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AERATING DEVICE

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## AERATING DEVICE

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8 Claims. (Cl. 239—431)

This invention relates to an aerating device, and more particularly to an aerator for use with a water faucet.

One of the objects of this invention is to provide an aerator with screens or foraminous members having their surfaces embossed so that when the screens or foraminous members are in superposed position they are properly spaced with respect to each other by reason of the embossings.

In the construction of the aerators presently on the market, or as exemplified by the prior art, a plurality of screens are positioned in superimposed relation and various means are employed for providing the spacing therebetween. In certain instances the edges of the screens are provided with specially constructed rims which provide the spacings and in other instances separate spacing members are interposed. The foregoing type structures increase the cost of the devices and increase the number of parts utilized. With this invention the screens are preshaped or embossed in such a manner that the surfaces provide embossings or undulations so that when they are in superposed position they are properly spaced with respect to each other. The bossings or undulations of the screens serve to position and properly space the screens with respect to each other to achieve the desired results and hence eliminate the use of the structures of the prior art.

Another object of this invention is to provide an aerator in which the air enters adjacent the discharge end rather than through the side and in which an air space is provided between the outer casing and an inner shell so that the air enters in said spacing and is introduced into the interior through suitable communicating openings in the inner shell.

Another object of this invention is to provide an aerator with a spray jet unit which is readily removable.

Another object of this invention is to provide an aerating device which is very simple and inexpensive to manufacture and which is highly efficient in operation.

Other objects will become apparent as this description progresses.

In the drawings:

FIG. 1 is an enlarged cross-sectional view of the aerator forming this invention.

FIG. 2 is an exploded cross-sectional view of the parts comprising the aerator shown in FIG. 1.

FIG. 3 is a perspective view of one of the screens.

FIG. 4 is an enlarged view of the three screens in superposed spaced relation position.

FIG. 5 is an enlarged top plan view of the screen, and

FIG. 6 shows a modified form of spray jet unit that may be used in lieu of the spray jet unit shown in the preceding figures.

Referring to FIGS. 1 to 5 inclusive of the drawings, the aerator includes a tubular body or casing generally indicated by the numeral 10. The upper inner surface of the casing 10 is threaded as at 12 to engage the externally threaded end 14 of the water faucet or tap 16. The upper outer surface is externally threaded as at 15. The casing 10 is provided with an annular recessed portion below the threaded portion 14, said annular recessed portion being indicated 17. The said recessed portion defines an annular shoulder or ledge 18.

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Supported within the tubular body or casing 10 is an annular ring or shell generally indicated at 20. The shell or ring has a tubular body portion with the lower end thereof turned inwardly to form an inwardly extending annular lip 22. The upper portion of the body of the shell is provided with three elongated spaced slots 24, and the shell body above the aforementioned slots is enlarged to form an enlarged annular body portion adjacent the upper end, indicated by the numeral 26. The upper end of the enlarged body portion 26 is turned outwardly to form an annular outwardly extending lip 28.

The shell or ring 20 is positioned inside the casing 10 and is pressed into the casing. It will be noted that with the shell body in the casing the outwardly extending lip 28 at the upper end rests on the shoulder or ledge 18 of the casing 10 and the shell body is spaced from the inner wall of the casing to provide the space indicated by the numeral 30 between the shell body and the interior of the casing. The air is drawn into the aerator through the bottom or adjacent the discharge end, as indicated by the arrows, and passes in the annular space 30 between the shell and the casing and into the interior of the shell 20 through the spaced communicating slots 24. It thus enters the onrushing water passing down through the interior of the shell for the purpose of aerating same, as is understood.

Supported within the shell 10 are three screens or foraminous members generally indicated at 32 which are the mixing screens. The surfaces of the screens are so formed that when the screens are superposed there is a spaced relationship between them, as best seen in FIGS. 1 and 4. Each screen 32 is of circular shape and is formed of a brass wire cloth and is embossed to form a plurality of equally spaced alternating raised and depressed sections extending radially from a central flat diameter. Each screen 32 has a central flat annular portion 34 with radially extending alternating raised sections 36 and depressed sections 38. The screen is thus provided with a central raised portion 34 and with radially extending segments generally indicated at 40, each segment including at one end the depressed section 38 and at its opposite end the raised section 36. The segments 40 give the appearance of a continuous corrugated band having alternate high and low surfaces.

When the screens are superposed, the high or raised portion of one screen is contiguous to the depressed or low portion of the adjacent screen, as best seen in FIGS. 1 and 4, to provide the necessary spacing between the screens. The lowermost screen rests on the inwardly extending lip 22 of the shell 20, with the other superimposed screens resting on each other. With this arrangement the screens are offset and spaced from each other, which is essential to the operation of the aerator, without the necessity of providing other spacing means or annular rims around each of the screen disks to provide the spacing. The screen disks may be thus formed by a simple die pressed thereagainst and produced at a fraction of the cost heretofore required in producing spacing means between the screens.

The spray jet unit generally indicated at 42 includes a dish-shaped member 44 provided with a concavo-convex surface 46 having spaced openings 48 and a centrally positioned enlarged opening 50. The annular vertical wall of member 44 is turned outwardly at its upper end to form an annular lip 52 which rests on the lip 28 of the shell 20 and is supported thereon. The dish-shaped member 44 nests within the enlarged upper portion 26 of the shell 20. The spray jet unit includes a circular plate 54 adapted to rest on the flange or lip 52 of the dish-shaped member 44. The plate 54 has an enlarged central opening 56. A cotter pin 58 extends through the opening in the plate 54

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and dish-shaped member 44 and the ends of the legs of said cotter pin are spread to diverge in opposite directions for securing said cotter pin. The upper end or curved head of the cotter pin extends upwardly of the plate 54 so that it may be manually engaged when it is desired to lift or remove the spray jet unit 42 from the casing. A resilient ring or washer 56 rests on the top of the plate 54.

The aerator is attached to the end of the faucet 16 through the threaded engagement previously described. In operation, as water flows from the faucet through the aerator, the air will pass up into the aerator through the bottom of the aerator, into the chamber 30 between the wall of the casing and the inside shell and into the interior of the shell through the spaced slotted openings to mix with the flowing water. The water from the faucet will pass from the faucet through the spray jet unit 42 and through the spaced screens which are the mixing screens, to be discharged through the bottom of the aerator.

FIG. 6 is a sectional view of the modification of a spray jet unit which may be substituted for the spray jet unit 42. In other details the aerator remains the same as previously described. In this modification the spray jet unit, generally indicated at 60, comprises a funnel-shaped canopy 62 which flares upwardly as at 64 and is provided with a restricted inlet opening 66. A flat disk or diaphragm 68 is secured to the canopy by crimping the lower end of the canopy over the disk 68. The disk 68 is provided with a plurality of spaced openings 70. Extending upwardly of the disk 68 and formed therewith is a stud 71 which extends through the canopy opening and has a knob 72 on the end, whereby it may be manually engaged for inserting or removing the spray jet unit.

The liquid from the water faucet 16 enters the central restricted inlet opening 66 of the spray jet unit and passes through the openings 70 of the disk 68. The spray jet unit increases the pressure of the liquid entering the unit and it is discharged through the disk 68 in a fine stream or spray. The same is equally true with respect to the spray jet unit 42 in FIG. 1. The central restricted inlet opening of the plate and the openings in the dish-shaped member increase the pressure of the liquid entering the unit and discharges it through the openings in a fine stream or jet.

It will be understood that various changes and modifications may be made from the foregoing without departing from the spirit and scope of the appended claims.

What is claimed is:

1. A device for aerating a liquid under pressure, com-

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prising a casing having an inlet and an outlet, a shell supported within said casing, a plurality of screens supported in said shell adjacent the outlet thereof, each said screen being embossed to form a plurality of radially extending segments, each segment including at one end a depressed section and at its opposite end a raised section so that when the screens are in superposed relation spaces are provided therebetween.

2. A structure defined in claim 1 in which the shell is spaced from said casing to provide an air inlet adjacent the outlet of said casing.

3. A structure defined in claim 1 in which a spray jet means is positioned adjacent the upper end of the shell and within said casing.

4. A structure defined in claim 3 in which the spray jet means includes a dish-shaped member provided with a plurality of spaced openings, with said dish-shaped member supported on the upper end of said shell, and a plate having a central opening positioned upwardly of said dish-shaped member.

5. A structure defined in claim 3 in which the spray jet means has upwardly extending means which may be manually engaged to remove said spray jet means.

6. A structure defined in claim 3 in which the spray jet means includes a canopy member and a plate supported within said canopy.

7. A structure defined in claim 6 in which the plate has means extending upwardly thereof and through the canopy to be manually engaged for removing said spray jet means as a unit.

8. A structure defined in claim 1 in which the embossed screens each have a central circular flat area with the segments extending radially outward of the central flat area.

#### References Cited by the Examiner

##### UNITED STATES PATENTS

|           |         |               |
|-----------|---------|---------------|
| 2,774,584 | 12/1956 | Aghnides.     |
| 2,787,452 | 4/1957  | Aghnides.     |
| 2,849,217 | 8/1958  | Bachli et al. |
| 2,929,567 | 3/1960  | Aghnides.     |
| 2,998,930 | 9/1961  | Aghnides.     |

##### FOREIGN PATENTS

|           |        |         |
|-----------|--------|---------|
| 1,270,477 | 7/1961 | France. |
|-----------|--------|---------|

EVERETT W. KIRBY, *Primary Examiner.*