Nov. 8, 1927.

1,648,476

A. H. DU GRENIER

VENDING MACHINE

Filed Oct. 14, 1925

2 Sheets-Sheet 1

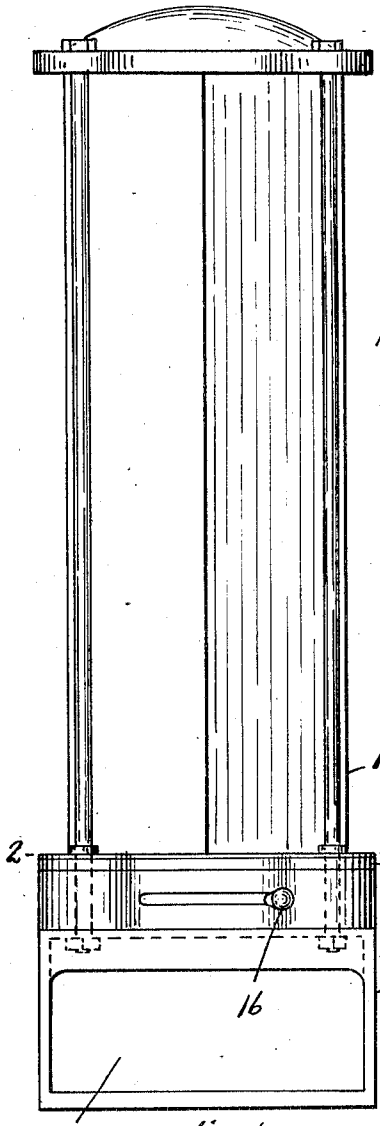


Fig. 1.

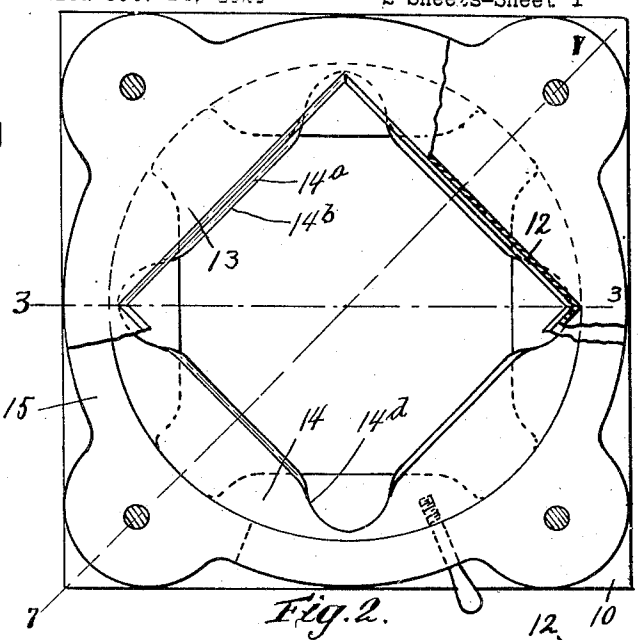


Fig. 2.

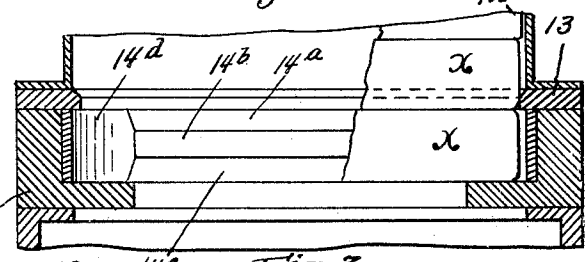


Fig. 3.

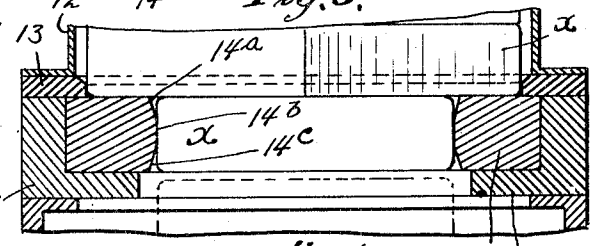


Fig. 4.

Inventor.
Arthur H. Du Grenier
by L. L. Marriman
Atty.

Nov. 8, 1927. 1,648,476

A. H. DU GRENIER

VENDING MACHINE

Filed Oct. 14, 1925 2 Sheets-Sheet 2

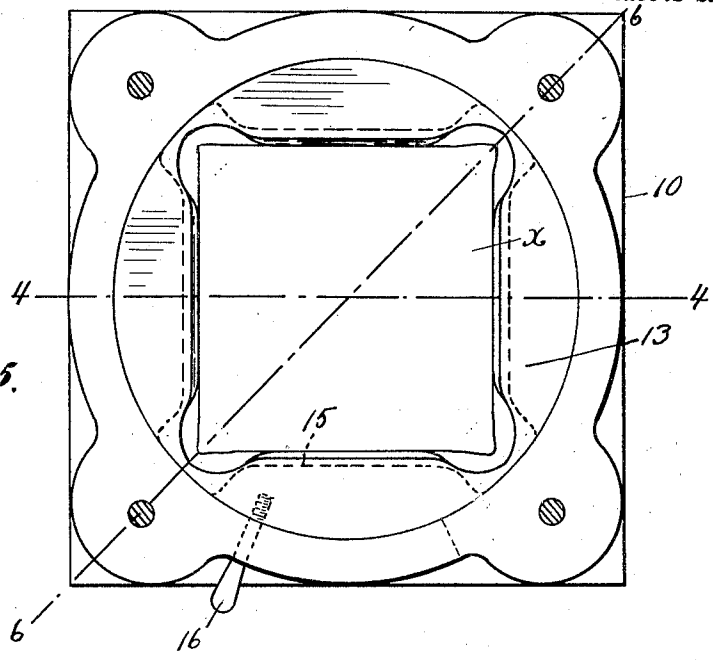


Fig. 5.

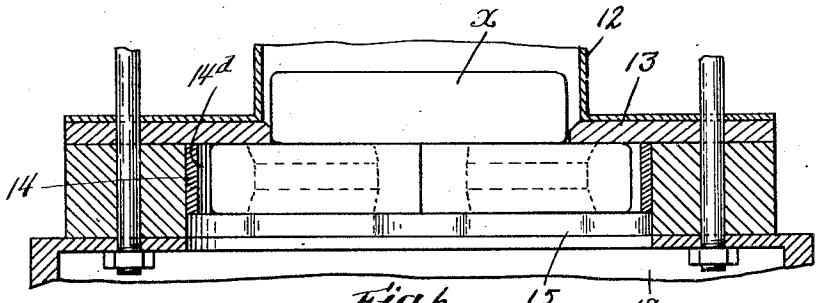


Fig. 6.

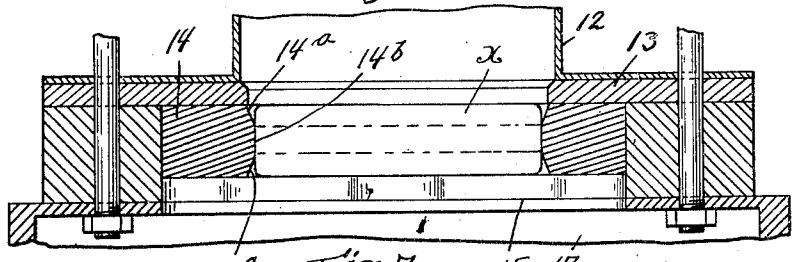


Fig. 7.

Inventor.
Arthur H. Du Grenier
by L. B. Herriman
Atty.

Patented Nov. 8, 1927. 1,648,476

UNITED STATES PATENT OFFICE.

ARTHUR H. DU GRENIER, OF HAVERHILL, MASSACHUSETTS, ASSIGNOR TO REMINGTON ARMS COMPANY, INC., A CORPORATION OF DELAWARE.

VENDING MACHINE.

Application filed October 14, 1925. Serial No. 62,418.

This invention relates to that class of vending machines which are primarily designed for use in vending rectangular shaped packages, and more particularly articles of food, such as sandwiches, which are packed in cartons.

The most convenient and practical form of magazine for a machine of this character is believed to be one in which the cartons are held flatwise in a stack, from the bottom of which a carton is delivered on each operation of the machine. Cartons, in which articles of food are packed to enable convenient delivery by a vending machine, are usually formed from a light weight cardboard, which easily bends and crushes, and, when articles of food are packed therein, the carton is usually only partly filled, so the contents have but little effect in supporting the walls. Consequently, when cartons, thus packed, are placed in a stack, the pressure on the lowermost cartons therein is liable to cause them to spread or bulge out both at the sides and corners. Because of the fact that the side edges of the cartons are somewhat yielding, machines which are provided with mechanism for pushing the bottom carton horizontally from beneath the stack have, so far as I am aware, been found to operate unsatisfactorily. A form of machine which has been found to operate more satisfactorily for this purpose comprises means for supporting the bottom carton at its corners, over and out of register with a rectangular shaped hole, and for turning it into register with the hole, so that it will fall by its own weight therethru.

In operating a machine of the latter type, the sides of each bottom package are not only liable to be bulged out by the weight of the other packages thereon, but in turning the package into register with the opening thru which it is discharged, its sides are liable to be so bent that the corners of the package are distorted sidewise from their normal positions, so that, in passing thru a rectangular shaped hole which normally fits the package, its corner portions are liable to catch or bind therein.

I have ascertained that clogging of the delivering means, by reason of bulging of the sides and lateral binding of the corners, was not obviated by merely increasing the size of the openings thru which the cartons passed, as the length of the arc thru which the separating device was oscillated, to effect the separation of the bottom carton from the stack, would then have to be increased to an undesirable extent, on account of the lost motion therebetween, and its operation would be rendered uncertain. That is, in order that a machine of this type may operate satisfactorily the carton should be closely engaged at all sides by the separating device, so that the amount of lost motion between the separator and carton will be reduced to a minimum.

The object of my invention is to provide a form of separating and discharge mechanism which will permit separation, by a downward movement, of the bottom carton from a stack of cartons of the type above referred to, and which will be so constructed that the movement of the cartons therethru will not be obstructed in case of distortion of the carton, and that each carton will be closely engaged by the separating device when it is separated from the stack, so that a minimum motion of the device will be necessary and the carton will always be brought into accurate register with the discharge opening thru which it is to pass.

I accomplish these objects by means of the construction hereinafter described and illustrated in the accompanying drawing in which:—

Fig. 1 is a front elevation of a vending machine embodying my invention.

Fig. 2 is a sectional view, partly broken away, at line 2—2 of Fig. 1.

Fig. 3 is a sectional view at line 3—3 of Fig. 2.

Fig. 4 is a sectional view at line 4—4 of Fig. 5.

Fig. 5 is a view, similar to Fig. 2, with the separator plate in the position of Fig. 4.

Fig. 6 is a sectional view at line 6—6 of Fig. 5.

Fig. 7 is a sectional view at line 7—7 of Fig. 2.

As shown in the drawings, the machine comprises a base 10 on which a vertically extending magazine casing 12 is mounted, said casing being adapted to contain a stack of flat packages or cartons X, which are square in form and of substantial thickness, being primarily designed to receive certain articles of food. A metal bottom plate 13 is provided at the lower end of the magazine, having a square opening therethru into which the packages stacked in the magazine

pass, the dimensions of the opening being somewhat greater than the dimensions of the carton X, so that, if the weight of the stack of cartons on a carton at the bottom of the stack should cause its sides to bulge out to some extent, the carton will nevertheless pass therethru.

A separator plate 14 is mounted for oscillation on a base plate 15 fixed on the base 10, said plates each having a square opening therethru, the geometrical centers of which are in line with a prependicular line thru the center of the opening in the bottom plate 13 of the magazine. The openings in plate 13 and the base plate 15 are so arranged relatively that the vertical projections of the sides of the opening in the plate 13 are at right angles to the diagonals of the opening in plate 15. The separator plate has a handle 16 for oscillating the same between limits in which its opening is in register with the openings in plates 13 and 15 successively, the length of its arc of movement being 45°. The intermediate portions of the sides of the opening in the plate 14 are inclined inward from its upper side, to form guiding faces 14^a and then are extended vertically to form engaging faces 14^b and then are inclined outward from faces 14^b to form faces 14^c, and each corner portion of the opening is recessed from the ends of the faces 14^b to the full size of the opening at its top and bottom and preferably to a somewhat greater depth closely adjacent the corners, providing corner recesses 14^d. The thickness of the plate 14 is approximately equal to the thickness of the package, or carton X, and the perpendicular distance between the opposite faces 14^b is slightly greater than the normal length of the sides of the carton, so that the carton may pass thru the opening in the plate 14, but, when held therein, the faces 14^b will engage its sides sufficiently closely to hold it against any appreciable turning movement in the opening.

The beveled faces 14^a at the upper end of the opening in the separator plate extend to the lower edges of the opening in plate 13, when said openings are in register, as shown in Fig. 7 and the faces 14^c at its lower end flare outwardly nearly to the extent of the width of the opening in plate 15, as shown in Fig. 4, and the corner portions of the latter opening are recessed to a slightly greater extent than the corner portions of the opening in said plate 15. A receiving chamber 17 is provided in the base beneath the plate 6 into which the goods are discharged and from which they may be secured by the purchaser.

The operation of the above described machines is as follows: When the separator plate 14 is in the receiving portion of Fig. 2, its opening will be in register with that in the bottom plate of the magazine and the stack of packages in the magazine will be supported on the base plate 15, the bottom package of the stack being held in the opening in the separator plate with its corner portions resting on the upper side of plate 15 midway between the corners of its opening. To deliver the package, the plate 14 is moved to its opposite position, shown in Fig. 5, turning the bottom package with it until it is held in register with the opening in the base plate 15, so that it will fall from the plate 14, through the opening in plate 15, and into the delivery chamber 17. At the same time the next package above it will be supported at its corners on the upper side of the plate 14, and, when the latter is returned to its initial, or receiving position it will pass into the opening thereof, in position to be delivered on the next oscillation. When the package falls through the opening in the bottom plate of the magazine if the sides of the bottom package have been bulged outward by the pressure of the other packages thereon, the beveled surfaces 14^a will act to press them back to their perpendicular position, so that its shape will be nearly restored by the time it has passed completely into the opening. In such case, however the corners of the package may still be somewhat distorted, and this distortion is likely to be substantially increased by the action of the faces 14^b in pressing against the sides of the package, as it is turned into discharging position, and bending the corners laterally. As the corner portions of the opening in the separator plate are recessed, free movement of the package into and thru this opening, will not be prevented by the lateral distortion of its corners, as indicated in Fig. 5. When the package is in position for delivery by the separator plate, its sides will be firmly grasped by the faces 14^b, so that there will be practically no lost motion between the package and plate when the latter is moved to delivering position. By beveling the lower portion of the opening thru the plate 14, away from the faces 14^b, the movement of the package from the separator plate is facilitated, or less likely to be obstructed than if the faces 14^b extended to the under side of the plate. The above described construction is, therefore, adapted to deliver yieldable cartons with practically no liability that they will obstruct the delivery means.

I claim:

In a machine for dispensing flat, rectangular shaped packages successively from the bottom of a vertical stack of such packages, a magazine for holding the stack of packages having a rectangular shaped package-discharge opening in its bottom, a horizontally disposed separator plate having a package-receiving opening extending from top to bottom thereof and arranged to be oscillated

about a vertical axis between a receiving position, in which it registers with said bottom opening, and a delivery position, said plate opening having its corner portions recessed to provide an intermediate projection at each side thereof, each projection having a flat, vertical face arranged for engagement with the corresponding side of a package held in the opening between points adjacent each corner, and having a beveled face extending downwardly and inwardly from the top of the plate to the vertical face thereof, and a base plate having a package-delivery opening arranged to register with the opening of the separator plate when the latter is in delivering position.

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

ARTHUR H. DU GRENIER.