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AUTOMATIC FEEDING OR DELIVERY APPARATUS

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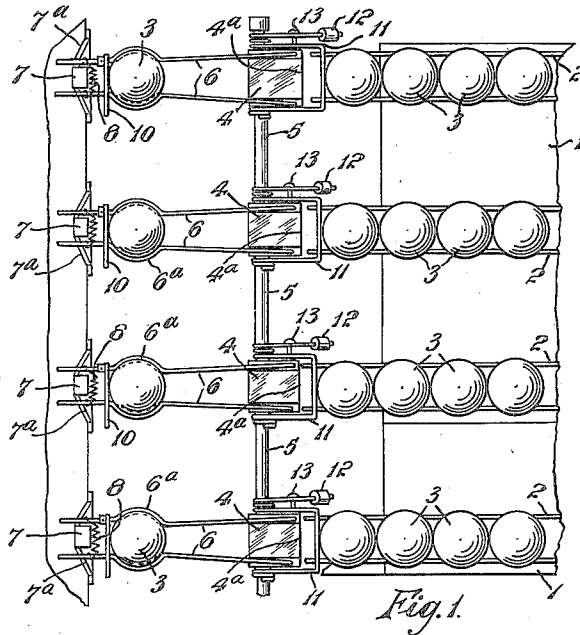


Fig. 1.

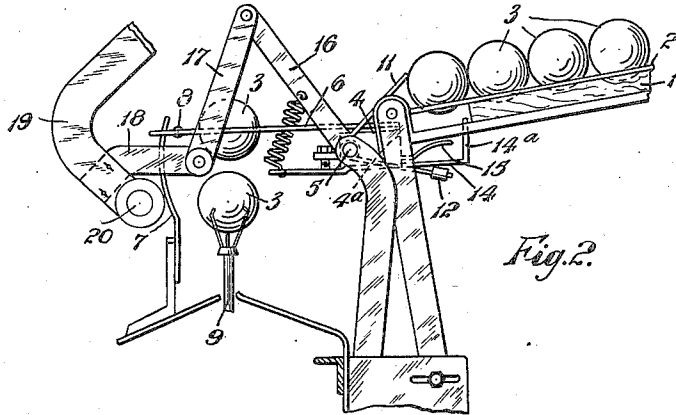


Fig. 2.

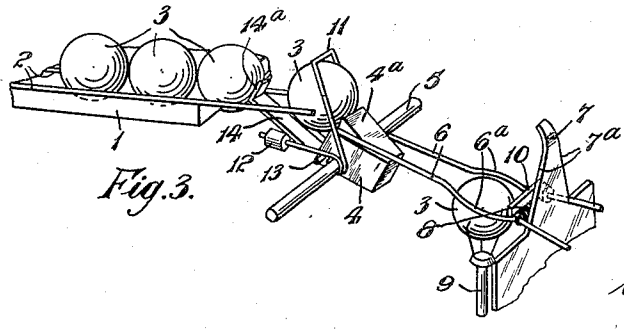


Fig. 3.

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UNITED STATES PATENT OFFICE

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AUTOMATIC FEEDING OR DELIVERY
APPARATUS

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5 Claims. (Cl. 198—26)

Our invention relates to apparatus for feeding or delivering objects, such as balls, automatically or in a controlled intermittent succession.

In our invention balls, such as golf balls, placed indiscriminately are automatically fed intermittently or in repeated uniform intervals by a mechanically controlled feeding mechanism which may be synchronized with apparatus for treating the balls.

Our apparatus comprises a fixed inclined runway or groove which may be mounted in an open tray and down which the balls or objects roll by gravity to an admission bracket which controls the further intermittent feeding of the balls. The admission bracket is mounted on a platform tiltable about a horizontal axis beneath and transverse to the path of the balls being fed and comprises a runway or pair of rail members which in one position of the platform permits an object to pass by; the following objects are retained by mechanism on the platform, and in the other position stops the further feed of the objects or balls. With each rocking cycle one ball is permitted to pass over the rails or runway of the platform while the others are detained.

As the ball or object arrives at a predetermined position on the platform runway it is stopped and delivered to a receiving mechanism of the treating apparatus. This is accomplished by spreading the rails of the runway so as to permit the ball, or other object, to drop between the rails to a receiving and holding element of the treating apparatus.

A series of parallel runways and feeding mechanisms may be arranged in parallel and the feeding mechanisms controlled simultaneously by a single rock shaft.

The apparatus is illustrated in the accompanying drawing as adapted particularly to supplying golf balls to an element supporting the ball in position suitable for painting, but it will be understood that it may be applied to handling golf balls or other articles for other treating apparatus.

In the drawing:

Fig. 1 is a plan view of a four-ball automatic feed apparatus in accordance with this invention including the lower part of the feed tray. Fig. 2 is a side view of the apparatus as shown in Fig. 1 showing the link mechanism by which the feed is operated from mechanism in a machine in which the automatic feed is embodied. Fig. 3 is a detail perspective view of one of the units of the four-ball feed shown in Fig. 1 and illustrating the functioning of the admission bracket.

Referring to the drawing a shallow, open inclined tray 1 carried four runways consisting of rail members 2 to guide, under gravity feed, balls 3 placed thereon to four suitably spaced and preferably aligned points at each of which is located an admission bracket for mechanically controlling the further gravity feed and final delivery of the balls to the ball supporting devices.

Each admission bracket comprises a feed control platform 4 situated in juxtaposition to the end of the runway or rail members 2 which project beyond the edge of the inclined tray 1. The platform 4 is mounted upon a horizontally disposed spindle 5 arranged transverse of the feed path and which conveniently may be common to the whole series of admission brackets operating in unison, the arrangement being that oscillation of the spindle 5, accomplished by suitable link mechanism operated from a machine drive, causes corresponding rocking of the platform 4.

The oscillation of the spindle 5 is effected through articulated links 16, 17 connecting through the arm 18 with a part 19 in the mechanism of a machine, the part 19 having an oscillatory movement about the pivot 20 originating from such mechanism as a cam (not shown).

A delivery runway comprising rail members 6 moves with and is carried by the platform 4 in continuation of the gravity feed path.

The disposition and form of the platform 4 is such that in one extreme of the rocking movement the surface of the platform 4 constitutes a continuation or substantial continuation of the feed runway of the inclined tray 1 and thus allows a ball to pass thereover to the delivery runway.

A subsequent rocking movement raises the leading edge 4^a of the platform, i. e. that edge immediately adjacent the end of the tray runway temporarily to stop the feed.

Fixed adjacent but independent of the free end of the delivery runway rails 6 is a vertically or substantially vertically disposed plate 7 of suitable shape and so disposed that when the rails 6 are rocked with the platform 4 in a downward movement they ride on inclined faces 7^a of the plate 7 to be moved apart against the action of a spring 8 to an extent to permit passage of a ball 3 between the rails 6 and so to be vertically dropped for delivery on to conveyor ball supports 9 carried thereunder.

The moving apart of the delivery rails 6 to deliver a ball 3 takes place while the platform 4 operates temporarily to stop the feed; and the

passage of a ball 3 across the control platform 4 takes place only after the delivery rails 6 are rocked away from the plate 7 and are returned, under the influence of the spring 8 to a position to support a ball 3.

A suitable stop 10 to which the ball may run is provided at the free end of the delivery rails 6 and the latter may be shaped as at 6^a to create a definite point in the length of the runway at which each ball rests prior to delivery.

Control members for the gravity feed functioning prior to and in co-operation with the rocking platform 4 operate to permit an intermittent feed of one ball at a time to the platform 4 when the latter is in a position where it operates as a step.

One of these control members comprises wire 11 bent to U form and positioned to bridge the platform 4 transverse to the feed path, it being mounted by the free ends being conveniently coiled around the oscillating spindle 5 at either side of the platform 4, one free end of the wire 11 extending therefrom to carry a weight 12 operating to throw the U-shape forward into the path of the oncoming balls 3 and the weighted free end against a set screw stop 13 conveniently located at the side of the platform 4 and carried thereby on the feed tray side of the rocking pivot, the arrangement being that a rocking movement of the platform 4 causes the set screw stop 13 to contact with and move the wire control member against the action of the weight 12, upwardly sufficiently to permit the passage of a ball under gravity feed to the edge 4^a of the platform 4 which is then in the raised position to retain the ball until a reversal of the rocking movement brings the platform 4 to the position permitting this ball to travel forward across the platform while simultaneously the set screw stop 13 on the rocked platform permits movement of the wire control under the influence of the weight 12 to a position where the closed end of the U-shape contacts with the next ball in the column to restrain its gravity feed until a reversal of the rocking movement again permits its passage to the platform as aforesaid.

A second feed control member functioning in conjunction with the platform 4 and the wire control comprises a finger member 14 carried from the underside of the platform 4 and extending beneath the guide rails 2 projecting from the adjacent edge of the feed tray 1. The finger member 14 has an upturned end 14^a and is so disposed that the rocking movement of the platform 4 to operate the wire control to permit the feed of a ball brings the upturned end 14^a into a position where it is interposed between the last two balls in the gravity feed column sufficient temporarily to stop the feed while the wire control permits the passage of the last ball in the column to the edge 4^a of the platform 4 as clearly shown in Fig. 3 of the drawing.

This second feed control member 14 also usefully functions as a means for ensuring the free gravity feed in the column of balls just prior to their reaching the wire control member this being sometimes desirable where the balls are in a state where they are liable to stick together, and the control member 14 is assisted in this by a spring member 15 carried by the platform 4.

Having now particularly described our said invention, we claim:

1. Apparatus for automatically feeding objects such as balls in intermittent succession which comprises a fixed inclined runway for said objects, a feed control platform pivotally supported to

rock about a horizontal axis beneath the platform and transverse to the path of said balls, said platform having a runway adapted in one position to form a continuation of said fixed inclined runway and to deliver said object, and in another position to retain said object, said platform acting in one position to stop passage of said objects from said inclined runway and feed control members to intercept objects on said inclined runway when said platform is in position to permit the passage of an object, said members comprising a U-shaped element pivoted at its free ends on opposite sides of said platform at the axis thereof and weighted to swing into intercepting position, said platform having means to lift said U-shaped element against the action of said weight when tilted into intercepting position.

2. Apparatus for automatically feeding objects such as balls in intermittent succession which comprises a fixed inclined runway for said objects, a feed control platform pivotally supported to rock about a horizontal axis beneath the platform and transverse to the path of said balls, said platform having a runway adapted in one position to form a continuation of said fixed inclined runway and to deliver said object, and in another position to retain said object, said platform acting in one position to stop passage of said objects from said inclined runway and feed control members to intercept objects on said inclined runway when said platform is in position to permit the passage of an object in which the runway of said platform comprises a pair of separable rails, and means to separate said rails when said platform rocks to position to deliver an object therefrom.

3. Apparatus for automatically feeding objects such as balls in intermittent succession which comprises a fixed inclined runway for said objects, a feed control platform pivotally supported to rock about a horizontal axis beneath the platform and transverse to the path of said balls, said platform having a runway adapted in one position to form a continuation of said fixed inclined runway and to deliver said object, and in another position to retain said object, said platform acting in one position to stop passage of said objects from said inclined runway and feed control members to intercept objects on said inclined runway when said platform is in position to permit the passage of an object in which the runway of said platform comprises a pair of separable rails, a spring to hold said rails to a fixed distance from each other and means to spread said rails against the action of said spring as said rails are lowered to position to deliver an object thereon.

4. Apparatus for automatically feeding objects such as balls in intermittent succession which comprises a fixed inclined runway for said objects, a feed control platform pivotally supported to rock about a horizontal axis beneath the platform and transverse to the path of said balls, said platform having a runway adapted in one position to form a continuation of said fixed inclined runway and to deliver said object, and in another position to retain said object, said platform acting in one position to stop passage of said objects from said inclined runway and feed control members to intercept objects on said inclined runway when said platform is in position to permit the passage of an object in which the runway of said platform comprises a pair of separable rails, a spring to hold said rails to a fixed distance from each other and means to spread said rails against the action of said spring as said rails are lowered to position

to deliver an object thereon and a stop plate spanning said rails in position to stop an object.

5 5. Apparatus for automatically feeding objects such as balls in intermittent succession which comprises a fixed inclined runway for said objects, a feed control platform pivotally supported to rock about a horizontal axis beneath the platform and transverse to the path of said balls, said platform having a runway adapted in one position to form a continuation of said fixed inclined runway and to deliver said object, and in another position to retain said object, said platform acting in one position to stop passage of said objects from

said inclined runway and feed control members to intercept objects on said inclined runway when said platform is in position to permit the passage of an object in which the runway of said platform comprises spaced rails resiliently held to a predetermined distance and curved outwardly from each other at the delivery point of said objects and means to spread said rails when said platform is rocked to delivery position to permit an object to fall between said outwardly curved parts of said rails. 5 10

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