W. MILLARD.

VENDING MACHINE.

APPLICATION FILED AUG. 23, 1911.

1,109,134.

Patented Sept. 1, 1914.

2 SHEETS—SHEET 1.

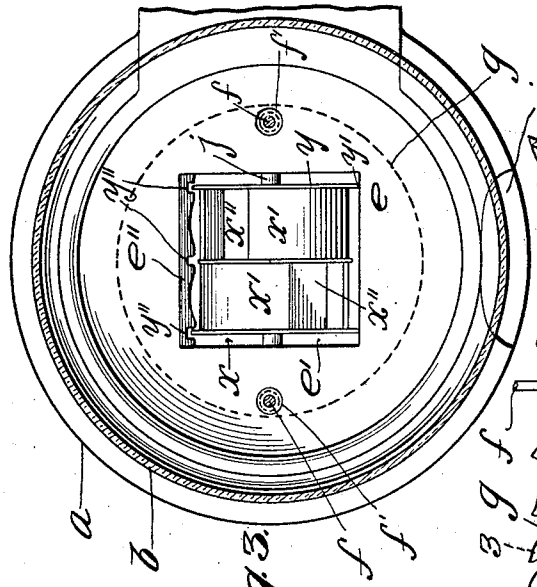


Fig. 3.

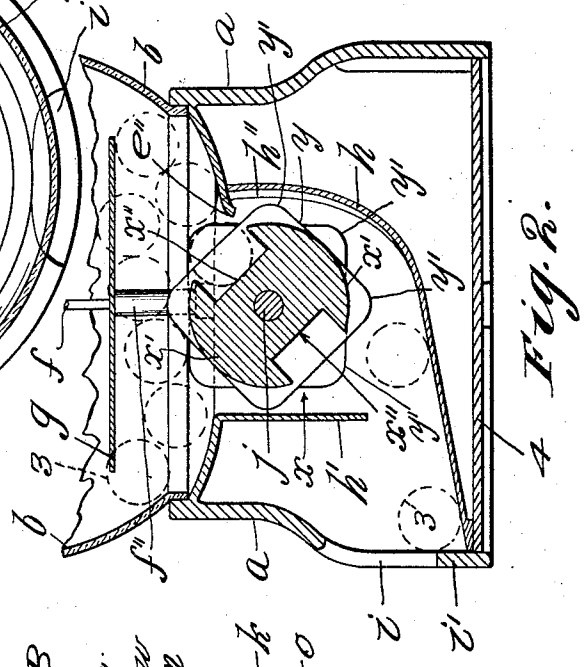


Fig. 2.

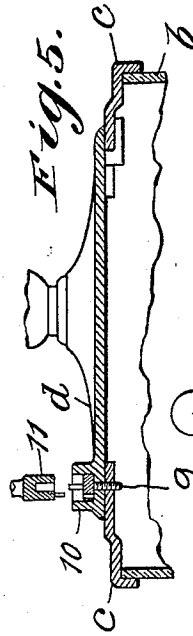


Fig. 5.

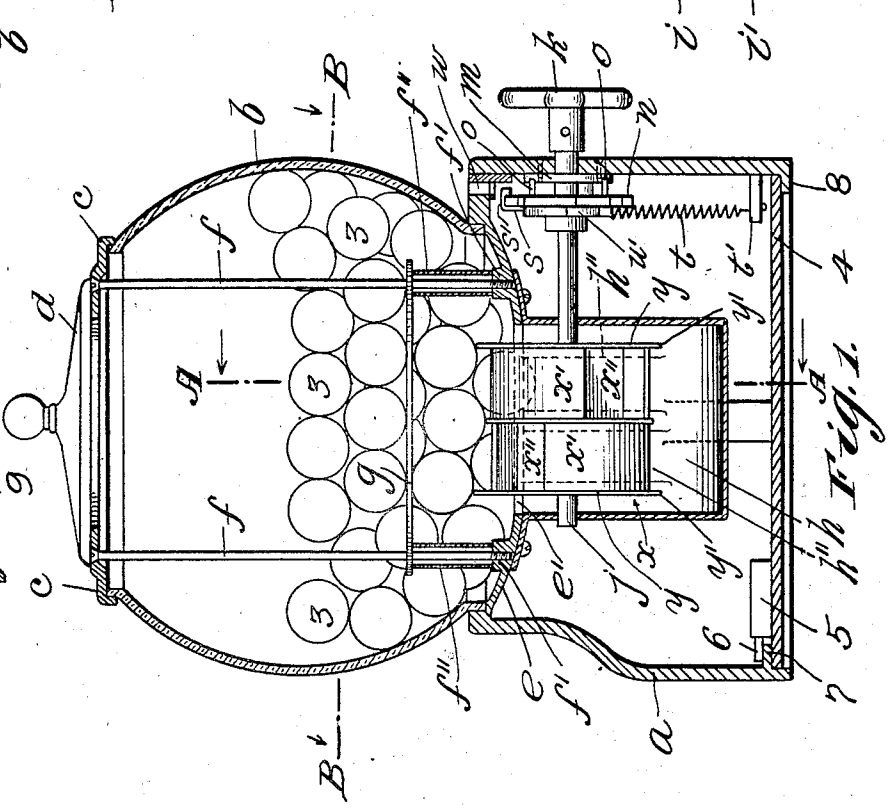


Fig. 1.

Witnesses:
Harry G. Hebig
Albert Hamilton

William Millard Inventor
By his Attorney
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2 SHEETS—SHEET 2.

Fig. 6.

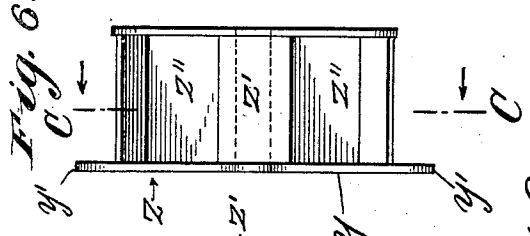


Fig. 7.

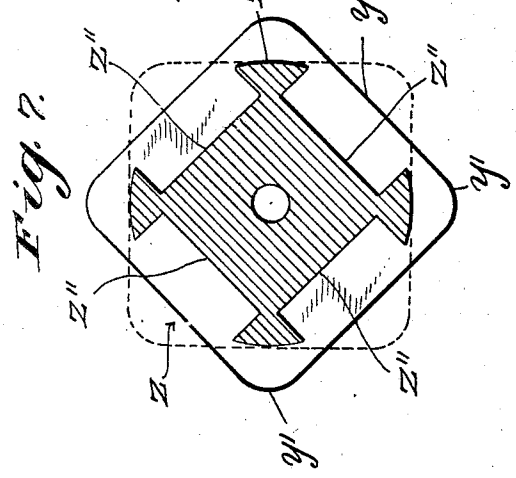


Fig. 9.

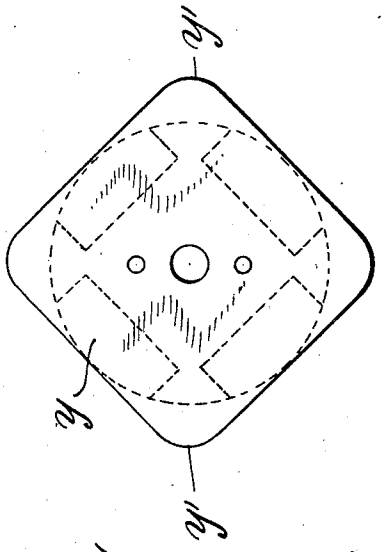


Fig. 8.

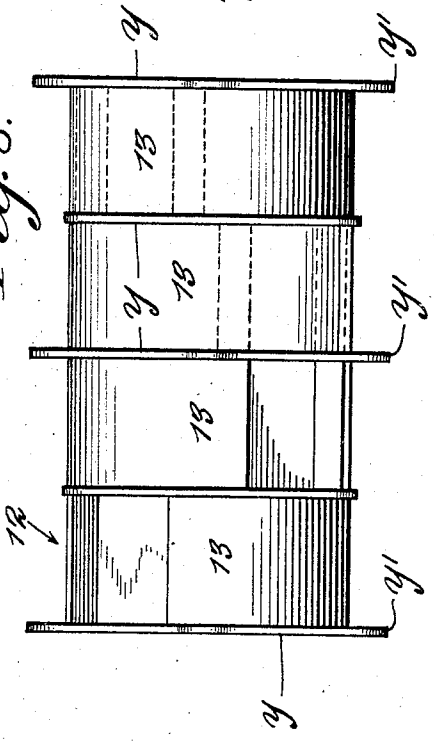
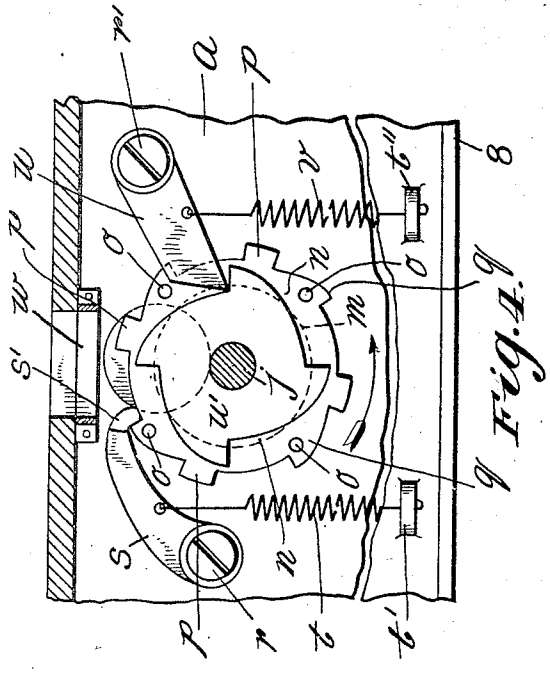


Fig. 1.



Witnesses:

Harry L. Hebig

Albert Hamilton

William Millard Inventor

By his Attorney

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UNITED STATES PATENT OFFICE.

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VENDING-MACHINE.

1,109,134. Specification of Letters Patent. Patented Sept. 1, 1914.

Application filed August 23, 1911. Serial No. 645,559.

To all whom it may concern:

Be it known that I, WILLIAM MILLARD, a subject of Great Britain, residing in the borough of Manhattan, in the city, county, and State of New York, have invented certain new and useful Improvements in Vending-Machines, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to improvements in vending machines and particularly to improvements in vending machines designed and adapted to vend commodities in the shape of balls; and an object of this invention is to provide a vending machine of the character just mentioned which will be simple in construction, comparatively cheap in manufacture and most efficient and durable in operation and use.

Another object of this invention is to provide a vending machine of the character just described with means which will insure the feeding of the balls one by one and which will prevent the "bridging" of the balls; that is, which will prevent the formation of the balls into layers or lumps, as by caking or sticking together.

A third object of this invention is to provide in a machine of the character above mentioned means for relieving the lowermost layers of the balls from the superincumbent weight of the balls in the top of the receptacle or container and for keeping the latter balls in a condition in which they are free to roll under the influence of gravity, when their turn comes to fall into the holes in the feed roller (that is, in what may be called, perhaps, an unbridged condition.)

In the drawings illustrating the principle of this invention and the best mode now known to me of applying that principle, Figure 1 is a central vertical section through my new vending machine; Fig. 2 is a fragmentary section on the line A—A of Fig. 1; Fig. 3 is a section on the line B—B of Fig. 1; Fig. 4 is a detail illustrating the coin-controlled mechanism; Fig. 5 is a detail of the lock for the lid; Fig. 6 is a front elevation of a modified form of the roller and Fig. 7 is a section on the line C—C of Fig. 6; Fig. 8 is a front elevation of another form of the roller and Fig. 9 is a side elevation of the same.

The base *a* is hollow and carries a casing *b* of glass which is somewhat rounded in contour or formed with a central swell. On the top of the casing *b* is fitted an annular cover-plate *c* the central opening in which is closed by a lid *d*. The casing *b* constitutes the side wall of a receptacle or container the bottom of which is formed by the top *e* of the base *a*. A pair of long screw-bolts *f* pass through holes in the cover-plate *c* and their threaded lower ends engage in suitable sockets *f'* formed in the top *e* of the base *a*. On each of the bolts *f* there is mounted a sleeve or collar *f''* which supports a plate *g* free to tilt thereon. In the top *e* there is formed a central hole *e'* and recesses *e''*; and below the central opening *e'* there is fastened to the top *e* a chute *h* which leads to an opening *i* formed in the side wall of the base *a* and across which extends a stop-plate *i'*. The chute *h* is provided with a guide-plate or apron *h'* and with a guard-plate *h''*. In the side walls of the chute *h* there is rotatably mounted the inner end of a shaft *j*, the outer end of which projects beyond the base *a* and is there provided with a suitable knob *k*. Just within the base *a* there is fastened thereto an annular plate *m* through which passes the shaft *j*; and between the plate and the chute *h* there is mounted upon the shaft *j* a ratchet wheel *n* from which projects axially of the shaft *j* and toward the plate *m* a series of pins *o*. The peripheral edge of the ratchet *n* is formed with radially-disposed lugs *p* and with ratchet teeth *q*. Pivoted on the screw-pin *r* is a pawl *s* the toe *s'* of which is adapted to engage the teeth *q* of the ratchet *n* and the other end of which is connected to one end of a coil spring *t*, the other end of the latter being fastened to an inwardly-projecting lug *t'* on the inside of the casing *a*. On the side of the ratchet *n* opposite from the pawl *s* there is pivoted at *r'* on the inside of the casing *a* a dog *u* to which is attached the upper end of a coil spring *v* the lower end of which is fastened to a lug *t''* which projects inwardly from the inside of the casing. The toe or free end of the dog *u* is arranged to engage in succession the teeth of ratchet *u'* which is mounted fast upon the shaft *j* closely adjacent to the ratchet *s*. The spring *v* acting through the dog *u* and the ratchet *u'* brings the ratchet *s* into position to receive the next coin; that is, it brings the toe *s'* of the pawl *s* and one of the teeth *q* into engagement with each

other. In a slot in the top of the base *a* there is fitted a coin chute *w* through which a coin may be dropped and will then rest upon the shaft *j* between a pair of the pins *o*; and the spring *v* at the end of each feeding operation brings the ratchet *s* into such a position that the coin is free to fall between a pair of the pins *o* (see the position of the pins in Fig. 4 with respect to the coin chute).

Upon the shaft *j* and in the chute *h* there is mounted a feed-roller or ejector *x* which in the preferred form of the invention illustrated in Fig. 1 is made up of two disks *x'* and three substantially square-shaped plates *y* the central one of which separates the two disks *x* and is turned through an arc of forty-five degrees on the shaft *j* with respect to the two outside plates. The diameter of the disks *x* is in the case illustrated substantially equal to the length of one side of the plates *y*, from which it results that the corners *y'* of the latter project beyond the rim or peripheral face of the disks, in each of which there are formed a pair of ball-receiving holes *x''* diametrically opposite each other; and the plates *y* are so placed with respect to these holes *x''* that there is at least one corner *y'* at one side of each hole. However, it will be distinctly understood that, while this arrangement is preferred by me, yet I do not desire to be limited thereto. The holes *x''* of one disk are in staggered relation with respect to the holes *x''* of the adjacent disk; that is, the holes of one disk are in line axially with solid portions of the other disk and there is one hole for each ninety degrees of arc of the double-disk feed-roller or ejector *x*. The corners *y'* form the wall (interrupted, to be sure) of a pair of channels through which the balls in some cases roll in dropping into the holes and thus the corners serve as guides for the balls. They also serve as agitators which disturb and disarrange the balls and which thereby break up their "bridged" formation or condition and insure that a ball shall be fed for each quarter-turn of the ejector *x*. To facilitate the movement of the balls toward the ejector *x*, one edge of the opening *e'* is turned downwardly to form a curved lip *e''* and this lip is formed with slots *y''* to permit the passage of the corners *y'* of the square plates *y*. The guard-plate *h''* prevents the surreptitious movement of the roll *x* by a person passing his hand through the opening *i* and also prevents a ball from being fed by a retrograde or counter-clockwise turn of the feed-roller *x*. The guide-plate or apron *h'* holds the balls in the pockets *x''* until they have reached their lowermost position, when they are allowed to fall to the bottom of the chute *h* and roll against the flange *i*.

In the vending of balls of gum which are candied on their outer surface, it has been found that the balls will "bridge" or cake together in layers or lumps and that this effectually prevents their being fed one by one as is desirable in a vending machine. This caking is found to be produced to a greater or less extent by the weight of the balls in the upper part of the receptacle pressing together the balls in the bottom thereof. To take this pressure of the upper part of the balls from the lower part of the same, there is interposed the tiltable plate *g*. The normal turning of the feed-roller *x* in the ordinary operation of the machine will cause the agitators *y* to push upwardly the lowermost balls and to shake the plate *g*. In this way the balls are furthermore prevented from sticking or caking together and are kept in a condition where they will roll from above the plate *g* to below the same and thence into the pockets *x''*.

It is to be observed that the partition wall *e*, which forms the top of the base *a* and the bottom of the receptacle for the balls 3 of gum, is dished and this formation of the wall *e* tends to cause the balls 3 to feed by gravity toward the feed-roller *x*.

The bottom plate 4 of the base *a* is provided with a lock 5, the bolt 6 of which is adapted to engage with the inwardly-projecting flange 7 which extends from the base *a*. The latter is also formed with an inwardly-extending flange 8 upon which rests the edge portion of the bottom plate 4.

The lid *d* overlies the heads of the screw-bolts *f* and prevents access to the latter for the purpose of removing them and thereby dismantling the machine to gain access to the balls 3. The lid *d* will be locked to the cover plate *g* in any suitable manner; for example, it may be fastened thereto by a screw 9 the head of which lies in a socket 10 formed in the lid and is of such peculiar form as to require a special wrench 11 to unscrew the same.

Instead of the double-disk roller *x* shown in Fig. 1, a single-disk roller *z* (Figs. 6 and 7) may be used. In this case the disk *z'* is formed with four pockets *z''*. A four-disk ejector 12 is illustrated in Figs. 8 and 9. Each of the disks 13 is formed with a single pocket and each disk is separated from the one next adjacent to it by means of a plate *y*. Certain of these plates are set at an angle with respect to the others. The form of roller shown in Figs. 6 and 7 is adapted for use in small machines, while the roller shown in Figs. 8 and 9 is suited for use in a large or wide machine. Any of the rollers illustrated may be used with the form of coin-controlled mechanism shown in Fig. 4.

I claim:

1. A vending machine having a rotary ejector consisting of a plurality of disks,

each having pockets on the periphery thereof, and said pockets on one disk being staggered in relation to the pockets on the other disks, and a separating plate, said plate having corners which project beyond the periphery of the disk, so as to form a channel to direct the articles to be vended, to such pockets, and also agitate such articles.

2. A vending machine having a rotary ejector consisting of a plurality of disks, each having pockets on the periphery thereof, and said pockets on one disk being staggered in relation to the pockets on the other disks, and a separating plate, side plates on the sides of the disks, said plates having corners which project beyond the periphery of the disk, so as to form a channel to direct the articles to be vended, to such pockets, and also agitate such articles.

3. A vending machine having a rotary ejector formed with pockets in its rim face and provided with a side-plate formed with corners which project beyond the rim face and agitate the articles to be vended; and a plate mounted free to tilt above said ejector and arranged to relieve the articles below the plate from the weight of the articles above the same.

4. A vending machine having a rotary ejector formed with pockets in its rim face and provided at each side with a side-plate formed with corners which project beyond the rim face and agitate the articles to be vended and form the interrupted lateral walls of a channel for guiding the articles to the pockets; and a plate mounted free to tilt above said ejector and arranged to relieve the articles below the plate from the weight of the articles above the same.

5. A vending machine having a receptacle the bottom of which is formed with an opening for the escape of the articles to be vended; an ejector mounted in close proximity to said opening and formed with pockets in its rim face and provided at each side with a side-plate formed with corners which project beyond the rim face and agitate the articles to be vended and form the interrupted lateral walls of a channel for guiding the articles to the pockets; and a plate mounted free to tilt above said opening and arranged to relieve the articles below the plate from the weight of the articles above the same.

6. A vending machine having a receptacle the bottom of which is formed with an opening for the escape of the articles to be vended and the side wall of which is formed with a swell above said opening; a rotary ejector mounted in close proximity to said opening and formed with pockets in its rim face and provided with a side-plate formed with corners which project beyond the rim face and agitate the articles to be vended; and a plate mounted above said opening free to tilt and arranged to relieve the articles below the plate from the weight of the articles above the same; said swell directing toward said ejector the articles falling from above said tiltable plate.

Signed at the borough of Manhattan, New York city this twenty-first day of August, 1911, in the presence of the two undersigned witnesses.

WILLIAM MILLARD.

Witnesses:
JAMES HAMILTON,
E. I. MCCARTHY.