

Jan. 1, 1963

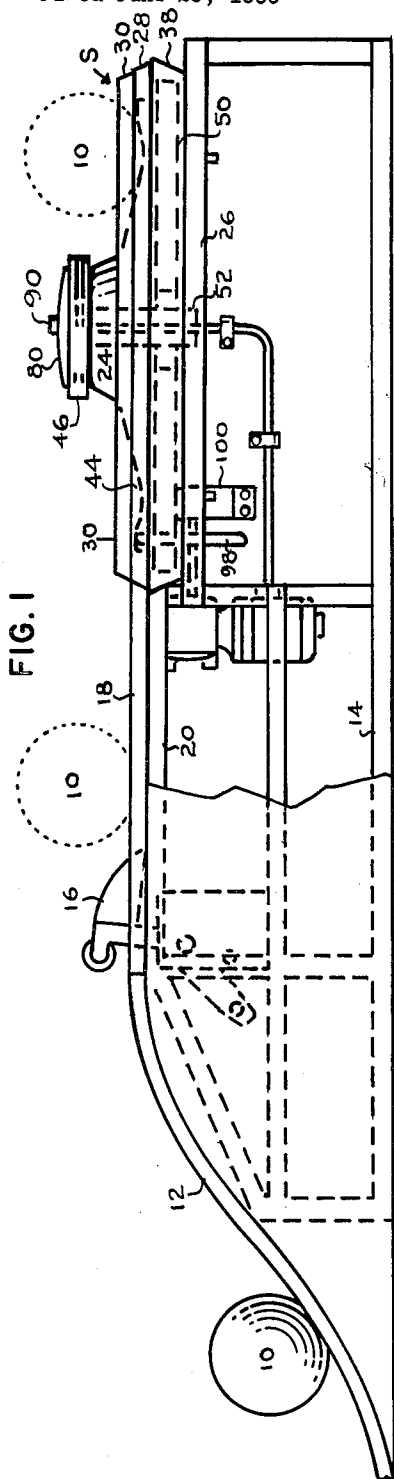
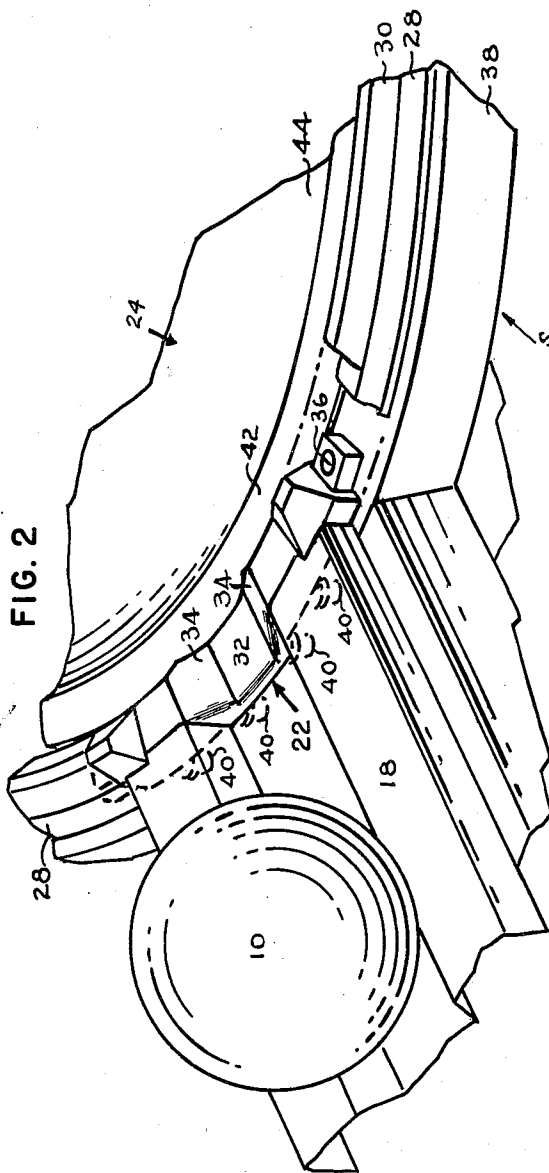
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3,071,376

BOWLING BALL STORAGE RACK

Filed June 25, 1959

3 Sheets-Sheet 1



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FIG. 3

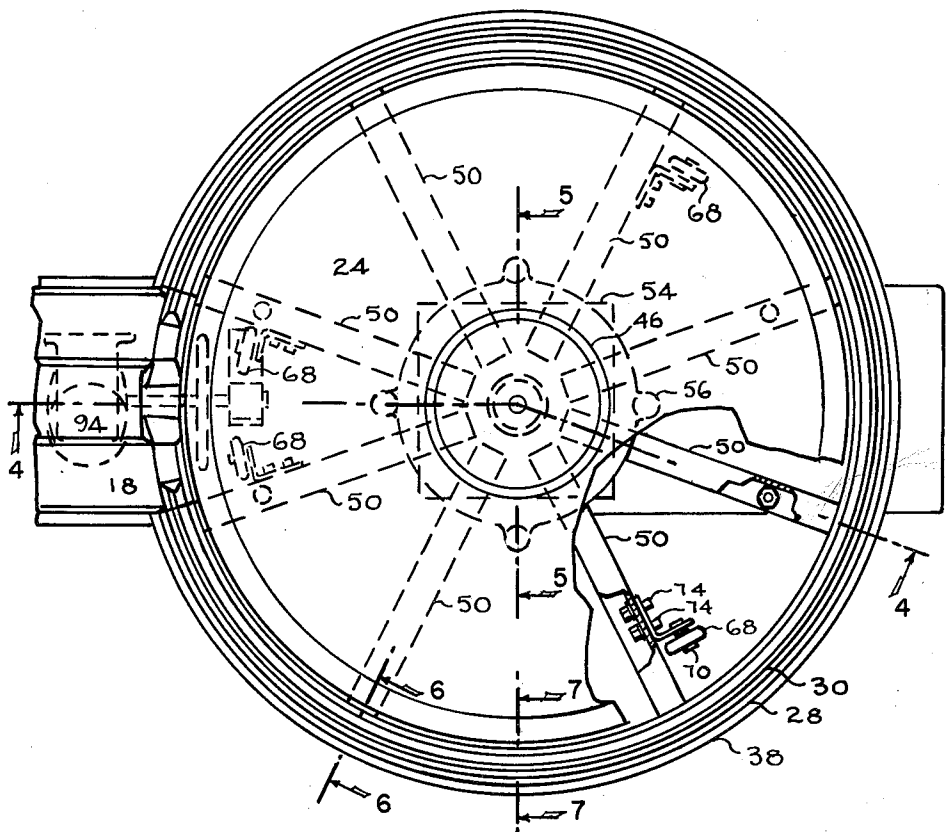
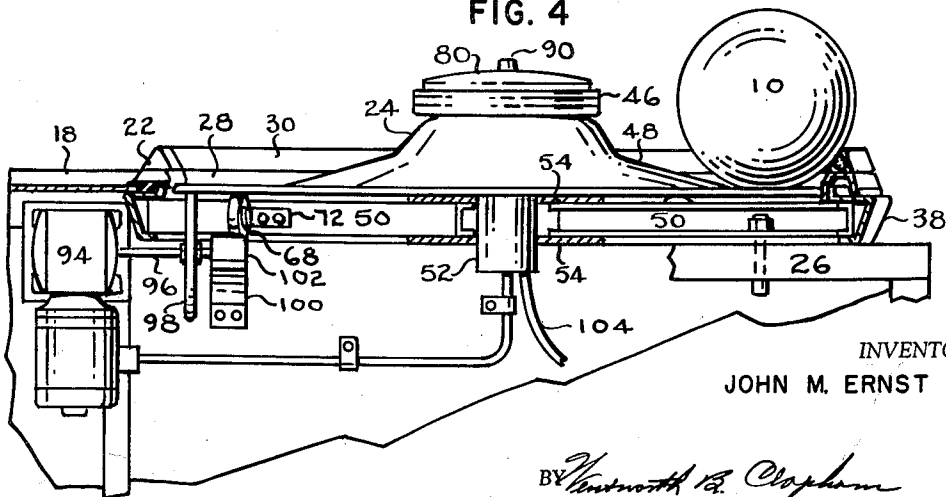


FIG. 4



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FIG. 5

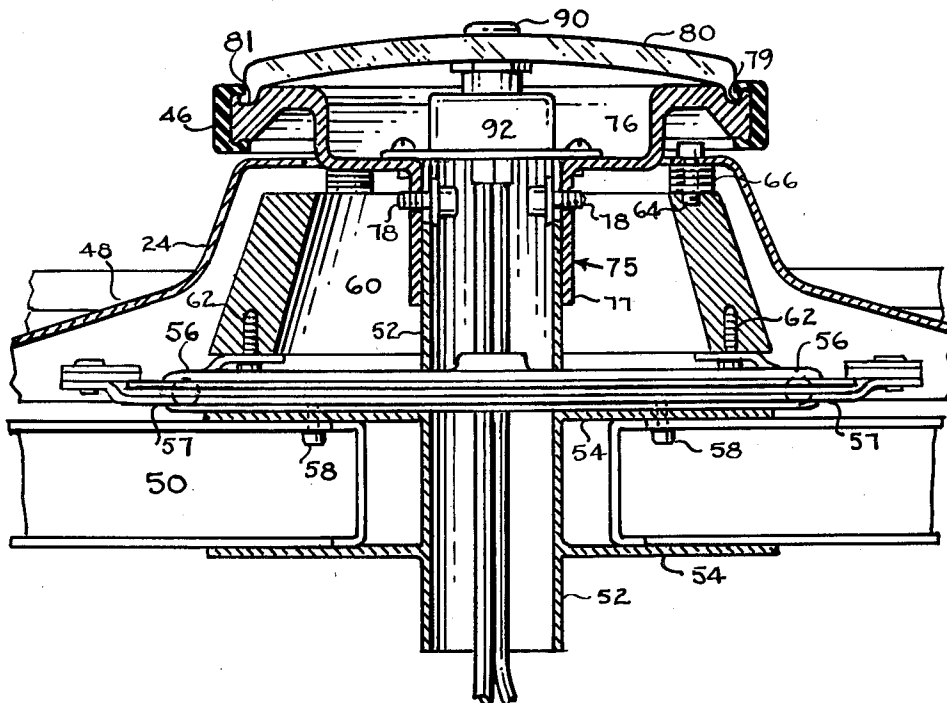


FIG. 6

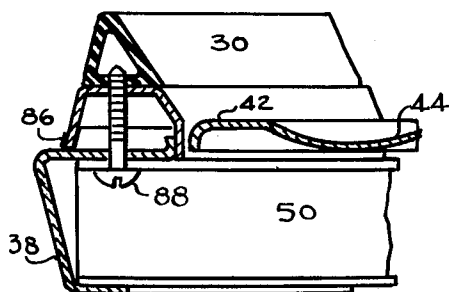
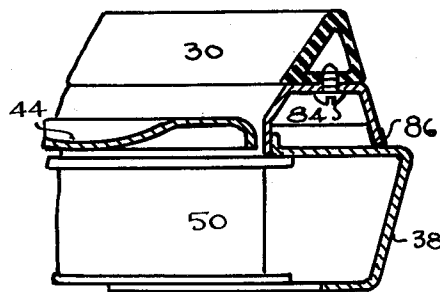


FIG. 7



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3,071,376

BOWLING BALL STORAGE RACK

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10 Claims. (Cl. 273-47)

This invention relates to bowling equipment and more particularly to an improved depository or storage rack for bowling balls returned from the pit to the head end of a bowling alley during the course of a bowling game.

In the game of bowling, it is desirable that the bowling ball returned from the pit of the alley be made readily available to the player at the alley approach in order that the play of a game can continue with as little interruption as possible. In most devices provided heretofore for this purpose, the respective bowling balls have not been easily accessible, and bowling balls have been otherwise subjected to hard usage when returned to the alley approach for subsequent play. An object of the present invention, therefore, is to provide a ball return runway with a convenient storage rack adjacent or at the entry to the alley approach and to provide gentle delivery of balls thereto, thereby preventing injury to players' fingers and minimizing ball damage.

According to the present invention, a bowling ball returned from the pit of the bowling alley or otherwise placed on the ball return runway will roll therealong and be discharged therefrom onto a revolvable, circular tray at the head end or alley approach where it is readily accessible to a player as he moves forward to pick up his ball and bowl.

The present invention also is directed towards the solution of the problem of providing a satisfactory transfer of bowling balls from the return runway onto the storage rack. This is effected with little or no restriction or confinements in the passage of balls from the return runway to the ball storing means of the storage rack.

The invention further consists in the provision of suitable drive mechanism operative in conjunction with the ball supporting means to effect the positioning of a player's ball in the most convenient position for the convenient removal of his ball, when a number of balls are in the storage rack.

It is a further object of the invention to provide protection against injury to the bowling ball in the course of travel into and within the revolvable tray. This is accomplished by providing a rubber bumper and a rubber retaining ring within the mechanism.

With these and other objects not specifically mentioned in view, the invention consists in certain combinations and constructions which will be fully described hereinafter, and then set forth in the claims hereunto provided.

In the accompanying drawings, which form a part of the specification, and illustrate a preferred embodiment of the invention, and in which like characters of reference indicate the same or like parts:

FIGURE 1 is a side elevation showing a preferred embodiment of the invention;

FIGURE 2 is a partial view in perspective showing the juncture of a ball return runway with a ball storage rack embodying the invention;

FIGURE 3 is a plan view of a ball storage rack embodying the invention with a cut-away section showing its supporting structure;

FIGURE 4 is a sectional side elevation approximately on line 4-4 of FIGURE 3.

FIGURE 5 is an enlarged section view along line 5-5, FIGURE 3.

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FIGURE 6 is an enlarged section on line 6-6, FIGURE 3.

FIGURE 7 is an enlarged section on line 7-7, FIGURE 3.

In the preferred embodiment of the invention selected for purposes of illustration and shown in FIGURES 1-7, bowling ball 10, returning from the pit of the bowling alley along return track (not shown) is directed upwardly by upsweep track 12 which is mounted on ball return framework 14. A suitable ball check mechanism 16 is provided at the upper end of upsweep track 12.

Ball check mechanism 16 may be similar to that described in Zuercher Patent 2,857,162. In the interest of brevity, only such description of ball check 16 is included as required for an understanding of the present invention.

After being checked by ball check mechanism 16, bowling ball 10 moving therepast onto infeed or ball guide track 18, has little or no remaining momentum. Track 18 is mounted on frame member 20 of the ball return framework 14. This framework is inclined downwardly towards the alley approach entry or the extreme right, as viewed in FIGURE 1. Ball track 18 and member 20 are substantially parallel. Therefore, ball 10 rolls by gravity along ball track 18 and over transition device 22 into storage rack S.

Storage rack S, as shown in the drawings, comprises a generally circular storage unit. As illustrated herein, this storage unit comprises a circular tray 24 revolvably mounted on a frame supported on frame member 26 which is also inclined downwardly towards the alley approach entry.

As shown in FIGURE 2, transition device 22 preferably is formed of a resilient material such as rubber, and is symmetrical about its center line or minor axis. This formation centrally conforms with the ball supporting surfaces of ball track 18 and its outer ends with ring 28 and rubber retainer 30. Transition device 22 includes a central portion having an upper surface 32 disposed in line with or slightly above the flat outer surface portion 42 of circular tray 24. Its inner opposed inclined edges 34 are bevelled in order to allow a ball to "fall off" or accelerate upon entering storage rack S and moving onto tray 24. Suitable means, such as screws 36, secure transition device 22 to frame ring 38 of the storage rack support framework mounted on frame member 26.

Integrally formed on the under face of device 22 are lugs 40 which are seated in holes in frame ring 38 to further support and stabilize it in operative position, as shown in FIGURE 2.

Tray 24 provides a support means for receiving and supporting bowling balls delivered thereto from track 18 and includes an annular peripheral flat portion 42 arranged outwardly of an annular track or depression 44 onto which balls rolling from transition device 22 come to rest. Tray 24 further includes a centrally located inclined surface 48 which slopes upwardly from depression 44 so that any balls rolling on the inclined surface 48 tend to roll back into depression 44. Thus it will be seen that an annular track is provided which extends along a line intersecting the path of travel of balls delivered from track 18. Due to the inclination of frame member 26, the depression 44 is also inclined, the inclination being toward a point diametrically opposed to track 18. Thus, depression 44 has two sloped portions which are generally opposed across the loop defined by the storage track, the sloped portions extending downwardly toward a point spaced along the storage track from the delivery end of the infeed track so that a bowling ball entering the storage track rolls along and comes to rest at a point remote from the delivery end.

In the embodiment illustrated in the drawings, transition device 22, as stated, is symmetrical about its minor axis. In this way, a ball rolling along track 18 is guided in a straight line path of movement bisecting the center of rotation of tray 24 and into the curvilinear storage space between retainer 30 and bumper 46. In accordance with the invention as shown, bowling ball 10 being delivered from track 18 by transition device 22, will roll in either direction over surface 42 into annular depression 44 formed in tray 24 and continue therein to the opposite side of circular tray 24.

In the event that a bowling ball 10 is accelerated manually or otherwise along ball track 18, it may be delivered over transition device 22 with sufficient force to strike against rubber bumper 46, FIGURES 1, 3, 4 and 5, and rebounding, roll downwardly upon inclined surface 48 of tray 24 (FIGURES 4 and 5). Such a ball in rolling down inclined surface 48 may bump against rubber retainer 30 and be directed thereby into depression 44 of tray 24.

As shown in FIGURES 3 and 4, a suitable supporting framework for circular tray 24 includes outer ring 38 fixed to U-shaped spokes 50 disposed radially about a central tube 52. U-shaped spokes 50 are secured by screws 58 to reinforcing plates 54 attached to or formed integrally with tube 52.

In the embodiment illustrated herein, tray 24 is mounted on a rotatable support or fixture 56, FIGURE 5, mounted on plates 54 by screws 58. This fixture also includes a truncated cone shaped member designated 60, fastened by screws 62 to the upper or revolving member of fixture 56. Tray 24 is attached to member 60 by screws 64 with suitable adjusting shims 66. It will be seen, therefore, that circular tray 24 can be rotated around central fixed tube 52. Any additional support for tray 24 is provided near its outer periphery by supporting rollers 68 (FIGURES 3 and 4). These rollers are rotatably mounted on shafts 70 in brackets 72 secured to spokes 50 by screws 74. A head piece designated generally 75, having a tubular portion 77, is seated upon the top of tube 52 and secured thereby by screws 78. Cap 75 is provided with a dished upper section 76 having a peripheral groove 79 in which is seated the peripheral edge 81 of a circular cap 80 which is secured in fixed position by means of an inwardly directed flange of resilient bumper 46 which, as shown in FIGURES 1, 3, 4 and 5, surrounds the outer periphery dished portions 76 of cap 75. Bumper 46 preferably is made of rubber, although it may be made of any other suitable material.

Rubber retainer ring 30, as shown in FIGURES 6 and 7, is generally triangular in cross section, although it may be of any other suitable cross section as desired. This ring is mounted on the outer ball retainer member 86 of storage rack S and is secured thereto by screws 88 (FIGURE 6).

In the operation of the device, balls 10 upon having their momentum checked by ball check 16, roll slowly downwardly along ball track 18 and between bevelled faces 34 of transition device 22 into the ball seating and retaining portion of storage device S formed by member 86, retainer ring 30 and tray 24. If a ball has considerable momentum, it may strike against bumper 46 and then roll downwardly on the tray to a position of rest. Since there will be some residual movement in a ball, it will tend to roll along the circular track to a position remote from the transition device 22 which position is adjacent the approach area of the alley and conveniently accessible to a player. In this manner, a large number of balls, no less than eight, can be stored at any one time in storage rack S. It will be obvious that when a bowler wishes to pick up his ball, and because of the relatively small diameter of storage rack S with respect to the number of balls stored thereon, it is quite easy to lean over the storage rack and pick up his ball. However, by means of the structure provided, it is only necessary for a bowler to grip bumper 46 and push it or pull it towards him, thereby

rotating or turning tray 24 gently which will result in his ball being moved towards him on a "lazy Susan" principle for easier pickup. While tray 24 has been shown with a dished circumferential portion 44 and a flat peripheral portion 42, it will be readily appreciated that some other cross sectional design could be provided, as for example, dished portion 44 could be made flat as in the case of portion 42 and form a continuation thereof.

Since under some conditions it may be desired to rotate tray 24 positively, there is shown in FIGURE 4 a positive drive means which permits a bowler to effect the rotation of tray 24 automatically and thereby position his ball adjacent the location where he is standing for more accessible pick-up of his ball. To effect this result, a ratio motor 94 is mounted on frame 26 in any suitable manner. The motor circuit includes a switch 92 (FIGURE 5) and a push button 90 mounted in cap 80 which can be pressed by a bowler to operate motor 94 and effect the desired slow rotation of tray 24.

Motor shaft 96 is provided with a friction wheel 98 which bears against the under surface of tray 24. Wheel 98 is maintained in contact with the under surface of tray 24 by means of a spring 100 which exerts an upward force against a pillow block 102 of shaft 96, the latter preferably being flexible in nature. The circuit through the motor and the motor construction are such that as long as push button 90 is depressed, tray 24 is slowly rotated to effect the movement of balls thereon in a circular path of travel whereby a bowler's ball is moved into proximity with the position in which he is standing. Power for the motor is supplied from a conventional source of electric power through cable 104.

What I claim is:

1. In a bowling alley installation of the type wherein the alley bed extends from a player's approach area to a pit and including a return runway for delivering bowling balls from the pit to a point adjacent the approach area, the combination of an infeed track mounted in a position to receive bowling balls from the return runway and along which such bowling balls can roll to a delivery end; support means defining a generally horizontal storage track having a portion extending along a line which extends transverse to said infeed track adjacent the delivery end thereof and another portion which extends adjacent the approach area at a point conveniently accessible to a player, said storage track being dimensioned to receive and support bowling balls and being so positioned that a bowling ball rolling from the delivery end of said infeed track will enter said storage track and come to rest thereon; and means mounting said support means for movement, such movement causing said storage track to move lengthwise past the delivery end of said infeed track and to carry such bowling ball from its point of rest to said point conveniently accessible to a player.

2. A bowling alley installation in accordance with claim 1 and wherein said storage track is circular.

3. In a bowling alley installation of the type wherein the alley bed extends from a player's approach area to a pit and including a return runway for delivering bowling balls from the pit to a point adjacent the approach area, the combination of an infeed track mounted in a position to receive bowling balls from the return runway and along which such bowling balls can roll to a delivery end; support means mounted adjacent the delivery end of said infeed track and defining a storage track having the configuration of a closed loop which extends along a line intersecting the path of travel of bowling balls from the delivery end of said infeed track, said storage track being dimensioned to receive and support bowling balls and being so positioned that a bowling ball rolling from the delivery end of said infeed track will enter said storage track, said storage track having two sloped portions which are generally opposed across the loop defined by said storage track, each of said sloped portions extending downwardly toward a point spaced along said storage

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track from the delivery end of said infeed track, whereby a bowling ball entering said storage track from said infeed track is caused to roll along said storage track and come to rest at a point remote from the delivery end of said infeed track so that succeeding bowling balls from said infeed track can freely enter said storage track.

4. A bowling alley installation in accordance with claim 3 and wherein the loop defined by said storage track lies substantially in a single inclined plane so disposed that the highest portion of said storage track is adjacent to the delivery end of said infeed track.

5. In a bowling alley installation of the type wherein the alley bed extends from a player's approach area to a pit and including a return runway for delivering bowling balls from the pit to a point adjacent the approach area, the combination of an infeed track mounted in a position to receive bowling balls from the return runway and along which such bowling balls can roll to a delivery end; a support frame disposed at the end of said infeed track and extending adjacent the approach area; a bowling ball receiving and supporting member including an annular track, said supporting member being carried by said frame in a position such that said annular track extends along a line transverse to the path of travel of bowling balls delivered from said infeed track and which extends adjacent to the approach area at a point conveniently accessible to a player, which point is spaced from said delivery end, said annular track being so dimensioned and positioned that bowling balls delivered from said infeed track come to rest on said annular track, said support member being mounted for rotation about an upright axis, rotation of said member causing bowling balls on said track to move with said track from the position of initial rest to said conveniently accessible point spaced from said delivery end.

6. A bowling alley installation in accordance with claim 5 wherein said ball supporting member includes an annular flat peripheral portion positioned adjacent to and in alignment with said delivery end, said track comprising an annular concave surface located inwardly of and adjacent to said peripheral portion, and a centrally located surface adjacent to said track and inclined upwardly toward the center of said member, said concave portion providing a bowling ball supporting surface lower than said peripheral portion and said centrally located surface

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so that bowling balls from said infeed track roll onto said annular track and come to rest on said concave surface.

7. A bowling alley installation in accordance with claim 6 including resilient bumper means mounted concentrically with respect to said member and dimensioned and disposed to confine movement of bowling balls delivered to said support member to said annular track.

8. A bowling alley installation in accordance with claim 7 wherein said bumper means include a first annular resilient bumper mounted concentric to and inwardly of said centrally located surface in the path of movement of bowling balls delivered onto said support member from said infeed track, and a second substantially annular resilient bumper extending around said support member and operative to prevent bowling balls from rolling off of said support member.

9. A bowling alley installation in accordance with claim 5 including an inclined centrally located surface arranged inwardly of said annular track, and an annular rail arranged outwardly of said annular track, at least one of said centrally located surface and said rail being stationary, said rail and said centrally located surface being dimensioned and arranged to confine to said annular track movement of bowling balls delivered to said member.

10. A bowling alley installation in accordance with claim 5 including an electric motor mounted on said frame, drive means powered by said motor and operatively engaging said supporting member for rotating the same, and switch means disposed at a point conveniently accessible to a player and operatively connected to said electric motor for controlling the operation thereof.

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