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2,998,925

AERATING FAUCET

Filed April 30, 1959

FIG. 1.

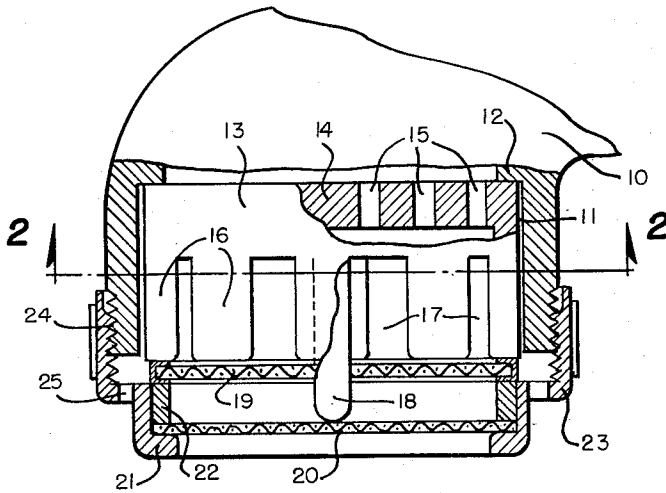
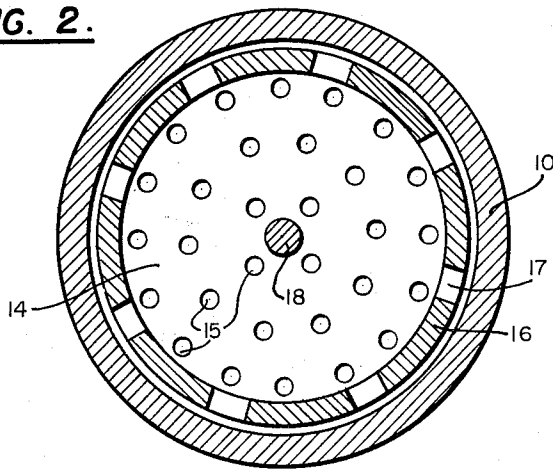


FIG. 2.



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AERATING FAUCET

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Claims priority, application France Nov. 29, 1949

5 Claims. (Cl. 239-430)

This invention relates to a faucet that produces an aerated stream of water.

In the prior art, for example my U.S. Patents No. 2,210,846 entitled, "Fluid Mixing Device," granted August 6, 1940, and No. 2,316,832 entitled, "Fluid Mixing Device," granted April 20, 1943, it was customary to attach an aerator on the spout end of a faucet, the aerator extending below the faucet. In my Patent No. 2,633,343 entitled, "Gas and Liquid Mixing Device," granted March 31, 1953, I illustrated an aerator located inside the faucet, but there is a disadvantage to that particular aerator in that it is difficult to clean. A major advantage of that patent is that it is difficult to replace the parts incorrectly after the aerator has been removed from the faucet for the purposes of cleaning. The main object of the present invention is to overcome the difficulties in respect to cleaning found in that prior patent without loss of the advantages.

Another main object of the invention is to provide an effective way of locating an aerator in a faucet.

Another object of the invention is to improve the aerator so far as the air passageway to the mixing space is concerned.

Other objects of the invention will become apparent as this description proceeds.

This application is a continuation-in-part of my prior copending application Serial No. 601,712, filed August 2, 1956, entitled, "Fluid Mixing Device," which is in turn a continuation-in-part of my application Serial No. 135,645, filed December 29, 1949, entitled, "Fluid Mixing Device." The latter application, with some of the figures relevant to the invention here disclosed and claimed cancelled, issued into U.S. Patent No. 2,811,340 on October 29, 1957. The last-named application was copending with my prior application Serial No. 88,797, filed April 21, 1949, now U.S. Patent No. 2,664,278, issued December 29, 1953, entitled, "Fluid Mixing Device." This application is related to my prior copending application Serial No. 337,501, filed February 18, 1953, entitled, "Faucet Attachment," (now abandoned) which is in turn related to my application Serial No. 63,110, filed December 2, 1948, entitled, "Gas and Liquid Mixing Device," now U.S. Patent No. 2,633,343. This application is also a continuation-in-part of my prior copending application Serial No. 752,458, filed August 1, 1958, entitled, "Water Taps Having Improved Aerating Spouts." It is also related to my prior copending application Serial No. 560,299 which in turn is related to my application Serial No. 424,982, filed April 22, 1954, now U.S. Patent No. 2,799,487, entitled, "Aerator with Unitary Molded Inner Assembly." It is also related to my prior copending application Serial No. 639,783, filed February 12, 1957, entitled, "Vandal-Proof Aerator." It is moreover, a continuation-in-part of my prior copending application Serial No. 746,539, filed July 3, 1958, entitled, "Assembled Jet and Mixing Means for Water Aerators." This application is also a continuation-in-part of my prior copending application Serial No. 351,907, filed April 29, 1953, entitled, "Fluid Mixing Device," (now abandoned).

In the drawings:

FIGURE 1 is a cross-sectional view of an aerating faucet embodying the invention.

FIGURE 2 is a cross-sectional view taken along line 2-2 of FIGURE 1.

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In FIGURE 1, a faucet 10 which is of course a tubular conduit, has an enlarged internally bored portion 11 extending upwardly from its discharge end and terminating in a shoulder 12. An aerating system is adapted to be slipped into the enlarged bore from the discharge end of the faucet and to rest against the shoulder 12 and that system is composed of the following parts. A polyethylene inverted cup 13 has eight legs 16 separated by spaces 17. The upper end of the inverted cup 13 comprises a disc 14 having three rows of apertures 15. Located centrally in the cup is a projection 18. An upstream screen 19 has a frame around its periphery to hold it in a flat plane and a centrally located hole which is originally slightly smaller than the diameter of projection 18, whereby during assembly when the screen is manually pressed into position the screen wires will grip the projection 18 and hold the screen to the projection by friction once it is inserted thereon. The lower screen 20 is permanently mounted in a cylindrical member 21 and held therein by means of a retaining ring 22. The cylindrical member 21 has an upper part 23 which has internal threads 24 which are in engagement with complementary threads on the outside of the faucet 10. Air inlet holes 25 are located in a shoulder on the cylindrical member 21.

The cylindrical member 21 forms a tubular outlet element.

The device functions as an aerator in basically the same way as my aforesaid prior patents in that water is forced under pressure through the openings 15, producing a plurality of separate high velocity spaced streamlets inside the cup 13. These high velocity streamlets impinge upon the screens 19 and 20 where they are finely broken up and mixed with air and the water is discharged from the outlet of the device in the form of a white coherent bubbly jet of aerated water.

I have shown the holes 15 as conventional since the details thereof form no part of the present invention; however it is understood that the present device could be improved if any of the improved forms of upstream discs that I have shown in my prior copending applications are substituted for the disc 14. The aforesaid patents and applications show some of the improved forms of upstream discs that may be used.

The device herein disclosed can be easily cleaned by the housewife by simply unscrewing the member 21 from the faucet 10 whereby the inverted cup 13, the screen 19 and the screen 20 are removed from inside the faucet. The screen 19 can be readily removed from the projection 18 and cleaned separately. Upon removal of that screen both sides of disc 14 are exposed whereby it may be easily cleaned. Moreover, the screen 20 is separate from the screen 19 and from the disc 14, and therefore it may be readily cleaned. After cleaning it is very difficult for the housewife to assemble the device incorrectly, especially since the member 21 which carries the screen 20 permanently is too large to fit inside the faucet and therefore it will be apparent to the housewife that it is assembled last and is screwed onto the outside of the faucet.

The housewife will see at once that screen 20 is adapted to be replaced onto projection 18. All she then needs to do is to replace the unit 13-20 inside the faucet and screw the member 21 onto the faucet until the inverted cup is pressed against shoulder 12.

It is noted that the cylindrical member 21 (tubular outlet element) is smaller in diameter than the faucet 10 and its downstream end is located below the downstream end of the faucet. It carries screen 20 downstream of the faucet 10. Moreover, the air entering inlet ports 25 enters the mixing space (the space where the water is mixed with air due to screen resistance) im-

mediately adjacent the upstream side of screen 19. This provides a short and direct air path which is easy to keep clean.

I claim to have invented:

1. In an aerator, a tubular conduit adapted to be connected at its upstream end to a source of water under pressure, jet forming means in the path of the water for increasing the velocity of while decreasing the cross-section of the water, a tubular outlet element having smaller cross-section than that of the tubular conduit, the tubular outlet element being supported by the downstream portion of the tubular conduit with the downstream end of said tubular outlet element further downstream than the downstream end of the tubular conduit, mixing means spaced downstream of the jet forming means to thereby form therebetween a mixing space, said mixing means being at least partly located downstream of the downstream end of the tubular conduit and at least partly in the tubular outlet element and including means for finely breaking up the water from the jet forming means and mixing the broken water with air to produce a coherent stream laden with numerous small bubbles and to discharge such stream through the tubular outlet element, said tubular conduit and said tubular outlet element having at least one opening between them thereby providing at least one air inlet which enters the downstream end of the tubular conduit through the inlet between said conduit and said element, and enters said mixing space adjacent said mixing means.

2. An aerator as defined in claim 1 in which said tubular conduit is a faucet.

3. An aerator as defined in claim 1 in which there are supporting means carried by the downstream end of the faucet extending inwardly to support said tubular outlet element, said supporting means having said air inlet therein.

4. An aerator as defined in claim 1 in which the downstream end of the tubular conduit is threaded; and a cap, including said tubular outlet element, threaded to mate with the downstream end of the conduit; said cap having said air inlet therein.

5. An aerator as defined in claim 1 in which the tubular conduit is a faucet having external threads, a cap having internal threads mating with those on the faucet, said cap including said tubular outlet element and defining said air inlet adjacent the outer surface of the tubular outlet element.

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