April 2, 1957 E. P. AGHNIDES 2,787,452

FAUCET ATTACHMENTS

Filed Feb. 18, 1953

FIG. 1.

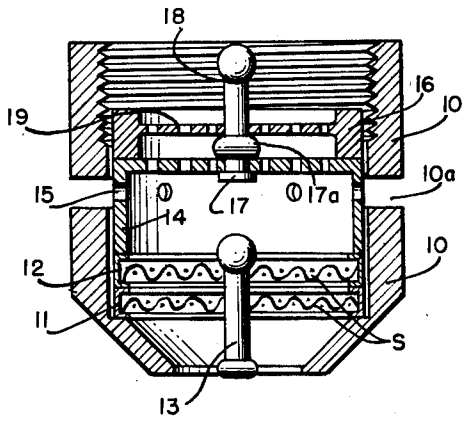


FIG. 2.

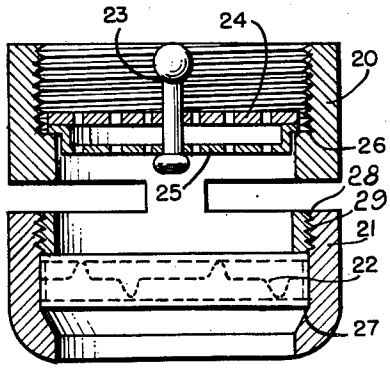


FIG. 7.

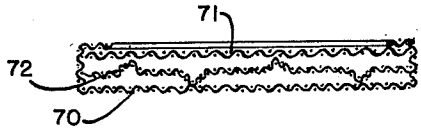


FIG. 3.

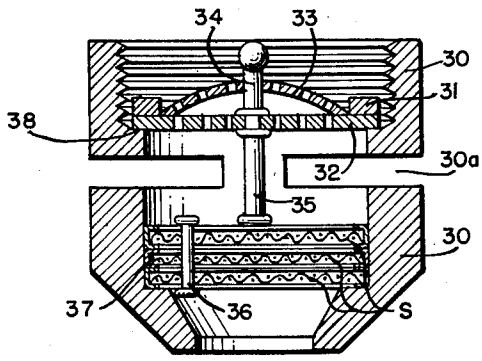


FIG. 4.

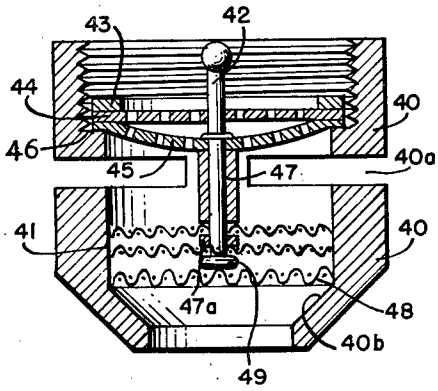


FIG. 5.

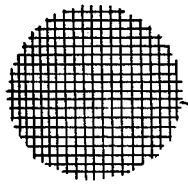
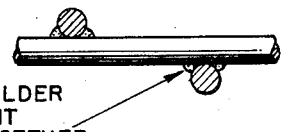


FIG. 6.



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United States Patent Office

2,787,452

Patented Apr. 2, 1957

2,787,452

FAUCET ATTACHMENTS

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Application February 18, 1953, Serial No. 337,502

3 Claims. (Cl. 261—76)

This invention relates to faucet attachments and more particularly to devices of that type which may be readily assembled and disassembled.

Devices of the type described and shown in my U. S. Patent 2,210,846, Fluid Mixing Device, granted August 6, 1940 and U. S. Patent 2,316,832, Fluid Mixing Device, granted April 20, 1943 have gone into widespread use. The commercial devices built under these patents can be disassembled for the purpose of cleaning but there is some difficulty in disassembling and reassembling the devices. Moreover there is the possibility that an inexperienced person may improperly assemble the device. There are also certain difficulties involved in supplying spare parts. A primary object of the present invention is to provide an aerator which overcomes the disadvantages of the prior aerators.

Another object of the invention is to provide an aerator which it is difficult to assemble improperly.

Still another object is to provide an aerator which may readily be disassembled for cleaning by inexperienced persons.

Another object of the invention is to provide improvements in aerators whereby the discharge end of the aerator may be larger than with prior arrangements, for a given overall diameter of the body of the casing.

Still another object of the invention is to provide an aerator in which particles of the screen wires will not fall off and go into the water passing through the aerator.

In carrying out the foregoing objects I provide a perforated disc at the upstream end of the aerator carrying a handle upon which a second somewhat similar perforated disc may be mounted. The nature and function of these two discs are fully described in my aforesaid prior Patent No. 2,316,832. At the downstream end of the aerator I may connect the screens together with a handle. I also use screens in which the screen wires are welded, soldered, cemented or otherwise rigidly interconnected. In the alternative they may be molded or stamped or otherwise cut from a sheet of metal or other material or produced by any other process. In any event all of the screen elements are fastened together at every junction point. In the alternative screen-like perforations may be punched or otherwise placed in a sheet of metal or other material to form the screen. This produces results as hereinafter fully explained.

In the drawings:

Figure 1 is a cross-section of one form of the invention.

Figure 2 is a cross-section of still another form of the invention.

Figure 3 is a cross-section of an additional modification of the present invention.

Figure 4 is a cross-section of yet another modification of the invention.

Figure 5 is a view of a screen used in connection with the invention.

Figure 6 is an enlarged view of two of the screen wires of the screen of Figure 5.

Figure 7 is a cross-section view of a modified form of screen unit employed in Figure 2. It should be understood, however, that this modified screen unit may be used in any of the devices shown in Figures 1, 3 and 4 if desired.

In Figure 1, the metal cup or casing 10 has internal threads at its upstream end for attachment to a faucet. Located in the body of this casing is an inverted cup 14 having perforations 15 along its side wall and additional perforations along the top. A handle 18 is attached to the top of cup 14 by means of enlarged heads or beads 17. An upper disc or perforated diaphragm 19 mounted on or integral with an enlarged rim 16 may slide freely along the handle 18. The screens S may be mounted in rims 11 and 12, and it is the thickness of these rims that space the screens one from the other. A handle 13 having enlarged heads or beads at both ends thereof passes through holes in the centers of the screens.

Since in Figure 1, the disc 19 and cup 14 are carried by a common handle 18, they may be readily removed for purpose of cleaning and there is little chance that the upper diaphragm 19 may become lost. The disc 19 is not fastened to handle 18 and may therefore slide along the same. This is desirable during cleaning since it enables the diaphragm to be separated from the cup 14. Essentially the same is true as for screens S. They are connected together by handle 13 to render their removal easy and to reduce the possibility of losing one of them yet they may be readily separated somewhat for purposes of cleaning.

While handle 18 is attached to cup 14 by enlarged heads 17 and 17*a*, the head 17*a* may be omitted (so far as the broader aspects of the invention are concerned) whereby cup 14 may slide along handle 18.

The rim 16 for diaphragm 19 may be composed of resilient or soft material capable of acting as a washer, for example soft metal, plastic or rubber. Polyethylene is a recommended material. The disc 19 could be composed of metal and the rim 16 of polyethylene. The whole could be molded in one material.

In Figure 2 an upper cap 20 has internal threads adapted for connection to a faucet. Cap 20 has a lower part having external threads 28. A lower cap 21 has internal threads 27 complementary to threads 28 and also complementary to the external threads on the faucet. Hence lower cap 21 may be fitted either onto the faucet itself or onto the lower part of upper cap 20. A ledge 26 supports the lower dished disc or diaphragm 25 which has perforations to create high velocity streamlets. A handle 23 is preferably permanently secured to disc 25 by any suitable process or means but the upper disc or diaphragm 24 fits loosely upon the handle 23, and may be moved along the same for purposes of cleaning all in a manner similar to the description of handle 18 of Figure 1. Handle 23 can be made to move up and down in the disc 25 however, without departing from the broader aspects of this invention.

In Figure 3 an improved form of aerator is illustrated in which a casing 30 has a ledge 38 on which the lower perforated disc 32 rests. A second curved perforated disc 33 rests on disc 32 and a washer 31 rests on top of disc 33. The handle 34 is permanently affixed to disc 32 but the dished disc 33 is slidable along the handle 34 when the latter has been removed from the body of the casing. The casing 30 has air inlet holes 30*a*. Three screens S have mounting rims 37 and are held together as a unit by rivet 36. The handle 34 has a projection 35 extending downwardly to the top screen S to hold the latter in position during operation of the device.

Another form of this invention is illustrated in Figure 4 wherein a casing or cup 40 has a ledge 46 upon which rests a dished disc 45 attached permanently to handle 42.

A second perforated disc 44 rests on the dished disc 45 and fits loosely around handle so it may be moved along the same. Washer 43 rests on the disc 44 and is used for sealing purposes. Below the disc 45 there are washers or spacers 47 and 47*a* associated with two unframed screens 41. A third screen 48 rests on a ledge in cup 40. The lower head 49 of handle 42 rests on the lower screen 48 which in turn rests on a ledge 40*b* of casing 40. The casing has air inlet holes 40*a*. One feature of the present invention is best shown in Figures 2 and 4 where unframed screens are used. In the past it has been the practice to use screens that are woven or otherwise formed but without welding, soldering, cementing or otherwise attaching the wires together. In certain commercially used screens the practice has been to place a frame or rim around the periphery of the screen. This has been deemed necessary in commercial aerators for the reason, among others, that unless the screen is framed, small portions of screen wires, especially near their ends, are likely to fall off and to pass out the downstream end of the aerator. This is likely to seriously affect any drinking water involved. Due to framing the edges of the screens, the size of the screen and therefore the area of the downstream opening is greatly reduced. For example, in certain aerators the cross-sectional area of the flow is reduced by 28% due to the frames on the screens. With the forms of invention shown in Figures 2 and 4 I use screens that have the various wires composing the same welded, soldered, cemented, or otherwise permanently attached to each other at each juncture of the wires as shown in Figures 5 and 6. These screens are not framed and consequently the cross-section through which water may flow is larger than in prior art aerators. In Figure 4 they are held in place by the washer 47 and head 47*a* and in Figure 2 they rest on a ledge 27.

The upper discs 19, 24, 33 and 44 of Figures 1, 2, 3 and 4 respectively may be made of resilient material such as rubber, plastic, etc. or of soft metal; or may be made of metal in which case washers such as washers 31 and 43 of Figures 3 and 4 or the rim 16 of Fig. 1 are desirable. In Figure 2 the resilient disc 24 does away with the need of a washer. The three screens carried by cap 21 are perforated discs having openings corresponding to those in a wire mesh screen.

Figure 7 illustrates a screen unit in which the lower screen 70 is dished and holds upper screens 71 and 72 in it. Middle screen 72 has indents and raised portions arranged to space it from screens 70 and 71. The upper edge of screen 70 may be bent over the edge of top screen 71 to hold it in place. The middle screen 72 has indents such as shown and described in connection with Figure 12 of my said prior copending application S. N. 63,110, now U. S. Patent 2,633,343, granted March 31, 1953.

I claim to have invented:

1. An aerator comprising means adapted for connection to a source of water under pressure for breaking up the water into high velocity streamlets, an air inlet below said means, and means below the air inlet for finely breaking up the water and mixing it with air and for joining the streams together to produce at the outlet end of the aerator a coherent stream containing bubbles, the first-named means including a pair of perforated discs having a central stud for removing the two discs from the aerator as a unit, at least one of said discs being slidable on said stud whereby the discs may be separated from each other when it is desired to clean the same, said stud having enlargements on both ends to confine the perforated discs thereto.

2. An aerator comprising means adapted for connection to a source of water under pressure for breaking up the water into high velocity streamlets, an air inlet below said means, and means below the air inlet for finely breaking up the water and mixing it with air and for joining the streams together to produce at the outlet end of the aerator a coherent stream containing bubbles, the first named means including a pair of perforated discs the downstream one of which is dished to separate the two discs from each other, the downstream disc having the outer upstream portion thereof in contact with the outer downstream portion of the upstream disc with the central portion of the downstream disc being farther downstream than the outer portion thereof, the first named means comprising a casing having a ledge on which said downstream disc rests, the casing having larger diameter than the discs upstream said ledge, a handle fastened at the center of the downstream disc, the upstream disc having a hole therethrough through which said handle freely passes, said handle having disc confining enlargements at both ends to limit the spacing of the discs.

3. An aerator comprising means adapted for connection to a source of water under pressure for breaking up the water into high velocity streamlets, an air inlet below said means, and means below the air inlet for finely breaking up the water and mixing it with air and for joining the streams together to produce at the outlet end of the aerator a coherent stream containing bubbles, the first-named means including a pair of perforated discs having a central stud for removing the two discs from the aerator as a unit, the lower disc being fixed to the central stud and the upper disc being slidable on said stud whereby the discs may be separated from each other for purposes of cleaning, said stud having enlargements on both ends to confine the discs thereto.

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