Dec. 4, 1934. L. E. WERNER 1,982,847

MIXING MACHINE

Filed April 1, 1932

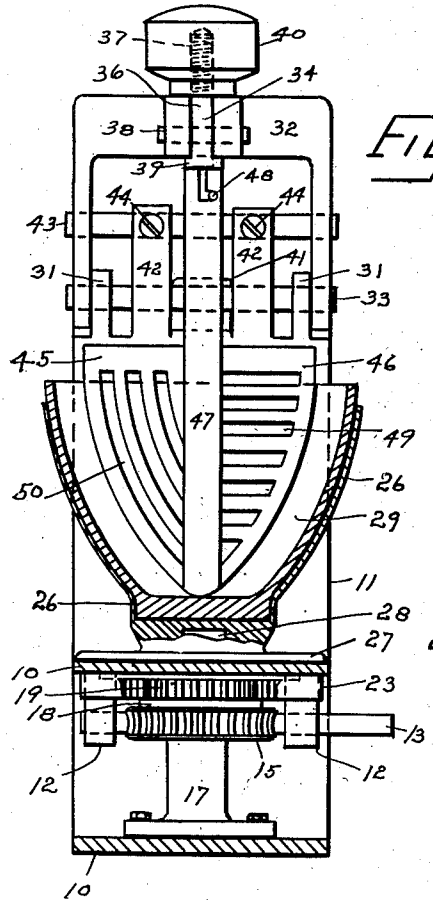


Fig 1

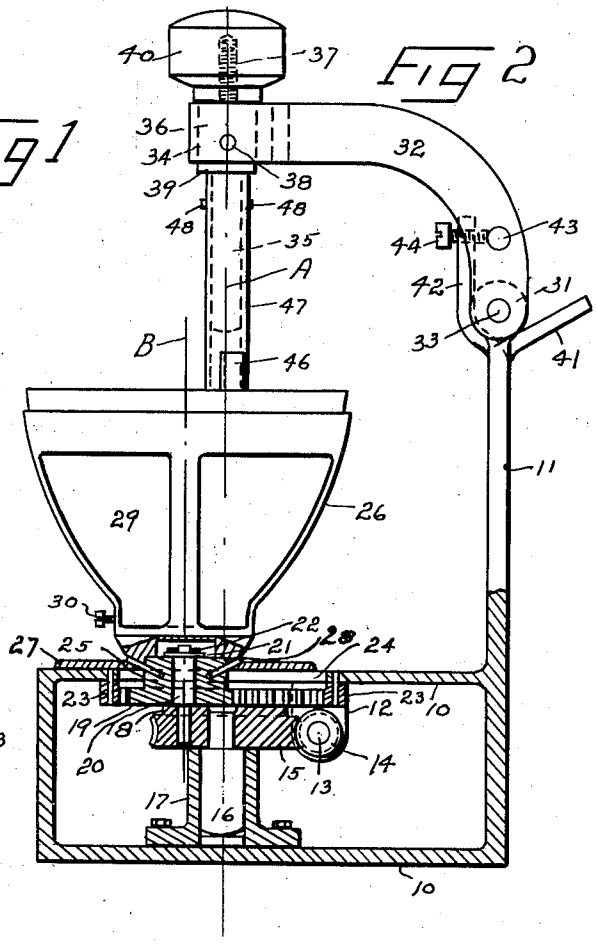


Fig 2

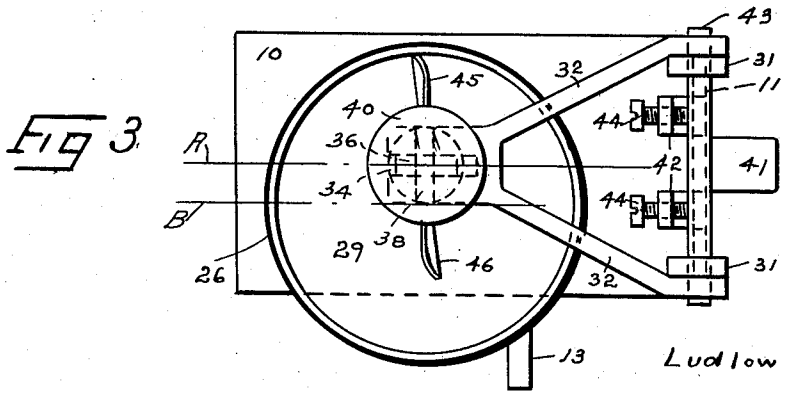


Fig 3

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MIXING MACHINE

Ludlow E. Werner, Brooklyn, N. Y.

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3 Claims. (Cl. 259—88)

The invention relates to mixing machines and has for its main object to provide a machine in which a novel movement is imparted to the rotary member, causing a very thorough and very rapid mixing of the ingredients operated on. Another object is to provide a paddle of a novel construction which will further aid in the rapid and thorough mixing of the ingredients. A further object is to provide a machine which may be used for mixing a great variety of substances, and a still further object is to provide a mixing machine of simple and strong construction, easy to clean, which requires only a small amount of power for its operation, and which can be manufactured at a comparatively low price.

These and various other objects and advantages will be readily understood from the following description and from the accompanying drawing of a preferred embodiment of the invention in which, however, modifications may be made without departing from the scope of the appended claims. In the drawing

Fig. 1 is a front elevation of the preferred embodiment shown partly in cross-section,

Fig. 2 a side elevation also shown partly in cross-section, and

Fig. 3 a plan view.

Referring now to all the views, simultaneously, the machine is mounted on a box-shaped base or frame 10 having an upwardly extending rear member 11. A pair of bearings 12 support the main shaft 13 on which a worm 14 is secured. This worm meshes with a worm gear 15 which is rigidly secured on a short, vertical shaft 16 which rotates in a bearing 17 mounted on the frame. The worm gear is constructed with a shoulder 18 on which a pinion 19 is eccentrically mounted on a pin 20 which is riveted in the worm gear. A washer 21 and pin 22 prevent displacement of the pinion. The pinion 19 meshes with an internal gear ring 23 which is securely pinned to the underside of the upper member of the frame 10. A circular opening 24 is cut in the frame, concentric with the gear ring, and a boss 25 which is formed on the pinion 19 extends upwardly through this opening.

A bowl holder 26 is provided with a flange 27 and a recess 28 in which the boss 25 fits tightly. The bowl holder is pinned to the boss so as to turn with it, and the flange is of sufficient size to cover the opening 24. A mixing bowl 29 is inserted in the holder 26. While I find that friction alone will prevent it from turning in the holder, suitable securing means may be used. For example, a screw may be employed as shown at 30.

The upper end of the rear member 11 terminates in lugs 31 and to these a paddle frame 32 is hinged by means of a pin 33. This frame, which is bifurcated at the rear, extends upwardly and forwardly and is provided with an open slot 34 at its front end. A rod 35 is provided with a flattened part 36 near its upper end and a threaded portion 37 at its extreme upper end. The flattened part is inserted in the slot 34 and hinged therein by means of a pin 38. Shoulders 39 are formed at the lower end of the flattened part and an internally threaded knob 40 is placed on the thread 37. A stop 41 limits the upward movement of the frame 32, while stops 42 limit its downward movement by engaging with a rod 43 which extends across the frame. The stops 42 are provided with screws 44 for adjusting the downward movement of the frame.

The paddle consists of two oppositely disposed blades 45 and 46 to which a tubular shaft 47 is secured. This shaft fits snugly on the rod 35 and is held in place by bayonet joints 48. One of the blades is preferably made with horizontal slots 49, while the other blade is made with substantially, vertical slots 50.

The machine operates in the following manner: Power is imparted to the main shaft 13 by any suitable means, as for example an electrical motor. As this shaft turns the worm 14 rotates the worm gear 15 which consequently rotates the pinion 19 on the circle described by the eccentrically-located pin 20. As this pinion meshes with the teeth of the internal gear ring 23 it is also rotated on the pin 20, thus imparting two motions to the pinion. In Figs. 2 and 3 the center axis of the paddle is shown at A, while the center axis of the pinion 19, in the particular position shown, is indicated at B. From this it will be seen that the bowl 29, which through the bowl holder 26 is attached to the pinion, not only rotates on its axis B but that this axis also revolves around the axis A of the paddle.

As the paddle is stationary the material contained in the bowl is forced against it and part of the material is forced, alternately, through the slots 49 and 50. As these slots extend in different directions the material is thoroughly broken up and therefore more thoroughly mixed. The motion of the bowl also tends to compress the material between its wall and the paddle. The size of the paddle is such that it will touch the wall of the bowl when in certain positions. By using a pinion with a number of teeth which is indi-

visible by the number of teeth of the gear ring, the blades will eventually touch every part of the bowl as it rotates, thus preventing the material from adhering to the bowl.

The paddle is hinged to facilitate its removal from the bowl, but when the knob 40 is tightened the paddle is held firmly in place by the shoulders 39 being drawn against the frame 32. The paddle may be adjusted in relation to the bowl by means of the screws 44, so that the axis A of the paddle may be tilted from the vertical position, shown in Fig. 2, to any angular position between the vertical position and a position in which this axis will intersect the axis B of the bowl. Or, in other words, to a position in which the tip of the paddle will be directly over the center of the bowl when the bowl is in the position shown in Fig. 2.

Having described my invention and its operation, what I claim as new and wish to protect by Letters Patent is—

1. In a mixing machine of the class described; a mixing bowl; a non-rotating paddle suspended within said mixing bowl; a planetary gear train for imparting planetary motion to the mixing bowl; said planetary gear train consisting of a driven member, a gear eccentrically mounted upon said driven member, and a stationary internal gear ring with which said first-mentioned gear meshes, the number of teeth of the gear ring and in the eccentrically-mounted gear being prime to each other; and means for clamping the paddle with its lower point in a position over the circle described by the center of the eccentrically-mounted gear, or in any position between this angular position and a position in which the axis of the paddle is parallel with the axis of the bowl.

2. In a mixing machine of the class described; a stand having a lower compartment and an upright member; a mixing-bowl holder rotatingly mounted on said stand; a mixing bowl insertable in said holder; a non-rotating, removable paddle supported from said upright and suspended within said mixing bowl; a planetary gear train for imparting planetary motion to the mixing-bowl holder contained within the compartment in the stand; said planetary gear train consisting of a driven member, a gear eccentrically mounted upon said driven member, and a stationary internal gear ring with which said first-mentioned gear meshes and which is secured in the upper part of said compartment, the number of teeth of the gear ring and in the eccentrically-mounted gear being prime to each other; and means connected with the upright member for clamping the paddle with its lower point in a position over the circle described by the center of the eccentrically-mounted gear, or in any position between this angular position and a position in which the axis of the paddle is parallel with the axis of the mixing-bowl holder.

3. In a mixing machine of the class described; a stand having a lower compartment and an upright member; a mixing-bowl holder rotatingly mounted on said stand; a mixing bowl insertable in said holder; a non-rotating, removable paddle supported from said upright and suspended within said mixing bowl; a planetary gear train for imparting planetary motion to the mixing-bowl holder contained within the compartment in the stand; said planetary gear train consisting of a driven member; a gear eccentrically mounted upon said driven member, and a stationary internal gear ring with which said first-mentioned gear meshes and which is secured in the upper part of said compartment, the number of teeth of the gear ring and in the eccentrically-mounted gear being prime to each other; means connected with the upright member for clamping the paddle with its lower point in a position over the circle described by the center of the eccentrically-mounted gear, or in any position between this angular position and a position in which the axis of the paddle is parallel with the axis of the mixing-bowl holder; an opening formed in the top of the stand in which the eccentrically-mounted gear revolves; and a flange associated with the mixing-bowl holder for covering this opening.

LUDLOW E. WERNER.