

April 22, 1958

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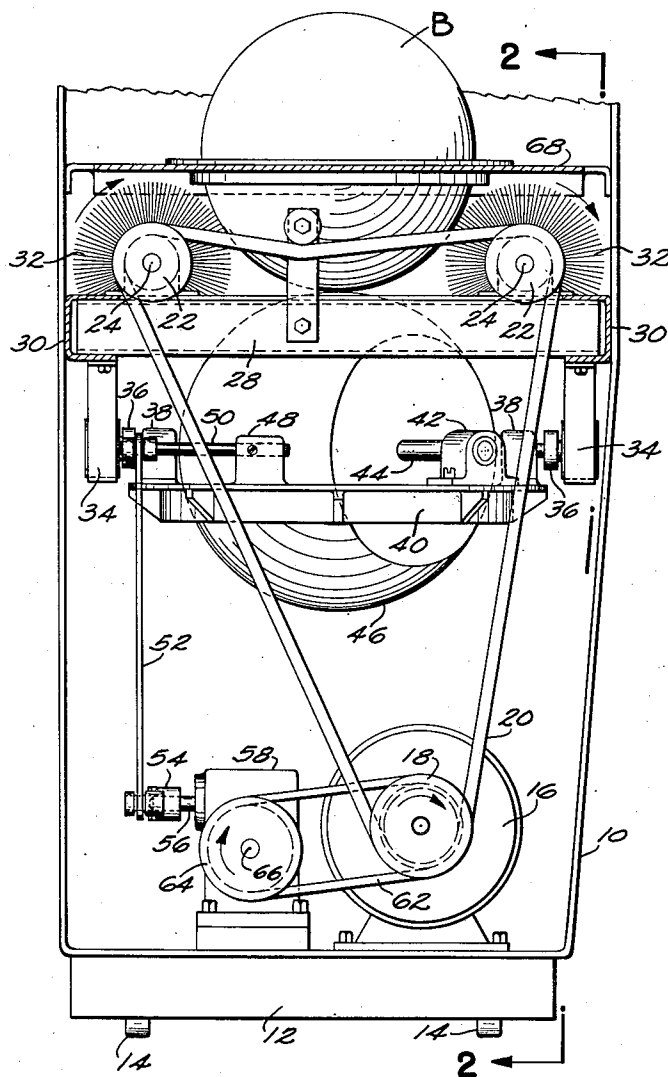
2,831,205

BOWLING BALL CLEANER AND POLISHER

Filed April 26, 1956

3 Sheets-Sheet 1

FIG. 1



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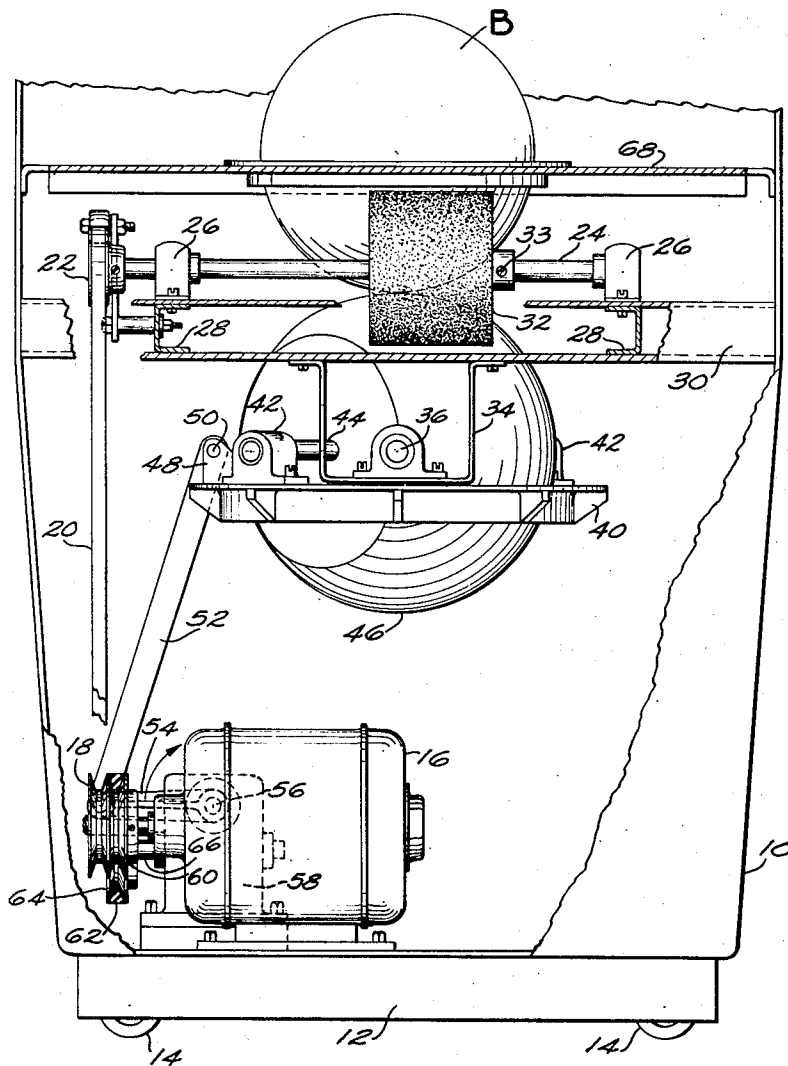
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Filed April 26, 1956

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FIG. 2



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2,831,205

BOWLING BALL CLEANER AND POLISHER

Filed April 26, 1956

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FIG. 3

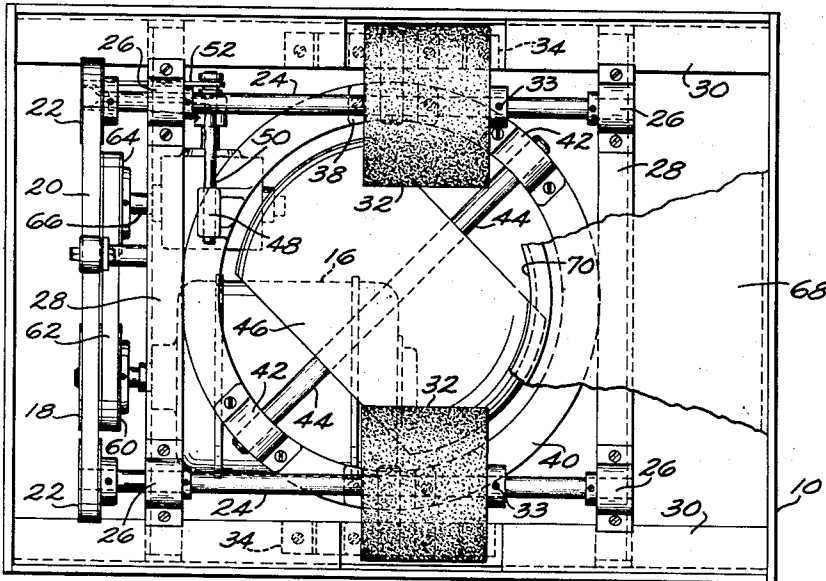


FIG. 4

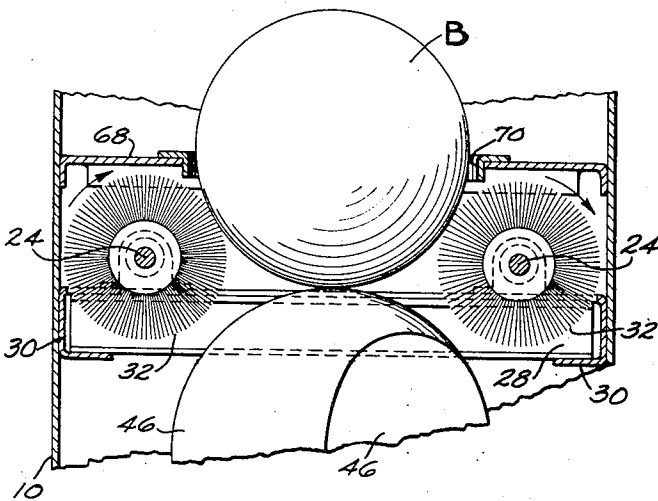
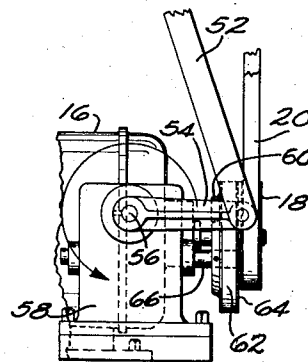


FIG. 5



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2,831,205

BOWLING BALL CLEANER AND POLISHER

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Application April 26, 1956, Serial No. 580,760

7 Claims. (Cl. 15—21)

This invention relates to the art of bowling and more particularly to improvements in bowling ball cleaning and polishing apparatus provided with opposed rotating cleaning and polishing brushes which rapidly clean and polish bowling balls.

The invention includes a vertically movable oscillatory ball support which is raised and lowered to locate a ball to be cleaned between spaced rotating cleaning and polishing brushes. The ball support provides a moving surface on which the ball rests and as the result of the upward and downward movement of the support, the ball is shifted as well as rotated relative to the brushes. Thus all portions of a ball are progressively cleaned and polished.

It is an object of the invention to provide a novel ball cleaning apparatus having opposed positively driven cleaning and polishing brushes in combination with means such that the ball to be cleaned and polished not only rotates about one axis but is oscillated about another axis, such compound rotary and oscillatory motion assuring that the entire surface of the ball will be contacted by the brushes in a relatively short time.

It is a further object of the invention to provide a novel bowling ball cleaning and polishing apparatus wherein a bowling ball is supported on a moving surface and is simultaneously rotated about one axis and oscillated about another axis while in contact with spaced rotating brushes which clean and polish the ball.

It is another object of the invention to provide a bowling ball cleaning and polishing device in which the ball to be treated is supported in contact with rotary brushes in such manner that operation of the brushes causes rotation of the ball and wherein the means for so supporting the ball is constructed and actuated so as to impart to the ball an oscillatory movement about an axis which is displaced angularly from the axis of rotation of the ball.

With these and other objects not specifically mentioned in view, the invention consists in certain combinations and construction which will be hereinafter described, and then set forth in the claims hereinto appended. In the accompanying drawings which form a part of this specification, and wherein the several reference characters designate same or like elements:

Fig. 1 is a view showing a front elevation of a preferred form of a bowling ball cleaning and polishing apparatus made in accordance with the invention.

Fig. 2 is a side elevation taken on line 2 of Fig. 1.

Fig. 3 is a plan view of the apparatus shown in Figs. 1 and 2.

Fig. 4 is a partial sectional front elevation of the bowling ball cleaning mechanism.

Fig. 5 is a partial side elevation showing a detail of the drive and agitating mechanism.

Referring to the drawings it will be seen that in the embodiment of the invention selected for purposes of illustration the ball cleaning and polishing apparatus consists of a housing 10 mounted on a base 12 provided with

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suitable casters or rollers 14 enabling it to be moved from one location to another when so desired.

Mounted on base 12 within housing 10 is a suitable motor 16 provided with a pulley 18 which through belt 20 drives a pair of pulleys 22 supported on spaced parallel horizontal shafts 24. The ends of each shaft 24 are supported in bearings 26 secured to spaced cross beams 28, fastened at their ends to bars or brackets 30 mounted on the inside of the two opposite walls at top of housing 10. (See Figs. 1 and 2).

Adjustably mounted on each horizontal shaft is a cylindrical brush 32. Since during the operation of the apparatus motor 16 is continuously in operation, brushes 32 will be rotated continuously. To adjust brushes 32 on shafts 24, set screws 33 can be unscrewed and brushes 32 can then be moved along shafts 24 to any desired operative position. Screws 33 are then turned home to secure brushes 32 in adjusted positions.

A bearing bracket 34 is attached to the underside of each bracket 30. Each bearing bracket 30 supports one end of a rotatable stud shaft 36. The other end of each stud shaft 36 engages a bearing bracket 38. Bearing brackets 38 are mounted on opposite sides of a ring shaped support member 40, thereby providing a pivoted mount for ring member 40.

Ring member 40 carries two other spaced axially aligned bearings 42. These bearings rotatably support the ends of shaft 44 on which is mounted a movable ball support and agitating member 46. In the form illustrated herein member 46 comprises a spherical surface on which a ball B rests. Referring to Fig. 3, it would be noted that shaft 44 is positioned at an angle of approximately 45 degrees from the central line passing through stud shafts 36. The reason for this arrangement will be described hereinafter. In the illustrated embodiment ball support and agitating member 46 is shown as a double truncated sphere. If desired an entire spherical member could be used.

Projecting upwardly from the upper surface of ring member 40 is a lug 48 which carries a horizontal stud 50 to which is attached one end of a link 52, the other end of which link is connected to the free end of crank-arm 54 mounted on shaft 56 projecting from the housing 10 of a suitable gear reduction unit 58 secured to the bowling ball cleaning and polishing unit. Gear reduction unit 58 is driven (Figs. 2 and 3) through a belt 62 by a pulley 60 which preferably is formed integrally with pulley 18. Pulley 60, by means of belt 62, drives pulley 64 mounted on shaft 66 (Fig. 1) projecting from gear reduction unit 58 and provides the driving means for the latter.

Secured within the upper portion of housing 10, as shown in Figs. 1, 2, 3 and 4, is a horizontal ball guide retainer plate, which is provided with a centrally located opening 70, the diameter of which is slightly larger than a bowling ball. As shown in Figs. 1, 2 and 4, plate 68 is so located with respect to ball supporting and agitating member 46 that a ball can be readily inserted by a bowler through opening 70 and come to rest on the surface of member 46. A ball can also be removed without difficulty when it has been cleaned and polished. The diameter of opening 70 is such that a ball may move freely relatively thereto and will not bind during the operation of the apparatus.

In operation: When it is desired to clean and polish a bowling ball, a ball B is placed through opening 70 of retainer plate 68, and positioned on spherical ball support member 46. Motor 18 is then started by suitable means (not shown). The starting of motor 16 causes belt 20 to rotate shaft 24 and hence rotate brushes 32. It will be observed from a consideration of Figs. 1 and 4, that the brushes are both rotated in the same direction and in this

way the pressure asserted by the brushes upon a bowling ball B resting on member 46 causes the ball B to rotate, and as a result of the rotation of ball B, the spherical agitating and supporting member is also rotated by ball B resting thereon. While supporting member 46 is rotating about shaft 44, the frame 40 is being oscillated through elements 52, 54, 56 about an axis defined by stub shafts 36, such axis being at 45° to the shaft 44 and thus at 45° to the axis of rotation of supporting member 46. By reference to Fig. 3 it will be seen that the axis of oscillation of the frame member 40 and thus of the ball supporting member 46 is displaced angularly by 90° from the axes of rotation of brushes 32. Since the ball B contacts supporting member 46 with sufficient frictional engagement that the rotation of the ball is transmitted to the supporting member, it will be clear that the oscillatory movement of the supporting member is imparted to the ball. Accordingly, while the ball B is being rotated by brushes 32, it is also being oscillated about an axis disposed angularly from the parallel axes of the brushes. Such simultaneous rotation and oscillation of the ball assures that every part of the surface of the ball is contacted by the brushes.

It requires only relatively short time to secure the desired degree of cleaning and polishing and when this has been done, in a period of say one or two minutes time, the circuit through motor 16 is broken and the drive of brushes 32 ceases. The brushes 32 when immobile exert somewhat of a braking force on a ball and when it comes to rest or is stopped by pressure of the hand of the bowler engaging it, the cleaned and polished ball can be removed and is ready for play.

Brushes 32 can be of any suitable conventional type. Experience has shown that brushes formed with relatively soft bristles or fiber or steel wire give satisfactory results.

What I claim is:

1. In a bowling ball cleaning and polishing apparatus, the combination of a rotary brush, supporting means for supporting a bowling ball in contact with said brush and including a supporting member disposed beneath the ball and in contact therewith, said supporting member having a generally spherical ball engaging surface and being mounted for rotation, drive means connected with said brush to rotate the same, whereby a ball to be cleaned and polished disposed on said supporting member will be rotated by contact with the rotating brush and will in turn rotate said supporting member, and actuating means connected to said supporting member and operative to impart to said supporting member an oscillatory movement about an axis angularly displaced from the axis of rotation of said brush, whereby a corresponding oscillatory movement is imparted to the ball through its contact with said supporting member.

2. In a bowling ball cleaning and polishing apparatus, the combination of frame means, two rotary brushes, means mounting said brushes on said frame means for rotation about their respective axes with the axes being parallel and spaced apart sufficiently for a bowling ball to be accommodated between the brushes, a ball supporting member having a generally spherical surface, means mounting said member in ball supporting position below said brushes for rotation about one axis and for oscillation about an axis angularly displaced from said one axis, drive means operatively associated with said brushes to drive both brushes in the same direction, whereby a ball supported on said supporting member and in engagement with said brushes will be rotated by the brushes and will in turn rotate said supporting member about said one axis, and actuating means operatively associated with said supporting member to oscillate the same about said angularly displaced axis during such rotation.

3. In a bowling ball cleaning and polishing apparatus, the combination of frame means, a ball supporting member having a generally spherical ball supporting surface, means mounting said member on said frame means for rotation about one axis and for oscillation about a second axis angularly displaced from said one axis, means operatively associated with said member for oscillating the same about said second axis, a rotary brush mounted on said frame means above said member and disposed to contact a ball supported on said member, said brush being mounted for rotation about an axis angularly displaced from said second axis, and means for rotating said brush.

4. In a bowling ball cleaning and polishing apparatus, the combination of frame means, two rotary brushes mounted on said frame means for rotation about their respective axes, said brushes being disposed with their axes parallel to each other and spaced apart by a distance such that both brushes will engage a bowling ball supported therebetween for cleaning, whereby a ball so disposed will be rotated by contact with the brushes when the brushes both rotate in the same direction, means connected to said brushes to rotate the same both in the same direction, ball supporting means comprising a spherical ball supporting surface disposed in ball supporting position below said brushes, said surface being rotatable about one axis through its engagement with the ball being cleaned and oscillatable about a second axis angularly displaced from the parallel axes of said brushes, and means for oscillating said surface about said second axis.

5. In a bowling ball cleaning and polishing apparatus, the combination of frame means including a brush support, two rotary brushes mounted in spaced apart relation on said brush support with their axes of rotation substantially parallel, means for driving said brushes in the same direction, a movable support, means mounting said movable support below said brush support for pivotal motion about a substantially horizontal axis displaced angularly from the parallel axes of said brushes, a ball supporting member having a generally spherical surface, means mounting said ball supporting member on said movable support for rotation about an axis displaced angularly from the pivotal axis of said movable support, whereby said ball supporting member can rotate with the ball supported thereby as the ball is rotated by contact with said brushes and means operatively connected to said movable support to pivot the same substantially simultaneously with such rotation.

6. In a bowling ball cleaning and polishing apparatus, the combination of two rotary brushes, means rotatably mounting said brushes with their axes of rotation substantially horizontal, parallel and spaced apart by a distance such that a bowling ball to be cleaned can be received between the brushes, means connected to said brushes to drive the brushes both in the same direction, a ball supporting member disposed in ball supporting position below said brushes and having a generally spherical ball supporting surface, said member being mounted for free rotation about one axis angularly displaced in the horizontal from the parallel axes of said brushes and for oscillation about a second axis angularly displaced in the horizontal both from the parallel axes of said brushes and from said one axis, and means for oscillating said ball supporting member about said second axis.

7. The apparatus of claim 6 including a ball centering guide member disposed above said brushes.

References Cited in the file of this patent

UNITED STATES PATENTS

2,405,344	Cloutier	Aug. 6, 1946
2,420,988	Tholen	May 20, 1947
2,588,714	Fleming	Mar. 11, 1952
2,733,464	Le Mieux	Feb. 7, 1956