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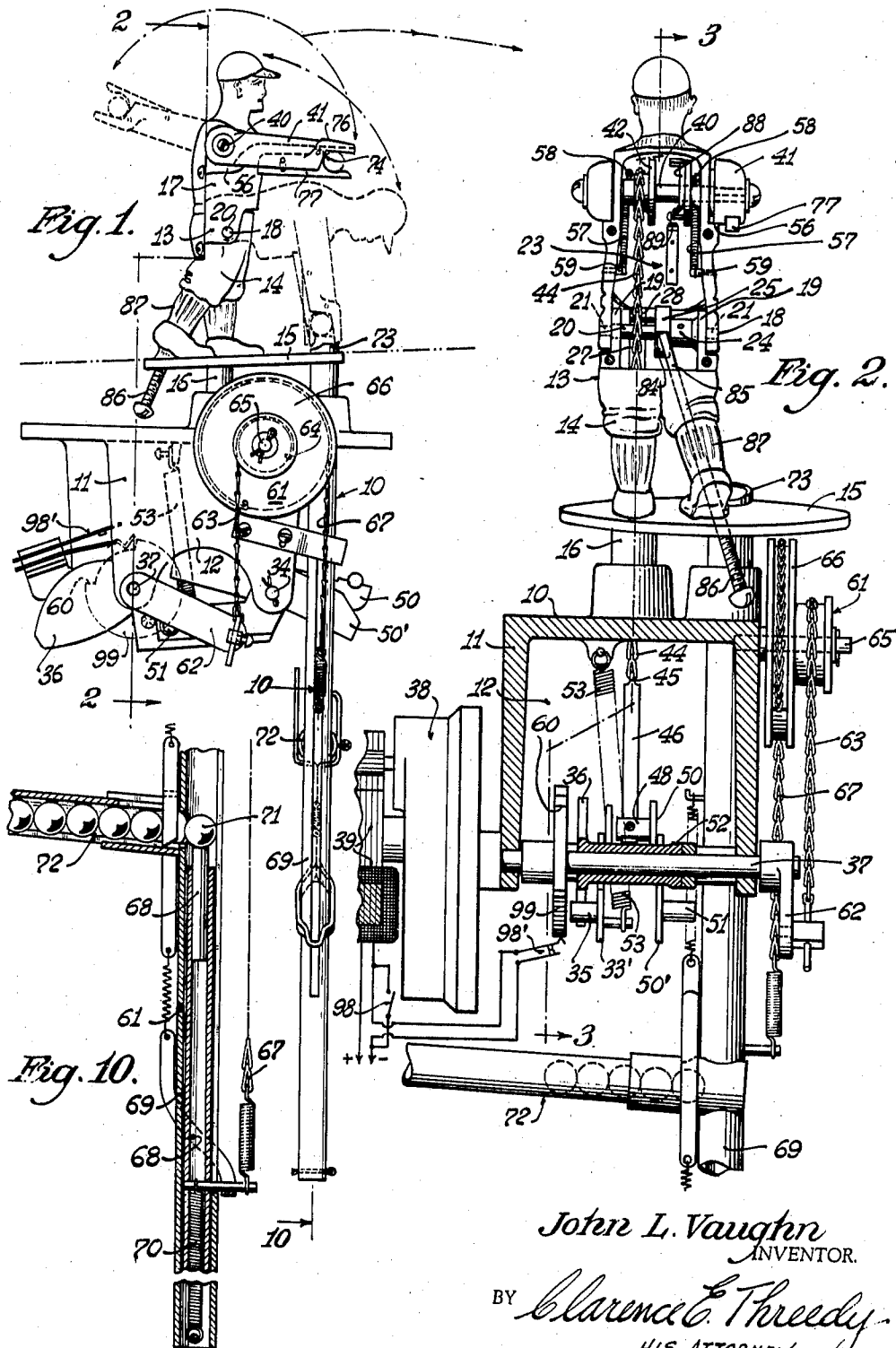
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PITCHER MANIKIN

Filed Aug. 22, 1942

2 Sheets-Sheet 1



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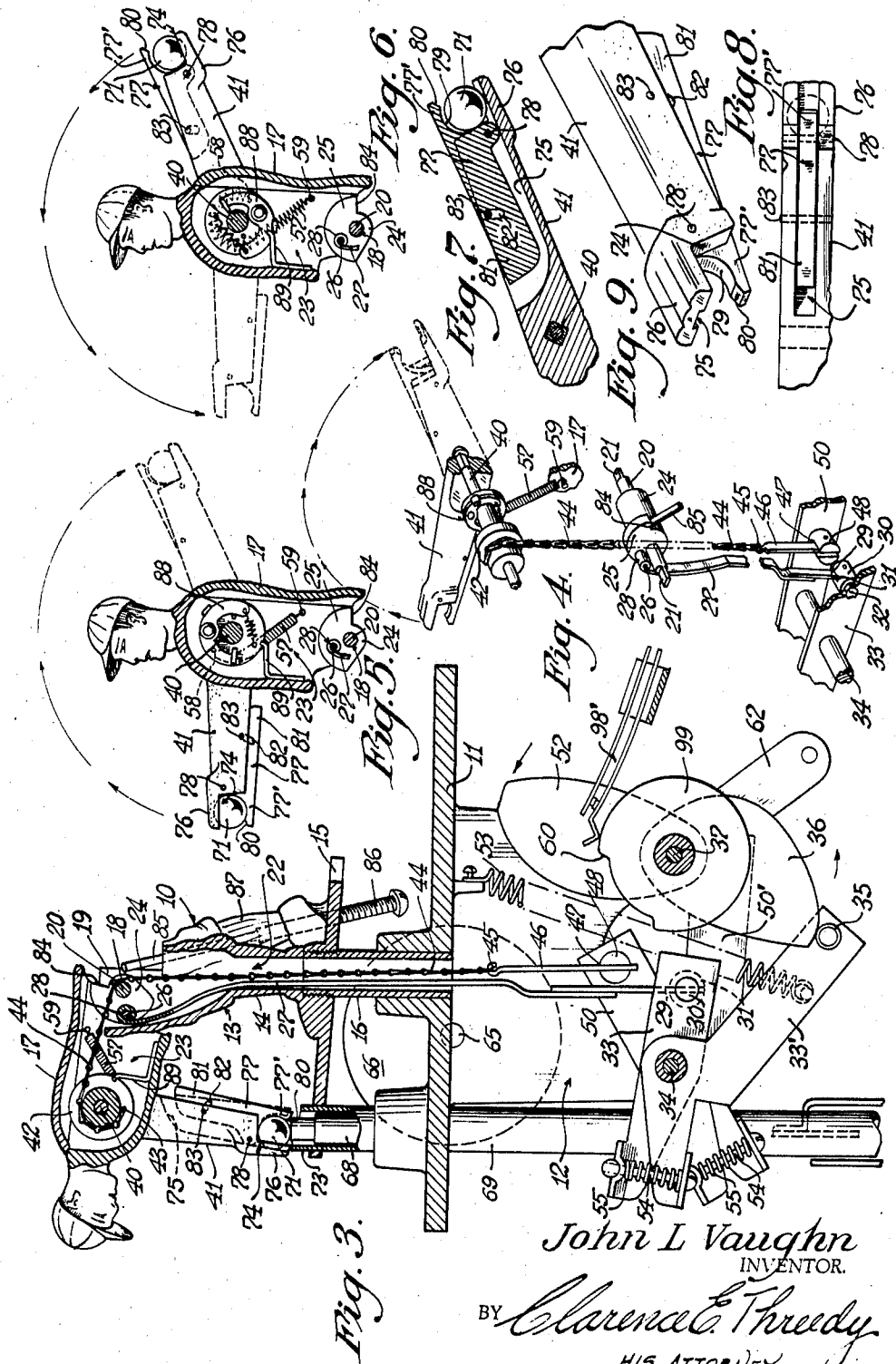
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2 Sheets-Sheet 2



UNITED STATES PATENT OFFICE

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PITCHER MANIKIN

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6 Claims. (Cl. 124—6)

This invention relates to ball projecting devices for game apparatus and has as its principal object the provision of a ball projector which will be simple in construction, economical in manufacture and highly efficient in use.

Another object of this invention is to provide an automatic ball pitching mechanism adapted to receive a ball from a supply source and to project such ball along a predetermined trajectory.

A further object of this invention is to provide an improved ball gripping arm for a ball projecting mechanism, the hand of which arm will automatically grasp a ball and hold the latter until pitching action is to take place.

Still another object of this invention is to provide in a ball pitching manikin an improved ball holding hand which will automatically grip and release the ball to be pitched in the course of pitching operation of the manikin.

Other advantages and novel aspects of this invention reside in certain details of construction as will become more apparent in the description hereof in view of the drawings in which:

Fig. 1 is a right side elevational view of a ball pitching manikin unit embodying my invention;

Fig. 2 is a rear elevational view of the same, partly in section as seen along line 2—2 in Fig. 1 and at slightly larger scale with respect thereto;

Fig. 3 is a vertical sectional detail of the same taken along line 3—3 in Fig. 2 with the trunk portion of the manikin bent down in ball receiving position;

Fig. 4 is a skeletonized perspective view of the essential drive connections of the manikin structure to illustrate the body movement thereof;

Fig. 5 is a vertical sectional detail of the upper part of the manikin body, in erect posture attained after reception of a ball as seen in Fig. 3;

Fig. 6 is a view similar to that of Fig. 5 with the ball pitching arm in extreme retracted condition and about to project the ball;

Fig. 7 is a vertical sectional detail through the long axis of the ball pitching arm when disposed in the position shown in Fig. 6;

Fig. 8 is a view of the under side of the arm as viewed from above in Fig. 7;

Fig. 9 is a fragmentary perspective view of the ball gripping hand embodied in the ball pitching arm; and

Fig. 10 is a vertical sectional detail through the ball elevator mechanism embodied in the present manikin structure.

Heretofore in the art pertaining to amusement

devices, both robots and manikins have been employed to simulate ball players and various means have been suggested to cause such manikins to undergo a certain cycle of movement to

attain the end of pitching a ball. This invention relates to improved means for pitching a ball and among other things there is provided a manikin unit generally indicated at 10. The unit includes a frame 11 providing an arbor 12 (Fig. 2) within which certain cam and drive mechanisms are supported. The manikin proper is designated 13 and includes a fixed nether portion 14 comprising legs which stand upon a plate 15 simulating the "pitcher's box." This plate 15 is supported on a tube 16 extending upward from the frame 11 and constituting the left leg of the manikin 13 to dispose the plate 15 at the desired pitch with respect to the horizontal for alignment with the top surface of an inclined playboard (not shown, but indicated by dot-dash line Fig. 1).

The manikin 13 includes a trunk portion 17 which is pivotally mounted as at 18 at the hipline of the manikin, the upper end of the nether portion 14 providing a trunnion 19 in which is mounted for rotatable movement a shaft 20. The outer ends of shaft 20 are keyed as at 21 to the trunk 17 so that the trunk 17 will rotate with the shaft 20. The left leg being hollowed by reason of the tube 16 provides a clear passage 22 from the arbor 12, within which the drive mechanism is supported to the recessed interior 23 of the manikin body wherein certain drive take-off means are employed. The means for driving the trunk into a bent condition constitutes a hub 24 fixedly carried by shaft 20 and provided with a disc formation 25 from which extends laterally an eccentrically mounted pin 26. A connecting rod 27 has an end portion 28 thereof looped about the pin 26 and has its lower end portion 29 fastened to a swivel block 30 within a yoke 31 formed therein. The block 30 is mounted for rotative movement as at 32 on a rocker arm 33 which is mounted upon a shaft 34 extending across arbor 12. A counterpart 33' of the rocker arm 33 carries a roller 35 disposed in the path of a cam lever 36 carried for rotation on a drive shaft 37 which is supported on the arbor 12 in parallelism with respect to the shaft 34 and extends from a gear reduction box 38 of a stock drive unit including an electric motor 39.

A shaft 40 is mounted for rotation at the shoulder line of the manikin 13 and has its ends projecting exteriorly of the body to support the arms of the manikin, the right arm 41 of which is keyed

to the shaft 43 for rotation therewith. Means for rotating the shaft 40 comprises a pulley 42 fixedly mounted upon the shaft 43 for rotation therewith. This pulley 42 has arranged thereon a pin 43 to which is attached one end of a flexible element 44, in the present instance in the form of a chain comprising a plurality of links. The opposite end of the flexible element 44 is attached to a hook 45 formed on the upper end of a connecting rod 46 having its lower end disposed in the yoke formation 47 of a swivel block 48 which in turn is mounted for rotative movement as at 49 on a rocker arm 50 carried by the shaft 34 for rocking movement. A counterpart 50' of the rocker arm 50 has a roller 51 at one end thereof and disposed in the path of movement of a cam lever 52 carried for rotation on and with the drive shaft 37.

The manikin unit 10 is normally positioned as shown in Fig. 1 with the ball pitching arm 41 in outstretched or ball pitched condition. In this condition the trunk portion 17 is held in an erect position by a spring 53 having an end attached to the counterpart 33' of the rocker arm 33 and its opposite end anchored to the underside of the frame 11. The two elements 33 and 33' are linked together by a tie rod 54 having a compression spring 55 coiled thereabout and bearing against lateral projection of the two elements 33—33' thus transmitting motion from the counterpart 33' to the rocker arm 33 to urge the connecting rod 27 upward to rotate the disc 25 and pin 28 into a position to dispose the trunk 17 in erect stature. The rocker arm 50 and its counterpart 50' are likewise linked together by a similar tie rod and compression spring arrangement indicated by like reference characters 54—55 respectively.

The ball pitching arm 41 is normally held in ball pitched condition against a stop 56 formed on the trunk 17. The shaft 40 to which the arm 41 is keyed is urged into a position to dispose the arm 41 against the stop 56 by a pair of tension springs 57, each of which has one end attached to the shaft 40 by a pin means 58 and its opposite end anchored on a pin 59 carried by the trunk 17. By these two spring means 57 the shaft 40 and arm 41 will always, when freed, assume a normal position by pulling up on the flexible element 44 when the cam lever 52 associated therewith has its shorter radial edge in engagement with the cam roller 51.

In the operation of this device the motor 39 is initially energized by a push button switch 98 there being a suitable holding switch 98' which is operated by a disc 99 carried by the drive shaft 37 and recessed as at 60 to provide a stopping point wherein the holding switch may be disposed in broken circuit condition (see Fig. 1). Incidental to the operation of the manikin 13 there is provided a ball elevating mechanism 61 which is simultaneously operated by the drive shaft 37 through a bell crank 62 which through a chain 63 is connected to a free floating pulley 64 carried at one side of the arbor 12 on a stud shaft 65. Step-up pulley 66 integrally formed with the pulley 64 carries a drive chain 67 which has its free end connected to a plunger 68 which is disposed for vertical movement within an elevator tube 69 and which plunger 68 is normally urged downwardly by a tension spring 70 (Fig. 10). In the initial part of the cycle of operation of the manikin, the plunger receives a ball 71 from a ball return trough 72 and proceeds to elevate the ball 71 up toward the plate 15. The upper end 73 of the elevator tube 69 extends up

through the arbor 12 and plate 15 to provide an open ball seat upon the upper surface of the plate 15.

As the motor 39 continues to drive the shaft 37 the cam 36 thereof engages roller 35 to depress rocker arm 33—33' thus rotating the eccentric pin 26 on disc 25 to bend the trunk 11 at hip line 18 into the position shown in Fig. 3. The ball 71 being positioned at the plate 15 is ready to be picked up by the arm 41 by a novel automatic claw 74 constructed in the arm 41 as best illustrated in Figs. 7 to 9 inclusive. In this respect the arm 41 has a deep groove 75 formed on its underside in the direction of its long axis. The end of the arm 41 is formed to simulate a hand 76 with four fingers of the hand extended and the palm of the hand substantially at right angle thereto. The groove 75 extends centrally through the palm of the hand and partially into the under side of the fingers thereof to provide a ball trough later to be explained. A movable lever 77 having a projection simulating the thumb 77' of the hand 76 is pivotally mounted as at 78 in the groove 75 and extends from the heel of the hand to coact with the fingers thereof in gripping a ball. To this end the lever 77 is concaved as at 79 to the contour of a ball and has the forward end of the thumb 77' beveled as at 80 whereby when the arm 41 descends with the trunk 17 as aforesaid the ball will engage the bevel 80 to cam the thumb 77' in a direction away from the fingers of the hand to permit the ball to be disposed within the concaved portion 79 of the lever 77. The lever 77 is counterbalanced by a weighted end 81 which is formed integrally with the lever 77 and extends into the groove 75 in the region of the elbow of the arm 41. A slot 82 is formed transversely through the weight 81 and a pin 83 extends through the arm 41, slot 82 and groove 75 to limit the movement of the weight 81 and the thumb 77' on the lever 77.

As shown in Fig. 3 the ball 71 is urged into the claw 74 and the weighted end 81 of the lever 77 pivots the latter into gripping action upon the ball 71 with the ball engaging the two edges of the trough formed in the underside of the fingers. It will be noted that the concavity 79 of the lever 77 is such as to extend beyond the center of the ball 71 so as to support the latter up in the palm of the hand 76. By this arrangement the ball is firmly held in the hand, automatically by the action of gravity upon the weighted end 81 of the lever 77, without the use of magnetic means or other such devices for attracting metal objects to a projector means. The drive shaft 37 continuing its rotation moves the cam 36 away from the roller 35 while the spring 53 urges the rocker arm 33—33' to normal condition, pushing rod 27 upwardly to move eccentric 26 and with it shaft 20 and trunk 17 to dispose the latter in erect position with a stop notch 84 on disc 25 engaging a stop pin 85 adjustable by screw 86 through the leg 87.

The trunk 17 is now positioned as seen in Fig. 5 whereupon the cam lever 52 engages roller 51 to depress rocker arm 50—50' and pull down on the flexible element 44 to rotate pulley 42 and shaft 40 against the action of springs 57. The ball pitching arm 41 rotates clockwise (as indicated by the arrow, Fig. 5) into full line position as shown in Fig. 6. A spring urged stop means 88 is arranged on shaft 40 and engages a fixed stop 89 in the manikin trunk to prevent the arm 41 from swinging beyond the desired ball pitching position shown. The ball 71 is now released from

the claw 74 and is free to be projected out of the hand 76 upon abrupt return of the arm toward normal position (counterclockwise, Fig. 6). As seen in Fig. 7 the thumb 77 does not engage the ball 71 by reason of the weighted end 81 of the lever 77 now being on the opposite side of the pivot pin 78 so as to rock the lever 77 counterclockwise, Figs. 6 and 7. The ball 71 is then resting in the trough formed on the underside of the hand and is free to move radially with respect to the swing of the arm 41 about the shoulder shaft 40.

When the extreme pinnacle of the cam 52 passes the roller 51 the rocker arm 50—50' is free to return to normal position by means of the tension springs 57 within the trunk 17 thus producing an abrupt swing of the ball pitching arm 41 back to its initial or ball pitched condition (dotted lines Fig. 6). The force of the arm in this ball pitching movement causes the lever 77 to remain in the position shown in Fig. 7 thus permitting the ball 71 to move under centrifugal force out of the hand 76 and along a predetermined trajectory as though the ball were actually thrown from the hand of a human being. When the arm 41 engages the stop 56 the lever 77 will rotate (clockwise Fig. 5) back into normal ball grasping condition in preparation to receive the next ball to be pitched.

By this device I have provided a ball pitching manikin which actually grasps a ball by the employment of a counterbalanced claw which claw is automatically released from gripping action on the ball by the same counterbalanced action when the ball pitching arm reaches a totally withdrawn position preparatory to the actual pitching action by the arm.

While I have illustrated and described the preferred form of construction for carrying my invention into effect, this is capable of variation and modification without departing from the spirit of the invention. I, therefore, do not wish to be limited to the precise details of construction set forth, but desire to avail myself of such variations and modifications as come within the scope of the appended claims.

Having thus described my invention, what I claim as new and desire to protect by Letters Patent is:

1. In a ball projecting device comprising a swinging arm pivotally mounted for movement out of normal position into ball projecting position, an inverted trough formation at the free end of said arm, a lever pivotally mounted on said arm for rocking movement in the direction of the orbit of movement of said arm, a projection on said lever and movable toward and away from said trough formation and adapted to coact with the latter to receive a ball and to hold the latter while said arm is moved into ball projecting position, and counterbalance means formed on said lever normally urging said projection toward said inverted trough formation and adapted to urge said projection in an opposite direction when said arm arrives at a point adjacent said ball projecting position, and the trough formation is disposed in ball supporting position to release the ball for projection upon return of said arm toward normal position.

2. In a ball pitching device comprising a body having an arm portion movably mounted thereon and movable from ball pitched condition into an inverted ball pitching position and means for bending the body to a stooped condition to dispose the arm in a position to receive a ball from

a ball seat and for returning the body to an erect position, the combination of a ball gripping claw on said arm for grasping a ball disposed on said ball seat and for releasing said ball when the arm reaches ball pitching position, said claw comprising a projection on the free end of said arm, a groove formation in said arm in the direction of its long axis, a lever means pivotally mounted in said groove formation and having a movable lever arm disposed opposite said projection to cooperate with the latter to embrace a ball, and a counterbalance on said lever and adapted to urge said movable lever arm toward said projection when the arm is disposed in ball pitched condition, and to urge said movable lever in an opposite direction when said arm is disposed in an inverted position.

3. In a ball pitching device comprising a body having an arm portion movably mounted thereon for movement from ball pitched condition into an inverted ball pitching position and means for bending the body to a stooped condition to dispose the arm in a position to receive a ball from a ball seat and for returning the body to an erect position, the combination of a ball gripping claw on said arm for grasping a ball disposed on said ball seat and for releasing said ball when the arm reaches ball pitching position, said claw comprising a projection on the free end of said arm, a groove formation in said arm in the direction of its long axis, a lever means pivotally mounted in said groove formation and having a movable lever arm disposed opposite said projection to cooperate with the latter to embrace a ball, a counterbalance on said lever and adapted to urge said movable lever arm toward said projection when the arm is disposed in ball pitched condition, and to urge said movable lever in an opposite direction when said arm is disposed in an inverted position to free the ball for projection by centrifugal force of said arm in its return toward ball pitched position, and means for returning said arm to said ball pitcher's position.

4. In a ball pitching arm for a ball projector structure including a body disposed in erect position, means pivoting said arm at the shoulder line of said body, means for urging said arm into ball pitched position and means for rotating said arm into ball pitching position, and for releasing said arm for sudden return movement toward ball pitched position, the combination of ball holding means on said arm, said ball holding means comprising a lever pivotally mounted on said arm, said lever having a finger portion thereof disposed to cooperate with said arm to embrace a ball, said lever having a counterweighted end portion disposed to urge said finger portion in the direction of said arm when the latter is disposed in ball pitched condition and adapted to urge said finger portion away from said arm when the latter is disposed in ball pitching position.

5. In a ball pitching device including a body having an arm mounted for rotative movement into and out of ball pitching position and means for rotating said arm into ball pitching position beyond a vertical center line through said body and for releasing said arm for return to normal ball pitched position, the combination of a ball holding means on said arm and comprising a projection on the end of said arm, a lever pivotally mounted on said arm for rocking movement in the direction of swing of said arm, a finger portion on said lever and disposed adjacent said projection to cooperate with the latter in grip-

ping a ball, a counterweight on said lever and adapted to urge said finger portion in the direction of said projection to embrace a ball and hold the latter therein while the arm is moved into ball pitching position, said counterweight automatically urging said finger portion in an opposite direction when said arm passes beyond the vertical centerline of said body to release the ball for pitching action.

6. In a ball pitching device including a body having an arm portion mounted for rotatable movement into and out of overhand ball pitching position, means normally urging said arm into normal ball pitched position, means for moving said arm into ball pitching position and for releasing the arm for return to normal position,

the combination of a ball gripping claw comprising a recessed hand formation at the free end of said arm, a lever pivotally mounted on said arm for rocking movement co-extensive with the rotatable movement of said arm, a thumb formation on said lever and providing a concavity in which to seat a ball, a counterweight on said lever and including means for limiting rocking movement of the latter, said counterweight being disposed on said arm to urge said thumb in the direction of said hand formation to receive and to grasp a ball when the arm is disposed forwardly of said body and adapted to urge said thumb in an opposite direction to release the ball when said arm is disposed rearwardly of said body.

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