Oct. 9, 1951 J. E. HANNIGAN 2,570,669

AERATING FAUCET ATTACHMENT

Filed April 30, 1948

FIG. 1.

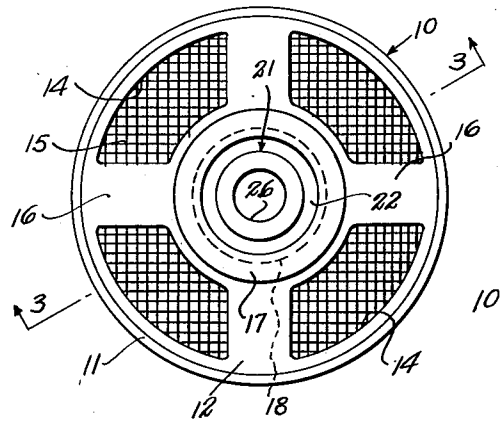


FIG. 2.

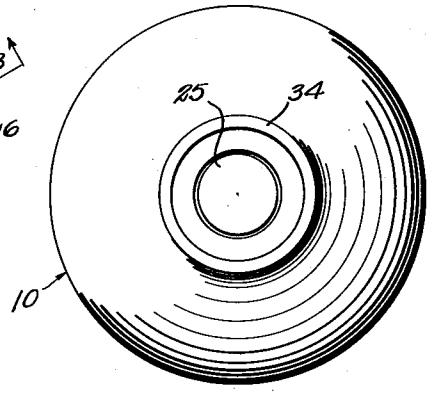


FIG. 3.

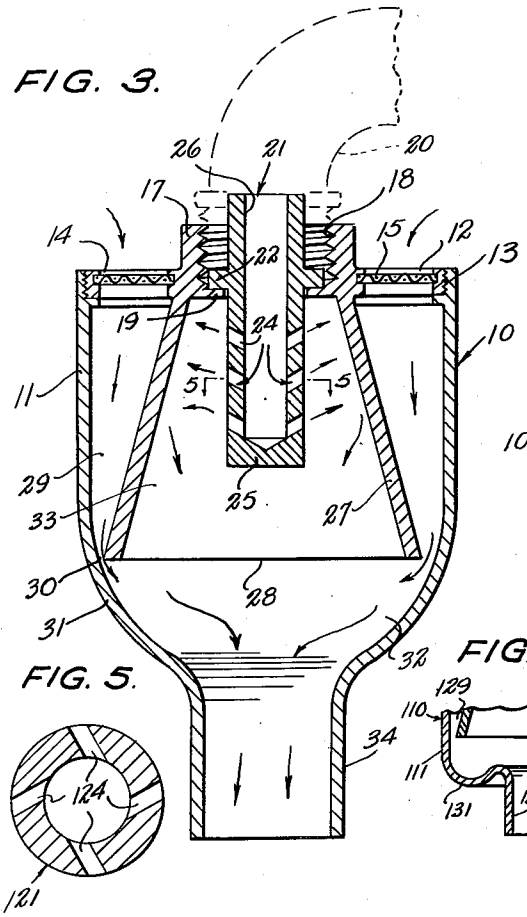


FIG. 4.

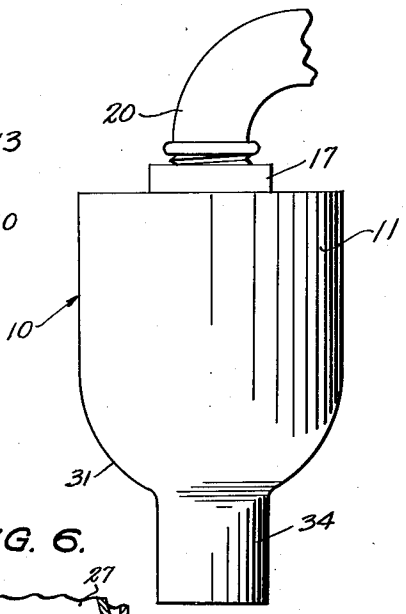
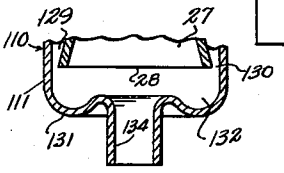


FIG. 5.

FIG. 6.



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AERATING FAUCET ATTACHMENT

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2 Claims. (Cl. 261—116)

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My invention relates to aerating attachments for faucets of the type wherein the fluid discharged from the faucet is aerated and ultimately discharged as a foam formed of a large number of minute bubbles. While the term "faucet" has been and will be used, it is understood that any spout or discharge end of a conduit for fluid may be utilized with the device according to the invention. Likewise, while it is contemplated that the principal use of the device according to the invention will comprise the aeration of water, it is to be understood that the device is not to be so limited except as hereinafter claimed.

With the foregoing in view, it is an object of my invention to provide an improved device for the aeration of fluid.

A further object is to provide an improved aerating attachment for a faucet which includes an atomizing chamber, an air chamber and a mixing chamber all in operative association whereby to aerate the fluid in the mixing chamber and discharge it therefrom in the form of a stream of foam composed of minute bubbles.

Other objects and advantages of the invention reside in the particular structure, the structure of the elements comprising the invention, combination and arrangement of such elements, and will be readily understood by those skilled in the art upon reference to the attached drawing in connection with the following specification, wherein the invention is shown, described and claimed.

In the drawing:

Figure 1 is a plan view of a preferred form of the invention apart from a supporting structure such as a faucet;

Figure 2 is a bottom plan view thereof;

Figure 3 is a transverse vertical sectional view taken substantially on the plane of the line 3—3 of Figure 1;

Figure 4 is an elevation of the invention showing the same attached to a faucet and on a slightly reduced scale;

Figure 5 is an enlarged horizontal sectional view taken substantially on the plane of the line 5—5 of Figure 3, but showing a modified form of the invention;

Figure 6 is a fragmentary vertical sectional view like Figure 3, but showing a further modification of the invention.

Referring specifically to the drawing, wherein like reference characters have been used throughout the several views to designate like parts, and referring at first to Figures 1 to 4, inclusive, 10 designates generally an open ended upstanding shell or housing for the aerator according to the invention and may comprise a substantially cylindrical side wall 11 having an upper end closed by a substantially disc-like end wall 12. Preferably, the end wall 12 is readily detachably

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connected to the side wall 11, as by being threadedly engaged therewith, as at 13, Figure 3. The end wall 12 is provided with an annular series of air inlet ports 14 formed therethrough, and such ports are spaced by arms 16. Likewise, such ports 14 are screened by any suitable reticulated member or fine screening material, as indicated at 15, to prevent the passage of foreign material through the ports. The end wall 12 is provided with an annular boss 17 which extends upwardly thereof in inwardly concentric relation to the ports 14. The inner surface of the boss 17 is preferably threaded or otherwise formed, as at 18, for a readily detachable connection with the complementary threads on a faucet 20. The boss 17 inwardly thereof is provided with a radially inwardly-directed annular flange 19 comprising a seat.

An atomizer is formed from an upstanding tube 21 having its upper end open and its lower end closed and is concentrically disposed within the boss 17 and includes a radially outwardly-directed annular flange 22 adapted to seat atop the flange 19 aforesaid and to be maintained thereon by an engagement with the bottom edge of the faucet 20. If desirable, a suitable fluid-tight washer, not shown, may be interposed between the upper surface of the flange 22 and the bottom edge of the faucet 20. The atomizer 21 comprises an upwardly-directed tubular portion 26 which extends upwardly into the faucet 20 and includes a fluid intake port for the device. Below the flange 22, the atomizer 21 is provided with a plurality of radially outwardly and upwardly-directed atomizing ports 24 for the discharge of atomized fluid outwardly of the atomizer. The lower end of the atomizer 21 is closed, as at 25, whereby to force all fluid entering the atomizer to be discharged therefrom through the ports 24.

The end wall 12 includes a depending and substantially downwardly flaring wall 27 which depends therefrom inwardly of the side wall 11 and which is concentrically disposed about the atomizer 21. The wall 27 includes a lower edge 28 which extends a substantial distance below the floor 25 of the atomizer. The wall 27 likewise cooperates with the side wall 11 to define an air chamber 29 therebetween. The flange 17 and downwardly flaring wall 27 form an inverted upstanding funnel. Likewise, the lower edge 28 of the wall 27 cooperates with the substantially inwardly converging lower wall portion 31 of the side wall 11 to define a circular gap 30 providing communication between the air chamber or space 29 and a mixing chamber 32. As is readily apparent from the foregoing, the atomizer 21 and the downwardly flaring wall 27 provide an atomizing chamber 33 which is in open communication with the mixing chamber 32. Likewise, the air chamber 29 is in open communication through

the gap 30 with the mixing chamber 32, but is not in direct communication with the atomizing chamber 33.

In the form of invention just described, and with the same operatively attached to a faucet 20, as shown, when the faucet valve is opened, fluid enters the intake port 26 of the atomizer and is at least partially atomized by being discharged therefrom through the atomizing ports 24. Atomization is completed by the impact of the fluid droplets against the inner periphery of the wall 27. Such impact discharges the atomized fluid downwardly toward the wall 31 of the mixing chamber 32. However, as such droplets pass the gap 30 they are intercepted by the blast of air discharged from the air chamber 29 and thoroughly aerated within the mixing chamber. Thereafter, the fluid is discharged from the mixing chamber through a substantially cylindrical downspout or outlet port 34 disposed axially of the housing 10.

Referring now to Figure 5, there is there disclosed an atomizer 121 which is similar in all respects to the atomizer 21 aforesaid, except that the atomizing ports 124 are more in number and instead of discharging from the atomizer in radial upward directions, discharge therefrom in substantially tangential and upward directions. Thus, a whirling of the fluid is effected as it is atomized and discharged from the atomizer 121. Moreover, such whirling tends to retard the falling of the atomized fluid from the wall 27, whereby it is more readily intercepted by the air blast discharging through the gap 30.

Referring now to Figure 6, the aerator there disclosed is similar in all respects to that previously described, except that the housing 110 includes a cylindrical side wall 111, the lower portion of which is radially inwardly and upwardly directed at the bottom to provide a substantially annular cup-shaped floor 131. Thus, as air from the air chamber 129 is discharged through the gap 130 and mixed with the fluid droplets, the mixture of fluid droplets and air is discharged upwardly and inwardly by the floor 131 whereby a more thorough aeration of the fluid is achieved. Thereafter, the aerated fluid is discharged through the outlet port 134, as in the first-described form of the invention.

It is to be understood that in all forms of the invention, the air ports 14 are substantially large and that the air chamber 29 or 129 at the upper end thereof is substantially large terminating at the bottom thereof in the restricted circular gap 30 or 130. Obviously, the lowered air pressure created by the rush of fluid through the housing 10 sucks air into the air chambers 29 and 129 through the inlet ports 14.

While I have shown and described what is now thought to be the preferred embodiments of the invention, it is to be understood that the same is susceptible of other forms and expressions. Consequently, I do not limit myself to the precise structures shown and described hereinabove except as hereinafter claimed.

I claim:

1. An aerating device for attachment to the discharge end of a faucet comprising an inverted upstanding funnel having the upper end adapted to be dependingly secured to the discharge end of said faucet, an upstanding tube having its upper end open and its lower end closed positioned within and spaced from the wall of said funnel and dependingly supported intermediate its ends in said funnel, the upper open end of said tube being adjacent the upper end of said funnel and adapted to be embraced by the discharge end of said faucet and the lower closed end of said tube being spaced from the lower end of said funnel, there being a plurality of spaced ports extending transversely through the wall of said tube adjacent to and spaced from the closed end thereof for the egress of water therethrough, and an open-ended upstanding shell having the upper end and the portion adjacent to said end circumposed about and spaced from said funnel and having the upper end dependingly supported on said funnel adjacent the upper end of the latter, the space between said upper end of said shell and said funnel providing an opening for the ingress of air from the atmosphere, the lower end of said funnel being spaced from and forming with the adjacent portion of the wall of said shell a gap for the passage of the air therethrough.

2. An aerating device for attachment to the discharge end of a faucet comprising an inverted upstanding funnel having the upper end adapted to be dependingly secured to the discharge end of said faucet, an upstanding tube having its upper end open and its lower end closed positioned within and spaced from the wall of said funnel and dependingly supported intermediate its ends in said funnel, the upper open end of said tube being adjacent the upper end of said funnel and adapted to be embraced by the discharge end of said faucet and the lower closed end of said tube being spaced from the lower end of said funnel, there being a plurality of spaced ports extending transversely through the wall of said tube adjacent to and spaced from the closed end thereof for the egress of water therethrough, an open-ended upstanding shell having the upper end and the portion adjacent to said upper end circumposed about and spaced from said funnel and having the upper end dependingly supported on said funnel adjacent the upper end of the latter, the space between said upper end of said shell and said funnel providing an opening for the ingress therethrough of air from the atmosphere, the lower end of said funnel being spaced from and forming with the adjacent portion of the wall of said shell a gap for the passage of the air therethrough, and a reticulated member positioned over the space between the upper end of said shell and said funnel and fixedly supported on the upper end of said shell and said funnel, the portion of said shell adjacent said gap converging inwardly toward and terminating at a point spaced from the lower end thereof to provide a mixing chamber for the water discharged from the lower end of said funnel and the air discharged from said gap.

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