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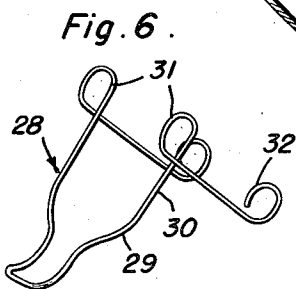
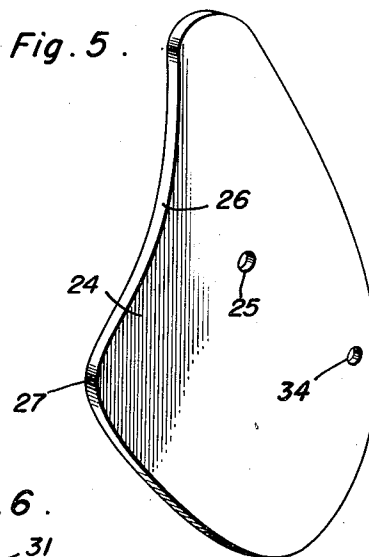
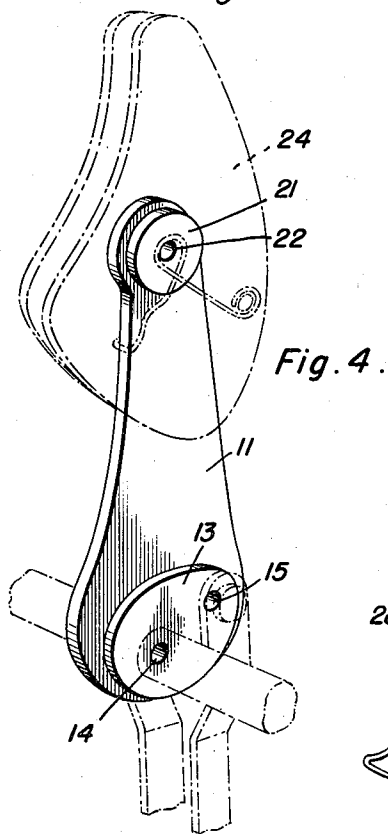
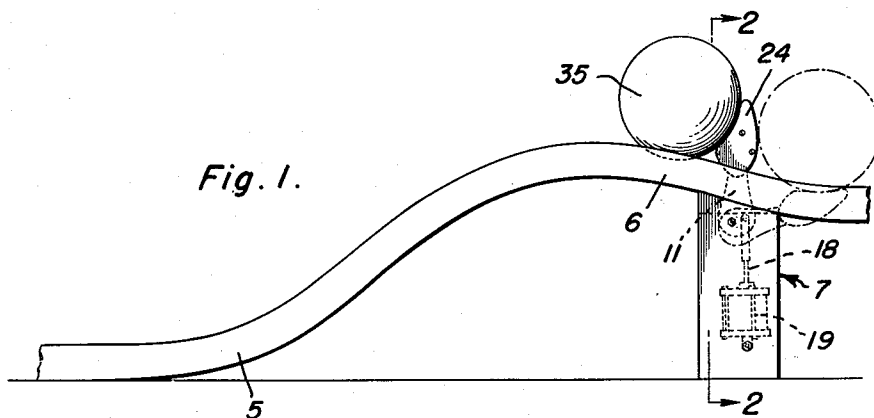
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2,597,072

BOWLING BALL AUTOMATIC RETARDER

Filed Aug. 23, 1948

2 SHEETS—SHEET 1



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2 SHEETS—SHEET 2

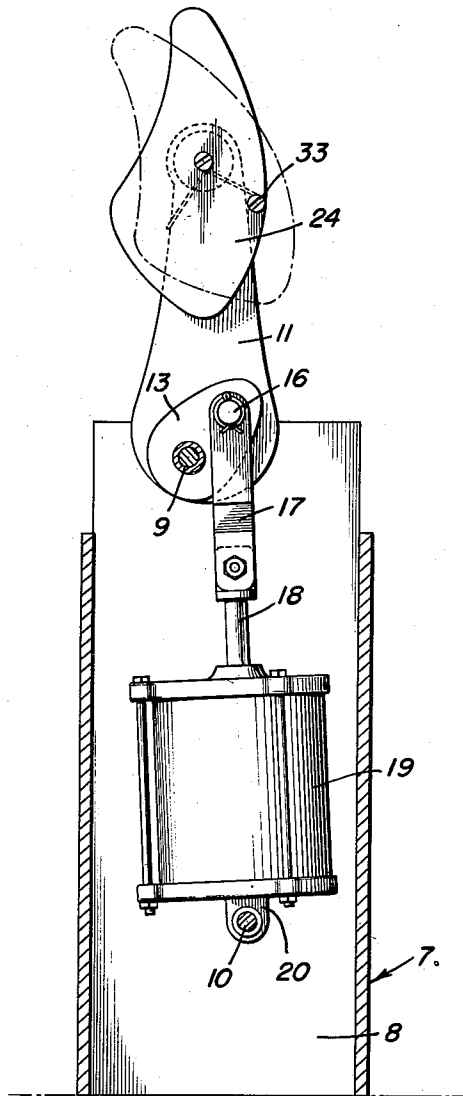


Fig. 3.

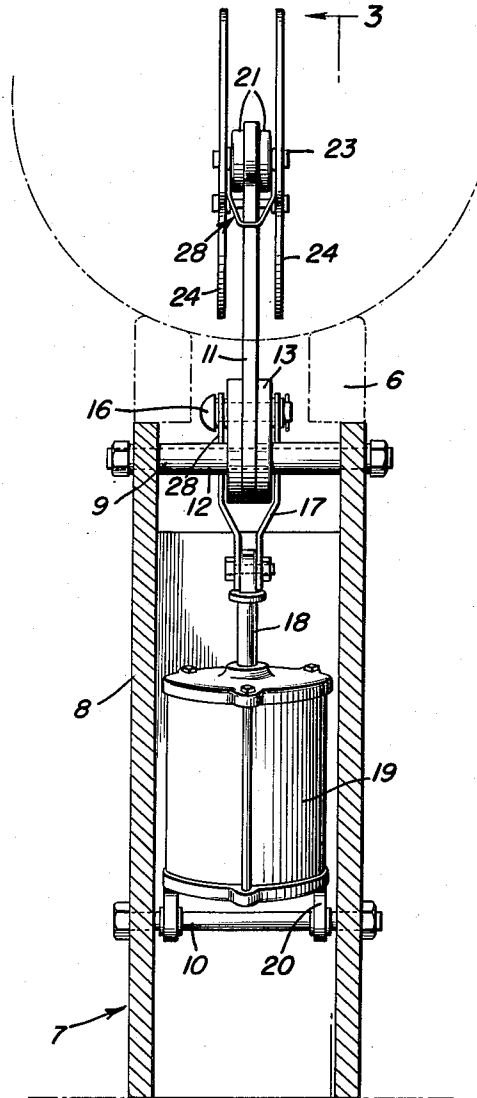


Fig. 2.

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## UNITED STATES PATENT OFFICE

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## BOWLING BALL AUTOMATIC RETARDER

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5 Claims. (Cl. 273-47)

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The present invention relates to new and useful improvements in automatic bowling ball retarding devices to reduce the momentum of a bowling ball on its return to the ball rack from the pit end of a bowling alley.

It is important in the return of bowling balls to the ball rack to reduce the speed thereof as the ball approaches the rack to eliminate the danger to bowlers when reaching for a ball on the rack. Several types of ball retarders have been designed and placed in use which usually involve the provision of an overhead structure through which the ball passes and it has been found that such overhead structure presents a physical and mental hazard to the bowler and its appearance is unsightly.

Accordingly, it is an object of this invention to provide an automatic ball retarder of this character wherein the aforesaid objectionable features are eliminated.

A further object of the invention is to provide a device of this character of simple and practical construction, which is neat and attractive in appearance, relatively inexpensive to manufacture and otherwise well adapted for the purposes for which the same is intended.

Other objects and advantages reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming part hereof, wherein like numerals refer to like parts throughout, and in which:

Figure 1 is a fragmentary side elevational view of a ball return rack showing the automatic retarder mechanism in position thereon;

Figure 2 is an enlarged vertical sectional view of the retarder mechanism, taken on line 2-2 of Figure 1;

Figure 3 is a sectional view taken on the line 3-3 of Figure 2;

Figure 4 is a perspective view of the pivoted retarder arm;

Figure 5 is a perspective view of one of the retarder pads, and

Figure 6 is a perspective view of the booster spring for the pad to release the ball therefrom.

Referring now to the drawings in detail, and wherein for the purpose of illustration I have disclosed a preferred embodiment of the present invention, the numeral 5 designates a bowling ball return track at the rear end of which is provided an upwardly inclined ball rack 6 to which the balls are fed from the track. Positioned beneath the rack 6 adjacent its front end is a housing 7 which includes spaced parallel side walls 8 having upper and lower pins 9 and 10 extending transversely thereof.

A ball retarder arm 11 is pivotally mounted at one end of the upper pin 9 with spacing sleeves

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12 positioned between the sides of the arm 11 and the sides 8 of the housing. The pivoted end of the arm 11 at each side thereof is provided with spacing plates 13 fixedly secured to the arm, the plates being of substantially ovate formation through the wider portion of which the pin 9 extends through an opening 14 and with the narrow portion of the plates extending upwardly and rearwardly from said pin. The narrow upper portion of the plates 13 are also formed with openings 15 receiving a pin 16 to the ends of which are secured the upper ends of a yoke 17 extending downwardly into the housing 7 behind the pin 9.

The lower end of the yoke 17 is pivotally attached to the upper end of a piston rod 18 which extends downwardly through the top of a cylinder 19 formed with apertured ears 20 at its lower end for pivotally mounting on the lower pin 10.

A piston (not shown) is carried at the lower end of the piston rod 18 for working in the cylinder 19 and the cylinder may be either of a pneumatic or hydraulic type to provide a check for the downward movement of the piston rod 18 upon a downward swinging movement of the arm 11 and having spring means (not shown) to return the piston rod and arm to their upper positions and to normally maintain the arm in an upstanding position as shown in Figure 3 of the drawings.

The upper end of the arm 11 at both sides is provided with spacing washers 21 which may be fixedly secured to the arm and having an opening 22 extending therethrough. A pin 23 is positioned in the opening 22 and on the ends of which are pivotally mounted a pair of ball contacting pads 24.

The pads 24 are of flat construction and of suitable material and positioned in spaced parallel relation with respect to each other at opposite sides of the upper end of the arm 11. The pads are formed with an opening 25 substantially at the center thereof for pivotally mounting on the pin 23 and the forward edges of the pads are curved inwardly as shown at 26 at their upper portion, the lower curved edge terminating in a forwardly projecting hump 27 positioned below the pivot pin 23.

A wire spring designated generally at 28 is formed intermediate its ends with a substantially U-shaped portion 29 which straddles the front edge of the arm 11 and with the legs 30 of said U-shaped portion looped or coiled as at 31 on the pin 23 at opposite sides of the arm. The ends of the spring extend downwardly from the coil 31 and terminate in eyes 32 engaging the ends of a bolt or screw 33 carried in openings 34 adjacent the rear edges of the pads 24. The spring 28 normally holds the pads 24 in an upstanding position with the hump 27 projecting forwardly as

shown by the full lines in Figure 3 of the drawings.

In the operation of the device, the housing 7 is mounted under the rack 6 with the arm 11 projecting upwardly between the sides of the rack as shown in Figure 2 of the drawings and with the pads 24 positioned in the path of a bowling ball 35 travelling on the track 5 onto the rack.

As the ball enters the front end of the rack 6 the ball will engage the hump 27 of the pads 24 whereby to swing the upper ends of the pads forwardly as shown by the dotted lines in Figure 3 of the drawings so that the balls will seat in the curved upper edge 26 of the pads.

The momentum of the ball will swing the arm 11 downwardly as shown by the dotted lines in Figure 1 of the drawings and move the piston in the cylinder 19 downwardly to thus check the momentum of the ball. The momentum of the ball and the weight thereof will move the pads 24 downwardly between the rack 6 and below the upper edge thereof as shown by the dotted lines in Figure 1, the engagement of the ball with the pads 24 placing the spring 28 under tension and as the arm 11 and pads 24 reach their lowermost positions the spring will exert its influence on the pads to swing the edge thereof provided with the hump 27 upwardly and to thus lower the outer ends of the pads to release the ball therefrom and to push the ball in a direction toward the rear end of the rack.

After the ball passes from the pads 24 the action of the spring projected piston rod in the cylinder will return the arm 11 and pads 24 to their normal upstanding positions.

In view of the foregoing description taken in conjunction with the accompanying drawings it is believed that a clear understanding of the device will be quite apparent to those skilled in this art. A more detailed description is accordingly deemed unnecessary.

It is to be understood, however, that even though there is herein shown and described a preferred embodiment of the invention the same is susceptible to certain changes fully comprehended by the spirit of the invention as herein described and the scope of the appended claims.

What I claim is:

1. A bowling ball retarder for ball return racks comprising a fluid check device mounted beneath the rack, an arm pivotally connected to said check device and normally held thereby in an upstanding position, and a spring biased pad rockably mounted at the upper end of the arm and disposed edgewise in the path of a ball entering the rack to retard movement of the ball and actuated by impact by the ball to move the pad out of the path thereof, said pad including upper and lower portions positioned respectively above and below the pivot of the pad, and said pad being rockably actuated by a ball passing thereover independently of the movement of the arm to move the rear portion of the pad upwardly behind the ball, and spring means engaging the pad and having its biasing action increased as a result of the impact by the ball with the pad to rockably actuate the pad in a direction to impart forward momentum to the ball.

2. A bowling ball retarder for ball return racks comprising a fluid check device mounted beneath the rack, an arm pivotally connected to said check device and normally held thereby in an upstanding position, and a flat spring biased pad rockably mounted in an upstanding position at

the upper end of the arm and disposed in edgewise position in the path of a ball entering the rack to retard momentum of the ball and actuated by impact thereof to move the pad out of the path of the ball upon impact of a ball with the pad, said pad having a forwardly projecting portion initially contacted by the ball and actuating the pad in a direction to increase the biasing action of its spring for subsequently imparting momentum to the ball following its retarding action.

3. A bowling ball retarder for ball return racks comprising a fluid check device mounted beneath the rack, an arm pivotally connected to said check device and normally held thereby in an upstanding position, and a flat spring biased pad rockably mounted in an upstanding position at the upper end of the arm, said arm and said pad being disposed in edgewise position in the path of balls entering the rack to individually retard momentum of the ball and actuated by impact thereof to move the pad out of the path of the ball upon impact of a ball with the pad, and said ball actuating the pad upon initial contact thereby to increase the biasing action of the pad, and said pad subsequently subjecting the ball to such action for imparting momentum to the ball following its retarding action.

4. In a bowling ball retarder, means mounted on a ball return rack in the path of a ball moving thereon for initially retarding movement of the ball and subsequently imparting momentum thereto, said means comprising an upstanding vertically swingable arm, a flat upstanding pad pivoted to the upper end of the arm, said arm and said pad being positioned in the path of the ball for actuation thereby to lower the arm and pad, spring means engaging the pad and opposing downward movement of the pad, a fluid check device connected to and opposing downward movement of the arm, and a ball seat at the contacting edge of the pad and including a lower edge urged upwardly behind the ball by said arm during passage of the ball over the pad.

5. A bowling ball retarder for ball return racks comprising an upstanding arm, means pivotally connecting the arm for vertical swinging movement to a supporting structure under a ball rack, a flat upstanding pad pivoted substantially at its central portion to the upper end of said arm and disposed in edgewise position in the path of a ball entering the rack and actuated by the momentum of a ball to swing the pad downwardly to permit passage of the ball over the pad, spring means engaging the pad and opposing downward movement of the pad, the lower end of the pad being swung upwardly behind the ball by a downward movement of the upper end of the pad during passage of the ball thereover, and a fluid check device supported beneath the ball rack and connected to the arm to return the arm to its upstanding position and also raising the pad behind the ball during passage of the ball thereover to impart a forward momentum to the ball.

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