April 5, 1966 A. J. FESSMAN 3,244,319

BALL DISPENSING MACHINE

Filed June 3, 1963 2 Sheets-Sheet 1

FIG. 1.

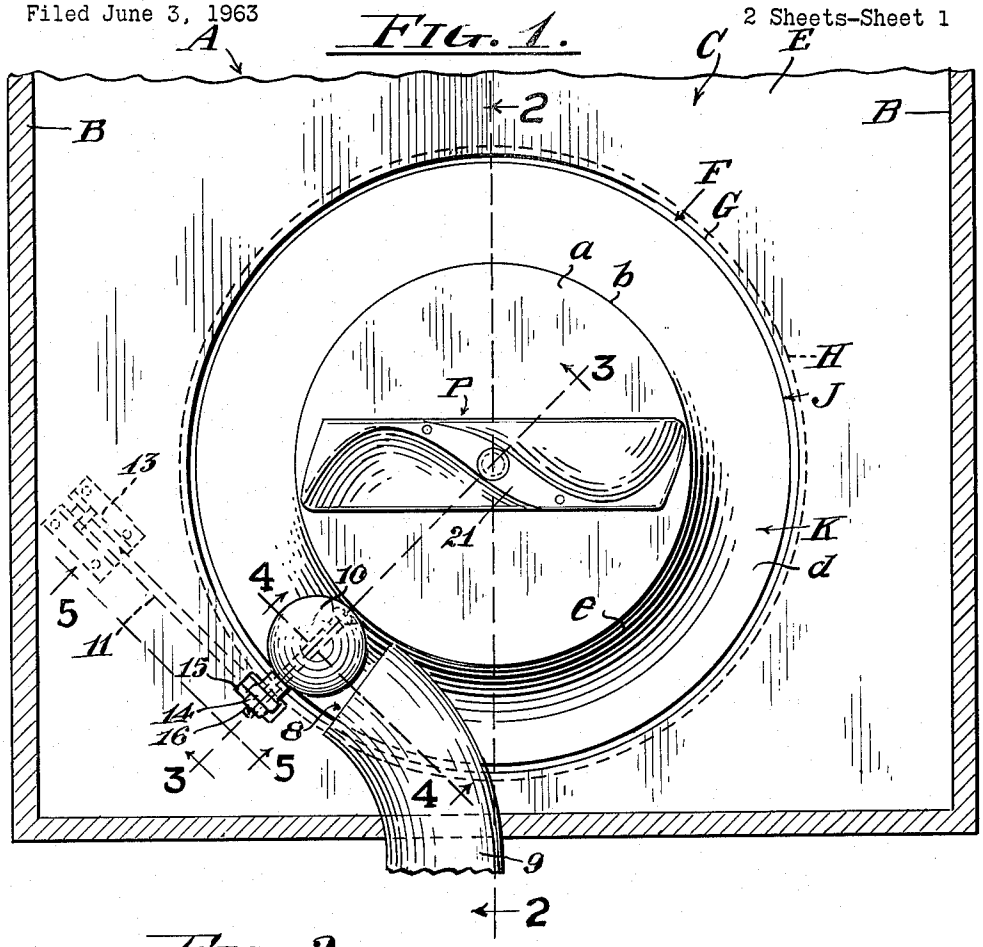
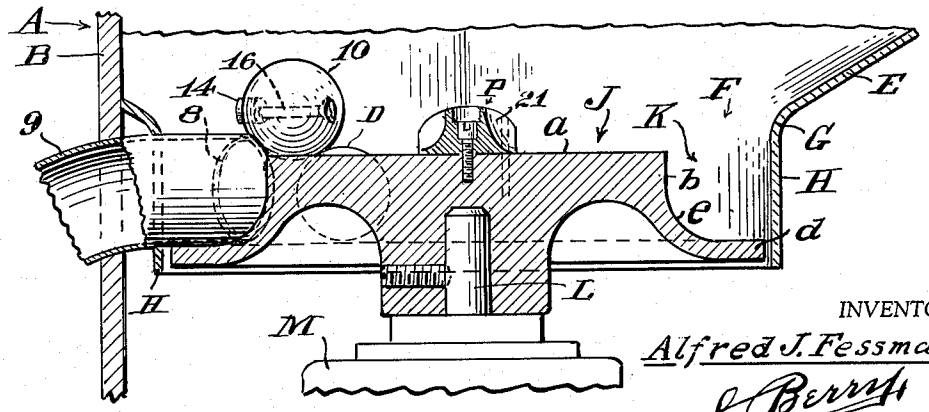


FIG. 2.



INVENTOR
Alfred J. Fessman;
BY R. S. Berry
ATTORNEY

April 5, 1966 A. J. FESSMAN 3,244,319

BALL DISPENSING MACHINE

Filed June 3, 1963 2 Sheets-Sheet 2

FIG. 3.

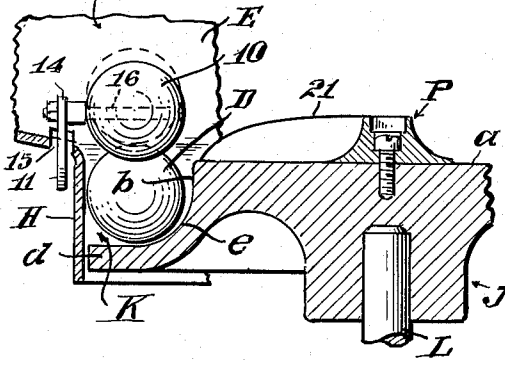


FIG. 4.

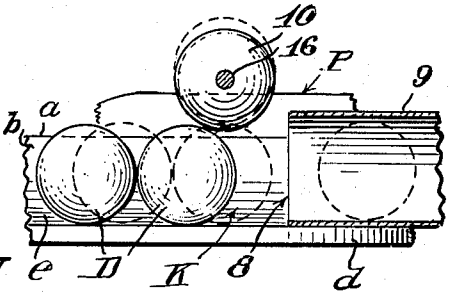


FIG. 5.

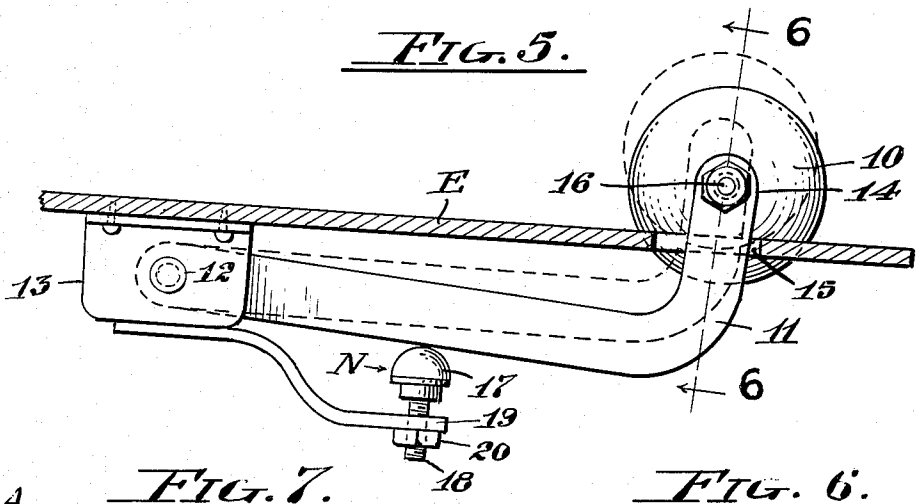


FIG. 7.

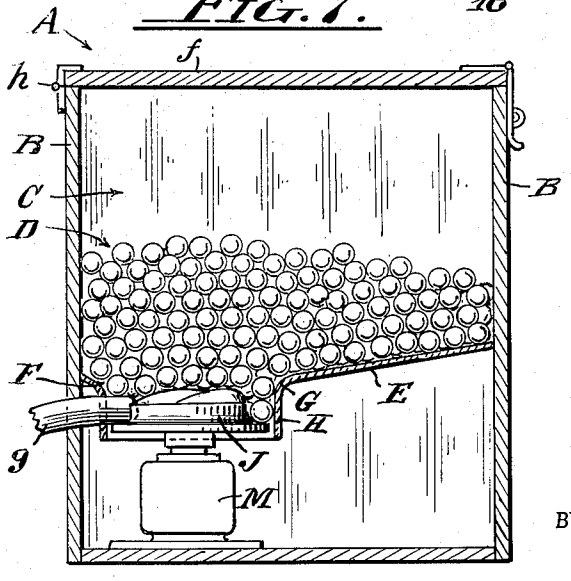
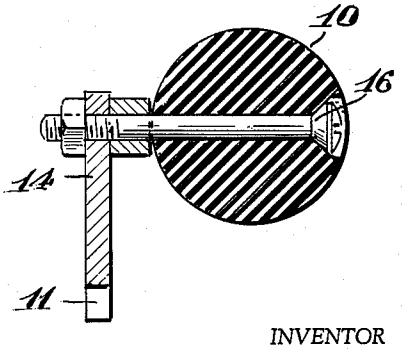


FIG. 6.



INVENTOR

Alfred J. Fessman;

BY R. S. Berry

ATTORNEY

United States Patent Office

3,244,319

Patented Apr. 5, 1966

3,244,319

BALL DISPENSING MACHINE

Alfred J. Fessman, 900 W. 13th St., P.O. Box U, National City, Calif.

Filed June 3, 1963, Ser. No. 285,103
5 Claims. (Cl. 221—203)

This invention relates to an ejector for ball dispensing machines and more particularly pertains to a mechanism for discharging balls from golf ball dispensing apparatus.

The primary object of the invention is to provide a ball ejector for use on the type of ball dispenser embodying a hopper adapted to contain a mass of uniform sized balls and having a discharge outlet from which the balls are discharged singly, wherein the ejector embodies barrier means for preventing accumulation of the balls in front of the outlet in such manner as to block their discharge, as by bridging, jamming or otherwise clogging the outlet, thereby insuring flow of the balls to discharge one at a time and enabling rapid and substantially uniform feed of the balls from the hopper.

Another object is to provide a ball ejector of the above character embodying a powered agitator whereby the mass of balls in the hopper may be maintained in a state of turbulence during the dispensing operation together with means whereby the lower-most balls will be fed to the outlet in line, and including a barrier adapted to prevent jamming of the balls at the outlet and to momentarily restrain each ball as it passes to discharge and at the same time serve to insure proper successive feed of the balls in line.

A further object is to provide a ball dispensing apparatus embodying a hopper having a ball discharge outlet together with an ejector adapted to deliver balls from the hopper to and through the outlet one at a time, in which a moveable barrier is arranged to block the outlet against the passage of balls therethrough yet is adapted to be actuated by a leading ball advancing under the urge of the ejector to free the outlet and permit such ball to pass therethrough.

With the foregoing objects in view, together with such other objects and advantages as may subsequently appear, the invention resides in the parts and in the combination, construction and arrangement of parts hereinafter described and claimed and illustrated by way of example in the accompanying drawings in which:

FIG. 1 is a plan view of the ball ejector or dispenser;

FIG. 2 is a view in cross section and elevation as seen on the line 2—2 of FIG. 1;

FIG. 3 is a detail in section and elevation as seen on the line 3—3 of FIG. 1, showing the barrier as disposed to arrest an advancing ball;

FIG. 4 is a detail in section and elevation taken on the line 4—4 of FIG. 1, depicting the manner in which the advancing ball acts to elevate the barrier to allow the ball to pass to discharge;

FIG. 5 is a view in section and elevation as seen on the line 5—5 of FIG. 1, showing the mounting of the ball barrier;

FIG. 6 is a cross section of the barrier taken on the line 6—6 of FIG. 5; and

FIG. 7 is a view in section and elevation of a ball dispensing machine showing the invention as applied.

Referring to the drawings more specifically, wherein corresponding reference characters indicate corresponding elements and parts throughout the several views, the housing of a ball dispensing machine is indicated generally at A. The housing has side walls B enclosing a hopper C adapted to contain a mass of balls D to be dispensed, such as golf balls, which balls are of substantially like diameters.

The hopper C has an inclined bottom wall E having a circular aperture F. A downturned margin G on the bottom wall surrounding the aperture leads to a downwardly extending cylindrical wall H encompassing a horizontal rotary ball ejector or dispensing element J having a flat top face *a*, a cylindrical side wall *b* and a continuous peripheral flange *d* on the lower end of the side wall *b*.

A continuous fillet *e* is provided at the juncture of the side wall *b* and flange *d*, which fillet has a concave curvature conformable at least in part with the curvature of a ball D seated on the flange *d* to afford a substantial area of frictional surface contact between the ejector and balls D seated on the flange *d*.

The top face *a* of the element J lies on a plane contiguous the margin G. The cylindrical side wall *b* is surrounded by the cylindrical wall H in spaced relation thereto a distance slightly exceeding the diameter of a ball D and the flange *d* is located with its upper face spaced below the top face *a* a distance slightly less than the diameter of a ball D.

The cylindrical wall H, side wall *b* and flange *d* collectively define an annular ball receiving channel K adapted to contain a multiple of the balls D arranged in single file around and supported by the ejecting element J beneath and subjected to the load of superimposed balls in the hopper C when the latter is supplied with a mass of balls D as shown in FIG. 7.

The ejector J is fixed on the upper end of a drive shaft L which extends vertically from an electric motor M arranged in the lower portion of the housing A beneath the hopper bottom wall E; the shaft L extending axially of the ejector J and its encompassing cylindrical wall H.

The hopper C has a cylindrical side discharge outlet 8 here shown as constituting the open intake end of a cylindrical ball conveying tube or chute 9 leading laterally through the cylindrical wall H and housing side wall B to a suitable point of discharge. The open intake end of the tube 9 overlies the flange *d* with the discharge outlet 8 arranged in and presented lengthwise of the channel K in a direction opposite the direction of rotation of the ejector J, whereby balls in the channel K will be directed toward the discharge opening 8 on driving the ejector. In the arrangement here shown the direction of rotation of the ejector is counterclockwise. The tube 9 has an internal diameter slightly larger than that of a ball D whereby balls entering the tube may pass freely along the interior thereof.

As a means for preventing balls in the hopper from jamming or bridging the discharge outlet 8 and thereby interrupt dispensing of the balls, barrier means are provided for momentarily restraining the lead ball being advanced by the ejector toward the discharge outlet 8 and effecting such action at a point in the channel K spaced from the outlet 8 a distance slightly less than the diameter of a ball D. Such means is here shown as comprising a sphere 10 having a diameter at least proximating the diameter of a ball D, and a mounting therefor whereby the sphere 10 is normally supported above the channel K in proximity thereto adjacent the discharge outlet 8 with the lower portion of the sphere projecting a short distance below the upper marginal portion of the tube 9 and with such lower portion overlying and projecting in the path of travel of the upper portion of the leading ball D being advanced by the ejector J, whereby the advancing leading ball D will be caused to come into contact with the sphere 10 and its advance momentarily arrested, as will be later described.

The mounting of the sphere 10 embodies an elongated horizontally extending arm 11 having an inner end pivoted at 12 on brackets 13 on the underside of the hopper

floor or bottom wall E; the arm 11 having an upturned outer end portion 14 projecting through a slot 15 in the wall E and having thereon near its outer end a laterally extending horizontal spindle 16 on which the sphere 10 is mounted for rotary movement around its axis in the direction of the length of the channel K.

The arm 11 gravitates to its lower position under the load of the sphere 10 and is arrested by an abutment N comprising a cushioned head 17 arranged to abut the underside of the arm 11, which head 17 is mounted on a threaded stem 18 screwed through an extension 19 on the brackets 13.

The stem 18 extends vertically through the extension 19 and is designed to be adjusted longitudinally relative to the arm 11 to vary the point of its arrestment and thereby vary the extent of projection of the sphere 10 relative to upper portion of the leading ball D. A lock-nut 20 is screwed on the outer end of the stem 18 to abut the underside of the extension 19 to clamp the stem against longitudinal displacement.

Rigidly mounted on the top face *a* of the ejector J and extending diametrically thereacross is an elongated agitator bar P embodying an upstanding contoured sinuous rib 21 adapted, on rotation of the ejector, to engage balls imposed thereon and effect displacement thereof upwardly and laterally of the ejector. This movement of balls contacted by the rib 21 is transmitted to adjacent balls and reflected throughout such mass of balls as may be contained in the hopper C with the exception of balls seated in the channel K. The housing A is here shown in FIG. 7 as equipped with a lid *f* hinged at *h* on a side-wall B, which lid serves as a cover for the hopper C.

In the operation of the invention, the hopper is supplied with a desired quantity of balls D, such as golf balls, of which a number of the initially supplied balls are directed by the inclined bottom wall E into the channel K. The hopper C is usually stocked with a sufficient number of balls to fill the channel K and to cover the ejector J and bottom wall E with a mass of balls as indicated in FIG. 7, which supply is replenished from time to time as need be.

When it is desired to dispense balls contained in the hopper, the motor M is set in motion thereby rotating the ejector J through the shaft L whereby the balls D seated on the flange *d* in frictional contact therewith will be advanced and the leading ball in the channel K will be forced beneath and past the barrier sphere 10 as indicated in dotted lines in FIG. 4; the leading ball being previously disposed in the channel K either in spaced relation to the sphere or abutting the underside thereof as shown in full lines in FIG. 4. Pressure of the leading ball against the lower portion of the barrier sphere projecting in front of the upper portion of the advancing leading ball, acts to elevate the barrier sphere, as indicated in dotted lines in FIGS. 3, 4 and 5, thereby permitting the leading ball to pass through the discharge outlet 8 and roll to discharge through the tube 9. This elevation of the barrier sphere 10 is effected in opposition to the load of the sphere and its arm 11 together with the load imposed on the sphere 10 by balls D in the hopper superimposed on the sphere as well as such other balls as are subject to and oppose displacement by reason of upward movement of the sphere. However, this upward movement of the barrier sphere 10 may be very slight, such as a sixteenth of an inch, and shown as exaggerated in the drawing for the sake of clearness. But whaever resistance is offered to lifting of the barrier sphere 10 by the advancing leading ball D, is overcome by the driving power rotating the ejector acting through frictional engagement of the flange *d* and fillet *e* with the periphery of the leading ball in the channel K supplemented at times by abutting following balls in the channel being collectively advanced by the ejector.

Furthermore continuous displacement of the balls in the mass thereof afforded by the rotating agitator acts to prevent packing of the balls in the hopper and renders the body of balls loose and fluid so as to offer little or no resistance to displacement by upward movement of the barrier ball.

Manifestly on the leading ball being advanced through the discharge outlet 8 a gap will be developed in the line of balls in the channel K, assuming the channel to have been previously filled. When this occurs, such gap will be immediately filled to replenish the line in the channel K by a ball falling from the stock into the gap.

On the leading ball passing from beneath the barrier sphere 10, the latter will drop from its elevated position to its normal lowered position in front of the upper ortion of the next succeeding ball to momentarily impede its advance followed by its action on the barrier sphere and subsequent discharge as above described and so on until rotation of the ejector is terminated.

Bridging or jamming of balls in front of the discharge outlet 8 is further prevented by arranging the tube 9 to dispose the discharge outlet formed by the open inner end of the tube within the channel K, whereby the sides of the channel prevent balls from advancing over the outlet from the sides thereof. This arrangement coupled with the action of the barrier sphere in shielding the discharge outlet from above and its action in association with the channel K permitting only a single ball to be delivered to the outlet one at a time insures against obstruction of the outlet with consequent proper delivery of the balls to discharge.

While a specific embodiment of the invention has been shown and described it is subject to changes and modifications coming within the meaning and scope of the appended claims.

I claim:

1. A ball ejector comprising the combination of a hopper embodying a bottom wall having an aperture, said bottom wall having a downturned margin bordering said aperture, a downwardly extending cylindrical wall leading from said margin, a powered rotary element having a cylindrical side wall surrounded by said cylindrical wall and spaced relative thereto, an annular ball supporting flange on said side wall spaced below said margin, said cylindrical wall, side wall and flange defining an annular ball receiving channel around said element adapted to contain a single row of the balls delivered from said hopper, said cylindrical wall having a side discharge outlet leading tangentially from said channel, a discharge chute leading from said outlet, an axially revoluble roller supported for up and down movement adjacent said outlet with its periphery normally projecting in spaced relation to said flange a distance less than the diameter of a ball to be ejected so as to project in the path of travel of the upper peripheral portion only of a leading ball seated on said flange to thereby arrest a ball advanced thereagainst, said roller being adapted to be lifted by pressure of a ball imposed against the underside thereof to permit the ball to pass beneath said roller to said discharge outlet.

2. The combination called for in claim 1 together with an upstanding agitator on said rotary element adapted on rotation of said element to displace balls imposed thereon and extending in mass thereabove.

3. The combination called for in claim 1 together with means for varying the spacing of said roller relative to said flange and thereby vary the extent of projection of the roller in the path of travel of a ball supported on and being advanced by said flange.

4. The combination with a hopper adapted to contain a multiplicity of complementary balls and having a side discharge outlet through which the balls may pass; of rotary powered dispensing means for delivering balls in a row from said hopper to said discharge outlet, a vertically moveable barrier in said hopper normally overlying a portion of said outlet and interposed between said outlet and a leading ball being delivered by said powered means adapted to momentarily restrain the leading ball

and also adapted to be elevated by pressure thereon of the leading ball so that the leading ball may pass into said discharge outlet, said barrier comprising a roller arranged with the lower porton thereof in the path of the upper portion of the advancing leading ball for engagement by the latter, an arm pivoted for vertical swinging movement, a spindle on said arm which said roller is revolubly mounted, and an abutment limiting downward movement of said arm and the roller thereon.

5. The combination with a hopper adapted to contain a multiplicity of complementary balls and having a side discharge outlet through which the balls may pass; of rotary powered dispensing means for delivering balls in a row from said hopper to said discharge outlet, a vertically moveable barrier in said hopper normally overlying a portion of said outlet and interposed between said outlet and a leading ball being delivered by said powered means adapted to momentarily restrain the leading ball and also adapted to be elevated by pressure thereon of the leading ball so that the leading ball may pass into said discharge outlet, said barrier comprising a roller arranged with the lower portion thereof in the path of the upper portion of the advancing leading ball for engagement by the latter, an arm pivoted for vertical swinging movement,

a spindle on said arm on which said roller is revolubly mounted, and an abutment limiting downward movement of said arm and the roller thereon, and means for varying the position of said abutment to vary the normal position of said roller relative to said discharge outlet and the leading ball.

References Cited by the Examiner

UNITED STATES PATENTS

330,951	11/1885	Wilkins et al.	221—184
990,593	4/1911	Ringland et al.	221—265
1,173,308	2/1916	Rockwell	221—277
1,236,519	8/1917	White	221—265
1,389,709	9/1921	Swangren et al.	221—182
1,562,152	11/1925	Du Grenier	221—203
1,639,370	8/1927	Flegel	222—370 X
1,870,162	8/1932	Beck	221—267
2,204,127	6/1940	Domke	221—265
2,543,244	2/1951	Klooz et al.	221—200
2,690,856	10/1954	Trondle	221—265

RAPHAEL M. LUPO, *Primary Examiner.*

LOUIS J. DEMBO, *Examiner.*