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BOWLING BALL CLEANER

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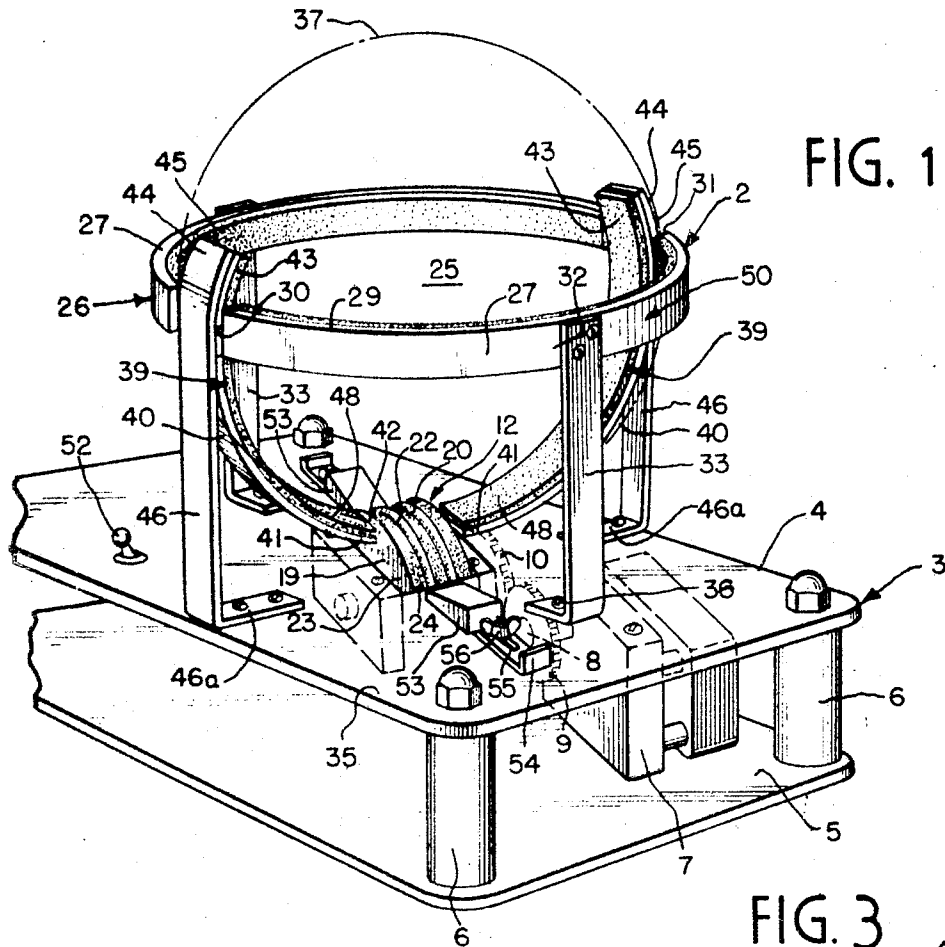


FIG. 1

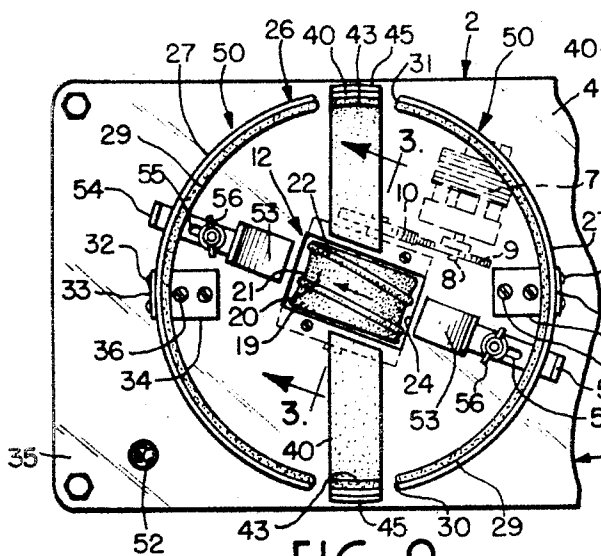


FIG. 2

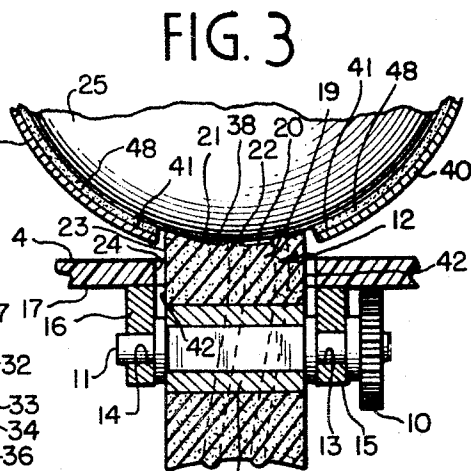


FIG. 3

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BOWLING BALL CLEANER

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7 Claims

ABSTRACT OF THE DISCLOSURE

A bowling ball cleaner having a resilient ball-supporting structure with ball-engaging cleaning material, the structure supporting the ball upon a roller having an elastomeric material surface incorporating means to simultaneously rotate the ball about a plurality of axes, the support-structure reducing the weight upon the roller to an extent so as to permit rotation of the ball without frustrating the action of the roller which would occur if the entire weight of the ball were loaded upon the roller.

Prior art devices of this nature either rotated the ball about a single axis and required the user to manually shift the ball. This is not only tedious but also interferes with enjoyment of the game in observing other players activities. In structures which attempt to accomplish rotation of the ball on a plurality of axes, a complex and expensive mechanism is utilized which normally cannot be contained in a bowling bag. The increase in weight is objectionable since it must be readily portable. Prior art structures also require various devices for locking the ball in place so that it will not damage the mechanism when it is being transported.

The present invention is directed to a novel bowling ball cleaner and particularly to a portable ball cleaner.

A general object of the invention is to provide a novel ball cleaner in which the cleaning structure cooperates with the turning mechanism by supporting a substantial weight of the ball to obtain effective contact therewith so that the ball can move on the driving roller upon which it is supported not only circumferentially but also axially.

A more specific object of the invention is to provide a novel drive for a bowling ball which comprises a deformable elastomeric body with areas in the form of an auger flight which causes the ball to rotate not only on an axis parallel to the roller, but also on an axis extending transversely of the axis of the roller against the yieldable restraint of the resilient support structure thus the ball is caused to wipe over its entire periphery without the necessity for manually shifting the ball to new positions.

A still further object is to devise a ball drive and support for the ball wherein the support provides a wedging effect on the ball so as to facilitate its shift in an orbit axially of the driving roller.

These and other objects and advantages inherent in and encompassed by the invention will become more apparent from the specifications and the drawings, wherein:

FIGURE 1 is a perspective view of the novel ball cleaner;

FIGURE 2 is a plan view thereof on a smaller scale, and

FIGURE 3 is a fragmentary sectional view on the scale of FIGURE 1 taken substantially on line 3—3 of FIGURE 2.

DESCRIPTION OF THE INVENTION

Describing the invention in detail, the ball cleaner generally designated 2 comprises a base 3 including top and bottom plates 4 and 5 and intervening corner columns 6, 6 suitably bolted to respective plates to hold them in vertically spaced relationship.

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A suitable power source such as an electric motor 7 is disposed between these plates and is suitably bolted thereto. The drive motor 7 has an output shaft 8 which is connected to a gear 9 which drives a spur gear 10 connected to the generally horizontal shaft 11 of a roller assembly 12.

The roller assembly shaft 11 is journaled adjacent to respective ends in coaxial apertures 13, 14 in a pair of lugs or ears 15, 16 which depend from the underside 17 of the top wall 4 of the base and are connected thereto. The roller assembly 12 has a metallic core 18 connected to the shaft 11 and about the core there is bonded a body 19 of relatively soft elastomer or rubber-like material of between 50 and 80 durometers. The outer periphery 20 of the body 19 is grooved to a concavity 21 and this peripheral surface 20 is formed with a helical flight or bead 22 which projects from periphery 20. The bead is preferably formed of elastomer material which is slightly harder than the body.

It will be observed that the upper sector 23 of the roller body projects through an aperture 24 in the top web 4 of the base and provides a deformable seat for the ball 25 which is positioned thereon in a cage 26.

The cage 26 comprises resilient preferably metallic semicircular elements 27, 27 each of which is lined internally with ball cleaning material 29 such as felt. Each element 27 is mounted midway between its ends 30, 31 as at 32 to the upper end of a standard 33 which at its lower end has a flange 34 mounted on the top 35 of the upper wall 4 of the base as by rivets 36, 36. These standards 33 are positioned at opposite sides of the roller 12 in alignment therewith and are flexible to admit the ball 25 between the arcuate segments 27 which lie in a plane substantially midway between the top and bottom 37 and 38 (FIGURES 1 and 3) of the ball. The cage further comprises a pair of cantilever supports 39, 39 which comprise arcuate segment 40, 40 which are aligned axially of the roller and have unsupported lower ends 41, 41 spaced slightly from the opposite ends 42, 42 of the roller body and disposed slightly below the upper sector of the roller body. These segments 40, 40 are lined with ball-cleaning material 43 such as felt. The upper end portions 44, 44 of these segments project above the maximum diameter of the ball and slightly below these end portions are connected the upper ends 45 of standards 46 which have flanged lower ends 46a riveted to the top of the base wall 4.

In order to admit a ball into the cage the ball wedges between the upper end portions 44 of the elements 40 and spreads them apart and since the arcs of the segments 40 as well as segments 27 conform to the spherical periphery of the ball each cleaning pad or material fully engages the ball.

As the ball rests upon the roller, the roller body is deformed slightly as allowed by the downspring of the support arms 40, 40. The upper surfaces 48, 48 of the pads 43, 43 slope upwardly from the ends of the roller sector and provide wedges which accentuate movement of the ball in a direction axially of the roller assembly. The flexibility of the arms 40, 40 enhances the turning movements of the ball by supporting the ball as it is wedged onto the arm 40 toward which the auger flight bodily urges it. The arms 40 continuously move up and down which helps to reposition the ball. The flexibility of the side assemblies 50, 50 constituted of parts 27, 30, toward which the ball is bodily urged causes the ball to oscillate back and forth slightly which also augments the cleaning action as well as repositioning of the ball, the ball being free to move between the side assemblies 50 in view of the construction of the upper end portions 44, 44. It will be appreciated that the forces urging the ball

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off the roller will deflect the arms 40 and assemblies 50 to an extent such that they spring back.

The cage as will now become apparent serves to hold the ball in place even when the device with the ball therein is being transported, it being understood that the ball and cleaner is adapted to fit within a bowling bag.

The motor may be battery driven or may have a cord which is readily plugged into an outlet at the play area. A switch 52 is provided in the circuit to the motor.

In order to prevent a set in the elastomer roller body when the ball is in storage, there are provided a pair of supports 53, 53 comprising wedges which are urged into wedging engagement between the ball periphery and the top surface of the top wall of the base. The wedges are connected to handles 54, 54 which are slotted at 55, 55 and receive bolts therethrough which are selectively locked by wing nuts 56. These nuts 56 are loosened and the wedges are spread apart to lower the ball onto the roller body during operation.

It will be appreciated that although the roller 12 is shown with a spiral flight 22, a cylindrical roller of elastomer body material is also contemplated which also deflects as does the previous embodiment, under the weight of the ball. Either roller as it rotates tends to urge the ball tangentially off the roller against the opposing cage assembly 50 and thus causes such assembly 50 to flex beyond that required to hold the ball on the roller. The ball rebounds and oscillates back and forth between the flexible side assemblies 50, 50. Thus the ball is constantly repositioned on the roller and is rotated on constantly changing axes.

As will be appreciated various forms of the invention have been described and that these and others will come within the scope of the appended claims.

We claim:

1. A bowling ball cleaner comprising a cage for receiving a ball therein, and roller means engaging the ball, means for driving said roller means, and ball cleaning means associated with said cage for engagement with the ball while in said cage, and said cage comprising opposed generally horizontally disposed ball-engaging wiping elements positioned at opposite sides of the axis of rotation

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of the roller means, means for resiliently mounting said elements for yieldable movement radially of the ball transversely of the axis of rotation of said roller means for rocking a ball disposed therebetween back and forth thereby dislodging the ball from the roller means and changing the disposition of the ball thereon.

2. The invention according to claim 1 and said roller means comprising a roller having a body of elastomer material and disposed at the bottom of the cage and having helical flight means in turning engagement with the ball.

3. The invention according to claim 1 and a base supporting said cage, and said roller means comprising a single roller having a yieldable body providing a sector projective through an aperture in said base beneath the ball between adjacent ends of said one pair of elements.

4. The invention according to claim 1 and auxiliary support means on the base adapted to be underposed beneath the ball for lifting it off the roller body.

5. The invention according to claim 1 and resilient support arms circumferentially spaced from said elements and having lower end portions disposed in yieldable supporting relation to a ball disposed within the cage.

6. The invention according to claim 5 and said lower ends positioned at opposite ends of the roller means.

7. The invention according to claim 1 and said roller means having a helical ball-engaging surface.

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