July 28, 1931. H. G. JOHANNES 1,816,046

MIXING DEVICE

Filed Oct. 29, 1928

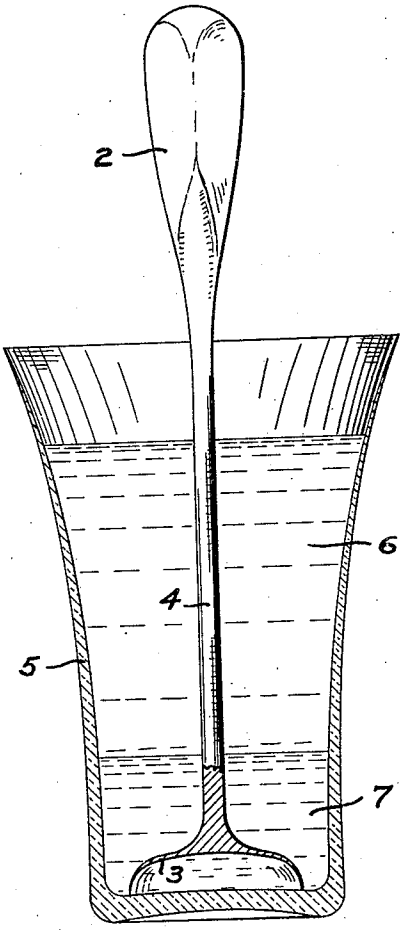


Fig. 1

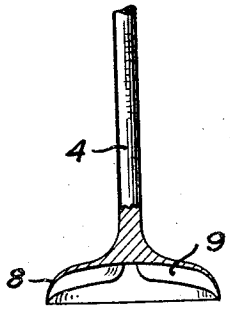


Fig. 3

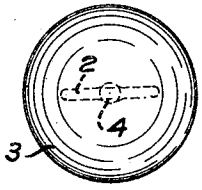


Fig. 2

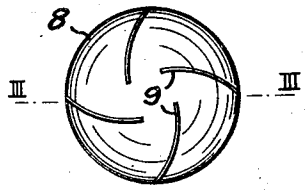


Fig. 4

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Patented July 28, 1931

1,816,046

UNITED STATES PATENT OFFICE

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MIXING DEVICE

Application filed October 29, 1928. Serial No. 315,641.

The present invention relates in general to improvements in the art of mixing or agitating fluent substances, and relates more specifically to improvements in the construction and operation of devices for mixing fluids such as drinks, in tumblers or the like.

A general object of the invention is to provide a new and useful drink mixing appliance which is extremely simple in construction and which is moreover highly efficient in operation.

It has heretofore been generally customary to mix various kinds of drinks consisting of two or more fluent materials, with the aid of an ordinary spoon. When a liquid is stirred in a glass or tumbler with an ordinary spoon, the mass of fluid is caused to rotate and the particles are whirled around the central axis of the tumbler in substantially horizontal planes. While it is perhaps possible to displace the particles out of these planes, to some extent, by moving the spoon vertically during the stirring operation, the rapid whirling action of the mass materially hinders such attempted displacement. Although stirring of the liquids may be rather effective when relatively light fluids having practically the same specific gravity are being treated, it is not at all effective when there is considerable difference in the specific gravity of the several fluids. In spite of the fact that some attempts have heretofore been made to eliminate these defects of the ordinary spoon, by providing specially shaped spoons for stirring liquids in tall containers, these efforts have not succeeded in obviating the difficulties.

It is a more specific object of the present invention, to provide a mixing device wherein a suction action is utilized to mix and agitate effectively the fluent contents of a tumbler of any height. With the improved device, the entire charge of fluid within a tumbler, is thoroughly mixed by a single upward stroke of the mixer. The invention also contemplates provision of simple and effective means for producing a slight whirling motion of the fluid, in order to enhance the agitation and additionally to insure lateral as well as longitudinal intermingling of the fluent particles. These and other objects and advantages of the invention will appear from the following description.

A clear conception of several embodiments of the invention and of the mode of constructing and of manipulating devices manufactured in accordance therewith, may be had by referring to the drawings accompanying and forming a part of this specification in which like reference characters designate the same or similar parts in the various views.

Fig. 1 is a central vertical section through an ordinary glass tumbler, showing one of the improved mixing devices, partly in section, disposed therein.

Fig. 2 is a bottom view of the improved mixing device shown in Fig. 1.

Fig. 3 is a fragmentary part sectional side elevation of a modified form of the improved mixing device.

Fig. 4 is a bottom view of the mixing device shown in Fig. 3.

While two specific embodiments of the invention are shown and described herein, it will be apparent that other modifications within the scope of this invention, are possible.

Referring specifically to the embodiments of the invention illustrated in Figs. 1 and 2, the improved mixing device comprises in general an upwardly dished disk 3 having a rod 4 formed integrally with the uppermost central portion thereof, and a manipulating handle 2 formed integrally with the upper end of the rod 4. The disk 3 is preferably imperforate and of slightly smaller external diameter than the internal diameter of an ordinary glass tumbler 5 with which the device is intended to cooperate. The entire mixing device may be formed of metal or of other suitable material such as paper or wood, and the disk 3 lies in a plane substantially perpendicular to the axis of the rod 4 and parallel to the tumbler bottom. The rod 4 and handle 2 should be of sufficient length to cause the latter to project well beyond the upper rim of the tumbler 5, and

the handle 2 may be of flattened formation, as shown, in order to present an easy grip.

Referring specifically to the embodiment of the invention shown in Figs. 3 and 4, the modified device comprises in general an upwardly dished disk 8 having a rod 4 and a handle 2 associated therewith in a manner similar to that disclosed in Figs. 1 and 2. The dished lower portion of the disk is provided with one or more fins or vanes 9 which may be disposed spirally with respect to the disk axis, as shown. The vanes 9 are preferably of rather thin formation and do not extend inwardly to the disk axis, but end short of this axis as clearly shown in Fig. 4. These vanes are furthermore preferably of such height that they do not extend beyond the lower rim of the disk 8.

During normal use of the improved drink mixer, the device may be disposed within an empty tumbler 5 in the manner shown in Fig. 1. Assuming that the mixer is to be used to mix thoroughly a relatively heavy fluid such as syrup 7, with a lighter fluid 6, the syrup 7 may first be deposited within the bottom of the tumbler 5 whereupon the fluid 6 may be poured thereover. After the constituents have been thus deposited within the tumbler 5, they may be thoroughly and intimately mixed by merely lifting the mixing device vertically out of the tumbler with the aid of the handle 2. As the mixer is raised, the dished disk 3 at the bottom of the rod creates a suction zone throughout the center of the liquid mass, and the heavy fluid 7 is caused to follow this suction zone upwardly through the center of the lighter fluid 6. Upon reaching the top of the charge of liquid, the heavy fluid 7 is precipitated downwardly throughout the lighter fluid 6, and is thus caused to mix intimately therewith.

If a mixing device of the type shown in Figs. 3 and 4 is utilized, the vanes 9 function to create a slight whirling motion in the heavy fluid 7 as it rises upwardly due to the suction action, thus creating centrifugal force which throws the heavier liquid outwardly and enhances the mixing action.

It will be apparent that either form of mixing device will produce effective intermingling of several layers of fluid by a single vertical movement of the mixer. If the device is moved downwardly through a charge of liquid within the tumbler 5, the central core of the liquid is forced violently toward the side walls of the tumbler 5 and upwardly therealong, thus likewise producing an effective mixing action.

From the foregoing description it will be apparent that thorough mixing may be effected by either an upward or a downward movement of the mixer, and that extremely thorough mixing may be effected by reciprocation of the device within the tumbler. The improved mixing device besides being extremely simple in structure and efficient in operation, has a pleasing appearance and may be manufactured at relatively low cost.

It should be understood that it is not desired to limit the invention to the exact details of construction and to the precise mode of operation herein described, for various modifications within the scope of the claims may occur to persons skilled in the art.

It is claimed and desired to secure by Letters Patent:—

1. In combination, a tumbler having a substantially flat bottom and a substantially cylindrical internal surface adjacent to said bottom, and a mixer comprising a slightly dished flat circular plate of diameter but slightly less than and cooperable with said bottom, and a handle of greater length than the height of said tumbler rigidly attached to the upper central portion of said plate and extending upwardly therefrom, said handle having a flat upper gripping portion.

2. In combination, a tumbler having a substantially flat bottom and a side wall with a substantially cylindrical lower portion adjoining the bottom, and a device for mixing liquids in the tumbler comprising a substantially flat plate of slightly less diameter than the cylindrical portion of the tumbler adapted to be placed in a horizontal position against the bottom and then moved upwardly in order to displace the liquid vertically in the tumbler and effecting a mixing thereof, a comparatively small flange secured to and projecting downwardly from the marginal part of the plate and forming beneath said plate a shallow chamber or compartment into which the liquid is drawn during upward movement of the plate and through which the liquid flows into contact with the lower face of said plate to augment the mixing action, and a perpendicular handle for use in actuating the plate for liquid mixture purposes, said handle being secured fixedly to and projecting upwardly from the central portion of the plate and being of such length that the upper end thereof projects above the top of the tumbler when the plate is positioned against the tumbler bottom.

3. In combination, a tumbler having a substantially flat bottom and a side wall with a substantially cylindrical lower portion adjoining the bottom, and a device for mixing liquids in the tumbler, comprising a substantially flat plate of slightly smaller diameter than the lower portion of the tumbler, adapted to be placed in a horizontal position against the bottom of the tumbler and then moved upwardly in order to displace the liquid vertically in the tumbler and effect a mixing thereof, a comparatively small flange secured to and projecting downwardly from the marginal part of the plate and forming beneath said plate a shallow chamber into

which the liquid is drawn during upward movement of the plate and through which the liquid flows into contact with the lower face of said plate to augment the mixing action, vanes connected to the under face of the plate and arranged wholly within the chamber and to impart a swirling motion to the liquid during the upward movement of the plate, and a perpendicular handle for use in actuating the plate for liquid mixing purposes, said handle being secured fixedly to and projecting upwardly from the central portion of the plate and being of such length that the upper end thereof projects above the top of the tumbler when the plate is positioned against the tumbler bottom.

In testimony whereof, the signature of the inventor is affixed hereto.

HUBERT G. JOHANNES.