United States Patent [19]

Holmes

[11] **3,794,318**

[45] **Feb. 26, 1974**

[54] **HOCKEY PUCK PRACTICE SHOOTING APPARATUS**

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[22] Filed: **Mar. 14, 1973**

[21] Appl. No.: **341,289**

[52] **U.S. Cl.** ..... **273/1 B,** 124/1, 124/32, 124/34, 124/47, 273/102 R, 273/105 R

[51] **Int. Cl.** . **A63b 71/02,** A63b 69/00, F41b 15/00

[58] **Field of Search** ..... 273/1 B, 101, 102–103, 273/104, 105, 126, 127; 124/1

[56] **References Cited**

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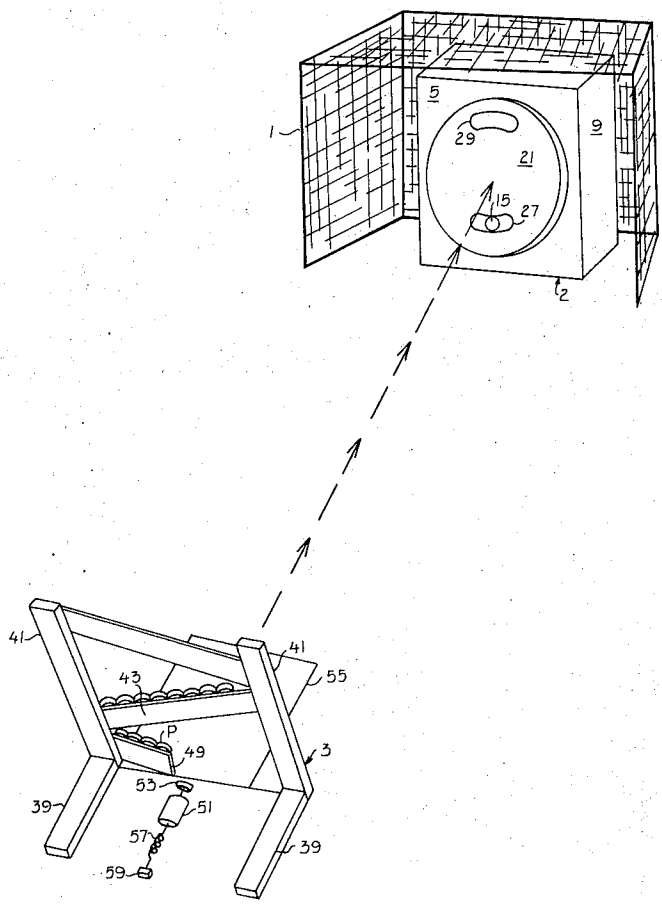
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Primary Examiner—Richard C. Pinkham
Assistant Examiner—Paul E. Shapiro
Attorney, Agent, or Firm—F. Travers Burgess

[57] **ABSTRACT**

Hockey puck practice shooting apparatus includes a target comprising a housing with a rotatable disc-shaped shield rotatably mounted on its front wall. The front wall is formed with holes large enough to receive a hockey puck and spaced one or more radial distances from the axis of the shield and the shield is provided with one or more arcuate slots of equal radii with the holes so as to register with the holes for a length of time proportional to the angular length of the slots and the rotational velocity of the shield. A puck ejector is electromechanically synchronized with the operation of the shield.

9 Claims, 9 Drawing Figures



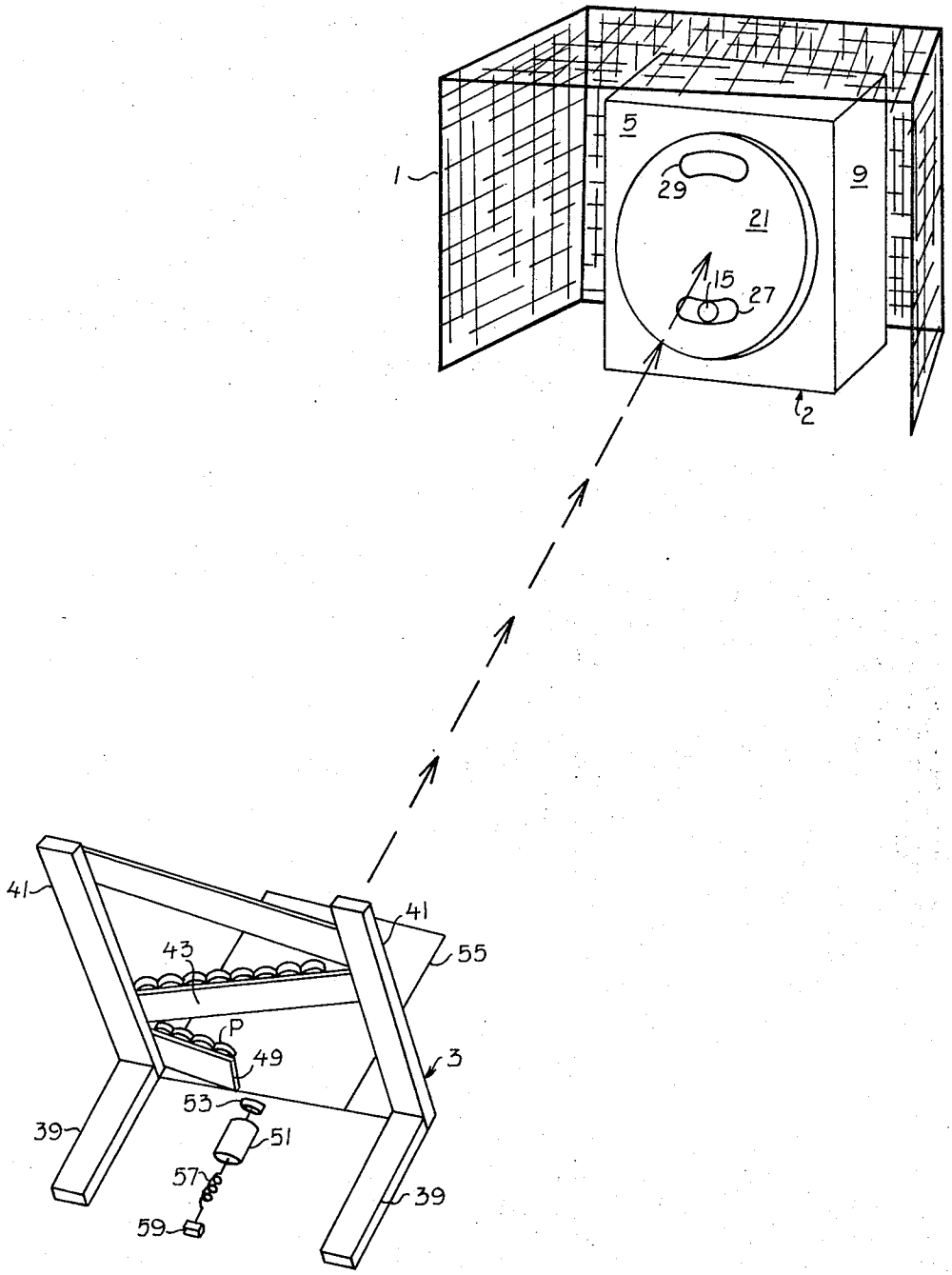


FIG. 1

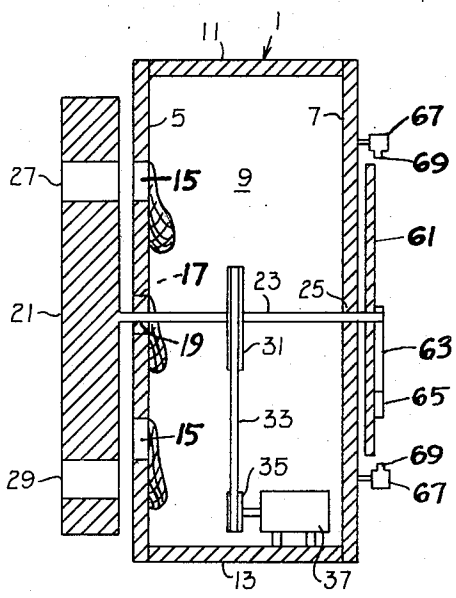


FIG 2

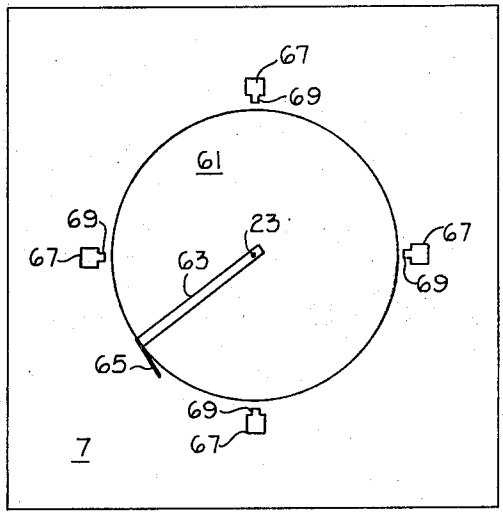


FIG. 3

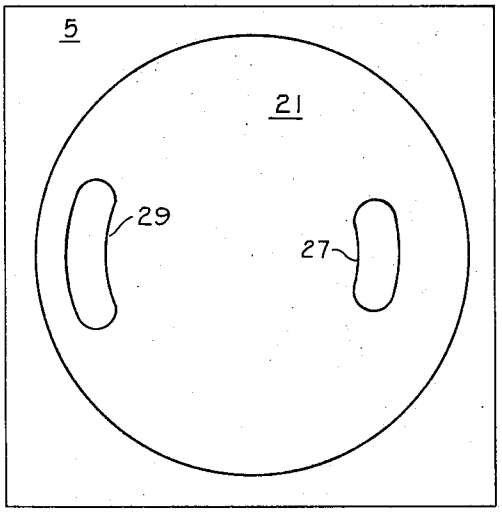


FIG. 4

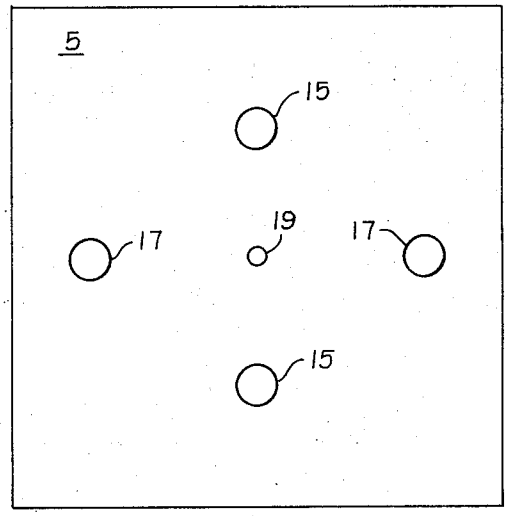


FIG. 5

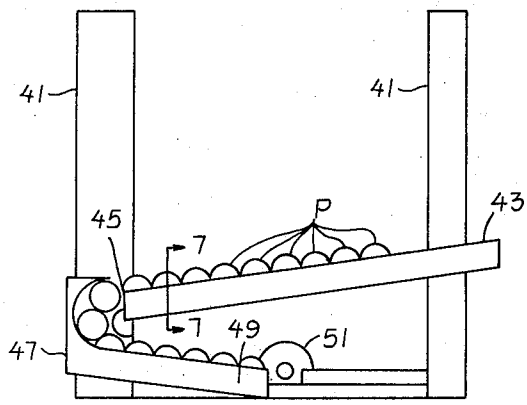


FIG. 6

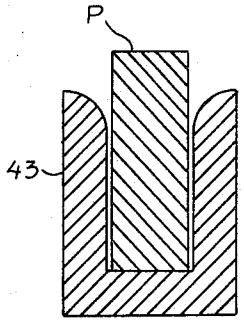


FIG. 7

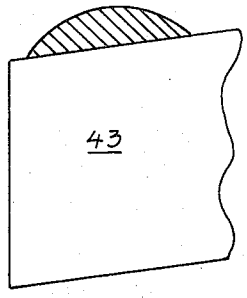


FIG. 8

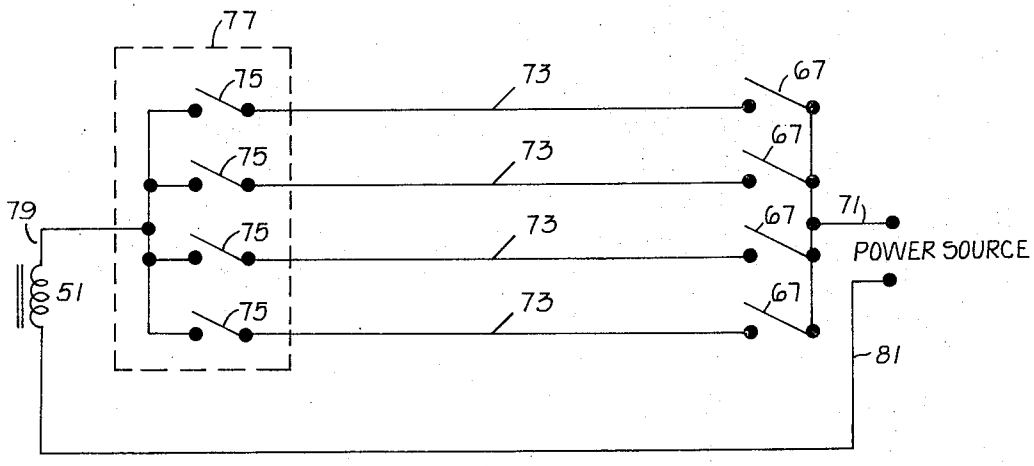


FIG. 9

HOCKEY PUCK PRACTICE SHOOTING APPARATUS

FIELD OF THE INVENTION

The invention relates to practice devices for hockey and consists particularly in practice puck shooting apparatus.

SUMMARY OF THE INVENTION

The invention provides means for determining and developing accuracy in shooting hockey pucks. In furtherance of this purpose, it provides accurately timed exposure of the target and synchronizes the exposure of the target with the ejection of pucks from a magazine. It also provides means for exercising some manual control over the ejection of pucks from the magazine.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of the apparatus with target and magazine with ejector constructed in accordance with the invention.

FIG. 2 is a longitudinal vertical sectional view of the target apparatus shown in FIG. 1.

FIG. 3 is a rear elevation view of the target apparatus.

FIG. 4 is a front elevation view of the target apparatus.

FIG. 5 is a front elevational view of the target apparatus with the shield removed.

FIG. 6 is a front elevation view of the magazine.

FIG. 7 is an enlarged transverse sectional view along lines 7—7 of FIGS. 6 and 8.

FIG. 8 is an enlarged front elevation view of the discharge end of the puck trough of the magazine illustrated in FIG. 6.

FIG. 9 is a wiring schematic of the apparatus.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The numeral 1 denotes the usual hockey target or goal. The numeral 2 refers generally to the target structure and the numeral 3 to a puck magazine constructed in accordance with the invention.

The goal structure 1 includes a box-like housing having a vertical front wall 5, a rear wall 7, side walls 9 and top and bottom walls 11 and 13. Front wall 5 is formed with four holes 15 and 17 of sufficient size to permit the passage through them of a hockey puck. Holes 15 and 17 are spaced equiangularly about a central hole 19, holes 15 being vertically aligned with central hole 19 and spaced equidistantly therefrom and holes 17 being horizontally aligned with hole 19 and being spaced equidistantly therefrom a somewhat greater distance than the spacing of holes 15.

In order to limit the duration of exposure of the target holes 15 and 17, a disc-shaped shield 21 is mounted on a shaft 23 which passes through central hole 19 and a corresponding central hole 25 in the rear wall of the target housing, and shield 21 is formed with two arcuate slots 27 and 29, the centers of which are 180° apart and the radii of which correspond respectively to the radii of holes 15 and 17 from center hole 19. Arcuate slots 27 and 29 are of the same angular length.

It will be evident from the foregoing that if shield 21 is rotated at uniform speed, slots 27 and 29 respectively will expose target holes 15 and 17 intermittently for an

equal length of time. For driving shaft 23 and shield 21 at a desired speed, shaft 23 mounts a sheave 31 which is connected by belt 33 to a sheave 35 on the shaft of electric motor 37 mounted on bottom wall 13 of the target housing.

For feeding pucks to a player, magazine 3 comprises a pair of transversely spaced base members 39 extending horizontally rearwardly from the magazine and a pair of correspondingly spaced upright members 41 spaced apart transversely of the magazine and supporting a transversely inclined channel section trough 43, the lower end 45 of which opens into an oppositely downwardly inclined outlet trough 47 of similar cross section and a plurality of pucks P are normally seated in troughs 43 and 47. The bottom or outlet end 49 of outlet trough 47 is near the transverse midpoint of the magazine and at floor level and to the rear of outlet end 49 of outlet trough 47 a solenoid 51 is mounted with its axis normal to the general vertical plane of magazine 3, and its plunger 53 arranged to engage pucks P from the rear when the solenoid is energized, and eject the forwardly from the magazine to a shooting position on a pad 55 forward of the magazine. Except when solenoid 51 is energized to move plunger 53 forwardly, a spring 57 anchored at 59 normally maintains plunger 53 retracted and rearward of magazine outlet 49.

In order to synchronize the ejection of the pucks with the exposure of target holes 15 and 17 by slots 27 and 29, shaft 23 projects outwardly from rear wall 7 of the target housing and there mounts a timing disc 61. A bar 63 adjustably rotatably mounted on disc 61 mounts a switch actuator flap 65 on its outer end projecting slightly beyond the periphery of disc 61, and at each of the cardinal positions corresponding to the locations in the front wall of holes 15 and 17 respectively are four momentary closure switches 67 adapted to be momentarily closed by the engagement of flap 65 with their plungers 69.

In the wiring schematic of FIG. 9, one wire 71 from the power source is connected to four switches 67. Wires 73 connect the respective switches 67 to corresponding manually actuable switches 75 on a control panel 77 which in turn is connected by a wire 79 to solenoid 51. The other side of the power source is connected by wire 81 to solenoid 51 so that as each target hole 15 or 17 is uncovered by slots 27 and 29 of shield 21, corresponding rotation of timing disc 61 causes flap 65 to successively close momentary closure switches 67. Solenoid 51 will be energized each time switches 67 are closed, subject to the manual closure of switches 75, thereby ejecting pucks a selected length of time before exposure of target holes 15 and 17 by shield 21. Switches 75 on control panel 77 permit manual variation of the duration of time the puck is available before exposure of the target holes in addition to the automatic uniform timing provided by switches 67.

Operation of the apparatus is as follows: A player stations himself in front of the magazine, the electrical system is energized, causing motor 37 to rotate shield 21 and as shield 21 rotates timer flap 65 successively closes momentary closure switches 67 a predetermined period of time before exposure of holes 15 and 17 by shield 21, causing plunger 53 to ejet a puck which the player attempts to put through the exposed hole. If it is desired to vary the timing manually, switches 75 can be used for this purpose.

The details of the apparatus may be varied substantially without departing from the spirit of the invention and the exclusive use of such modifications as come within the scope of the appended claims is contemplated.

I claim:

1. Hockey puck practice shooting apparatus comprising target structure having a vertical wall formed with at least one hole of sufficient size to permit the passage therethrough of a puck, a shield rotatably mounted on said structure forward of said wall with its center of rotation spaced radially from said hole, said shield being formed with an arcuate slot spaced the same distance from the axis of rotation as said hole and registrable intermittently with said hole to expose the same during continued rotation of said shield, and means for ejecting single pucks in selected time sequence with respect to the exposure and closure of said target holes by said shield.

2. Apparatus according to claim 1 including power means for rotating said shield at a uniform rate.

3. Apparatus according to claim 1 wherein said ejection means comprises a solenoid having its plunger retracted and projectible responsive to energization of said solenoid, electrical switch means on said target structure arranged to close momentarily at selective rotational positions of said shield, electrical circuit means including said switch means and said solenoid whereby upon closure of said switch means said solenoid is energized causing its plunger to eject a puck.

4. Apparatus according to claim 3 wherein said electrical switch means comprises at least one switch mounted on said target structure and an actuator for said switch rotatable with said shield and operatively engageable with said switch.

5. Apparatus according to claim 4 wherein there are at least two target holes, there being one of said switches for each of said target holes.

6. Apparatus according to claim 5 including a manual control switch device in series with each of said switches and said solenoid.

7. Apparatus according to claim 1 including at least two holes at different radii from the axis of rotation of said shield, said shield being formed with at least two arcuate slots of equal radii respectively with said holes.

8. Apparatus according to claim 7 wherein said arcuate slots are equiangular in length.

9. Apparatus according to claim 8 wherein there are four of said holes spaced equiangularly about the axis of rotation of said shield and two of said slots the centers of which are 180° apart.

* * * * *

UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

Patent No. 3,794,318 Dated February 26, 1974

Inventor(s) Lloyd G. Holmes

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Front page, data element number 76, "460 Wilcot Ave.,"

should read --460 Wilcox Ave.,--

Signed and sealed this 2nd day of July 1974.

(SEAL)
Attest:

EDWARD M. FLETCHER,JR.
Attesting Officer

C.MARSHALL DANN
Commissioner of Patents

FORM PO-1050 (10-69)

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* U.S. GOVERNMENT PRINTING OFFICE : 1969 O—366-334