap folding and pressing member, and a combined minor flap supporting and major flap pressing arm for folding and pressing the major flaps into position to close the carton end, and an intermittently acting gauge for positioning mispositioned cartons and preventing movement of the carton under action of said gluing and flap folding and pressing members.

3. In a packaging machine having a carton carrier member, carton end closing means comprising a glued flap folding and pressing member, and a combined movable minor flap supporting and major flap folding means acting on the major flaps.

4. In a packaging machine having a carton carrier, carton end closing means comprising a glued flap folding and pressing member, and a combined minor flap supporting and major flap pressing arm acting on the flaps from opposite sides of the carton, and an intermittently acting gauge for positioning misplaced cartons and preventing movement of the carton under the action of said pressing means, and operating means therefor.

5. In a packaging machine having a carton carrier, a carton end closing means comprising major flap gluing means, a glued flap ribbed folding and pressing member, and a combined minor movable flap supporting and major flap pressing arm in the path of travel of the carton, means for actuating the first element contra-clockwise, and the second element clockwise on the major flaps, the combined flap folding and pressing member subsequently acting again on one major flap in the opposite direction.

6. In a packaging machine having a carton carrier, carton end closing means comprising a glued flap folding and pressing member, and a combined minor flap supporting, and major flap pressing arm acting on the flaps from opposite sides of the carton, and an intermittently acting gauge, and operating means therefor acting to engage and position the major upper end flaps in line with the carton sides for preventing movement of the carton under action of the said pressing means.

7. In a packaging machine having a carton carrier member, flap gluing means, carton end closing means comprising a glued flap folding and pressing member, and a combined movable minor flap supporting and major flap supporting and folding means acting on the major flaps.

8. In a packaging machine having a carton carrier member, carton end closing means comprising a glued flap folding and pressing member, and a combined movable minor flap supporting and major flap step by step supporting and folding means acting on the major flaps.

9. In a packaging machine having a carton carrier, carton end closing means comprising a glued flap folding and pressing member, and a combined minor flap supporting, and major flap pressing arm acting on the flaps from opposite sides of the carton, and an intermittently acting gauge with an electrical contact member thereon constructed to engage a cooperating contact on a moving part of the machine to control the power circuit and stop the machine when a mispositioned carton in the carrier obstructs the movement of the gauge; and operating means for the gauge and contact member acting to engage and position the major upper end flaps in line with the carton sides for preventing movement of the carton under action of the said pressing means.

10. In a packaging machine having a carton carrier member, carrying carton receiving arms with inner faces inclined horizontally in a direction opposite to the natural inclination of the minor sides of the carton, carton end closing means comprising a glued flap folding and pressing member, and a combined movable minor flap supporting and major flap folding means acting on the major flaps.

11. In a packaging machine having a carton carrier, carton end closing means for the minor flaps operative while the carton is moving, a movable support for the folded minor flaps, means for applying glue to a flap, a glued flap folding and pressing member, and means to rock the support to fold a major flap.

12. Carton flap closing means comprising flap gluing means, a glued flap folding and pressing member, a combined minor flap supporting and major flap folding and pressing member on the latter of which the carton is received, means for operating the glued flap operating member contra-clockwise, and the combined major flap folding and pressing member clockwise, to engage different flaps, and to operate said members in the opposite directions to engage one flap only.

13. Carton flap closing means comprising a glued flap folding and pressing member, a combined minor flap supporting and major flap folding and pressing member on the latter of which the carton is received, means for operating the glued flap operating member contra-clockwise, and the combined major flap folding and pressing member clockwise, to engage different flaps, and to operate said members in the opposite directions engaging one flap only.

14. Carton closing means comprising a carton carrier, rocker members positioned operatively therewith so that the carton is received with the flaps straddling one member, and the rocker members straddling one flap, means for operating the rocker members to act upon the flaps first simultaneously and then singly.

In testimony whereof, I have signed my name to this specification.

ROBERT H. STIMPSON.