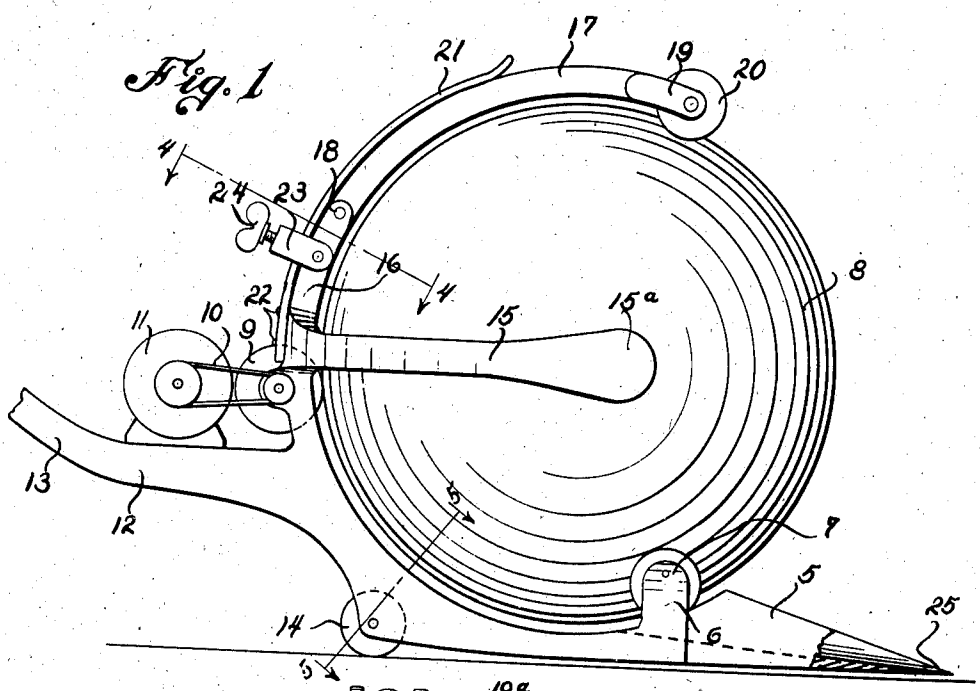
April 21, 1942. O. F. WHITTLE 2,280,331

APPARATUS FOR PROPELLING BOWLING BALLS

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Fig. 1



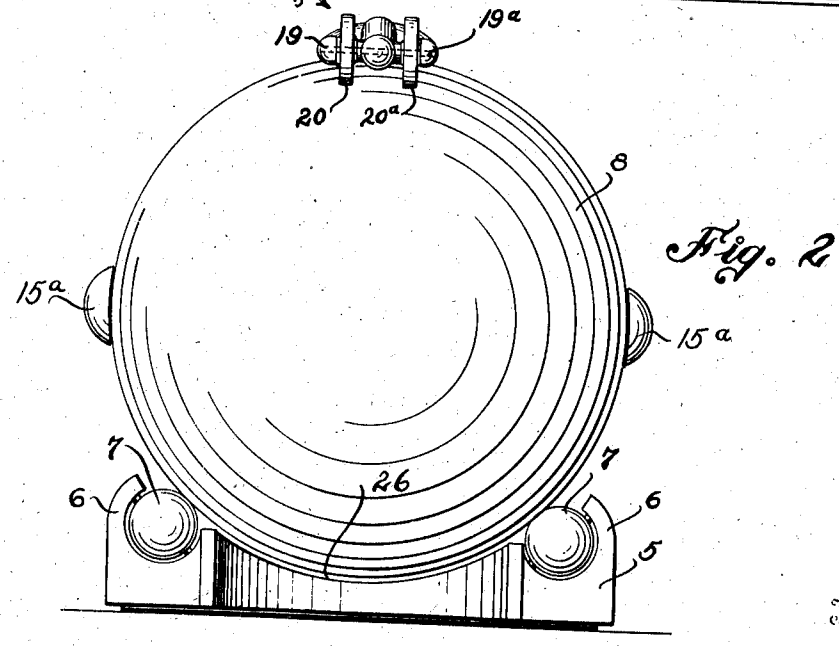


Fig. 2

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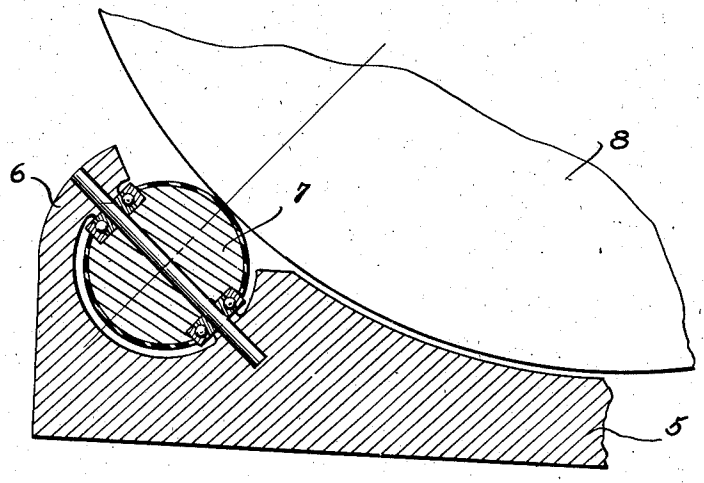


Fig. 3

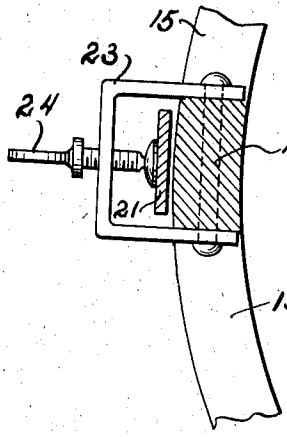
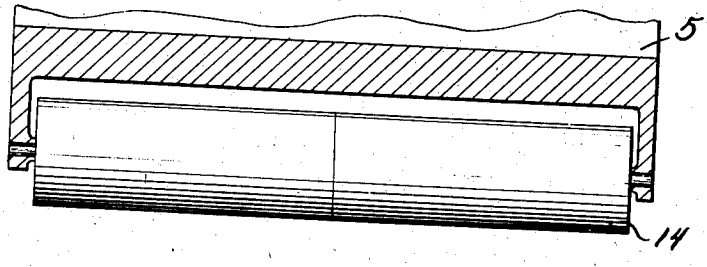


Fig. 4

Fig. 5



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UNITED STATES PATENT OFFICE

2,280,331

APPARATUS FOR PROPELLING BOWLING BALLS

Orville Felix Whittle, Miami, Fla., assignor to Rotobowling Corporation, a corporation of Florida

Application February 15, 1940, Serial No. 319,123

12 Claims. (Cl. 273—129)

This invention relates to an apparatus for driving and directing bowling balls and it has for its primary object to provide a manually manipulated carrier or carriage that is constructed to receive a bowling ball and to impart rotation to the same at a relatively high speed and to thereafter aim the ball and deliver it upon a bowling alley without shock or jar.

The apparatus is primarily to be used in conjunction with bowling balls of considerable size and in connection with bowling alleys of considerably greater length than the standard bowling alleys. However, the invention is not limited to any particular size of ball to be handled nor to any particular length of alley, since it will be clear that the principles involved are applicable to different sizes of balls and different lengths of alleys. Further objects and advantages of the invention will be set forth in the detailed description which follows.

In the accompanying drawings:

Fig. 1 is a side elevation of an apparatus constructed in accordance with the invention;

Fig. 2 is a front elevation of the structure of Fig. 1;

Fig. 3 is a detailed view of one of the rollers which support the lower, forward portion of the ball, and its bearing;

Fig. 4 is a sectional view upon line 4—4 of Fig. 1 through the tensioning means of the spring, hereinafter described, and

Fig. 5 is a sectional view on line 5—5 of Fig. 1 showing the manner of supporting the lower rear portion of the pan or carriage, hereinafter described.

Like numerals designate corresponding parts in all of the figures of the drawings.

The device of the present invention comprises a pan-like carriage 5 which, at its lower forward portion, carries bearing extensions 6 within which rubber covered ball like rollers 7 are mounted. These rollers engage the lower forward portion of the bowling ball 8 at a point in advance of the center of said ball. The weight of the ball holds its rear face firmly against a driving roller 9. This roller may be rubber covered or of any other suitable material to give it a good frictional grip upon the bowling ball. The roller 9 is driven by a suitable belt, chain or other connection 10 from a variable speed electric motor 11, the latter being mounted upon a rearward extension 12 of the carriage. A manipulating handle 13 provides means by which the operator may bodily impart movement to the carriage and manipulate it to swing it to varying positions of angularity with respect to a bowling alley upon which the device is to be used. To facilitate this shifting of the carriage and the consequent aiming of the ball at the ten-pins or like objects, not shown, at the far end of the alley, the lower rear portion of the carriage is mounted upon a roller 14. Guard arms 15 are preferably, but not necessarily, employed. They project forwardly upon opposite sides of the ball and are provided with heads 15a which lie in very light contact with the ball at the ends of the transverse, horizontal axis of the ball. These arms project from an extension 16 of the carriage. A curved tensioning arm 17 is pivotally connected at 18 to the upper end of the extension 16 and at its forward end is shaped to provide forks 19—19a in which restraining rollers 20—20a are mounted for rotation. These restraining rollers may be of any suitable material such as rubber, fiber or rubber covered metal and they engage the ball upon opposite sides of a vertical plane extending through the ball in the direction of the longitudinal axis of the apparatus. A leaf spring 21 is riveted or otherwise secured at 22 to the extension 16. This spring passes through a U-shaped yoke 23 that is carried by the extension 16. An adjusting screw 24 is threaded into the yoke and bears upon the spring and serves to adjust the degree of pressure that will be exerted by the free end of the spring upon the arm 17. By referring to Fig. 1 it will be seen that the forward end of pan 5 tapers to a thin edge as indicated at 25 and that that portion of the pan immediately in advance of the rollers 7 is of concave formation, as indicated at 26. In the operation of the device the player, through the medium of the motor 11, speeds the rotation of the ball 8 to such point as he finds by practice to yield the best results. During this speeding up of the ball it is held against any accidental dislodgment by the restraining rollers 20—20a. When the ball has reached the speed desired by the player it is aimed by the bodily shifting of the pan or carriage under the influence of the handle 13 and the ball is then ejected upon the alley by a sharp forward thrust and a quick stop of the pan or carriage. The forward momentum given to the ball by such quick thrust is sufficient, in conjunction with the forward turning movement of the ball under the action of roller 9 to lift the restraining rollers 20—20a and arm 17 and to permit the bowling ball to roll over the tapering forward end of the pan and upon the alley.

It is apparent that many ways will readily suggest themselves to the skilled engineer for carrying out the general objects herein described. I, therefore, wish it to be understood that the invention is not limited to the particular construction herein shown and described, because this illustration is intended to be illustrative of general principles susceptible of physical embodiment in many different ways. It is therefore to be understood that the invention includes within its purview whatever changes fairly come within either the terms or the spirit of the appended claims.

Having described my invention, what I claim is:

1. In a bowling apparatus, a manually shiftable carriage, capable of both bodily forward and lateral twisting motion, means carried by said carriage for receiving and supporting a bowling ball, and power means supported upon and bodily movable with the carriage and engageable with the surface of the ball for imparting rotation thereto in a substantially vertical plane and in the direction of proposed travel, while the ball is supported upon the carriage.

2. In a bowling apparatus, a manually shiftable carriage, means for mounting said carriage for both bodily forward and lateral twisting motion, means carried by said carriage for receiving and supporting a bowling ball, and power means supported upon and bodily movable with the carriage and engageable with the surface of the ball for imparting rotation thereto in a substantially vertical plane and in the direction of proposed travel, and a restraining element for holding the ball against movement away from the power means.

3. In a bowling apparatus, a manually shiftable carriage, means for mounting said carriage for both bodily forward and lateral twisting motion, means carried by said carriage for receiving and supporting a bowling ball, and power means supported upon and bodily movable with the carriage and engageable with the surface of the ball for imparting rotation thereto in a substantially vertical plane and in the direction of proposed travel, and a spring tending to move the ball toward the power means, said spring being of such tension and configuration that a bodily forward thrust and quick stop of the carriage and ball will release the ball from the spring and start it to travel along an alley under the bodily rotation imparted to it by the power means.

4. The combination with a carriage capable of free movement in all directions in a horizontal plane, of means carried by said carriage upon which a bowling ball may be supported for rotation, friction rollers engaging the surface of the ball, and power means for driving said friction rollers said friction rollers being mounted upon the carriage and being disposed in such planes as to rotate the ball in a substantially vertical plane and in the direction of proposed travel.

5. The combination with a carriage capable of free movement in all directions in a horizontal plane, of means carried by said carriage upon which a bowling ball may be supported for rotation, friction rollers engaging the surface of the ball, and power means for driving said friction rollers said rollers being disposed in such planes as to impart rotation to the bowling ball in a substantially vertical plane and in the direction of proposed travel, and a spring carrying an anti-friction member engaging the ball at a point in advance of its center for the purpose of restraining the ball against bodily forward movement.

6. The combination with a carriage capable of free movement in all directions in a horizontal plane, of means carried by said carriage upon which a bowling ball may be supported for rotation, friction rollers engaging the surface of the ball, and power means for driving said friction rollers said rollers being disposed in such planes as to impart rotation to the bowling ball in a substantially vertical plane and in the direction of proposed travel, and a spring carrying an anti-friction member engaging the ball at a point in advance of its center for the purpose of restraining the ball against bodily forward movement, said spring being of such configuration and tension as to yield and release the ball when the ball and carriage are thrust forwardly and suddenly stopped.

7. The combination with a wheeled pan-like carriage adapted to be rolled upon and turned to any position with respect to a bowling alley, of a pair of rollers mounted upon said carriage and adapted to engage the lower part of a bowling ball at each side of the latter and at a point in advance of its center, a friction roller supported from the carriage and engaging the bowling ball at a point in rear of its center, and a motor for driving said friction roller.

8. The combination with a wheeled pan-like carriage adapted to be rolled upon and turned to any position with respect to a bowling alley, of a pair of rollers mounted upon said carriage and adapted to engage the lower part of a bowling ball at each side of the latter and at a point in advance of its center, a friction roller supported from the carriage and engaging the bowling ball at a point in rear of its center, and a motor for driving said friction roller and rotative restraining means positioned to engage the upper portion of the bowling ball at a point in advance of its center.

9. The combination with a wheeled pan-like carriage adapted to be rolled upon and turned to any position with respect to a bowling alley, of a pair of rollers mounted upon said carriage and adapted to engage the lower part of a bowling ball at each side of the latter and at a point in advance of the center, a friction roller supported from the carriage and engaging the bowling ball at a point in rear of the center, a motor for driving said friction roller and rotative restraining means positioned to engage the upper portion of the bowling ball at a point in advance of its center, and spring means tending to move the rotative engaging means into engagement with the ball but yieldable to release the ball upon a quick forward thrust and sudden stop of the carriage.

10. A device of the character described comprising a pan-like wheeled carriage adapted to be turned in a horizontal plane over the surface of a bowling alley, a handle for manually manipulating said carriage, a pair of rollers located at opposite sides of the carriage and upstanding therefrom in a position to engage the lower portion of a bowling ball at a point in advance of the center thereof, a variable speed electric motor mounted upon the carriage, a friction roller driven from said motor and engaging the rear portion of the ball, said friction roller and motor being bodily shiftable with the carriage, an arm pivotally connected with the carriage and extending over the top of the ball to a point in

advance of the center of the ball, a pair of retaining rollers engaging the ball at a point in advance of a transverse vertical plane through the center of the ball and upon opposite sides of a longitudinal vertical plane through the center of the ball and tensioning means resisting upward movement of the free end of said arm.

11. The combination with a wheeled pan-like carriage adapted to be rolled upon and turned to any position with respect to a bowling alley, of a pair of rollers mounted upon said carriage and adapted to engage the lower part of a bowling ball at each side of the latter and at a point in advance of its center, a friction roller supported from the carriage and engaging the bowling ball at a point in rear of the center, and a motor for driving said friction roller, and guard arms projecting from the carriage and lying in proximity to the opposite sides of the ball at the horizontal axis thereof.

12. The combination with a wheeled pan-like carriage adapted to be rolled upon and turned to any position with respect to a bowling alley, of a pair of rollers mounted upon said carriage and adapted to engage the lower part of a bowling ball at each side of the latter and at a point in advance of its center, a friction roller supported from the carriage and engaging the bowling ball at a point in rear of its center, and a motor for driving said friction roller, said pan-like carriage comprising a tapering portion which extends forwardly of those rollers which support the lower forward portion of the ball and which serves to deliver the ball gently from the pan upon the bowling alley.

ORVILLE FELIX WHITTLE.