May 21, 1957 L. J. PONZA 2,792,822

MECHANICAL BASEBALL PITCHING MACHINES

Filed May 10, 1954 3 Sheets-Sheet 1

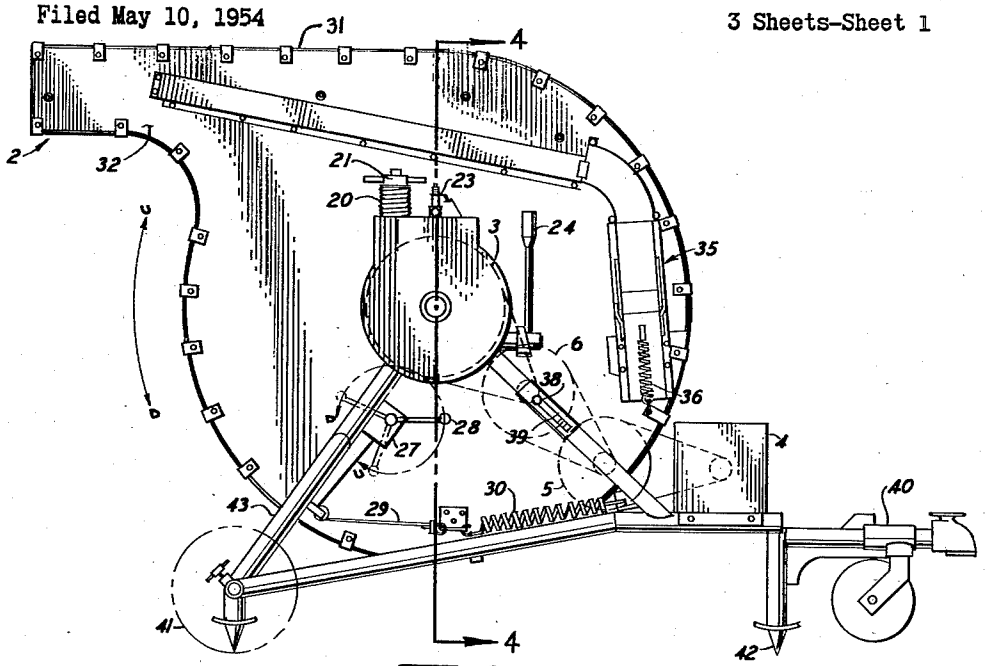

Fig-1

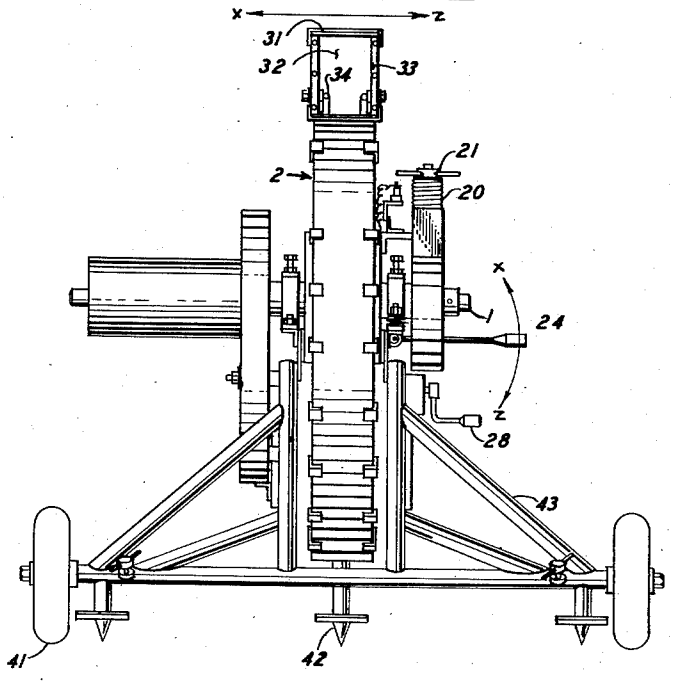

Fig-3

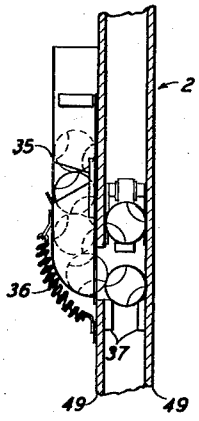

Fig-2

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MECHANICAL BASEBALL PITCHING MACHINES

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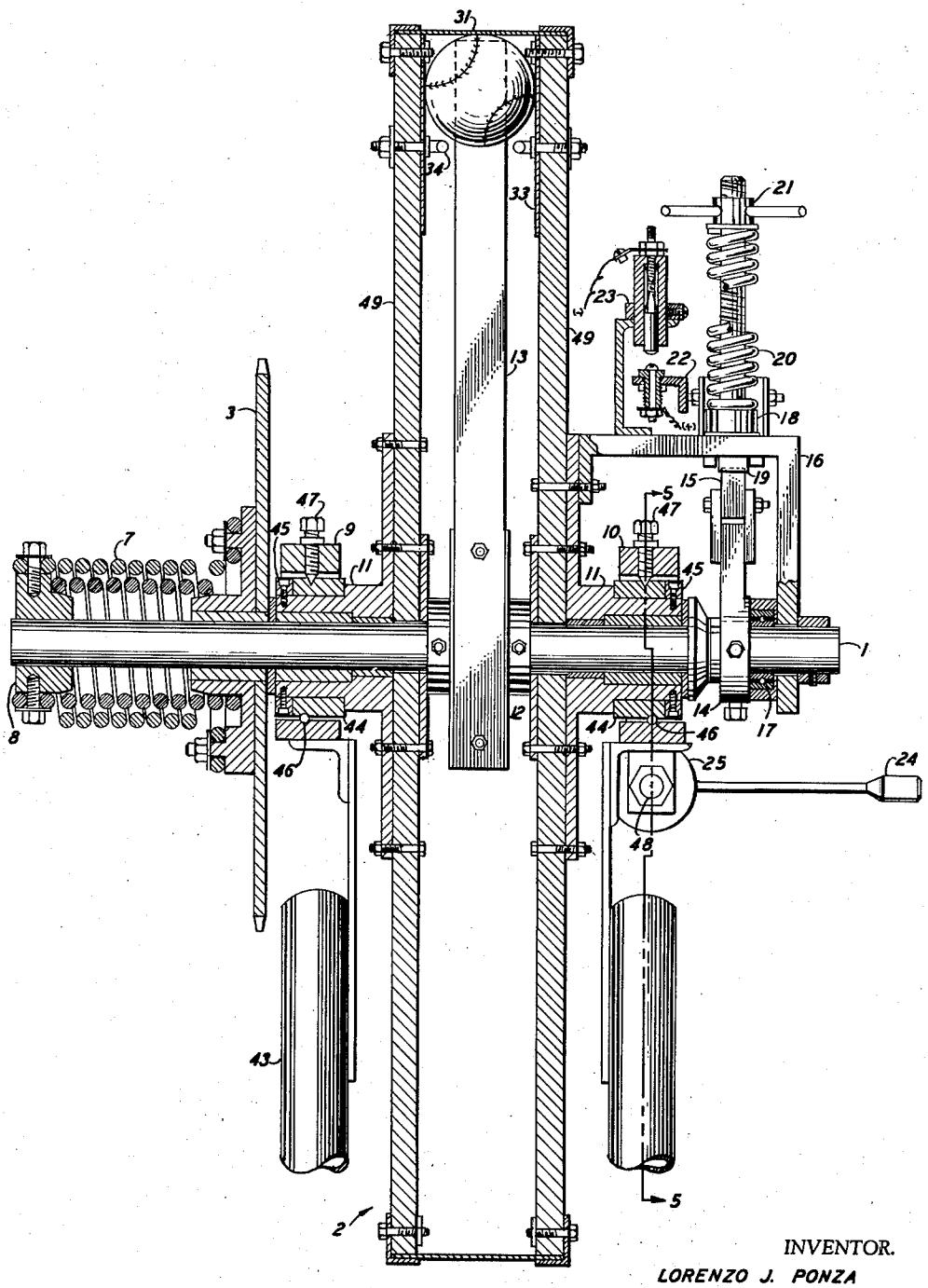

FIG-4

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MECHANICAL BASEBALL PITCHING MACHINES

Filed May 10, 1954 3 Sheets-Sheet 3

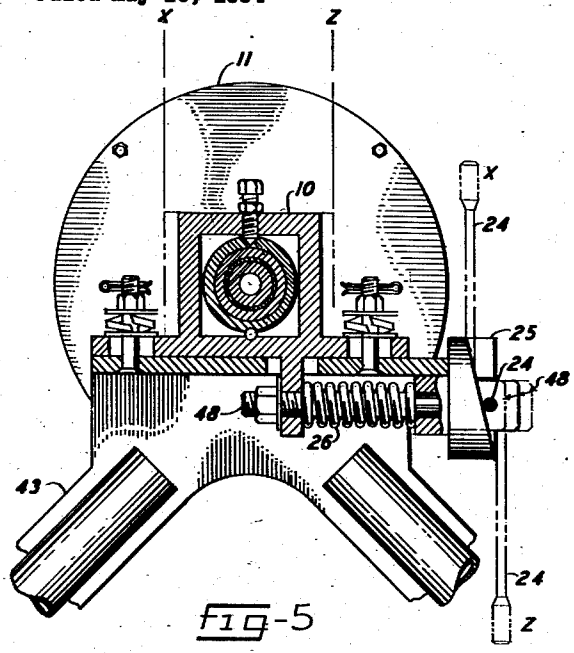

Fig-5

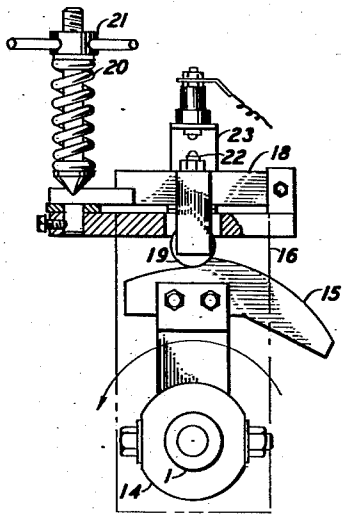

Fig-6

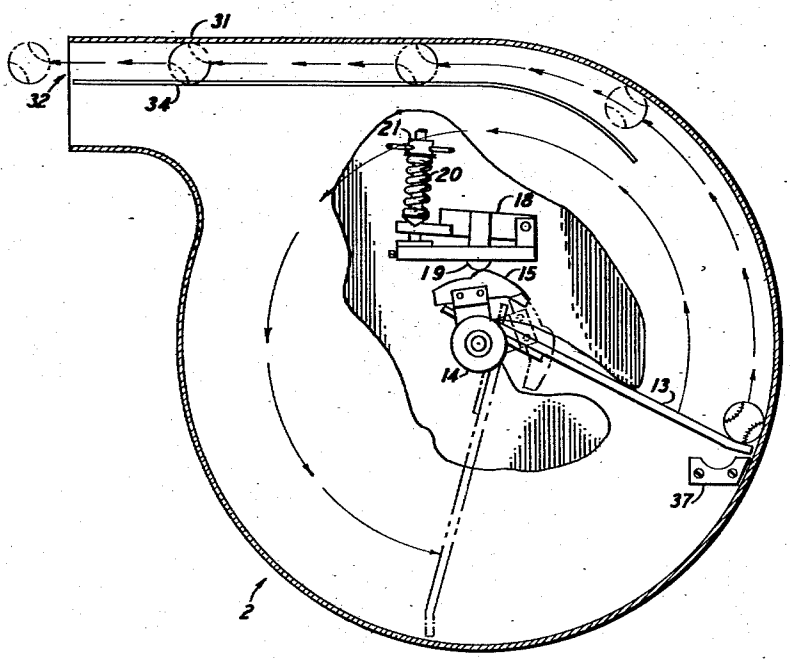

Fig-7

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2,792,822

MECHANICAL BASEBALL PITCHING MACHINES

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Application May 10, 1954, Serial No. 428,623

5 Claims. (Cl. 124—7)

The present invention relates to a mechanical baseball pitching machine. The prime object of the invention is to provide an automatic pitching machine for use by high schools, junior league baseball activities, industrial league baseball clubs, minor and major baseball leagues, which can be sold at a sufficiently low price to reach this market.

Other objects of this invention are to provide a simple mechanism which obviates the necessity for complicated or intricate parts and reduces maintenance costs to a minimum, means to provide a smooth mechanical action with follow through and shock absorbing capacities so as not to require securing the machine to the ground to prevent shifting while in operation; a light-weight portable designed to facilitate quick and convenient movement of the machine onto and off the pitcher's mound; means to quickly and easily adjust while the machine is in continuous operation, the trajectory of the ball for horizontal and vertical flight, and the speed of the pitched ball; an automatic warning bell mechanism to alert the batter immediately prior to each delivered pitch; an automatic feeding mechanism to feed balls into the machine from a volume supply hopper; a construction and operating design completely safe for the operator with no moving parts exposed; provision for projecting fly balls and ground balls with its subsequent practice potential by simple adjustment while the machine remains in continuous operation; accurate delivery of the pitched ball into the strike zone with maximum of efficiency for batting practice and complete safety to the batter; and in general, a completely automatic, safe, practical and economically feasible batting practice machine.

For the attainment of these and such other objects as may appear or be pointed out I have shown an embodiment of my invention in the accompanying drawings, wherein:

Fig. 1 is a side elevation view of the entire machine,

Fig. 2 is a rear fragmentary section view of a feeder hopper,

Fig. 3 is a front elevation view of the entire machine,

Fig. 4 is a cross section front view of the basic mechanism on the lines V—V of Fig. 1,

Fig. 5 is a cross section side view of an adjustable suspension bracket and horizontal adjusting mechanism substantially on the lines R—R of Fig. 4,

Fig. 6 is a side elevation view of a speed control mechanism, parts being broken away and,

Fig. 7 is a side elevation view illustrating the throwing cycle.

As shown in the drawings, the baseball pitching machine of the present invention includes a thin generally cylindrical housing or container 2 within which impetus is given to a baseball by mechanism hereinafter to be described so that the baseball will thereafter be ejected from a tangential opening or nozzle at a relatively great velocity. So that the machine may be easily moved onto a pitching mound, the container 2 is supported on a frame which in turn is mounted upon three triangularly-

spaced wheels 41. More particularly, the rear wheel is connected to a portion 40 of the frame 43 so as to be rotatable about a substantially vertical axis thereby permitting the machine to be guided as it is moved. This portion 40 of the frame is itself pivotally connected to the main portion of the frame 43 so that upon arrival of the machine at the pitching mound, the rear wheel may be pulled upwardly from the ground whereupon a spike 42 depending from the rear portion 40 can be lowered into the ground to stablize the machine's position. If further stabilization be desired, the two front wheels 41 can be removed from the frame 43 so that similar spikes adjacent these wheels can also enter the ground. While the described spikes 42 do provide for stabilization of the machine in the manner described, it is desired to point out that they usually need not be utilized because, as will become apparent hereinafter, the forces which propel the baseball are balanced so that the machine will be held against turning on the pitcher's mound even when supported on the wheels 41.

The cylindrical container with its tangential opening, is pivotally supported on the frame 43 by means of swivel collers 44 bearing on container hubs 11 and secured thereto by a retainer collar 45, supported by pivot bolts 47 and ball bearings 46 in a stationary suspension bracket 9 and an adjustable suspension bracket 10 as shown in Fig. 4. This construction design permits the centrifugal container 2 to rotate freely on the frame without interference to the remaining operating mechanism, providing a means for adjusting the height of a pitched ball at any time during continuous operation of the machine, as controlled by an elevation adjustment gear box 27 shown in Fig. 1. The elevation adjustment gear box 27 is linked to the container 2 by an elevation adjusting cable 29 with equalizing tension being provided by an elevation adjusting tension spring 30. Clockwise rotation of the elevation adjusting lever 28 as shown in Fig. 1 will rotate the container in a clockwise direction, and rotation of the lever 28 in a counter-clockwise direction results in counter-clockwise rotation of the container as shown by characters *d*—*u* of Fig. 1.

To provide for horizontal adjustability of a pitched ball, the adjustable suspension bracket 10 is actuated forwards and backwards on the frame 43, as seen in Fig. 5, by means of a horizontal adjusting lever 24 secured to a horizontal adjusting shaft 48, brought to bear against the face of a horizontal adjustment helical cam 25 by a horizontal adjustment tension spring 26. As the lever 24 is raised to position X, spring tension retains the lever 24 against the face of the helical cam 25 thusly moving the shaft 48 and the adjustable suspension bracket 10 forward to position X; by lowering the lever 24 to position Z, the shaft 48 is moved back with the adjustable suspension bracket moving backward to position Z; this action results in the ball bearing 46 and the pivot bolt 47 in the stationary suspension bracket 9 acting as a fulcrum, as seen in Fig. 4, thereby providing a horizontal movement of the container 2 and its tangential orifice 32 as illustrated by characters X—Z in Fig. 3. Horizontal adjustment can be made during continuous operation of the machine without interference to the propelling mechanism due to the propelling mechanism being combined with the container 2 in a way as to move in unison with it. The container 2 in itself consists of: a receptacle to hold the balls in position for the propelling mechanism; guides to insure controlled flight of the ball during original propulsion; a support for the feeding mechanism; and a support for a speed control yoke 16. As shown in Fig. 4, container side panels 49 are held together by a perimeter guide track 31, with this track 31, stainless steel side plates 33, and tangential outlet guides 34 performing the function of guiding the ball in a directed

trajectory as it is propelled from the machine (see Fig. 7).

The gravity feeder hopper 35 (see Figs. 1 and 2) is attached to the container side panel 49 in a manner as to permit balls placed in said hopper to flow by gravity through a provided opening in said side panel and come to rest on a ball receptacle nest 37. As the propelling arm 13 lifts a ball from the nest into firing position (see Figs. 2 and 7) the next succeeding ball drops into place in the receptacle nest 37, resulting in continuous automatic feeding.

The propelling mechanism is actuated by a drive sprocket 3 which is in turn driven by a motor 4 through a reduction pulley 5 and a reduction sprocket 6 (see Fig. 1). The revolutions per minute made by the drive sprocket determines the time interval between each pitched ball, (i. e., each revolution completes one operating cycle resulting in one pitched ball). Therefore the reduction ratio between the motor and the drive sprocket is computed and designed to produce a predetermined R. P. M. at the drive sprocket with approximately 8 R. P. M. being satisfactory with a pitched ball every 7.4 seconds. As the drive sprocket 3 revolves on its bearing over the main shaft 1, see Fig. 4, the multiple torsion springs 7 which have one end secured to the drive sprocket and the other end to a driver flange 8, actuate the main shaft 1 to revolve until a speed control cam 15 makes contact with a speed control tensioner bar roller 19 thereby momentarily stopping rotation of the shaft 1 (see Figs. 4 and 6). Attached to the main shaft 1 inside of the container is a propelling arm 13 by means of a propelling hub 12, in a position relative to the speed control cam such that the propelling arm rotates and picks up a ball from the receptacle nest 37 immediately prior to the cam 15 making contact with the roller 19 (see Fig. 7). With the cam in contact with the roller and the ball having been picked up and being held by the arm, the drive sprocket 3 continues to revolve and in so doing exerts increased pressure to the tensioner bar roller 19 through the cam 15 by energy being built up in the multiple torsion springs 7. When the power or energy of the torsion springs becomes great enough to overpower the resistance of the tensioner bar roller as controlled by spring tension of the speed control tension spring 20 against the speed control tensioner bar 18, the cam 15 passes under the roller and releases the main shaft with the propelling arm attached resulting in the ball being propelled up and out of the container (see Fig. 7), through the tangential orifice 32, guided by the perimeter guide track, the stainless steel side plates, and the tangential outlet guides. The propelling arm continues around to the end of its centrifugal sweep as shown in Fig. 7, reverses its direction and adjusts itself to a neutral pressure position in relation to the multiple torsion springs which have continued to revolve as driven by the drive sprocket 3. As the drive sprocket 3 is in constant motion, the cam and arm continue around until the arm picks up a succeeding ball and the cam again makes contact with the roller, thereby completing one entire cycle. This cycle is repeated uninterruptedly so long as the motor 4 is supplying power to the driver sprocket 3. Speed of the pitch is determined by the amount of resistance offered by the speed control tensioner bar (Fig. 6), controlled by the speed control adjusting nut 21 against the tension spring 20, this construction design permits speed control adjustment at any time during continuous operation of the machine without interference to any mechanism simply by screwing the adjusting nut 21 up or down. The tensioner bar assembly is mounted on a speed control yoke 16 (Fig. 4) which is secured to the container hub 11 and receives additional support while the cam is building up pressure against the roller from the speed control yoke bearing 17 over the main shaft 1.

A warning bell mechanism as shown best in Fig. 4 comprises a lower contact assembly 22 mounted on the speed control tensioner bar 18 which moves up to make contact with an upper contact assembly 23 mounted on the speed control yoke, at the time that the cam 15 is applying pressure to and lifting the roller 19, thereby actuating electrically a warning bell or buzzer. Vertical adjustment of the spring loaded upper contact determines the length of the warning signal. The actual warning bell or buzzer is secured inside the motor housing, a warning bell switch 38 along with a motor switch 39 is attached to the frame (see Fig. 1).

It will also be apparent that modifications and alternate structures can be fabricated which yet will embody the present invention. Accordingly, it is not intended that the foregoing description be considered as limiting in any sense but rather be construed only as an exemplary embodiment of the invention whose scope will be indicated rather by reference to the appended claims.

I claim:

1. A ball pitching machine comprising a container from which balls are adapted to be propelled, a rotatably mounted shaft projecting through said container, a propelling arm secured to said shaft and arranged to propel balls from said container upon rotation of said shaft, drive means including a member mounted for concentric relative rotation with respect to said shaft, a torsion spring surrounding said shaft and connecting said member to said shaft to establish a torsional driving connection therebetween, a cam secured to said shaft, and a roller resiliently urged into the rotative path of said cam to impede rotation of said shaft until a predetermined driving torque is established whereby a ball is propelled at a predetermined rate of speed.

2. A ball pitching machine comprising, an upright frame, a pair of horizontally spaced brackets on said frame, one stationary and the other movable in a horizontal plane, a horizontal shaft rotatable in said brackets, a thin, cylindrical ball container carried by and rotatable on said shaft in a vertical plane between the brackets and having a tangential opening through which balls are adapted to be propelled, a ball-propelling arm fixedly attached to the shaft within said container, means for rotating said shaft whereby to propel balls from said container through the opening therein, said container and the stationary bracket having a pivotal connection on a vertical axis, and means operative to shift the movable bracket selectively to various positions of adjustment in the horizontal plane of its movement whereby to pivot the container on said vertical axis of its connection with the stationary bracket.

3. In a ball pitching machine, means to guide a ball along a predetermined path, an arm movable to propel a ball along said path, drive means, means drivingly connecting said drive means to said movable ball-propelling arm including a force-transmitting resilient member, a cam connected to said arm for movement therewith, a member movable into the path of said movable cam to impede rotation of said arm, and means resiliently urging said impeding member into impeding position, said cam being arranged to push said impeding member out of impeding position when a predetermined force is exerted by said arm against the impeding member.

4. A ball pitching machine comprising, a container from which balls are adapted to be propelled, a rotatably mounted shaft projecting through said container, a propelling arm secured to said shaft and arranged to propel balls from said container upon rotation of said shaft, drive means including a member mounted for concentric relative rotation with respect to said shaft, a torsion spring surrounding said shaft and connecting said member to said shaft to establish a torsional driving connection therebetween, means for impeding advance of said arm until a predetermined amount of torque is transmitted to said shaft, and means for adjusting said impeding means to determine such amount of torque.

5. In a ball pitching machine having a ball propulsion delivery member movable under the force of a spring

which exerts a driving force thereon continuously while the machine is in operation; ball speed regulating means comprising, a second spring exerting on the delivery member periodically, while the machine is in operation, an impeding force in opposition to the force of the driving spring, and means manually adjustable, while the machine is in operation, selectively to vary the force being exerted by the impeding spring.

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