UNITED STATES PATENT OFFICE

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TUMBLING AND AGITATING MACHINE

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8 Claims. (Cl. 68—17)

This invention relates to tumbler and agitating machines and has for one of its objects to provide a simple and inexpensive apparatus which is well adapted for use as a washing machine and consists of comparatively few parts in a compact arrangement having less bulk than tumbling machines as heretofore made and which is characterized by a novel form of tumbler or washing bowl movable body in a particular manner to assure a most effective tumbling and agitating action of clothes and other material contained therein.

Another object is to provide a machine such as described in which a track carried by a freely and universally movable tumbling bowl provides for a turning, twisting and irregular movement of the bowl such that a most effective tumbling and agitating action is assured.

Another object is to provide in a machine a new and highly efficient drive means for driving a spherical tumbling bowl having a track on the exterior thereof which is suspended freely from a simple rotary driving means which, while supporting the bowl provides for turning it in a path corresponding to that of the track.

Another object is to provide a machine wherein a spherical and body movable bowl having fixed surfaces are used as an endless track extending over and conforming to the curvature of the outer surface of the bowl makes it possible to suspend the bowl from a rotary drive means which will turn it in accordance with the path of the endless track and thereby produce a motion which will assure a most efficient tumbling and agitating action with a lesser number of parts and elements than heretofore employed in similar machines.

Yet another object of the invention is to provide a machine of the character next above described wherein endless tracks curved to extend partly around the bowl and of varying shapes or contours may be applied to the same bowl and drive means to achieve a variety of irregular motions whereby the material therein will be most effectively tumbled and agitated.

With the foregoing objects in view, together with such other objects and advantages as may subsequently appear, the invention resides in the parts and in the combination, construction and arrangement of parts hereinafter described and claimed, and illustrated by way of example in the accompanying drawing, in which:

Fig. 1 is a side elevation of a machine embodying the present invention and showing in dotted lines one form of housing which may be employed as well as schematically indicating that the housing constitutes a support for the motor and drive means;

Fig. 2 is a top plan view of the machine as shown in Fig. 1, with the housing broken away and shown in part in dotted lines;

Fig. 2a is a fragmentary sectional view showing how the drive means is engaged with the track;

Fig. 3 is an elevational view of the bowl removed from the drive means and housing and looking directly toward the closure for the bowl as when in the position shown in Fig. 1;

Fig. 4 is a vertical sectional view of the bowl as shown in Fig. 3;

Fig. 5 is an enlarged fragmentary elevational view looking in the direction of the arrows on the line 5—5 of Fig. 1;

Fig. 6 is a schematic view showing a modified form of track; and

Fig. 7 is a schematic view showing another modified form of track.

One embodiment of my invention as shown in the accompanying drawing generally includes a tumbling bowl A preferably of spherical form, a track B mounted on the exterior of the bowl and preferably curved, substantially in conformity with the portion of the bowl over which it extends, a drive and supporting means C by which the bowl is supported and by means of which the bowl is turned in a path conforming to that of the track; and a suitable housing D (shown in dotted lines) for enclosing and supporting the drive and supporting means C and partially enclosing the bowl.

In accordance with this invention the drive means, including a motor such as the electric motor E shown in Figs. 1, 2 and 5, serves the purpose of supporting the bowl and turning the bowl with a motion in a direction dependent upon the formation of the track which latter as here shown is endless. This endless track when shaped to conform to the curvature of portions of the bowl over which it extends may take the form of a series of connected U-shaped portions with substantially parallel sides and disposed to embrace about two-thirds of the circumference of the bowl as shown in Figs. 1 and 2, or may be variously shaped, for example, as indicated in Figs. 6 and 7 where the tracks are shown of somewhat hour-
glass shape with the opposite portions or sides curved inward and outward in S form. These shapes may be varied as desired provided the track conforms more or less to the shape of the portions of the bowl over which the tracks extend or is curved to partly embrace the bowl, whereby on rotation of the drive means the bowl will turn in accordance with the path of the track and thereby give the bowl a movement which will effectively tumble the material therein and produce a quick and thorough washing action when used to wash clothes. In fact the bowl could be of various shapes provided the tracks as here shown are arranged to embrace or extend partly around the bowl.

The track B as here shown is welded to the bowl A but may be fixed thereto in any suitable manner and arranged to encompass greater or less portions of the bowl than here shown dependent on the amount of motion which it is desired to impart to the bowl.

As here shown the bowl A is provided between opposite portions of the track B with a circular opening 8 allowing access to the interior thereof. A closure 9 for said opening is supported by means of a hinged bar 10 being secured to the closure by means of a suitable fastening 11. A suitable latch member 12 cooperating with the free end 13 of the bar 10 serves to hold the bar in position to seat the closure over the opening 8, there being a sealing means 14 between the rim of the opening and the closure. Any suitable baffle means such as the baffles F may be provided interiorly of the bowl.

The bowl A is provided with a suitable drain opening 15 normally closed by a spring loaded valve means 16 operable on the exterior of the bowl.

The drive and supporting means C including the motor E is supported on a bracket structure 17 in turn supported by the housing D, the dotted line at 18 indicating diagrammatically a suitable bracket support afforded by the housing. Bearings 19 on the bracket 17 support like parallel shafts 20 which are driven or rotated simultaneously in the same direction by means of like gears 21 on said shafts arranged to mesh with gears 22 on a shaft 23 which latter is journaled in the bracket 17 and driven by means of pulleys 24 and 25 on the motor E and shaft 23 respectively and a belt 26 extending around said pulleys.

The like shafts 20 forming a part of the drive means C extend horizontally in spaced parallel relation to one another to points at the front of the housing D and at their outer ends are provided with like friction drive wheels 27 which are engaged with the track B so as to support the bowl A as indicated in Fig. 1.

As here shown the track A is channel-shaped in cross section and the drive wheels 27 fit within it as shown in Figs. 1, 2 and 2a, whereby not only is the bowl given a balanced support but is subject to being turned when the shafts 20 and wheels 27 fixed thereto are correspondingly rotated. The weight of the bowl assures an effective and safe friction drive providing possible slipage without damage to the drive mechanism and motor in case the bowl is overloaded.

Fig. 1 shows how the bowl A is normally suspended by means of the track B and drive means C, the bowl being free but prevented from tilting by the dual drive and supporting wheels 27 (see Fig. 2). In the position the closure 8 is below the top center of the bowl and presented so as to be readily accessible in front of the housing D.

The bowl may be loaded and the contents removed therefrom in easy fashion when in the position shown in Fig. 1. The usual switch means for the motor or any other suitable starting and stopping means (not shown) may be employed to make it possible to bring the bowl A to the loading and unloading position shown in Fig. 1. In this position the drain opening is at the lowermost point on the bowl and ready access to the drain valve is afforded. In fact the bowl may be readily manually shifted to the position shown in Fig. 1 or to any other position and as readily lifted off the drive means and replaced.

As shown in Fig. 6 diagrammatically a bowl 30 corresponding to the bowl A may be provided with an endless track 31 which is applied thereto in the same manner as shown in Figs. 1 to 5 but is somewhat hour-glass shaped with S-shaped sides instead of the parallel sides shown in Figs. 1 to 5. This will provide a more irregular motion and greater agitation of the material in the bowl.

Another modified form of endless track 32 on a bowl 33 corresponding to bowl A is shown in Fig. 7, this track having a more pronounced irregular movement and agitation.

While I have shown and described specific embodiments of my invention, I do not limit myself to the exact details of construction set forth, and the invention embraces such changes, modifications and equivalents of the parts and their arrangement and combinations as come within the purview of the appended claims.

I claim:

1. In a tumbling and agitating machine, a substantially spherical bowl having an opening affording access to the interior thereof, a closure member for said opening, an endless track fixed upon the outer surface of said bowl, and having a drive means engaging surface overlying the exterior of said bowl, a support, and driving means carried by said support including rotary means engageable with said surface of said track so that the bowl is freely suspended from said drive means and will be moved in a path corresponding to that of the track during operation of said drive means.

2. In a tumbling and agitating machine, a hollow bowl having an opening affording access to the interior thereof, a closure member for said opening, an endless track describing an irregular path fixed upon and having a portion spaced from and overlying the outer surface of said bowl, a support, and driving means carried by said support including a drive wheel drivingly contacting said portion of said track so that the bowl is suspended therefrom and will be moved in a path corresponding to that of the track during rotation of said rotary means, said track substantially conforming to the curvature of that part of the bowl on which it is mounted.

3. In a tumbling and agitating machine, a support, a rotary drive means carried by the support and including a friction drive wheel, an endless track of irregular contour suspended from said drive means in frictional contact with said drive wheel so as to turn in a circular path upon rotation of the drive wheel, and a bowl fixed to said track to turn therewith.

4. In a tumbling and agitating machine, a support, a motor thereon, a rotary drive means operated by said motor including a pair of rotary shafts, friction drive wheels on said shafts, an endless track of irregular contour and having a channel in which said wheels are disposed so that the track is freely suspended from said wheels.
subject to being turned responsive to rotation of said wheels, and a bowl fixed to said track for movement therewith.

5. In a tumbling and agitating machine, a support, a motor thereon, a rotary drive means operated by said motor including a pair of rotary shafts, friction drive wheels on said shafts, an endless track suspended from said wheels so that it will be moved responsive to rotation of said wheels, and a bowl supported by said track for movement therewith, said track being curved and extended only partly around said bowl.

6. In a tumbling and agitating machine, a support, a motor thereon, a rotary drive means operated by said motor including a pair of spaced apart parallel rotary shafts, friction drive wheels on the outer ends of said shafts, an endless track having a channel in which said wheels are disposed so that the track is freely suspended from said wheels subject to being moved responsive to rotation of said wheels, and a hollow container supported by said track subject to movement therewith, said container being substantially spherical, said track being curved so as to extend only partly around said container substantially in conformity to the curvature thereof.

7. In a tumbling and agitating machine, a drive means including a rotary driving wheel, an endless track of irregular contour suspended from said drive means in driving contact with said drive wheel so as to turn in a circuitous path on rotation of said wheel and a tumbling bowl fixed to said track to turn therewith.

8. In a tumbling machine, a rotary driving wheel, an endless track of irregular contour drivingly suspended from said wheel so as to turn in circuitous path upon rotation of said wheel and a tumbling container fixed to said track to turn therewith and being embraced by said track.

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