April 15, 1924. 1,490,617

D. R. McKILLICAN

AGITATOR

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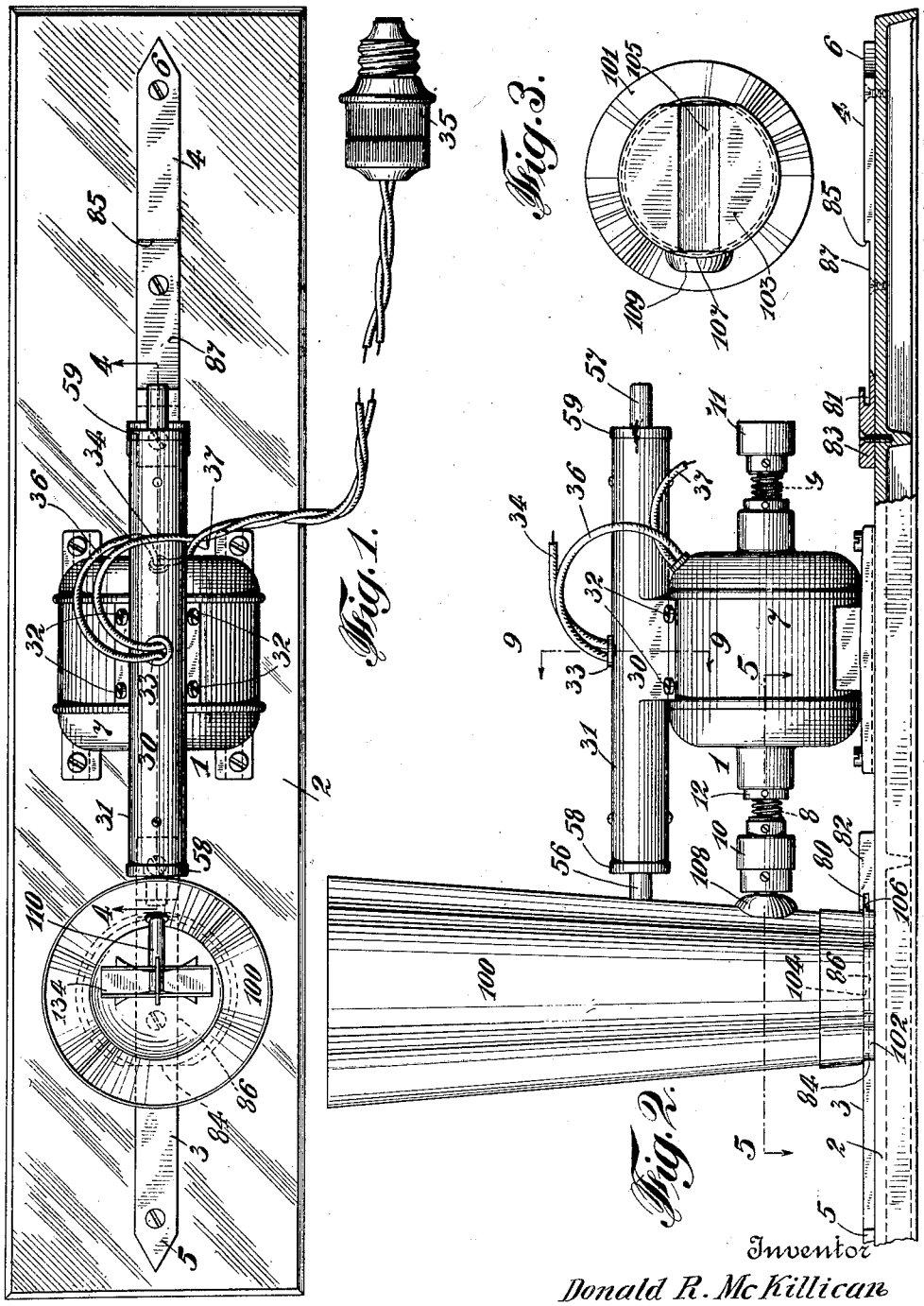


Fig. 1.

Fig. 3.

Fig. 2.

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Fig. 4.

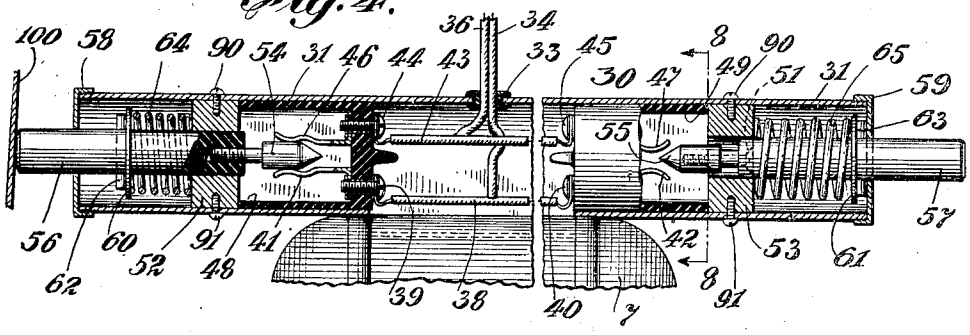
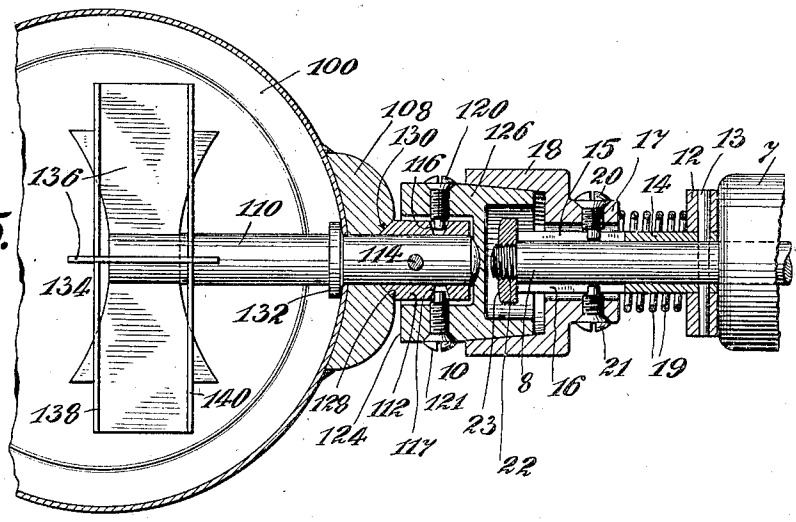


Fig. 5.



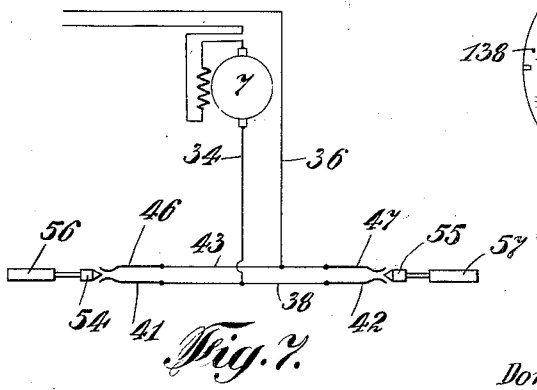


Fig. 7.

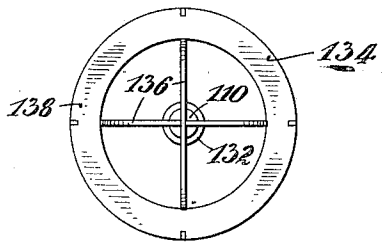


Fig. 6.

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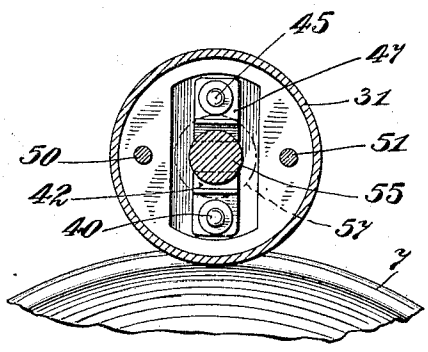


Fig. 8.

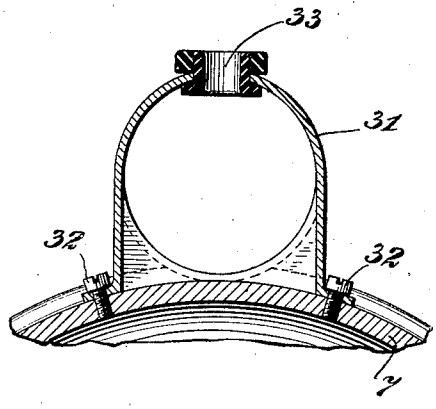


Fig. 9.

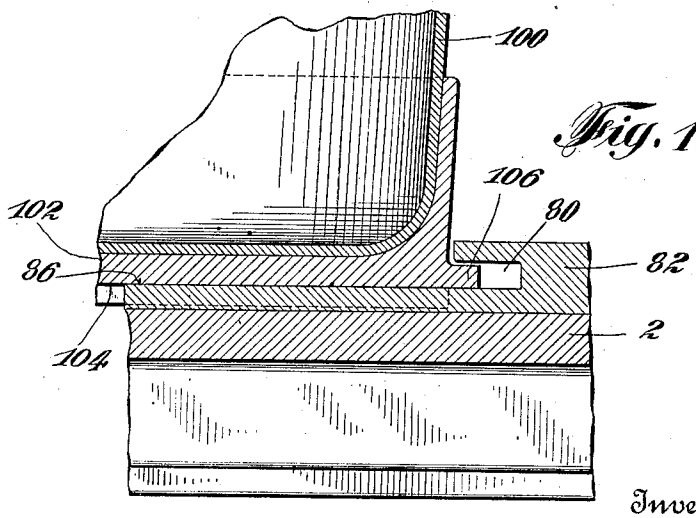


Fig. 10.

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Patented Apr. 15, 1924. 1,490,617

UNITED STATES PATENT OFFICE.

DONALD R. McKILLICAN, OF NEW YORK, N. Y., ASSIGNOR TO MECHANICAL MIXERS CORPORATION, OF NEW YORK, N. Y., A CORPORATION OF DELAWARE.

AGITATOR.

Application filed January 27, 1921. Serial No. 440,293.

To all whom it may concern:

Be it known that I, DONALD R. McKILLICAN, a citizen of the United States, residing at No. 121 West 79th Street, in the city of New York, county of New York, and State of New York, have invented a new and useful Improvement in Agitators, of which the following is a specification.

My invention relates broadly to agitators for the intimate mixing of substances in general, more particularly to the mixing of food products, and specifically to the mixing of drinks at soda fountains.

The broad object of my invention is to provide an agitator constructed in the general form of a centrifugal pump impeller, to draw in the substances at the centre and discharge and mix them in their passage through the agitator and to incorporate such an agitator in a container designed to prevent centrifugal cavitation of the substances at the centre of the agitator.

The specific object of my invention is to apply such an agitator to a soda fountain drink mixer, preferably with the axis of the agitator in a more or less horizontal plane, so that a shaker cup of conventional form, which is convenient and easy to clean, may be utilized, thus making the agitator a part of the shaker cup, and to also provide the agitator with a clutch for convenient and easily detachable connection to a motor.

Other objects of my invention are to provide a motor driven unit to be detachably coupled to the shaker cup, to provide a detachable positioning device for the shaker cups, an automatic spring switch for the motor unit to be actuated by the placing of the shaker cup in driven relation with the unit, and other objects which may appear from the following detail description of the preferred construction and be pointed out in the claims.

Referring to the accompanying drawings:

Fig. 1 is a plan view of a motor unit, and a shaker cup in driven relation to same;

Fig. 2 is a side elevation of Fig. 1, partly broken away;

Fig. 3 is a bottom view of one of the shaker cups;

Fig. 4 is a vertical cross-section of the switch;

Fig. 5 is an enlarged horizontal cross-section taken on the line 5—5 of Fig. 2, looking in the direction of the arrows;

Fig. 6 is an end view on a reduced scale of the agitator of Fig. 5;

Fig. 7 is a wiring diagram of the switch connections to the motor;

Fig. 8 is an enlarged cross-section of the switch, taken on the line 8—8 of Fig. 4, looking in the direction of the arrows;

Fig. 9 is a similar cross-section taken on the line 9—9 of Fig. 2, showing the method of attaching the switch shell to the motor;

Fig. 10 is an enlarged vertical cross-section of a part of the base of a shaker cup and its positioning devices.

The numeral 1 indicates the entire motor unit, including the base plate 2 upon which are rigidly mounted slides 3—4, having pointed end portions 5—6 to facilitate the placing of shaker cups 100—101 in driven relation with the motor 7, which is also mounted upon the base plate 2.

The motor 7 is provided with a shaft, having end portions 8—9 which project from it and are provided with two identical cone clutches 10—11. The clutch 10, shown at the left of Fig. 2, consists of a collar 12, pinned by a pin 13, through a tube 14 to the shaft end 8. The tube 14 is provided with slots 15—16 and over this tube 14 is loosely fitted the hub 17 of the female portion 18 of the clutch 10, the loose fit being designed to give play for the centering of the clutch when placed in driving relation. A compression spring 19 surrounds the tube 14 and thrusts against the collar 12 and hub 17 to provide spring maintained end thrust for the female member 18, which is held from rotating upon the tube 14 by the screws 20—21 which are threaded into hub 17 and project into the slots 15—16. The shaft end 8 is provided with a threaded portion 22 and a nut 23, which limits the distance to which the spring 19 can thrust the member 18 to the left. As the clutch 11 is similar to the clutch 10 the details need not be again described.

Upon the motor 7 is mounted the self-opening switch 30, which consists of a brass shell or tube 31 cut and bent for attachment to the motor 7 by means of screws 32, and provided with an insulating bushing 33, as best indicated in Fig. 9. From the bushing 33 one wire 34 extends to a flexible cord plug 35 of conventional design, and another wire 36 extends into the motor 7 and forms a circuit with the windings of

same, from which another wire 37 emerges and extends to the plug 35. The wire 34 is connected to the wire 38, which is connected by the binding screws 39—40 to the switch contacts 41—42, and the wire 36 is connected to the wire 43 which is connected by the binding screws 44—45 to the contacts 46—47.

The contacts 41 and 46 and the insulation support 48 is like the cylindrical switch mechanism used on some of the well-known automobile instrument board installations, and so need not be described in great detail, and contacts 42 and 47, which are supported on insulation 49, are similar to same.

The insulation supports 48 and 49 are secured in position within the tube 31 by screws 50—51, which are tapped into centering cylindrical washers 52—53, which are inserted within tube 31 and secured by screws 90—91. Cone pointed contact plungers 54—55 tapped into rods of insulating material 56—57 are next inserted through washers 52—53, which bear against insulators 48—49 and screw caps 58—59, having central holes to receive the rods 56—57 are screwed onto each end of the tube 31.

Upon the rods 56—57 are secured washers 60—61 by pins 62—63 and surrounding the rods compression springs 64—65 are provided. Spring 64 thrusts against washer 52, and washer 60, and spring 65 thrusts against washers 53 and washer 61. By this arrangement contact plungers 54—55 are normally held out of contact with contacts 41 and 46, and contacts 42 and 47, respectively, and the circuit through the motor 7 is dead. In Figs. 1 and 2, however, the rod 56 is shown pushed in against the compression of the spring 64 by the shaker cup 100, thus energizing the motor by completing the circuit through contact 41, contact plunger 54, and contact 46.

The shaker cups 100—101, which are duplicates, consist of shaker cups of conventional design, provided with improved bases 102—103, having slots 104—105 designed to facilitate their accurate placement on the motor unit by registering with the slides 3—4. The shaker cups are also provided with lips 106—107 at one end of the slots, to enter recesses 80—81 formed at the inner ends 82—83 of the slides 3—4. The slides 3—4 are also provided with shoulders 84—85 and portions of reduced height 86—87, whereby the bases 102—103 may be placed and locked in position by the operator against the compression of the switch springs 64—65 and the clutch springs 19, the action of which will be subsequently more fully described.

Each of the shaker cups 100—101 is provided with a bearing 108—109 containing a shaft 110 having a tubular collar 112 secured by a pin 114; the collar 112 is provided with two conical holes 116—117 to loosely receive the inner ends of screws 120—121, which are threaded into the hub 124, and cause the shaft 110 and the hub 124 to rotate together. The hub 124 is loosely fitted on the tubular collar 112 to facilitate alignment of the male member 126 of the clutch 10. Thus when the operator places the shaker cup 100 in the indicated position the spring 19 is compressed, the clutch grips and the motor starts as the shaker cup 100 pushes to the right according to Fig. 2 the rod 56 and closes the switch 30.

The shaker cups 100 or 101 may be operated singly, or both shaker cups may be operated together by the motor 7. The tubular collar 112 is provided with a conical portion 128 to mate with a female conical portion 130 of the bearing 108 forming a liquid tight joint when the shaker 100 is being operated by motor 7 as the spring 19 compresses these cones 128 and 130 together.

The shaft 110 extends inside the shaker cup 100 and is provided with a collar 132 and an agitator 134 having paddles 136 and rims 138—140, designed to act like the impeller of a centrifugal pump, and to co-act with the shaker cup 100 with which it is assembled to thoroughly mix the contents of the shaker.

The agitator 134 first mixes the portion of the contents with which it is in contact and simultaneously induces a flow of the remaining contents to its centre, and subsequently mixes same. All portions of the contents being successively mixed and remixed as the agitator continues to operate.

By placing the axis of rotation of the agitator in the indicated position, the contents of the shaker cup do not tend to form a centrifugal cavity at the center of the shaker cup. It is important that centrifugal cavitation should be avoided to secure the best mixing. My agitator by its construction does this in an ideal manner without the introduction of unsanitary baffle plates or the like.

Modifications of this invention and the incorporation of its novel elements or combinations with other means in accordance with the progress of the art may be made without departing from the spirit of this invention as pointed out in the following claims.

I claim:

1. A soda fountain shaker cup having a side and a bottom, provided with a shaft journaled in the side, a clutch member external to the shaker cup to actuate the shaft, an agitator inside the shaker cup actuated by the shaft, and a positioning device at the bottom.

2. A motor unit provided with a horizon-

tally operating coupling, a self-opening horizontally operating switch for the motor, a mixer cup provided with an agitator having a horizontal shaft and a base locking device to detachably secure the mixer cup to the motor unit in a position to close the switch and cause the agitator to be driven by the coupling.

3. A soda fountain drink mixing machine having a cup provided with a horizontal shaft journaled therein, an agitator and a coupling carried by the shaft, and said machine having a positioning slot substantially parallel with the shaft at the base of the cup designed to be placed in detachable mating relation with a corresponding tongue on the drink mixing machine.

4. A drink mixing machine provided with a horizontal base and a motor provided with a laterally extending shaft supporting a clutch member, a laterally self-opening switch for the motor and a cup provided with a mating clutch member and locking device designed to be thrust laterally into clutched, switch closing, motor starting, and locked position by an operator.

5. A motor, a motor shaft extending laterally from the motor, a clutch member on the shaft, a laterally self-opening switch for the motor, a mixer cup designed to be laterally thrust and locked into driven relation with the clutch and to automatically close the switch.

DONALD R. McKILLICAN.