Nov. 15, 1960 R. H. JOHNSON 2,960,337

BOWLING PIN CLEANING APPARATUS

Filed Aug. 31, 1959 2 Sheets-Sheet 1

Fig. 1.

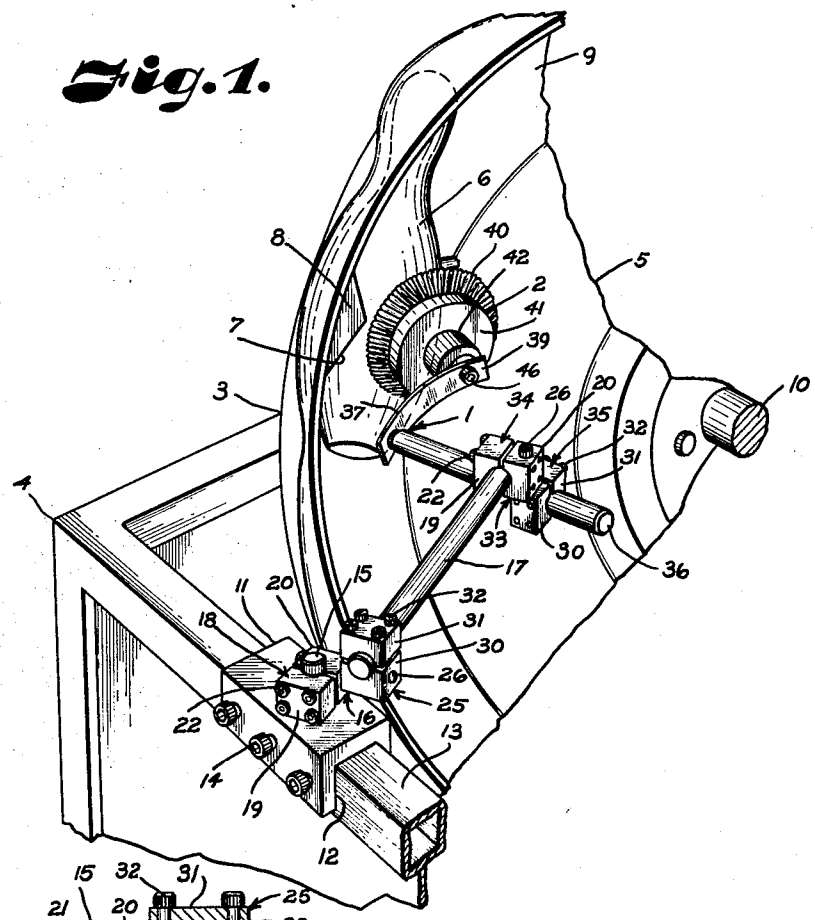


Fig. 3.

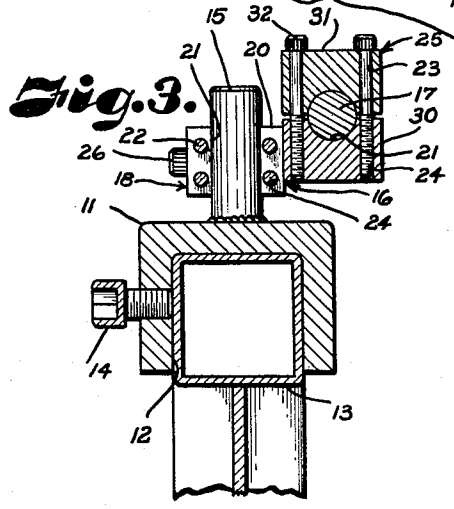
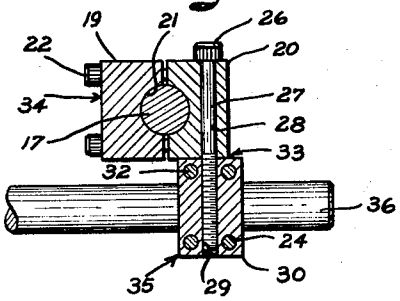


Fig. 4.



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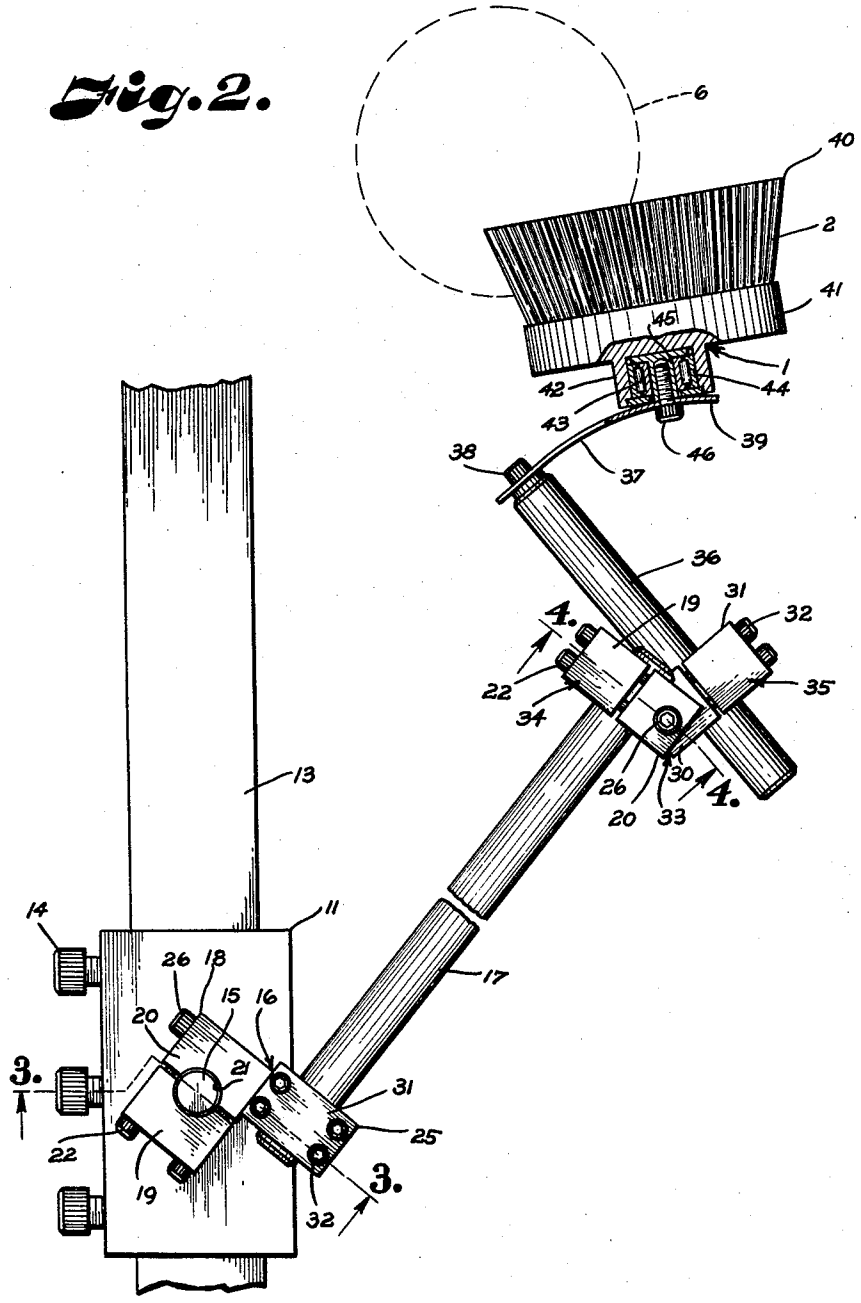
BY
Fishburn and Gold
ATTORNEYS.

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Fig. 2.



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BOWLING PIN CLEANING APPARATUS

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6 Claims. (Cl. 273—54)

This invention relates to improvements in bowling machines, and more particularly to a novel apparatus for cleaning bowling pins during operation of the machine.

Many present-day bowling establishments have machines for automatically removing fallen pins and resetting the pins in proper positions on the respective alleys. Even though care is exercised in endeavoring to maintain the alleys clean, there are deposits of dust and other material picked up by the ball when rolling down the alley, and some of the dust and other material is transferred to the bowling pins from the ball by the ball striking said pins. Also, the bowling pins in moving through the automatic pin-setting machines gather additional dirt and other material as a coating which gradually accumulates until the sounds from the ball striking the pins or the pins falling become less sharp and then it is usually said that the pins are dead. It is customary practice to remove the pins from the automatic pin-setters at periodic intervals and to scour said pins by hand to remove the accumulation of dirt and the like therefrom. This cleaning operation is time-consuming, and either requires that the alley be shut down or that the establishment have extra sets of pins to substitute during the cleaning operation. Automatic pin-setting machines presently in use have a setting frame supported over the end of the alley, and operable to move downwardly and deposit the pins in upright position on the alley at the required locations. When a bowling ball is rolled striking some of the pins which fall, the setting frame moves downwardly and picks up the standing pins, and the fallen pins are swept rearwardly onto a conveyor belt to a collecting station. Then the setting frame is lowered and those standing pins that were picked up are reset in their respective positions. During this time there is a second set of bowling pins positioned above the setting frame for movement therein for the next frame after all of the pins have been removed from the alley. As the pins are moved by the belt to a collecting station, they are picked up by a rotating wheel having ten positions for pins. When the second ball is rolled, all of the pins knocked down thereby, and any remaining standing pins, are swept back to the belt conveyor and conveyed to the collecting station, and then the second set of pins is moved to the setting frame and, in turn, deposited on the alley in their respective positions. The pins in the collecting station move into the pin positions on the wheel and are retained therein and rotated until the wheel positions are full, that is, ten pins positioned therein. After the wheel positions are all full, the mechanism is actuated whereby said pins are removed from the wheel and carried to the respective positions above the setting frame. The present invention brushes and cleans the pins as they are moved from the alley to the position above the setting frame as, for example, while being revolved in said rotating wheel.

The principal objects of the present invention are to provide an automatic pin-setting apparatus with a cleaning device to wipe or otherwise remove dirt deposits

from bowling pins as they are moved between selected positions in said machine; to provide such a cleaning apparatus wherein a rotatable brush is resiliently held in position to rotate against a portion of the surface of a bowling pin as it is moved in the automatic pin-setting machine; to provide an adjustable support for positioning the rotative brush relative to the path of the bowling pins whereby the engagement between the pins and brush effect rotation of the brush to clean the surface of said pins; and to provide a cleaning apparatus for use in automatic pin-setting machines for cleaning bowling pins that is economical to manufacture, easily installed and maintained to remove dirt deposits from the bowling pins during the operation of said machine.

Other objects and advantages of this invention will become apparent from the following description taken in connection with the accompanying drawings, wherein are set forth by way of illustration and example certain embodiments of this invention.

Fig. 1 is a partial perspective view of an automatic bowling machine with a cleaning device thereon embodying the features of the present invention.

Fig. 2 is a plan view of the cleaning device with a bowling pin shown in broken lines to illustrate the relative positioning of the brush and pin.

Fig. 3 is a vertical sectional view through the adjustable support for the cleaning device, taken on the line 3—3, Fig. 2.

Fig. 4 is a vertical sectional view through the adjustable support for the cleaning device taken on the line 4—4, Fig. 2.

Referring more in detail to the drawings:

1 designates a bowling pin cleaning apparatus which includes a brush or wiping member 2 adapted to engage surfaces of bowling pins as they are moved along a path of a bowling alley operating mechanism such as a bowling pin changing and spotting machine 3.

The bowling alley operating mechanism 3, as partially illustrated in Fig. 1, may be of conventional type presently used in bowling alleys for moving pins from the alley by means of conveying mechanism to a storage magazine wherein the pins are distributed for delivery to the pin-setting frame of pin-setting apparatus to be placed on the alley for the next play. An example of such a pin changing mechanism and bowling pin spotting machine is shown and described in the Strauss et al. Patent No. 2,786,679, issued March 26, 1957. Such machines have a frame or stationary supporting structure 4, and in the conveyor mechanism there is included a member 5 which receives bowling pins 6 in pockets or spaced positions 7 wherein they are retained by fingers 8 as they are moved through a portion of the path from the alley to pin-distributing mechanism that moves the pins to the positions thereof in the storage magazine. In the structure illustrated, the member 5 is a portion of the conveyor mechanism in the form of a wheel wherein the pins are collected until ten are arranged around the recessed portion 9 adjacent the periphery, said wheel being rotated by a shaft 10.

In the structure illustrated, a bracket 11 has an open way 12 in the lower portion thereof adapted to engage over a rail 13 of the frame or supporting structure 4 and secured thereon by suitable fastening devices such as set-screws 14. A post 15 is fixed on the bracket 11 and extends therefrom to provide a supporting member for the brush-carrying structure. A double clamp member 16 is arranged to be clamped on the post 15 and to adjustably carry an arm 17 at a selected angle thereto. The clamp portion 18 secured to the post 15 includes two halves 19 and 20 having adjacent portions provided with grooves 21 adapted to engage the post and be tightly held thereon by means of clamping screws 22 which ex-

tend through bores 23 in the member 19 and are threaded in threaded bores 24 in the member 20. The other portion 25 of the double clamp is substantially the same construction as the portion 18, and the portions 18 and 25 are pivotally connected by a fastening device 26 such as a screw having a shank 27 extending through a bore 28 in the member 20 with a threaded end on said shank being screwed into a threaded bore 29 in the clamp half 30 of the portion 25. The arm 17 is adjustaby mounted in the portion 25 and is secured in selected position by being clamped between the members 30 and 31 by means of clamp screws 32. The double clamp may be selectively positioned by loosening the screws 22 to swing said double clamp to selected position about the post 15 and the screw retightened. The portion 25 can be swiveled relative to the portion 18 by loosening the screw 26 for pivotal movement, as, for example, up and down movement of the arm 17 to selective position, and the screw 26 retightened to secure same in place. The extension of the arm 17 from the portion 25 may be adjusted by loosening the screws 32 and moving said arm through the clamp portion, and the screws 32 retightened to hold the arm in selected position.

At the other end portion of the arm 17, which is preferably a cylindrical rod, there is a second double bracket 33 which is of the same structure as the double bracket 16, with one portion 34 being secured to the arm 17 and the other portion 35 supporting a second arm or extension member 36 whereby the arms 36 and 17 may be adjusted to any angular relationship by selective positioning of the clamp portions 34 and 35.

A flexible arm 37, as, for example, a flat spring, is carried by the second arm or extension 36, and, in the illustrated structure, said flexible arm is secured at one end of the extension 36 by means of a suitable fastening device such as a screw 38 whereby said flexible arm has a portion 39 with free resilient movement relative to the arm extension 36.

The brush 2 is rotatably mounted and positioned on the flexible arm in such a manner that the brush elements or bristles 40 extend toward the bowling pin path and engage the bowling pin surfaces as the pins are moved thereby. In the structure illustrated, the brush has a head 41 provided with an extension 42 having bearing members 43 in an axial bore 44 thereof for rotatably mounting the brush on a shaft 45 that is secured to the flexible arm by means of a suitable fastening device such as a screw 46. The brush is preferably mounted whereby the bristles at one side of the axis of rotation of the brush engage the surface of the bowling pins as they are moved past said brush and held in the pockets of the conveyor whereby said brush will engage said bowling pin surfaces and wipe same. The engagement of the brush with the bowling pin being off-center from the axis of rotation of the brush will cause the brush to rotate giving a further wiping action to aid in removing dirt and other material from the bowling pin surfaces.

In the movement of bowling pins through the conveying mechanism from the pin in-play position to pin out-of-play position or storage, the bowling pins have no selective position relative to the surface that is exposed when the pins are held in the pockets of the conveying mechanism. Therefore, each time the pins are moved from the alley to the place of storage or magazine, there will be different portions of the pin surface exposed and engaged by the brush so as to progressively clean all of the surfaces of the pins.

The particular arrangement of the brush-carrying arms may be varied in accordance to particular structural variations thereof of pin-setting apparatus and the desired portion of the path of the pins during which the brush is desired to engage same, and it should be understood that the brackets may be such that it can be mounted on any stationary member of the bowling alley apparatus. Also, the clamps and arms, as illustrated, provide a wide variety of positions and adjustments of the brush whereby the mounting illustrated can be used on various positions of conventional machines, and some of the adjustable portions can be eliminated, as, for example, the arm extension 36 can be placed in the clamp member 25 and the arm 17 eliminated, and the resulting structure would still provide the flexible arm for the resilient mounting of the brush relative to the pins whereby the brush will move over the contour of the pins both from the small upper portion to the large lower portion of the bowling pins.

It is to be understood that while I have illustrated and described one form of my invention, it is not to be limited to the specific form or arrangement of parts herein described and shown except insofar as such limitations are included in the claims.

What I claim and desire to secure by Letters Patent is:

1. In a bowling alley operating mechanism having a stationary member and conveyor mechanism moving bowling pins from pin in-play position to a pin magazine which receives bowling pins for the next play, said conveyor mechanism having pin-receiving and holding portions in which the bowling pins have a substantial exposed surface as said pins are moved along their path of travel, a bowling pin cleaning device comprising a flexible arm, means on said stationary member adjustably mounting said arm for selective movement toward and away from said path of travel, a brush, means rotatably mounting said brush on said flexible arm with brush-wiping members extending from the axis of rotation whereby said brush-wiping members at one side of said axis extend into the path of the bowling pins and engage exposed surfaces thereof as they pass the brush and said engagement effects rotation of said brush to clean said engaged bowling pin surfaces.

2. In a bowling alley operating mechanism having a stationary member and conveyor mechanism moving bowling pins from pin in-play position to a pin magazine which receives bowling pins for the next play, said conveyor mechanism having pin-receiving and holding portions in which the bowling pins have a substantial exposed surface as said pins are moved along their path of travel, a bowling pin cleaning device comprising, an arm, means on said stationary member adjustably mounting said arm for selective movement toward and away from said path of travel, a flexible arm carried by said first-named arm for free resilient movement of a portion of said flexible arm, a brush, means rotatably mounting said brush on said free portion of said flexible arm with brush-wiping members extending from the axis of rotation whereby said brush-wiping members at one side of said axis extend into the path of the bowling pins and engage exposed surfaces thereof as they pass the brush and said engagement effects rotation of said brush to clean said engaged bowling pin surfaces.

3. In a bowling alley operating mechanism having a stationary member and conveyor mechanism moving bowling pins from pin in-play position to a pin magazine which receives bowling pins for the next play, said conveyor mechanism including a portion having pin-receiving and holding pockets in which the bowling pins have a substantial exposed surface as said pins are moved along their path of travel, a bowling pin cleaning device comprising, a bracket secured to said stationary member adjacent the path of travel of said bowling pins in said conveyor pockets, an arm, means on said bracket adjustably mounting said arm for selective movement toward and away from said path of travel, a flexible arm carried by said first-named arm for free resilient movement of a portion of said flexible arm, a brush, means rotatably mounting said brush on said free portion of said flexible arm with brush-wiping members extending from the axis of rotation whereby said brush-wiping members at one

side of said axis extend into the path of the bowling pins and engage exposed surfaces thereof as they pass the brush and said engagement effects rotation of said brush to clean said engaged bowling pin surfaces.

4. In a bowling pin changing and spotting machine having a frame, a pin in-play position and a pin out-of-play station and a conveyor with a plurality of pin-receiving and holding pockets in which said pins are moved along a path of travel from said pin in-play position to said pin out-of-play station, said bowling pins having a substantial exposed surface as they are moved along their path of travel, a bowling pin cleaning apparatus comprising, a shaft, a brush rotatably mounted on said shaft at one end of and axially thereof, a flexible arm, means mounting the shaft on said flexible arm, and means connected to said flexible arm remote from said shaft and adjustably mounted on the frame of the machine for moving the brush to position same with the brush elements in the path of the bowling pins whereby as said pins are moved along said path they are engaged by said brush and the engagement effects rotation of said brush to clean said engaged bowling pin surfaces.

5. In a bowling alley operating mechanism having a stationary member and conveyor mechanism moving bowling pins from pin in-play position to a pin magazine which receives bowling pins for the next play, said conveyor mechanism including a portion having pin-receiving and holding pockets in which the bowling pins have a substantial exposed surface as said pins are moved along their path of travel, a bowling pin cleaning device comprising, an arm, means on said stationary member adjustably mounting said arm for selective movement toward and away from said path of travel of said bowling pins, a resilient flexible arm carried by said first-named arm for free resilient movement of a portion of said flexible arm, said portion of said flexible arm being biased toward the path of the bowling pins, a brush, means mounting said brush on said biased portion of said flexible arm with brush-wiping members extending into the path of the bowling pins to resiliently and movably engage and clean exposed surfaces of the bowling pins as they move by the brush in said path of travel.

6. In a bowling pin changing and spotting machine having a frame, a pin-in-play position and a pin-out-of-play station and a conveyor with a plurality of pin-receiving and holding pockets in which said pins are moved along a path of travel from said pin-in-play position to said pin-out-of-play station, said bowling pins having a substantial exposed surface as they are moved along their path of travel, a bowling pin cleaning apparatus comprising, a shaft, a brush rotatably mounted on said shaft at one end of and axially thereof, an arm, means mounting the shaft on said arm, mounting means adjustably connected to said arm remote from said shaft for selective swinging and longitudinal movement of said arm thereon, and means adjustably mounting said mounting means on the frame of the machine whereby the said mounting means and arm are movable to position the brush with the brush elements at one side of the axis of rotation of the brush extending into the path of the bowling pins and engaging exposed surfaces thereof as said pins pass the brush in their movement along said path and said engagement effects rotation of said brush to clean said engaged bowling pin surfaces.

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