LIQUID AGITATOR AND DISPENSING SYSTEM

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ABSTRACT
A series of agitators driven by a single motor that is capable of stirring several liquid or paint colorant containers at the same time. The agitators may be selectively moved to engage or disengage their respective containers to allow manual stirring or filling of any desired number. Each agitator is driven through a circular stirring motion by a rotating motor shaft which is attached to a single eccentric member. A dispensing meter is attached to each container to precisely meter the desired amount of stirred liquid or paint colorant.

7 Claims, 3 Drawing Figures
LIQUID AGITATOR AND DISPENSING SYSTEM

BACKGROUND OF THE INVENTION

1. Field of the Invention:
This invention relates to a system with agitators for simultaneously mixing liquids contained in several containers. More precisely, it is concerned with a series of selectively movable agitators that allow the manual stirring of a selective number of liquid containers.

2. Description of the Prior Art:
Liquid mixing systems that utilize a single power source to stir a plurality of mixing and dispensing containers at the same time are known. For example, U.S. Pat. No. 3,088,714 to Isreeli dated May 7, 1963. In addition, the prior art teaches the use of a single motor to drive mixing paddles in several different liquid paint containers that also have dispensing valves for each container. In none of the known prior art is a single motor used to drive a plurality of agitators in different liquid dispensing and mixing containers with members that are selectively movable to allow engagement or disengagement of each individual container or group of containers. By incorporating such a selectivity feature, the recurring operations of filling and mixing only specific containers are more easily accomplished. The problem of stopping all agitators to fill or mix is completely eliminated.

SUMMARY OF THE INVENTION

The single motor driven agitator of this invention may be selectively engaged or disengaged from one or more of a larger group of liquid mixing and dispensing containers. These containers may also incorporate metering devices to dispense a desired amount of paint colorant.

The primary object of this invention is an improved system of liquid mixing containers.

An additional object is a single motor driven mixing system that is selectively operable to engage or disengage the motor source from one or more of its agitators connected to a plurality of liquid mixing containers.

Still another more specific object is a single motor driven paint colorant mixer that can be selectively operable to engage or disengage one or more of a plurality of paint colorant mixing, dispensing and metering devices. FIG. 1 represents a top view of the preferred embodiment of my invention. FIG. 2 shows the side view of FIG. 1 with a section partially cut away. FIG. 3 is an enlarged side view with one drive arm engaged in a cross-sectioned knob of a mixer's crank arm handle.

FIG. 1 shows a top view of the circular turntable that holds twelve liquid agitators in a circular configuration. Each agitator is part of a generally A-shaped wire member or drive arm 1 that has two leg members that are bent at right angles and terminate in two plastic or rubber tips 2. A swivel mounting at connection 3 allows each agitator 1 and its leg members to be pivoted in an upward direction past true vertical to end up in an obtuse angle when seated. As is readily apparent, each arm 1 with terminating leg tips 2 could by a minor modification engage only one knob 12, rather than the two leg members shown. The shaft 4 is the pivot for the circular plate member 5 that has the six pivot clamps 3 with members for each of the A-shaped members 1.

In FIG. 2 the eccentric element 6 with shaft 4 is shown connected to motor driven shaft 7 at the other end. Electric motor 8 provides the necessary power to rotate shaft 7. When this happens, eccentric shaped member 6 is rotated as a unit with shaft 7. However, because of a freely rotatable connection with shaft 4, plate 5 does not rotate in unison with members 6 and 7 but, instead, describes what may be termed a planetary motion. This motion of plate 5 is a radial motion around a different axis from the axis of rotation of shaft 7 and it causes the twelve ends 2 of the six drive arms 1 to rotate in twelve separate circular motions around twelve different axes.

The colorant dispensers 9 (or liquid containers or canisters) are shown in all three figures. They are usually equal in number to the driven agitator legs with ends 2. In the preferred embodiment, there would therefore be twelve in number. Only two are shown in FIGS. 1 and 2 for purposes of simplification and understanding.

Besides the main body 10 of the dispenser, each container has a mixing paddle crank arm 11 on its upper surface with a knob end 12 and a removable top 17. FIG. 3 shows how the agitator arm tip end 2 of the drive arm frictionally fits in a removable manner into knob end 12. As end 2 rotates in its circular path, the crank arms also rotate turning a paddle (not shown) that mixes whatever liquid is in container 9. The rate of mixing varies as does the rotational speed of shaft 7.

In addition to the mixing feature, container 9 also can meter and dispense liquids in a predetermined amount. U.S. Pat. No. 3,176,876 to Fischer et al. describes in a general way how such a metering and dispensing device operates. Spherical handle 13 is first manually lifted to pump the predetermined desired quantity of liquid that is to be dispensed. This is usually measured in ounces or fractions thereof. A color measurement gauge is depicted on a vertical scale 14 attached to the spherical handle 3 of each container 9. After the quantity desired to meter is selected, dispensing lever 15 is depressed downwardly by an operator (see FIG. 2) to open a closed valve, then pushing down spherical handle 13, thus emitting liquid from the outlet opening 16 at the bottom of each container 9 (FIG. 3).

One of the primary uses my invention finds its greatest benefit in is in dispensing paint colorant pigments. When used in that field, each of the containers or canisters 9 is filled with a different colorant pigment color coded at its metering gauge 14 to indicate the exact color it contains. Based on charts or other data supplied by paint manufacturers, the amount of pigment which is to be added to a certain color to obtain a desired different color is known. The amount of pigment to be added is then selected, metered, and dispensed into a second container of paint, as shown in FIG. 2, whose color or other characteristic it is desired to change. Mixing is then performed on the combination of added pigment and paint.

One of the problems in the paint colorant dispensing art is the requirement to stir pigments to keep them in suspension in containers on a periodic basis to prevent settling and solidification or other undesired changes to the pigment. Some manufacturers recommend stirring twice daily to overcome this problem. Such mixing may be either manual or power driven. In addition, as the pigments are variably dispensed, each individual container 9 may be a different amount of periodic refilling. Filling is accomplished by removing the top cover plate 17 of canister 9 as the need arises.
In the prior art where each agitator paddle did not have the flexibility of being selectively movable by a single motor drive without stopping the motor paddles as in my invention, all of the agitators had to be stirred together to do the required periodic stirring. Further, when filling was required, all of the agitator arm tips 2 had to be removed from their members that activate the mixers (knob holders 12 in my invention). By my invention, only two of the twelve agitators need be disturbed to either stir or refill any one of the containers. This number that need be distributed could of course be varied, depending on the construction of the drive arms 1. By a simple modification, the number of agitators that could be selectively disengaged could be one or more. For example, if the A-shaped drive arm 1 of the preferred embodiment were replaced by a single straight-shaped arm pivoted at one end as at connection 3 with an agitator arm tip like 2 at the other end, only one container would have to be disengaged at a time. Besides the pivot mounting to selectively move the agitators arms, other types of connections could be employed, e.g., a slideable horizontal arm that is extendable and flexible to allow engagement or disengagement of tip 2.

While it is usually not done, the arm 1 could, when it is desired not to be used for agitating, be pivoted back in an upward direction to its seated obtuse angled position as motor 8 rotates the remaining agitators arms. Motor 8 is housed in a conventional rectangular housing 22 and is connected to an AC electrical source by means of a three-pronged plug 18. Switch 19 controls the flow of current to motor 8.

The stationary, generally horizontal table 20 acts to mount motor housing 22 and the containers 9 with their attachments. As shown in FIG. 1, U-shaped cutouts 21 in the top plate portion of table 20 serve to allow the full manual downward depression of dispensing levers 15.

As will be apparent by not requiring the disengagement of all of the agitator arm tips 2 from the crank knobs 12, the time in filling containers 9 is reduced. Thus, when one or more of the containers are depleted earlier than the others because of their popularity, it is possible to easily refill the same without disengaging all of the agitators. It is also possible to mix a selected number of the same containers without agitating all or even turning on the motor 8. Thus, by manually rotating crank arm 11, an operator can perform the daily stirring maintenance chore usually required to prevent solidification of materials stored in containers 9. These two features allow the periodic operations of filling and mixing to be accomplished with a minimum of work and with less inconvenience.

While the preferred embodiment illustrates an agitator with twelve canisters, it is apparent any desired number may also be employed. Working embodiments of 9 to 16 canisters are now in use. As was stated, it is equally apparent that the structure for disengaging the agitator arms from the crank arms 11 could also vary as well as the structure of the metering, mixing and dispensing containers 9. None of these described features should be used to limit or otherwise restrict the scope of my invention which is set forth in the following claims.

I claim:

1. A liquid metering and dispensing system comprising:

- a generally horizontal table;
- a plurality of liquid containers mounted on said table, each having liquid metering and dispensing means;
- a plurality of driven agitator arms equal in number to said containers with one arm operatively associated with each container;
- means to allow selective moving of a predetermined number less than the whole number of arms of said agitators from its operatively associated position with each container;
- a single electrically driven power source connected to each agitator and capable of driving all of said agitator arms simultaneously to mix all of the liquids in said containers at the same time.

2. The system of claim 1 wherein the metering means for each container is the same and comprises a manually operable filling pump and a manually operable dispensing handle to dispense a predetermined amount of fluid therefrom.

3. The system of claim 1 wherein the means to allow selective moving of the agitators comprises a pivotal mounting on one end of each agitator arm.

4. A liquid mixing and dispensing system comprising:

- a plurality of containers each with mixing means for holding and mixing liquids, and each having a crank arm attached to the respective mixing means;
- a like plurality of driven agitator members with each member operably engaged with a crank arm;
- means to allow the selective disengagement of any desired number of agitator members less than and including the total number of agitator members for filling or manually mixing their engaged containers;
- and a single power source to move all of said agitator members to simultaneously mix all liquids in the containers that are engaged by agitator members.

5. A system for mixing and dispensing liquids from a plurality of containers, comprising:

- a circular table having positions along its periphery for holding said containers;
- motor driving means for driving a generally vertical rotating drive shaft, said motor driving means mounted on said table and said vertical drive shaft centered on said table;
- eccentric coupling means, rigidly attached at a first end to said vertical drive shaft, for creating a circular motion at its second end;
- a freely rotatable vertical shaft mounted in said eccentric coupling means second end, and having an agitator mounting plate attached to its top end;
- a plurality of agitator members radially attached to said agitator mounting plate, each agitator member having a detachable mechanical coupling at its outer extremity; and
- a plurality of crank arms, each crank arm connected to a means for mixing liquids within a single container, and connected to an agitator member mechanical coupling.

6. Apparatus as claimed in claim 5 wherein said agitator members are each hinged for freedom of vertical movement of said mechanical coupling, and said mechanical coupling is adaptable for vertical disengagement from said crank arm.

7. Apparatus as claimed in claim 6, further comprising a horizontally rotational mounting means for supporting said circular table.

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