July 14, 1964 B. J. ROSE 3,140,829

DETERGENT DISPENSER

Filed Nov. 28, 1962 2 Sheets-Sheet 1

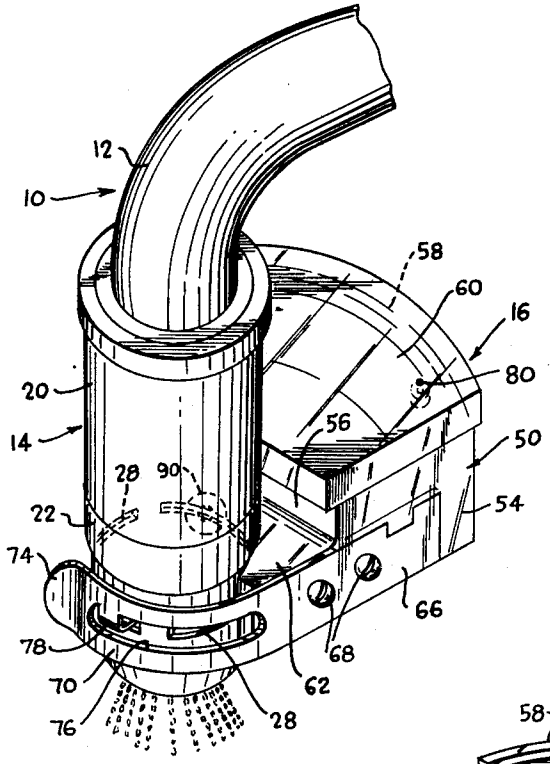


Fig. 1

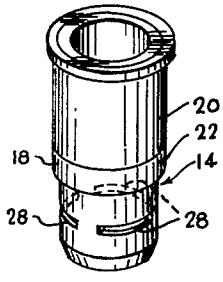


Fig. 8

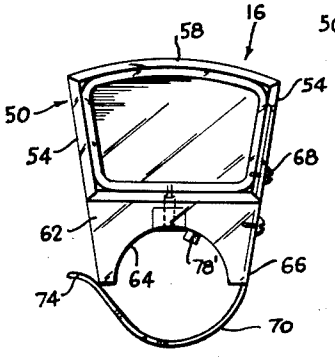


Fig. 11

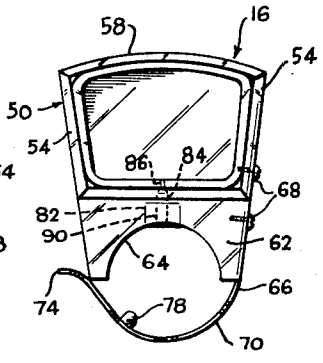


Fig. 6

INVENTOR.
BERT J. ROSE
BY
ATTORNEY

July 14, 1964 B. J. ROSE 3,140,829

DETERGENT DISPENSER

Filed Nov. 28, 1962 2 Sheets-Sheet 2

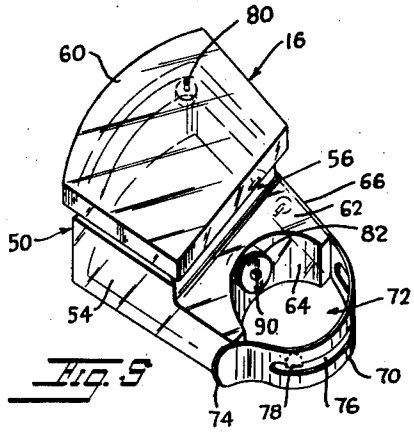


Fig. 5

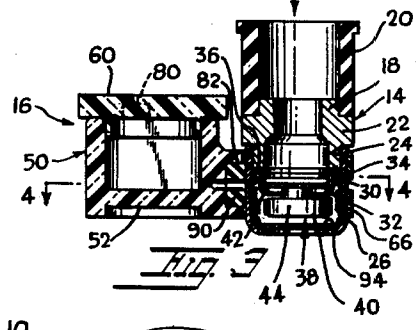


Fig. 3

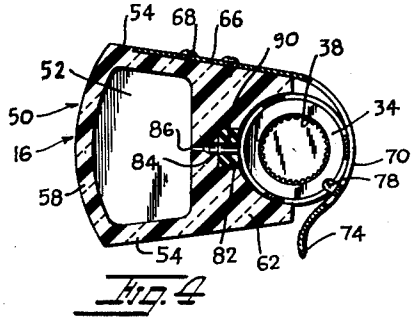


Fig. 4

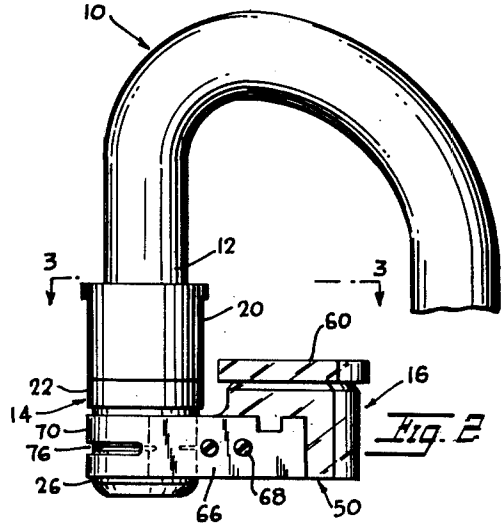


Fig. 2

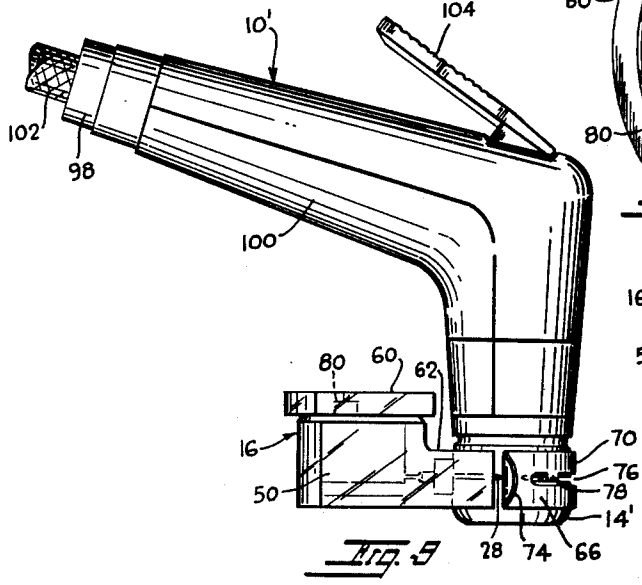


Fig. 9

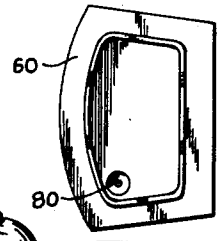


Fig. 7

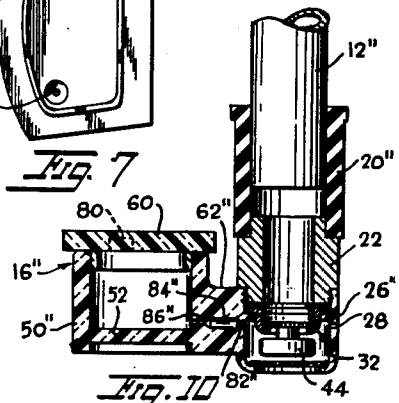


Fig. 10

INVENTOR.
BERT J. ROSE
BY Zoltan A. Polacek
ATTORNEY

United States Patent Office 3,140,829 Patented July 14, 1964

3,140,829

DETERGENT DISPENSER

Bert J. Rose, 25 Woodruff Ave., Brooklyn, N.Y.

Filed Nov. 28, 1962, Ser. No. 240,527
6 Claims. (Cl. 239—318)

This invention relates generally to fluid mixing devices and more particularly to new and useful improvements in a water and detergent mixer.

An important object of the present invention is to provide a device for mixing water with a detergent fluid in predetermined quantities, particularly for various washing and cleaning operations, including household work. The mixed liquids are aerated.

Another object of the invention is to provide an apparatus for mixing a fluid detergent with water, including a vacuum breaking element whereby the flow of liquid detergent may be manually shut off when the washing and cleaning operation is discontinued and wherein a subsequent initiation of the flow of water will not include a supply of detergent.

A further object of the invention is to provide a device of the class described with means for simply and readily reinstating the flow of liquid detergent and the mixing of same with water whenever needed.

For further comprehension of the invention, and of the objects and advantages thereof, reference will be had to the following description and accompanying drawings, and to the appended claims in which the various novel features of the invention are more particularly set forth.

In the accompanying drawings forming a material part of this disclosure:

FIG. 1 is a perspective view of a fragment of an ordinary hot and cold water faucet usually employed in household sinks and the like for dishwashing and similar purposes, and which faucet has an aerator applied thereto and a water and detergent mixer embodying the invention removably applied to the aerator.

FIG. 2 is a side elevational view thereof with the cover in place.

FIG. 3 is a vertical sectional view through the center of the aerator and mixer.

FIG. 4 is a transverse sectional view taken on the line 4—4 of FIG. 3.

FIG. 5 is a top perspective view of the container for the supply of fluid detergent.

FIG. 6 is a top plan view of the container, the cover being removed.

FIG. 7 is a bottom plan view of the cover.

FIG. 8 is a side elevational view of the aerator.

FIG. 9 is a side elevational view showing the water and detergent mixer applied to a modified form of water spray.

FIG. 10 is a vertical sectional view through the center of a modified combined aerator and container.

FIG. 11 is a view similar to FIG. 6 showing another modification.

Referring in detail to the drawings, in FIG. 1 an ordinary hot and cold water mixing faucet 10 as generally used in sinks for household work is shown with a delivery spout 12. An aerator 14 is mounted on the spout 12 and a water and detergent mixer, embodying the invention, is shown removably applied to the aerator 14 and is indicated generally at 16.

The aerator 14 as shown in detail in FIG. 8 includes a cylindrical metal sleeve 18, the upstream end of which is frictionally connected to one end of a plastic coupling 20, the other end of which is adapted to be connected to the outlet end of the spout 12 of the faucet 10 as shown in FIG. 1. Sleeve 18 is formed with an annular flange 22 intermediate its ends forming a shoulder upon

which the bottom of the tube seats. The outer surface of the sleeve below the flange is threaded as indicated at 24. A metal barrel 26 with internal threads at its upstream end is threaded onto the threaded end of the sleeve. The body of the barrel 26 is formed with a series of arcuate-shaped slots 28, annularly arranged, constituting air inlets. Barrel 26 is formed with an annular flange 30 below its threaded portion for supporting an annular metal ring 32. Ring 32 is formed with an annular flange 34 seated on flange 30 of the barrel. A plastic washer 36 is interposed between the bottom edge of the metal sleeve 18 and the flange of the ring. A center metal plug 38 is loosely mounted inside the barrel 26. The upper portion of the center plug 38 is disc-shaped and has teeth 40 formed on its periphery, which teeth cooperate with a portion 42 of the bore through the annular ring 32 to provide liquid flow passageways. As shown the center plug 38 also includes a reduced neck portion beneath the disc-shaped portion and a cylindrical plug body 44 of greater dimensions than the neck portion, at the lower end of said neck portion. The guide surface portion of the ring 32 downstream of the flange 30 tapers inwardly and in a downstream direction and serves to direct the fluid passing through the liquid flow passageways.

The cylindrical body portion 44 is provided with rounded splash surfaces and the water impinges against said surfaces and is reflected generally laterally outwardly, primarily in directions transverse to the axis of the aerator. The liquid and air are co-mingled and aspirated through the air inlets 28. Thereafter the mixed air and liquid passes out through the lower end of barrel 26.

In accordance with the invention, apparatus in the form of the mixing device 16 is removably attached to the barrel 26 of the aerator 14 for supplying a quantity of detergent to and mixing same with the water coming out of the faucet 10 and passing down through the spout 12. This mixing device comprises a rectangular-shaped container 50 having a shallow hollow body with bottom wall 52, end walls 54, 54, a flat side 56 and a slightly curved side wall 58. The top of the body is open and is adapted to be closed by a removable cover 60. The container is preferably formed of plastic material. A lateral extension 62 is formed on the flat side wall 56 having a semi-circular curved dished portion 64. An elongated flat spring 66 is secured at one end to one of the end walls 54 and to one end of the extension 62 by screw 68, the end wall being countersunk to receive the spring in flush relation. The other end of the spring is bent to form a substantially semi-circular curved portion 70 disposed opposite to the semi-circular curved portion 64 of the extension whereby a substantially circular opening 72 is defined between the spring and extension. The extreme end of the free end of the spring is bent outwardly forming a finger piece 74 for manipulating the spring.

The curved portion 70 of the spring is formed with an elongated slot 76 with closed ends and a short tongue 78. This tongue 78 of the spring extending inwardly from one long edge of the slot adjacent one end of the slot. Tongue 78 extends into the opening 72. The tongue may, however, be mounted on the curved dished portion of the extension 62 as indicated at 78' in FIG. 11 instead of being mounted on the spring 66, and will serve the same purpose.

An air vent 80 is formed in the cover 60 of the container. This air vent prevents the creation of a vacuum in the container outwardly of the detergent therein.

A cylindrical recess 82 is formed in the semicircular curved portion 64 of the extension 62 of the container at the center of said curved portion. A narrow cylindrical counter-sunk passage 84 is formed in the base of the recess 82 at its center and a narrow passage 86 is formed in the material of the extension leading from passage 84

to and communicating with the interior of the body of the container 50. A plastic sleeve 90 is seated in the recess 82 in the extension with its bore communicating with the passage 84. Sleeve 90 projects slightly outwardly of the recess 82 into the opening 72.

In use, the water and detergent mixing apparatus or mixing device 16, with a supply of detergent in the container 50, and the cover 60 thereof in closed position, is detachably and rotatably mounted on an aerator or spray device which is fastened on the spout of a water faucet, such as the aerator 14 shown in FIGS. 1 and 2. In order to accomplish this, the spring 66 is swung away slightly from the container 50 and the extension 62 to enlarge the opening 72 whereupon the spring and extension 62 are slipped upwardly over the aerator until the bore in sleeve 90 on the extension and the slot 76 in the spring 66 are aligned with a slotted air inlet 28 in the barrel 26 of the aerator. When the parts are thus positioned, the tongue 78 on spring 66 automatically springs into an air inlet 28 so that the container unit may be guided in its turning movements and whereby it is held onto the aerator. When the water in the faucet 10 is turned on and passes down through the coupling 20 and through the aerator 14, the running water is broken up by the toothed periphery of the disk portion of the plug body 38. The passage of water through the central bore in the sleeve 22 and through the toothed periphery of the disk portion of the plug creates an aspirating effect which has a tendency to pull a vacuum in the bore of the sleeve 90, passage 84 and passage 86. The vacuum thus created by the aspirating effect of the water flowing through the body of the aerator, will cause a suction in the passages 86, 84 and in the bore of sleeve 90 whereby liquid detergent will be impelled through the passages 86, 84 and bore of sleeve 90 and through the adjacent aligned slotted air inlet 28 where the detergent is mixed with the air and water and the mixture flows downwardly through the barrel 26 and out through the screen 46.

This condition will remain until such time as the container 50 is manually moved around and a solid portion of the body of the barrel 26 shuts off the passageway. When this occurs, the aspirating effect through the passages 86, 84 and bore of sleeve 90 will immediately cease and no more liquid detergent will flow.

When the flow of water through the spout 12 is resumed, no detergent will be drawn from the container 50 until such time as the container 50 is manually moved around again to open the passage through the bore of sleeve 90. In this manner, the mixture of detergent and water can first be used for washing and cleansing purposes and an instantaneous stoppage of the flow of water, followed by an immediate resumption of the flow will provided a source of clean rinsing water free from detergent.

It has been found that some undesirable splashing of the mixed water and detergent occurs if the sleeve 22 and barrel 26 are solely employed for the supply of mixed water and detergent. In order to remedy this situation, an anti-splashing screen 94 is positioned on the restricted outlet end of the barrel 26. The anti-splashing screen does not operate to effect any aeration or mixing with air or liquid passing therethrough.

In FIG. 9, the water and detergent mixing device 16 is shown applied to the head 14' of an automatic spraying device 10'. The head 14' is similar in construction to the aerator 14 and is connected to a tube 98 covered by a handle 100. The tube is connected to one end of a hose 102, the other end of the hose being connected to a source of water supply such as a faucet in a sink. An operating bar 104 controls the passage of water through the spray head.

A modified form of water and detergent mixing device 16'' is shown coupled to a spout 12'' by a coupling member 20'' in FIG. 10. This form of mixing device 16'' differs from the form of mixing device 16 in that the barrel 26'' is formed integrally with the extension 62'' of the container 50''. Furthermore, in place of the recess 82 in the extension 62'' a narrow cylindrical passage 82'' communicates with the passage 84'' and passage 86''.

In all other respects, the mixing device 16'' is similar to the mixing device 16 and similar reference numerals are used to indicate similar parts.

It is to be understood that the various parts may be made of any suitable material, of any desired shape.

While I have illustrated and described the preferred embodiments of my invention, it is to be understood that I do not limit myself to the precise constructions herein disclosed and that various changes and modifications may be made within the scope of the invention as defined in the appended claims.

Having thus described my invention, what I claim as new, and desire to secure by United States Letters Patent is:

1. An attachment for a liquid aerator having a cylindrical body with a water passage therethrough and having annularly arranged slots in the body constituting air inlets, the improvement comprising a container for storing a supply of liquid detergent, a lateral extension on said container having a semicircular recess, a flat spring secured at one end to the container, the other end of the spring being bent to provide a semicircular curvature disposed opposite the semicircular recess in the extension, said bent portion of the spring and the recess defining a circular opening receiving the cylindrical body of the aerator with the bent portion of the spring in intimate contact therewith for rotatably supporting the container on the body, and valve means carried by the container for controlling passage of the detergent to and through the slotted air inlets to the water passage in the body of the aerator, said valve means including a cylindrical recess in the extension of the container communicating with the opening defined by the extension and spring, said extension having a passage communicating at one end with said latter recess, and said container having a passage communicating with the other end of said first-named passage and with the interior of the container, and a sleeve in the cylindrical recess in the extension, the bore of the sleeve communicating with the passage in the extension, one end of said sleeve protruding outwardly of the cylindrical recess into said opening, the bore of said sleeve communicating with a slot in the body of the aerator.

2. An attachment for a liquid aerator having a cylindrical body with a water passage therethrough and having annularly arranged slots in the body constituting air inlets, the improvement comprising a container for storing a supply of liquid detergent, a lateral extension on said container having a semicircular recess, a flat spring secured at one end to the container, the other end of the spring being bent to provide a semicircular curvature disposed opposite the semicircular recess in the extension, said bent portion of the spring and the recess defining a circular opening receiving the cylindrical body of the aerator with the bent portion of the spring in intimate contact therewith for rotatably supporting the container on the body, and valve means carried by the container for controlling passage of the detergent to and through the slotted air inlets to the water passage in the body of the aerator, the curved portion of said spring having a central slot and a tongue supported on said curved portion and extending inwardly of the slot therein and through one of the air inlets in the cylindrical body of the aerator for guiding the rotary movements of the body.

3. An attachment for a liquid aerator having a cylindrical body with a water passage therethrough and having annularly arranged slots in the body constituting air inlets, the improvement comprising a container for storing a supply of liquid detergent, a lateral extension on said container having a semicircular recess, a flat spring secured at one end to the container, the other end of the spring being bent to provide a semicircular curvature disposed

opposite the semicircular recess in the extension, said bent portion of the spring and the recess defining a circular opening receiving the cylindrical body of the aerator with the bent portion of the spring in intimate contact therewith for rotatably supporting the container on the body, and valve means carried by the container for controlling passage of the detergent to and through the slotted air inlets to the water passage in the body of the aerator, said valve means including a cylindrical recess in the extension of the container communicating with the opening defined by the extension and spring, said extension having a passage communicating at one end with said latter recess, and said container having a passage communicating with the other end of said first-named passage and with the interior of the container, and a sleeve in the cylindrical recess in the extension, the bore of the sleeve communicating with the passage in the extension, one end of said sleeve protruding outwardly of the cylindrical recess into said opening, the bore of said sleeve communicating with a slot in the body of the aerator, the curved portion of said spring having a central slot and a tongue supported on said curved portion and extending inwardly of the slot therein and through one of the air inlets in the cylindrical body of the aerator for guiding the rotary movements of the body.

4. An attachment for a liquid aerator having a cylindrical body with a water passage therethrough and having annularly arranged slots in the body constituting air inlets, the improvement comprising a container for storing a supply of liquid detergent, a lateral extension on said container having a semicircular recess, a flat spring secured at one end to the container, the other end of the spring being bent to provide a semicircular curvature disposed opposite the semicircular recess in the extension, said bent portion of the spring and the recess defining a circular opening receiving the cylindrical body of the aerator with the bent portion of the spring in intimate contact therewith for rotatably supporting the container on the body, and valve means carried by the container for controlling passage of the detergent to and through the slotted air

inlets to the water passage in the body of the aerator, said valve means including a cylindrical recess in the extension of the container communicating with the opening defined by the extension and spring, said extension having a passage communicating at one end with said latter recess, and said container having a passage communicating with the other end of said first-named passage and with the interior of the container, and a sleeve in the cylindrical recess in the extension, the bore of the sleeve communicating with the passage in the extension, one end of said sleeve protruding outwardly of the cylindrical recess into said opening, the bore of said sleeve communicating with a slot in the body of the aerator, the curved portion of said spring having a central slot and a tongue supported on said curved portion and extending inwardly of the slot therein and through one of the air inlets in the cylindrical body of the aerator for guiding the rotary movements of the body, the free outer end of the curved portion of the spring being offset from the body of the spring providing a finger piece for manipulating the spring.

5. The attachment as defined in claim 3, wherein the container is provided with an air vent.

6. The attachment as defined in claim 3, wherein the container has a shallow rectangular body open at the top and a removable cover closing the opening at the top, said cover having an air vent.

References Cited in the file of this patent

UNITED STATES PATENTS

1,233,431	Witt	July 17, 1917
1,681,362	Pike	Aug. 21, 1928
2,564,618	Williams	Aug. 14, 1951
2,690,717	Goodrie	Oct. 5, 1954
2,908,227	McDougall	Oct. 13, 1959
2,962,226	Goodrie	Nov. 29, 1960
3,031,147	Goodrie	Apr. 24, 1962

FOREIGN PATENTS

492,850	Canada	May 12, 1953