April 26, 1966 E. MEIERJOHAN 3,248,008

GOLF BALL DISPENSER OR THE LIKE

Filed Sept. 3, 1964 2 Sheets-Sheet 1

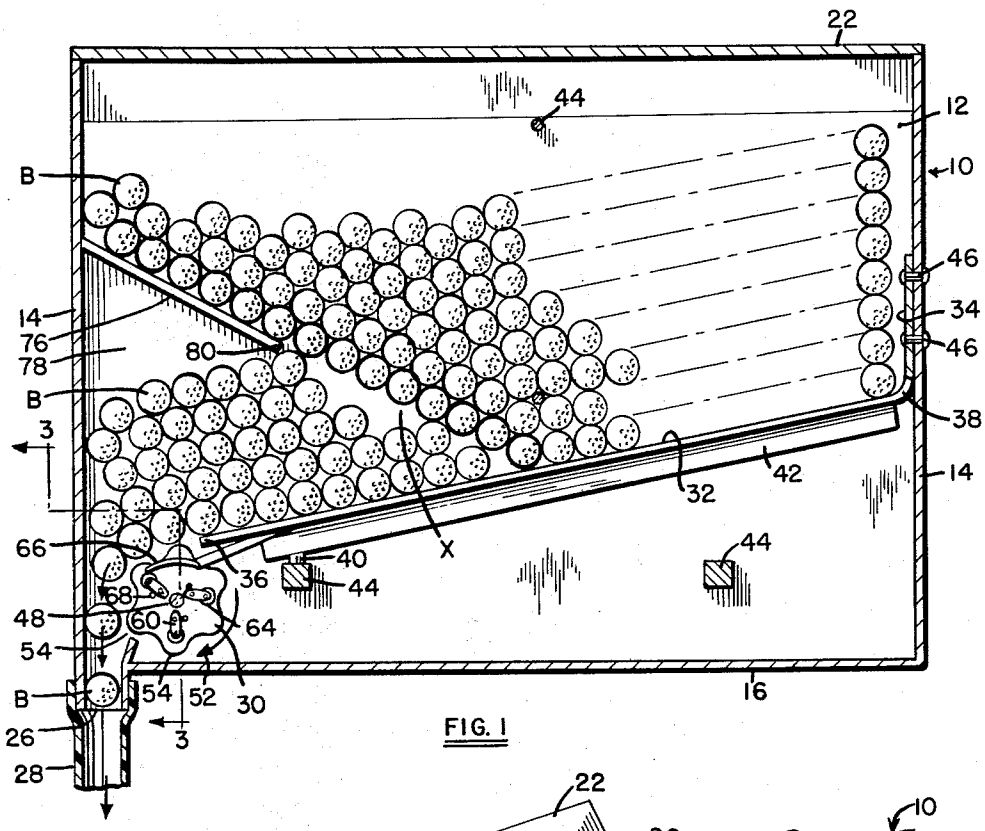


FIG. 1

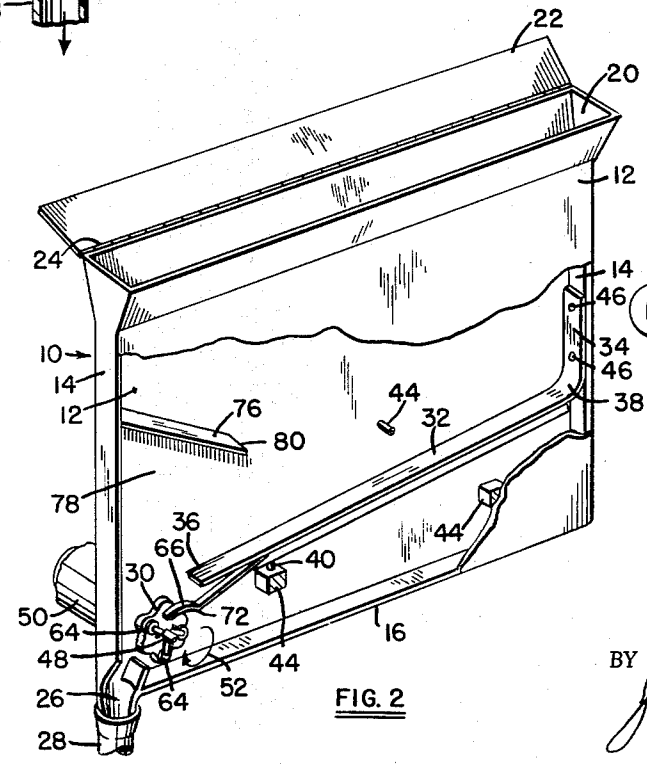


FIG. 2

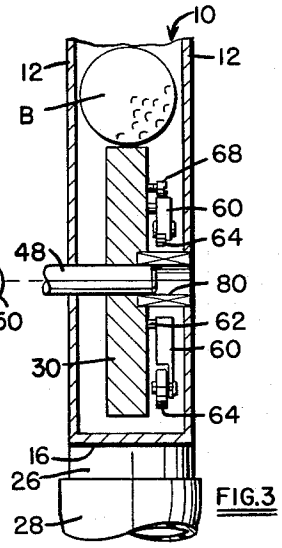


FIG. 3

INVENTOR.
ERNEST MEIERJOHAN

BY J. Warren Finney, Jr.
ATTORNEY

April 26, 1966 E. MEIERJOHAN 3,248,008

GOLF BALL DISPENSER OR THE LIKE

Filed Sept. 3, 1964 2 Sheets-Sheet 2

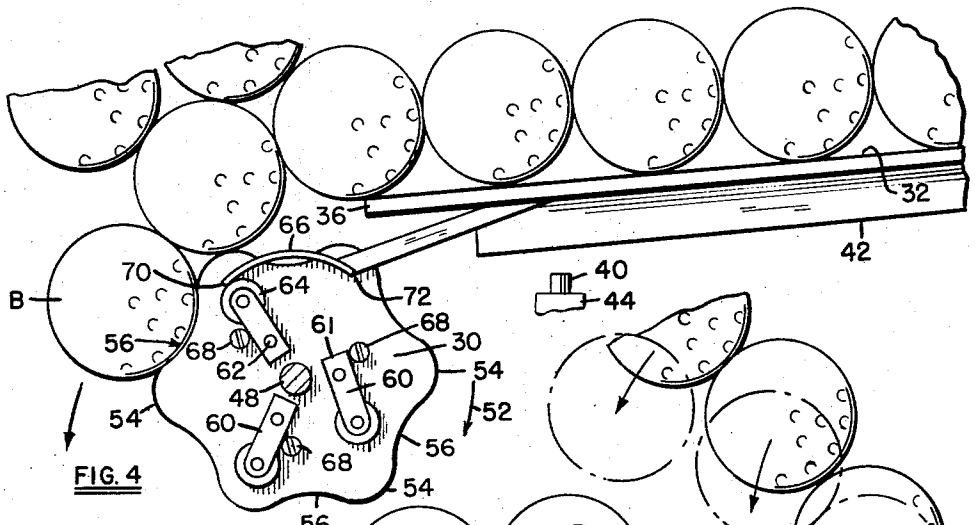


FIG. 4

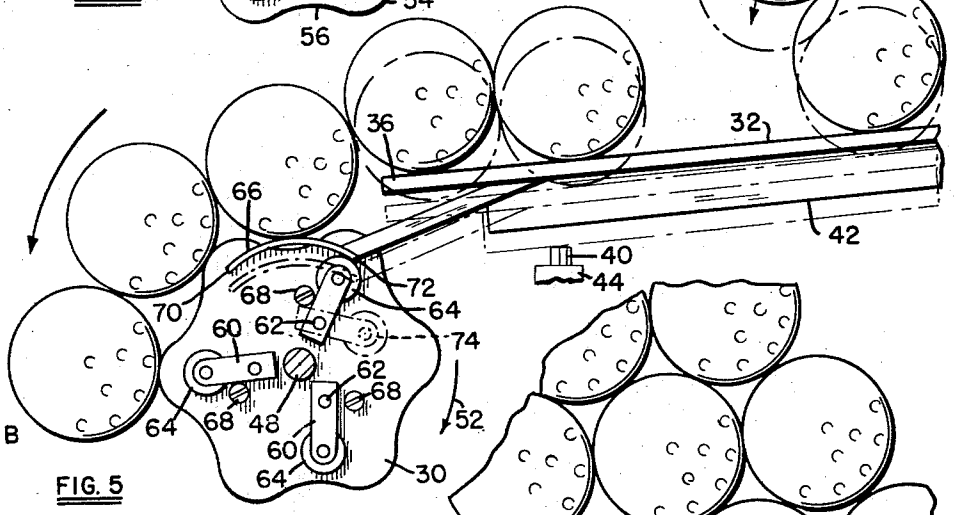


FIG. 5

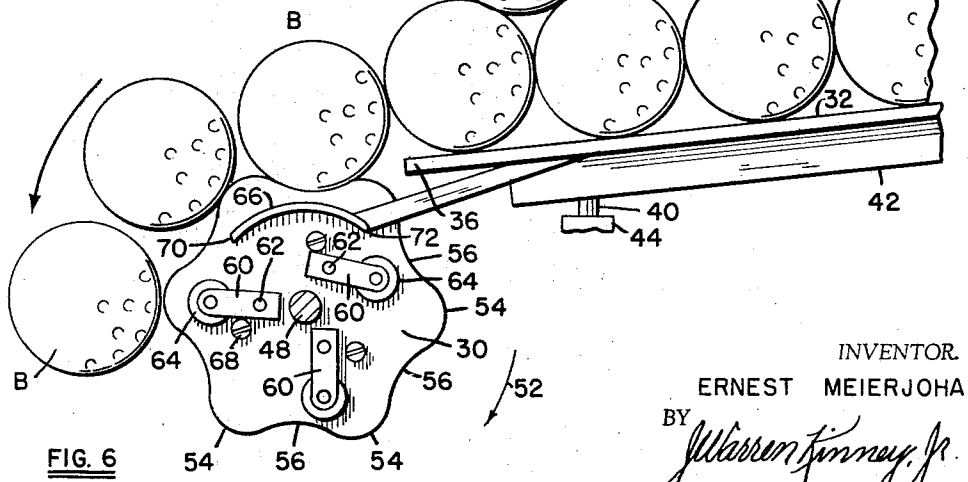


FIG. 6

INVENTOR.
ERNEST MEIERJOHAN
BY J. Warren Kinney, Jr.
ATTORNEY

United States Patent Office 3,248,008 Patented Apr. 26, 1966

3,248,008

GOLF BALL DISPENSER OR THE LIKE

Ernest Meierjohan, 3342 Hanna, Cincinnati, Ohio

Filed Sept. 3, 1964, Ser. No. 394,185
12 Claims. (Cl. 221—205)

The present invention relates to a ball dispenser, such as might be used for maintaining a readily available supply of balls or spherical objects in orderly arrangement, for continuous presentation to a user. By way of example, the dispenser may serve as a reservoir into which golf balls may be dumped at random, vibrated to assure an even flow, and fed promptly to a supply conduit or station at which the balls may be presented in uninterrupted succession, for use as driving practice balls at a driving range or the like.

In connection with any device of the character stated, profitable operation requires that the balls be supplied to the user or player without waste of time, and certainly without the annoyance of failure of the ball feed mechanism. In the past, efforts to mechanically feed golf balls from a hopper to the hands of a player, or to a T, encountered various difficulties which, as I have discovered, resulted from a peculiar tendency of the balls to cling to one another and resist rearrangement when in contact with one another within a hopper. Thus, in the absence of an effective form of agitation within the hopper, the balls contained therein would not readily rearrange themselves to induce dependable flow of balls from the hopper to a delivery chute or conduit leading to the players' station. In fact, it was common for the balls to form one or more arches within the hopper, as indicated at X upon FIG. 1, to block gravitation of the balls toward the hopper discharge port, and thereby defeat the objective of constantly and dependably maintaining a supply of balls accessible to the player or user.

An object of the present invention is to provide a dispenser of balls or spherical objects, which will feed balls from a hopper or reservoir to a delivery port, with unfailing dependability and despatch.

Another object is to provide apparatus for the purpose stated, which is simple and foolproof, and which requires no attention in the course of operation, to maintain an adequate supply of balls at its delivery station.

A further object of the invention is to provide an improved ball dispenser which may be quickly and easily charged with balls at any time during its operating period, and which will arrange and feed the balls in orderly fashion without damaging the balls.

The foregoing and other objects are attained by the means described herein and illustrated upon the accompanying drawings, in which:

FIG. 1 is a vertical cross-sectional view of the improved ball dispenser, showing a quantity of balls supported within the hopper portion thereof, the balls having been poured into the hopper portion from a bucket or other container.

FIG. 2 is a perspective view of the ball dispenser, part of a side wall being broken away to expose interior construction.

FIG. 3 is a fragmentary enlarged cross-section taken on line 3—3 of FIG. 1.

FIGS. 4, 5 and 6, are enlarged detail views of a ball feed wheel and associated agitator, these being illustrated in various phases of operation in the several views.

With particular reference to FIGS. 1 and 2, the numeral **10** denotes a housing having side, end, and bottom walls **12**, **14** and **16** respectively. Walls **12** preferably are spaced apart a distance slightly in excess of the diameter of a ball B, FIG. 3. In a preferred embodiment of the invention, the upper portion of housing **10** is flared outwardly to provide an enlarged funnel-like throat **20** facilitating pouring of balls into the housing from a bucket or other container. A lid or door **22** suitably hinged upon the housing at **24**, may control access to the interior of the housing.

At a lower corner of housing **10**, a ball delivery port **26** may direct balls from the housing to a delivery conduit or tube **28**, which leads to a remote players' station or possibly to a T that sets up a ball for play. Balls fed into the delivery conduit or tube **28** may accumulate therein, one behind another, so that a continuous succession of balls is presented at the players' station, preferably by gravity advancement. Means are provided for adequately feeding balls to tube **28** as balls are removed therefrom at the players' station.

The ball feed may comprise a motor-driven feed wheel **30**, and a cooperating vibratory shelf or inclined support **32** which carries the weight of most of the balls in housing **10**. Shelf **32** may consist of an elongate strip of metal or other suitable material, having a rear end **34** mounted upon an end wall **14** of the housing, and a forward terminal end **36** projecting toward and terminating short of the opposite end wall of the housing. The end **34** may be resilient at the location **38**, or may be otherwise adapted, to hinge the shelf for movement of terminal end **36** in a vertical plane. Preferably, the shelf is yieldingly biased rather strongly toward a stop **40** with a forceful snap action and thereby re-arrange the balls above it to break any cohesion or arching tendency such as is indicated at X, FIG. 1.

Shelf **32** may carry a depending reinforcing rib **42** to stiffen the shelf between hinge portion **38** and its terminal end **36**. The width of the shelf is less than the distance between the side walls **12** of the housing, so that the shelf may move freely between the side walls. Spacers as indicated at **44** may be employed to maintain a fixed spacing of the housing side walls from one another. In the example illustrated, the numerals **46** denote rivets or equivalent fasteners for mounting the shelf upon housing wall **14**.

The terminal end **36** of shelf **32** approaches, but does not reach, that end wall of the housing which includes the port **26**. Intermediate said end wall and the terminal end of the shelf, the housing supports a transverse rotary shaft **48** disposed at an elevation lower than the shelf end **36**, and upon said shaft is fixed the feed wheel **30**. A motor **50** disposed exteriorly of the housing, drives shaft **48** and wheel **30** constantly at slow speed, in the direction indicated by arrow **52**.

Feed wheel **30** may be considered a star wheel in the sense that it includes a plurality of peripheral lobes **54** separated from one another by valleys, recesses or depressions **56**. The valleys, recesses or depressions **56** may be formed on an arc corresponding substantially with the arcuacy of a portion of ball B (see FIG. 4). As the feed wheel rotates, the lobes thereof agitate the balls in an upward direction so as to preclude jamming of the balls against the end wall of housing **10**. The balls, however, are free to gravitate past the feed wheel and into delivery port **26**, since the lobes of the feed wheel are spaced from the adjacent end wall **14** of the housing a distance greater than the diameter of a ball.

Means are provided for imparting to shelf **32** a succession of forceful snap actions in a downward direction, to break any cohesion or arching tendency of the balls within the hopper capable of interrupting a steady flow of balls past the feed wheel and into the delivery port. Such means may be activated by the feed wheel or its drive shaft, and may comprise a plurality of shelf lifters each in the form of a lever **60** pivoted upon the feed wheel radially outwardly from shaft **48**. Each lever has an inner end portion **61** pivoted at **62** upon the feed wheel, and the outer end of each lever may carry an anti-friction roller **64** adapted to contact and lift an arcuate cam

follower **66** connected to the shelf **32** near its terminal end **36** by means of an extension finger **32***a* secured at one end to the shelf **32** and extending forwardly therefrom and having the cam follower fixed to its other end.

In FIG. 6, none of the lifters **60** are in contact with cam follower **66**, wherefore shelf **32** is disposed in the fully lowered or home position against stop **40**. It may be noted that lifter **60** at the left of shaft **48** in FIG. 6, extends radially and rests upon a stop **68** fixed upon wheel **30**. Clockwise rotation of wheel **30** will bring the roller camming **64** to the FIG. 4 position, at which roller **64** strikes the leading edge **70** of cam follower **66**, thereby to elevate the shelf **32** relative to stop **40** and cause the shelf to lift many of the balls within housing **10**.

Continued rotation of feed wheel **30** places the lifter roller **64** at the FIG. 5 position, where the roller is about to leave the trailing end **72** of cam follower **66**. As the roller passes off the cam follower end **72**, it will suddenly drop about pivot **62** to the broken line position **74**, permitting shelf **32** to snap down to home position as shown by broken lines in FIG. 5, the snap action being augmented by the spring section **38** of the shelf mounting. The displaced lifter, having dropped to the inoperative position **74**, is stopped against the abutment **68**. Rotation of the lifter about its pivot **62** may be limited to about 90 degrees, by the stop or abutment **68**.

As the feed wheel **30** continues to rotate, lifter **60** will be picked up by stop **68** for restoring the lifter to radial position (see lifter **60** at the left of shaft **48** in FIGS. 5 and 6), thereby placing the lifter in operative position to again actuate the cam follower **66**.

From the foregoing, it is apparent that a snap-action movement is imparted to shelf **32**, following each traverse of cam **66** by a lifter **60**. The number of lifters may be varied, and coordinated with the speed of rotation of feed wheel **30**, as desired. It is important, however, that the lifters leave the cam suddenly at the trailing end **72** in order to produce a form of agitation capable of breaking the inherent arching and cohering tendency of the ball compilation. It is desirable also that the shelf be returned to home position by spring action or other forceful means, in addition to the natural force of gravity ordinarily acting thereon.

At a location above the feed wheel and the terminal end **36** of shelf **32**, there is provided a stationary baffle or divider **76**, the purpose of which is to establish above the feed wheel a trap or zone limiting the number of balls which may impose their weight upon the feed wheel and the terminal end **36** of shelf **32**. As FIG. 1 clearly indicates, the baffle provides an air space or dome **78** into which may be readily displaced those balls which overlie the shelf end **36** and feed wheel **30** during the operating period. The baffle slopes from the housing end wall downwardly toward the shelf, and has a free end **80** which is spaced from the shelf sufficiently to permit passage of several courses of balls to the restricted zone **78**. By this means, the feed wheel and the terminal end **36** of shelf **32** are relieved of the strain of agitating and displacing the weight of the many balls within the hopper during rotation of the feed wheel, and the freedom of ball movement provided by zone **78** assures an easy flow of balls past the feed wheel and into delivery port **26**. The arrangement definitely eliminates the arching depicted at X in FIG. 1 while the apparatus is in operation.

In FIG. 3, the numeral **80** indicates a bearing carried by one of the housing side walls, to support an end of drive shaft **48**. Such bearing may or may not be needed, depending upon the adequacy of the drive motor to support the feed wheel without the assistance of exterior shaft bearings, as will be understood. The shelf stop or bumper **40** may be formed of rubber or other resilient material, if desired.

It is to be understood that various modifications and changes may be made in the structural details of the device, within the scope of the appended claims, without departing from the spirit of the invention.

What is claimed is:

1. A golf ball dispenser comprising in combination: a hollow housing to receive and store a supply of balls, said housing having a pair of end walls, a pair of side walls, and a bottom wall; means for introducing balls into the housing means spacing the side walls from one another a distance approximating the diameter of a ball with clearance sufficient for free gravitation of the balls between said side walls; a ball discharge port in the housing dimensioned to pass balls in succession downwardly from the housing, said port being adjacent to one end wall of the housing; an elongate shelf disposed within the housing in position to support the balls stored therein, said shelf being of lesser width than the space between the housing side walls, and having a base end and an opposite terminal end directed at an inclination downwardly toward and terminating short of said one end wall, forming a space for passage of a ball; means flexibily supporting the base end of the shelf upon the housing for movement of the terminal end in parallelism with the housing side walls; a rotary ball feed wheel disposed between the discharge port and the downwardly directed terminal end of the shelf with the major part thereof lying below the plane of said shelf and also lying in its major part beyond and spaced from said terminal end of the shelf whereby the balls roll in a row along the surface of the shelf and onto the top of the periphery of the wheel to pass thereover and downwardly through said space, means for rotating said wheel; and means for periodically elevating the terminal end of the shelf in parallelism with the housing side walls, to agitate and break up bridging of the balls thereon between the shelf and said end wall.

2. The combination as set forth in claim **1**, wherein the last-mentioned means includes means operative to induce sudden lowering of the terminal end of the shelf following each elevating movement thereof.

3. The device as set forth in claim **1**, wherein the aforesaid means for periodically lifting and suddenly releasing the terminal end of the ball support shelf is in part carried by the feed wheel.

4. A ball dispenser comprising in combination: a hollow housing to receive and store a supply of balls, said housing having a pair of end walls, a pair of side walls, and an upper charging opening, said side walls being spaced apart a distance approximating the diameter of a ball with clearance sufficient for free gravitation of the balls between said side walls, said housing having a lower ball discharge port dimensioned to pass balls in succession from the housing; an elongate ball-supporting shelf within the housing and having terminal end movable between the side walls of the housing in parallelism therewith toward and from the ball discharge port; a rotary ball feed wheel having peripheral spaced lobes, said wheel being disposed between the discharge port and the terminal end of the shelf, with the lobes exposed to contact with the balls; means for rotating the ball feed wheel in a plane substantially parallel to the housing side walls; a cam on the shelf extended toward the feed wheel, the cam being movable with the terminal end of the shelf, and having a leading end and a trailing end; a cam lifter in the form of a lever having opposite ends, and means intermediate said lever ends pivoting the lever upon the feed wheel in position for one end of the lever to strike and elevate the cam and the terminal end of the shelf as the feed wheel rotates; means on the feed wheel limiting rotation of the lever between an operative position of extension and an inoperative position of retraction relative to the axis of rotation of the feed wheel, said one end of the lever when in operative position acting to elevate the cam in traversing the cam from the leading end to the trailing end thereof, and to suddenly fall away from the cam upon passing the trailing end thereof; and

means yieldingly biasing the terminal end of the shelf in the general direction on the feed wheel axis.

5. The device as set forth in claim 4, wherein the combination includes: a stationary baffle disposed within the housing in spaced overhanging relationship to the feed wheel, the discharge port, and the terminal end of the shelf, said baffle having a free end spaced from the shelf a distance to limit the number of balls which may impose weight upon said shelf end and said feed wheel.

6. A ball dispenser comprising in combination: a hollow housing to receive and store a supply of balls, said housing having a pair of end walls, a pair of side walls, and an upper charging opening, said side walls being spaced apart a distance approximating the diameter of a ball with clearance sufficient for free gravitation of the balls between said side walls, said housing having a lower ball discharge port dimensioned to pass balls in succession from the housing; an elongate ball-supporting shelf inclined downwardly within the housing toward the discharge port, said shelf having a terminal end movable between the side walls in parallelism therewith toward and from the dischagre port; yielding means biasing the shelf end toward said port, and a stop limiting the extent of bias; a rotary ball feed wheel having peripheral spaced lobes, said wheel being disposed within the housing between the discharge port and the terminal end of the shelf, with the lobes exposed to contact with the balls; a cam fixed on the shelf and extended toward the feed wheel, said cam having a leading end and a trailing end; a displaceable cam lifter on the feed wheel having an end to contact and lift the cam and the terminal end of the shelf as the feed wheel rotates; and means effecting sudden displacement of the contact end of the cam lifter as said contact end passes the trailing end of the cam, thereby to produce a sudden lowering of the cam and shelf end onto the stop following each lifting movement of the cam lifter.

7. The device as set forth in claim 6, wherein the combination includes a motor for rotating the feed wheel in a direction such that the lobes thereof tend to lift the balls gravitating toward the discharge port, the lobes being spaced from the adjacent end wall of the housing a distance exceeding the diameter of a ball.

8. A ball dispenser comprising in combination: a hollow housing to receive and store a supply of balls, said housing having a pair of end walls, a pair of side walls, and an upper charging opening, said side walls being spaced apart a distance approximating the diameter of a ball with clearance sufficient for free gravitation of the ball between said side walls, said housing having a lower discharge port adjacent to one end wall and dimensioned to pass balls in succession from the housing; an elongate ball-supporting shelf inclined downwardly within the housing toward the discharge port, said shelf having a terminal end movable between the side walls in parallelism therewith toward and from the discharge port; yielding means biasing the shelf end toward said port, and a stop limiting the extent of bias; a rotary feed wheel having peripheral spaced lobes, said wheel being disposed with the housing between the discharge port and the terminal end of the shelf, with the lobes exposed to contact with the balls and spaced from the adjacent end wall of the housing a distance exceeding the diameter of a ball; a motor for rotating the feed wheel in a direction such that the lobes tend to lift the balls gravitating toward the discharge port; a cam fixed on the shelf and extended toward the feed wheel, said cam having a leading end and a trailing end; a displaceable cam lifter on the feed wheel having an end to contact and lift the cam and the terminal end of the shelf as the feed wheel rotates; means effecting sudden displacement of the cam lifter as the contact end thereof passes the trailing end of the cam; and a baffle disposed within the housing in spaced overhanging relationship to the feed wheel, the discharge port, and the terminal end of the shelf, said baffle being inclined downwardly toward the shelf and having a free end spaced therefrom a distance to limit the number of balls which may accumulate beneath the baffle and upon the feed wheel.

9. A ball dispenser comprising in combination: a hollow housing to receive and store a supply of balls, said housing having a forward and a rear end wall, a pair of side walls, and an upper charging opening, said side walls being spaced apart a distance approximating the diameter of a ball with clearance sufficient for free gravitation of the balls between said side walls, said housing having a lower discharge port adjacent to the forward end wall, said port dimensioned to pass balls in succession from the housing; an elongate ball-supporting shelf, means hinging an end of said shelf to said rear wall, said shelf being inclined downwardly from the rear end wall toward the discharge port, said shelf having an opposite terminal end movable between the side walls in parallelism therewith toward and from the discharge port; a stop limiting hinging movement of the shelf in the direction of the discharge port; a rotary feed wheel having alternating, spaced, curved peripheral lobes and valleys, said wheel being disposed within the housing between the discharge port and the terminal end of the shelf and substantially entirely below the plane of the shelf, with the lobes exposed to receive the balls thereon from the said terminal end of the shelf, said lobes being spaced from the forward end wall a distance exceeding the diameter of a ball; means for rotating the feed wheel in a direction such that the lobes tend to lift the balls gravitating thereonto toward the discharge port and the terminal end of the shelf, said shelf; means actuated by said feed wheel rotating means for effecting hinging movement of the shelf to raise and lower said terminal end thereof relative to the feed wheel; and an inclined ball support means disposed within the housing in vertically spaced relationship to the feed wheel, the discharge port, and the terminal end of the shelf, said inclined ball support means extending from the forward end wall of the housing downwardly toward and terminating a substantial distance from and above the shelf, to provide an expansion chamber over the feed wheel, the baffle of the said ball support means forming with the shelf a space to limit the number of balls movable along the shell to the feed wheel.

10. The device as set forth in claim 9, wherein the means for effecting hinging movement of the shelf includes means to sharply vibrate the shelf in at least one direction of its hinging movement.

11. A ball dispenser comprising in combination: a hollow housing to receive and store a supply of balls, said housing having a forward and a rear end wall, a pair of side walls, and an upper charging opening, said side walls being spaced apart a distance approximating the diameter of a ball with clearance sufficient for free gravitation of the balls between said side walls, said housing having a lower discharge port adjacent to the forward end wall, said port dimensioned to pass balls in succession from the housing; an elongate ball-supporting shelf hinged upon and inclined downwardly from the rear end wall toward the discharge port, said shelf having a terminal end movable between the side walls in parallelism therewith toward and from the discharge port; means for imparting to the shelf a succession of hinging movements while the shelf supports a supply of balls; and a baffle disposed within the housing in spaced overhanging relationship to the discharge port and the terminal end of the shelf, said baffle being inclined from the forward end wall downwardly toward an intermediate portion of the shelf, to provide an expansion chamber above the terminal end of the shelf, the baffle having a free end spaced from the shelf to limit the number of balls movable along the shelf onto the terminal end thereof.

12. The device as set forth in claim 11, wherein the combination includes means intermediate the discharge

port and the terminal end of the shelf, for agitating the balls in gravitating toward the discharge port.

References Cited by the Examiner

UNITED STATES PATENTS

758,539	4/1904	Kreter	221—204
799,996	9/1905	MacCordy	221—201
2,419,242	4/1947	Woodberry et al.	221—203
2,479,860	8/1949	Otis	221—204
2,511,951	6/1950	Solomon	221—204
2,627,973	2/1953	Sines	221—277
2,634,022	4/1953	Wyatt	221—200
2,858,046	10/1958	Pollmann	221—200

LOUIS J. DEMBO, *Primary Examiner.*

WALTER SOBIN, *Examiner.*