

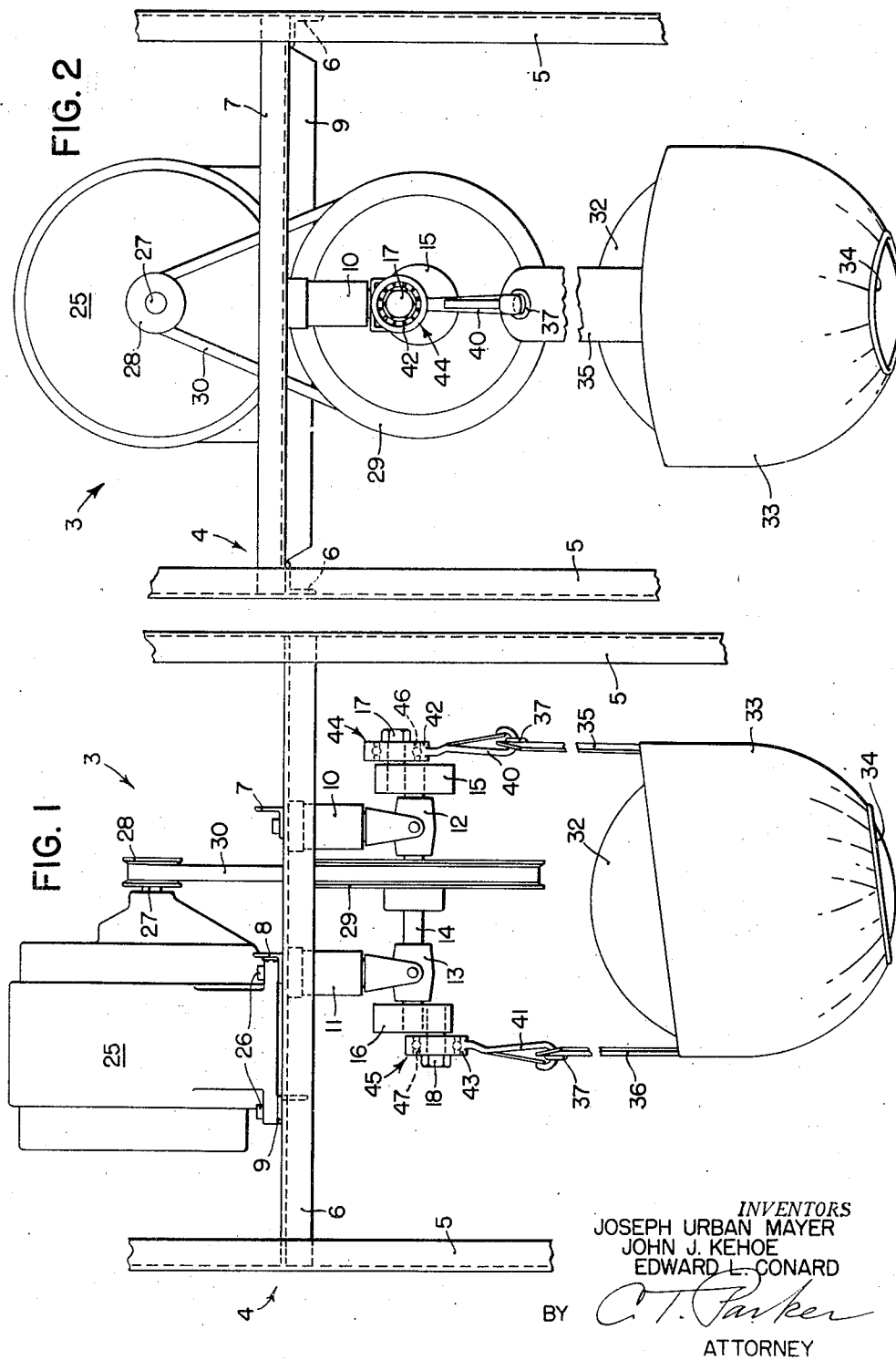
Jan. 3, 1950

J. U. MAYER ET AL

2,493,681

BALL CLEANING MACHINE AND METHOD

Filed Aug. 9, 1946



UNITED STATES PATENT OFFICE

2,493,681

BALL CLEANING MACHINE AND METHOD

Joseph Urban Mayer, John J. Kehoe, and
Edward L. Conard, Waterloo, Iowa

Application August 9, 1946, Serial No. 689,600

6 Claims. (Cl. 134—6)

1

The present invention relates generally to ball cleaning devices and more particularly to machines for cleaning and polishing bowling balls and the like, and has for its principal object the provision of a novel and improved ball cleaning machine that is simple and inexpensive to manufacture, but durable and efficient in operation.

Heretofore, ball cleaning machines have usually operated on the principle of holding the ball in contact with a high speed rotary brush, or rotating the ball in contact with a stationary brush. Either of these two methods requires a considerable amount of power and a certain amount of hazard is involved due to the high speed rotating parts. It is, therefore, another object of our invention to provide a machine which operates on an entirely different principle utilizing oscillatory movements of comparatively short extent together with a slowly rotative movement of the ball to insure that the entire surface is polished uniformly and thoroughly.

These and other objects and advantages of our invention will be apparent to those skilled in the art after a consideration of the following description, taken in conjunction with the drawings appended hereto, in which

Figure 1 is an elevational front view of a ball cleaning and polishing machine embodying the principles of our invention, portions of the frame being broken away to simplify the drawing; and

Figure 2 is an elevational side view of the machine.

Referring to the drawings, the ball cleaning and polishing machine is indicated in its entirety by reference numeral 3, and includes a structural supporting frame 4, comprising four vertical corner angle members 5 interconnected by horizontal angle members 6. Other angle members 7, 8, 9 are rigidly secured between the horizontal members 6. Complete details of construction of the frame are not deemed necessary to this description. The frame may be enclosed by suitable panel enclosures if desired, as will be evident to those skilled in the art.

A pair of depending bearing supports 10, 11, are fixed to two of the frame members 7, 8, respectively, and carry coaxially disposed bearings 12, 13 at their lower ends. A rotary power shaft 14 is journaled in the bearings and projects outwardly beyond the latter. A pair of disks or wheels 15, 16 are rigidly secured to the oppositely projecting ends of the power shaft 14, respectively. Each of the disks carries a crank pin 17, 18 in the form of a cap screw disposed parallel to the power shaft 14 and offset radially from the

2

latter. One of the crank pins 18 is offset a greater distance from the axis of the power shaft than the other 17 so that the crank pins 17, 18 rotate in orbits of relatively different diameters for reasons which will be explained. The crank pins 17, 18 are also spaced angularly from each other, preferably 180 degrees apart.

Power for driving the shaft 14 is obtained from a suitable drive means in the form of an electric motor 25, mounted on the frame members 8, 9 and rigidly secured thereto by bolts 26. The motor shaft 27 is disposed with its axis parallel to the axis of the shaft 14 and the shafts carry a pair of driving and driven sheaves 28, 29, rigidly mounted thereon, respectively, and interconnected by a power transmitting V-belt 30. The driven sheave 29 is fixed to the shaft 14 between the two bearings 12, 13.

The bowling ball 32 to be cleaned is received within a concave sling in the form of a flexible bag 33, preferably made of strong, durable fabric, such as canvas, lined with a soft material, preferably Turkish toweling or the like. The bag conforms to the shape of the bowling ball 32 and is provided with a hole 34 in the bottom of comparatively small diameter to facilitate removing the ball from the bag. The hole 34 is edged with a hem and the bag is formed to slidably embrace the lower hemisphere of the ball, the upper portion of the bag being open to receive the ball.

The bag 33 is supported by a pair of suspending members in the form of canvas straps 35, 36, secured to the bag in diametrically opposed relation. The upper ends of the straps are provided with apertures reenforced by grommets 37 adapted to receive snap hooks 40, 41, respectively. The snap hooks are fixed, as by brazing, to the outer races 42, 43, of a pair of ball bearings 44, 45, respectively. The inner races 46, 47 of the bearings 44, 45 are mounted on the crank pins 17, 18, respectively.

A ball is cleaned by placing it in the bag 33 and starting the motor 25, rotating the power shaft 14 and the crank pins 17, 18, which raise and lower the strap supports 35, 36 alternately. Inasmuch as the ball 32 is of considerable weight, the inertia of the ball restrains it from being oscillated with the bag, thereby effecting an oscillatory movement of the latter relative to the ball, with a rubbing or polishing effect of the lining of the bag on the surface of the lower hemisphere of the ball.

The greater throw or radius of orbit of the crank 18 imparts a vertical reciprocation of the

3

suspending strap 36 which is of greater extent than that of the other strap 35, which causes a gradual rotation of the ball relative to the bag, thereby insuring a thorough polishing of the entire surface of the ball, after which the polished ball can easily be removed from the bag by pushing it upwardly by inserting one hand through the hole 34 and lifting it out by the other hand. Preferably, the straps 35, 36 are made of sufficient length to permit the ball to be removed from the bag without detaching the straps from the hooks 40, 41.

The ball can be polished merely with a clean dry bag lining, although we have obtained good results by applying wood alcohol and carbon tetra-chloride to the lining as cleaning agents. Prepared cleaning agents are also obtainable on the market.

Although the dimensions and proportions of the machine can be varied to some extent, we have found that satisfactory results can be obtained by constructing the cranks with radii of $\frac{1}{8}$ inch and $\frac{5}{8}$ inch, respectively, and driving the power shaft 14 at 400 R. P. M. This can be accomplished with a motor of $\frac{1}{2}$ or $\frac{3}{4}$ horsepower rating. Thus, it is evident that a machine of this type has no parts which rotate at high speeds, except the motor itself, the polishing action being obtained by oscillatory movements of the bag of comparatively small extent, resulting in low power requirements and without hazard to the ball or the operator.

We do not intend our invention to be limited to the particular details shown and described here, except as set forth in the claims which follow.

We claim:

1. A ball cleaning device comprising a receptacle having a concave surface adapted to receive and slidably embrace a ball, a plurality of suspension members attached to said receptacle in peripherally spaced relation, and means for alternately reciprocating said suspension members vertically to shift the receptacle relative to the ball, said means being adapted to reciprocate said members through different extents of movement to effect a progressive rotary movement of the ball relative to the receptacle.

2. A ball cleaning device comprising a flexible bag adapted to receive and slidably embrace a ball, a pair of diametrically opposed suspension members attached to said bag, and means for alternately jerking said suspension members upwardly through unequal extents of movement to oscillate the bag in rubbing contact with the ball and to effect a progressive rotary movement of the ball within the bag.

3. A ball cleaning device comprising a flexible bag adapted to receive and slidably embrace a ball, a pair of diametrically opposed suspension members attached to the edge of said bag, a rotary power shaft, a pair of angularly spaced cranks mounted on said shaft for rotation therewith, and means connecting said suspension members with said cranks, respectively, said cranks having relatively different radial lengths to effect a non-uniform oscillatory movement of said bag relative to the ball to impart to the latter a progressive rotary movement.

4

4. A ball cleaning device comprising a frame, bearing means mounted on said frame, a horizontally disposed rotary shaft journaled in said bearing means, a pair of axially spaced cranks mounted on said shaft in angularly spaced relation to each other, one of said cranks being radially longer than the other, drive means mounted on said frame and connected to said shaft for rotating the latter, a bag for receiving a ball and slidably embracing the latter, a pair of diametrically opposed suspension members attached to said bag, and means for hanging said suspension members on said cranks, respectively.

5. A ball cleaning device comprising a supporting frame, a pair of coaxial bearings mounted thereon in axially spaced relation, a rotary shaft journaled in said bearings, a motor mounted on said frame and having a drive shaft substantially parallel to said rotary shaft, power transmitting means disposed between said bearings connecting said motor shaft and said rotary shaft, a pair of radially opposed cranks mounted at relatively opposite ends of said shaft, respectively, a flexible ball receiving bag disposed beneath said shaft and having an interior polishing surface adapted to slidably embrace a ball, a pair of suspension straps attached to diametrically opposite sides of said bag, and means for hanging said straps from said cranks, respectively, said cranks having relatively different radial lengths to effect a non-uniform oscillatory movement of said bag during rotation of said shaft to impart a rotation of said ball in said bag.

6. The method of cleaning a ball comprising placing the ball in a flexible bag having an interior polishing surface embracing the ball, suspending the bag from two diametrically opposed points on the mouth thereof, and reciprocating the points of suspension vertically and alternately and through relatively different extents of movement to impart an oscillatory movement of the bag relative to the ball and to effect a progressive rotation of the ball relative to the bag.

JOSEPH URBAN MAYER.
JOHN J. KEHOE.
EDWARD L. CONARD.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

55	Number	Name	Date
	892,104	Whelan	June 30, 1908
	1,025,781	Broussard	May 7, 1912
	1,352,138	McCray	Sept. 7, 1920
	1,430,786	Blunt	Oct. 3, 1922
60	1,602,016	Hamilton	Oct. 5, 1926
	1,759,075	Wahl	May 20, 1930
	2,035,014	Schaefer	Mar. 24, 1936
	2,405,344	Cloutier	Aug. 6, 1946
65	2,426,249	Taylor	Aug. 26, 1947

FOREIGN PATENTS

	Number	Country	Date
	29,224	Great Britain	1912
70	108,314	Australia	Aug. 17, 1939