

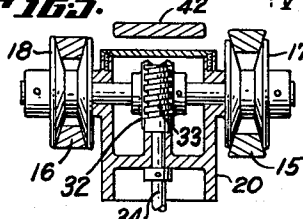
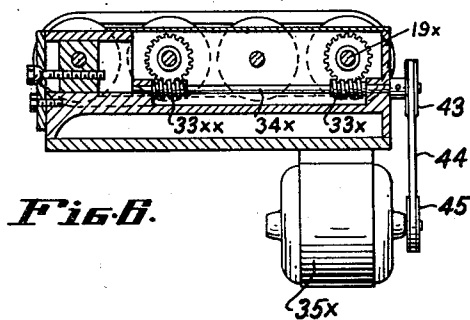
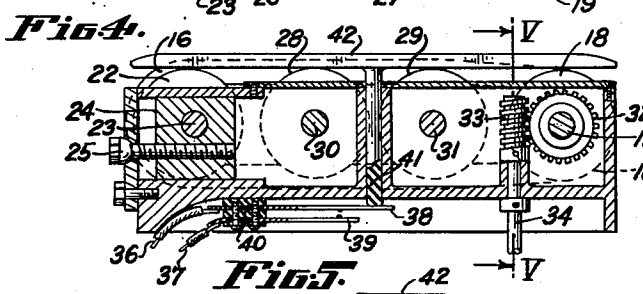
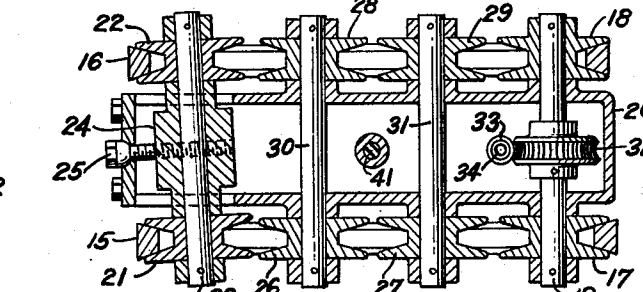
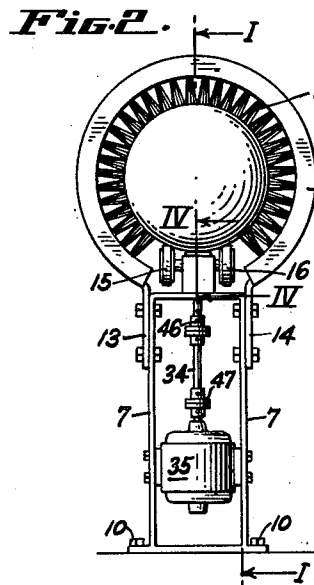
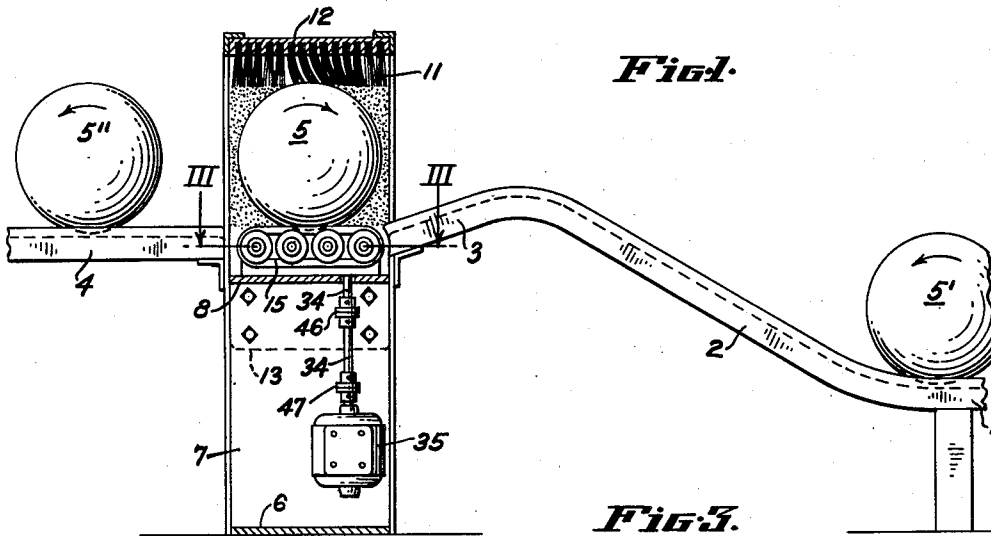
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2,226,872

BOWLING BALL RETURNWAYS

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BOWLING BALL RETURNWAY

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5 Claims. (Cl. 273-47)

This invention relates to improvements in bowling ball returnways.

Among the objects of the invention is to retard the returning balls before they come to rest on the rack.

Another object is to whirl the balls on their vertical axis during the retarding operation.

A further object is to clean the surface of the revolving balls.

Other objects and advantages will appear as the description progresses.

In this specification and the accompanying drawing the invention is disclosed in its preferred form. But it is to be understood that it is not limited to this form because it may be embodied in other forms within the purview of the claims following the description.

In the one sheet of drawings:

Fig. 1 is a side elevation in vertical section on the line I—I, Fig. 2, of a ball returnway constructed in accordance with this invention.

Fig. 2 is a front elevation of the ball retarding and brushing unit.

Fig. 3 is an enlarged detail in horizontal section on the line III—III, Fig. 1, of the reverse traction unit.

Fig. 4 is a vertical section of the same on the line IV—IV, Fig. 2.

Fig. 5 is a vertical cross section of the same taken on the line V—V, Fig. 4.

Fig. 6 is a view similar to Fig. 4 showing a modified drive for the traction unit.

In detail, the construction illustrated in the drawing, referring first to Fig. 1, comprises the conventional ball returnway 1, having the abrupt incline or hump 2, with a short decline 3 to the level of the rack 4. It is the usual practice to make these runways of two parallel separated rails upon and between which the balls, such as 5, roll.

The present invention is interposed in the path of the balls 5' and 5'' between the decline 3 and the rack 4. It consists of the rectangular frame having the base 6, sides 7, 7, and the top 8 preferably made of steel plate bent and welded to form a supporting standard. It is bolted to the floor at 10, 10.

The segmental retarding brush 11 is mounted within the curved frame 12, the ends 13, 14 of which are adjustably bolted to the sides 7, 7. The inner circumference of this brush is slightly greater than the outer circumference of the ball 5 which snubs or retards the forward movement of the ball to a standstill.

In its passage through the brush the ball is

supported on the flexible traction belts 15, 16. These belts are driven by their respective pulleys 17, 18 fixed on the driven shaft 19 and journaled in the box like bed 20. The belts pass around their respective idle pulleys 21, 22, free on the shaft 23 that is fixed in the adjustable block 24 slidable in the opposite end of the bed 20. This block is adjusted by the screw 25, swiveled in the end of the bed 20 and threaded into the block 24. This adjustment functions to take up slack and inequalities in the lengths of the belts 15, 16.

The top portions of the belts are supported by the intermediate idle pulleys 26—29 free on the cross shafts 30, 31 respectively.

The shaft 19 is driven by the worm gear 32 enmeshed with the gear worm 33, fixed on the shaft 34 of the motor 35 that is mounted between the sides 7, 7.

The belts 15, 16 are of substantially uniform cross section, but the grooves in the pulleys engaging the belt 15 are narrower than those for the opposed belt 16. This causes the belt 15 to travel slightly faster than the belt 16. This in turn causes the ball 5 supported thereby to rotate on the vertical as well as on the horizontal axis in its passage through the brush 11.

Both belts 15, 16 are driven in the direction of the normal travel, not the rotation, of the ball on the returnway toward the rack 4. The retarding action of the brush is further increased by the lateral whirling of the ball due to the differential in belt speeds in addition to the peripheral friction of the brush 11.

The motor circuit is indicated by the two wires 36, 37 leading to and from the resilient switch contact members 38, 39 mounted in the dielectric base 40. The dielectric plunger 41 guided in the bed 20 rests upon the member 38 and has the contact operating head 42 extending between the length of the belts 15, 16 in the path of the ball 5. This head 42 is depressed and closes the switch 38—39 to instantly energize the quick starting motor 35 when the ball rolls onto the belts 15, 16. The retarding effect of the brush may be proportioned to the average momentum of the ball by adjusting the brush on the sides 7, 7. The arrested ball is slowly advanced onto the rack 4 by the traction of the belts 15, 16.

In conventional bowling alley practice the dimensions of the balls are standardized but of different weights. The flexibility of the bristles in the brushes will accommodate some variation in ball diameter. The brush can be centered with the axis of the ball by adjusting it in its at-

tachment to the sides 7, 7. For greater variation in ball diameter, suitable brush sizes can be substituted for the standard size brush 11 shown.

The flexible couplings 46, 47 are introduced in the motor shaft 34 to compensate for possible disalignment between the motive and driven element.

The modification in Fig. 6 is the same as the structure and mode of operation described except that the driven shaft 19x is driven by the gear worm 33x on the counter shaft 34x. This counter shaft is driven by the pulley 43 and the belt 44 engaging the pulley 45 on the shaft of the motor 35x. A plurality of pulleys can be driven as by the second worm 33xx. This belt drive has some advantages due to the flexibility of the belt 44 in starting and possible slippage with consequent prevention of damage to the motor should the traction unit become jammed by a foreign obstruction entering the unit.

Having thus described this invention what is claimed and desired to be secured by Letters Patent is:

1. In a returnway in the class described, a ball retarder including a substantially cylindrical brush; a traction member within the arc of said brush; and means for driving said traction member in a direction opposite to the normal rota-

tion of a ball rolling through said brush from said returnway.

2. In a returnway in the class described, a ball retarder including a substantially cylindrical brush; a pair of parallel traction belts adapted to travel at relatively different speeds; a motor geared to said belts; and a motor switch control for said motor between said belts in the path of a ball passing through said brush.

3. A returnway in the class described, including a substantially cylindrical brush; a pair of parallel traction belts within the perimeter of said brush; and means for driving said belts at different speeds.

4. A returnway in the class described, including an inclined ball support; a substantially cylindrical brush arranged above said support; a traction means within the perimeter of said brush and forming a continuation of said support; and means for driving said traction means.

5. A returnway in the class described, including an inclined ball support; a substantially cylindrical brush arranged above said support; a traction means within the perimeter of said brush; and means for driving said traction means in a manner to alter the normal rotation of a ball descending said support as it passes through said brush.

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