June 20, 1961 H. M. RICHTER 2,989,249

AERATING DEVICE FOR FAUCETS AND THE LIKE

Filed Nov. 23, 1960 3 Sheets-Sheet 1

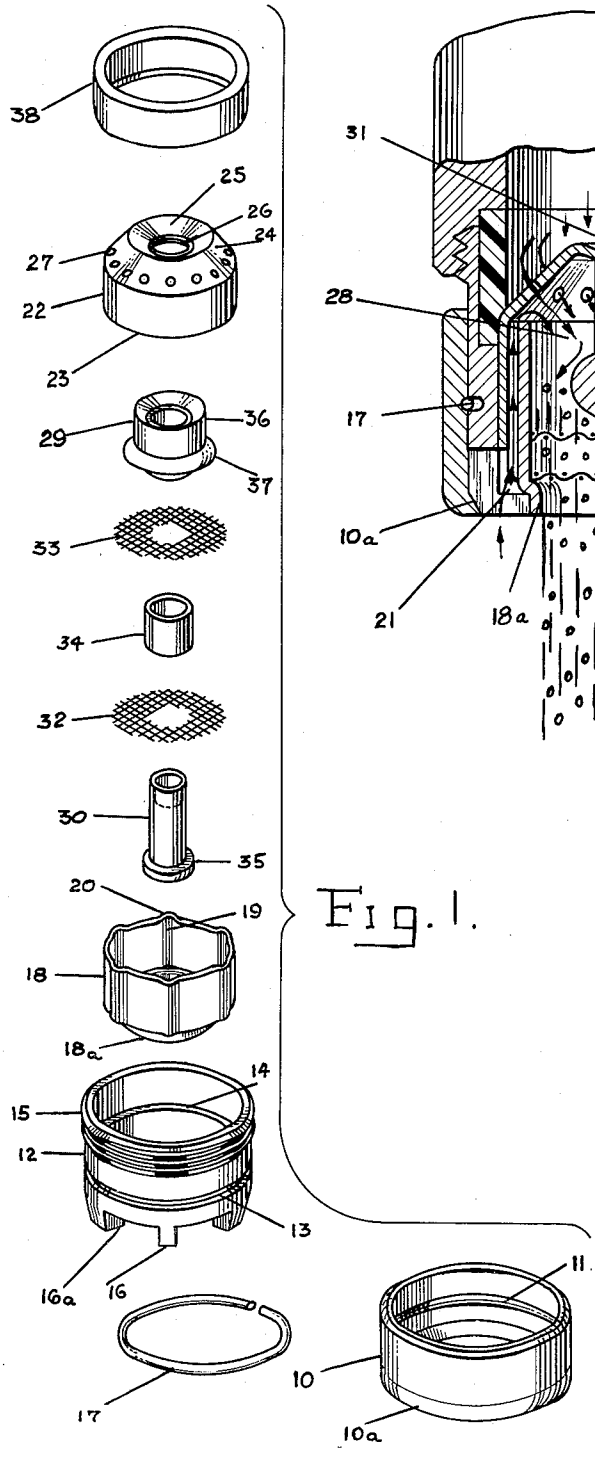

Fig. 1.

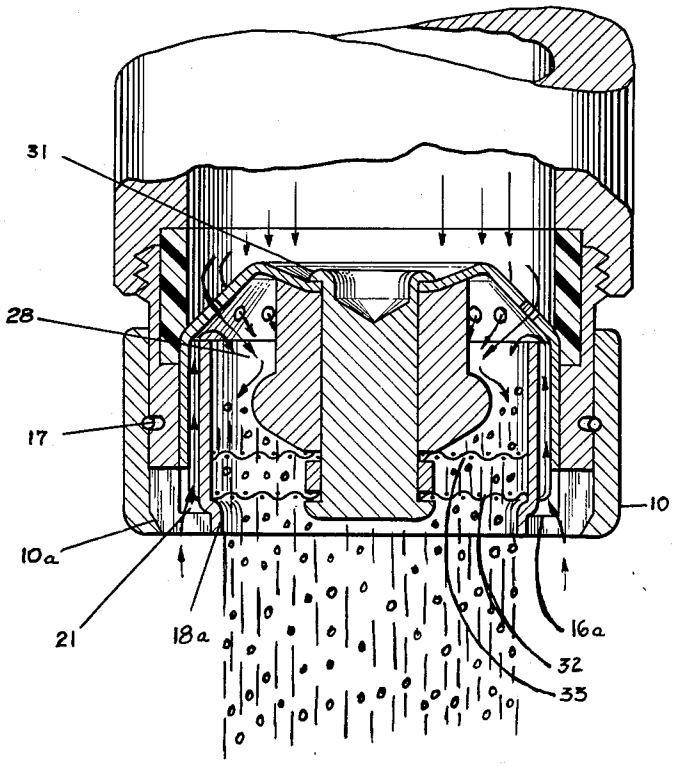

Fig. 2.

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AERATING DEVICE FOR FAUCETS AND THE LIKE

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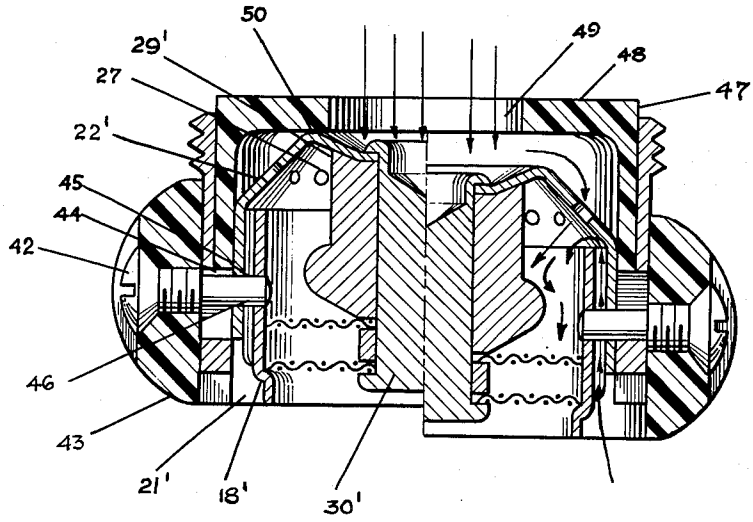

Fig. 3.

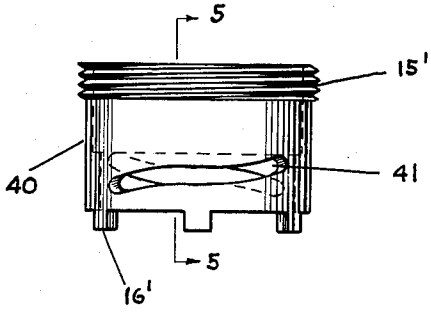

Fig. 4.

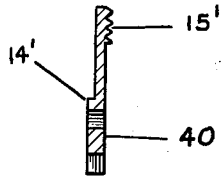

Fig. 5.

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AERATING DEVICE FOR FAUCETS AND THE LIKE

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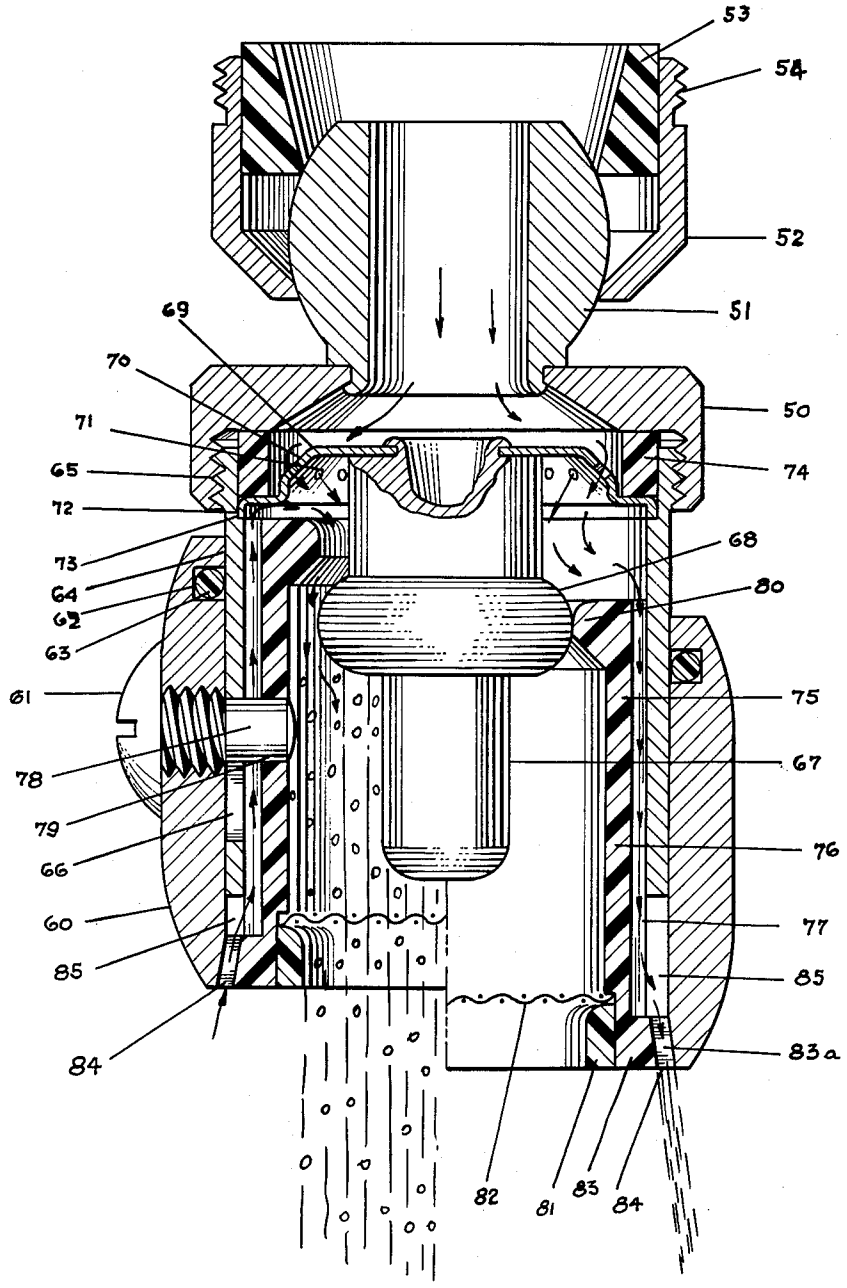

Fig. 6.

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United States Patent Office 2,989,249 Patented June 20, 1961

2,989,249
AERATING DEVICE FOR FAUCETS AND THE LIKE

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Filed Nov. 23, 1960, Ser. No. 71,276
18 Claims. (Cl. 239—427)

This invention relates to improvements in aerating devices for water faucets and the like.

This application is a continuation-in-part of my prior copending application for United States Letters Patent entitled "Aerating Device for Faucets and the Like" which was filed April 24, 1958 and which bears Serial No. 730,706.

There are many aerating devices for faucets presently on the market and many variations of such devices have been disclosed in the patent and other literature. For the most part, however, such devices presently available and previously disclosed have been cumbersome in operation, complicated and difficult to clean and expensive to manufacture.

The invention herein disclosed has as its principal object the furnishing of such a device that is economic of manufacture, simple, small and compact in structure, readily installed and easy to remove and replace for cleaning purposes.

Another object of this invention is to provide such a device with a casing or housing free of lateral air suction ports, but with a water flow guide sleeve therein and spaced therefrom to provide an unbroken cylindrical passageway for the upward flow of air therethrough completely around and moving directly the reverse of the water flowing through the sleeve peripherally to be drawn into a suction chamber above the sleeve.

Another object of the invention is to provide means overlying the sleeve and downwardly projecting therein to inject a plurality of converging jets of water under pressure and to deflect the jets in part laterally against the sleeve and downwardly thereof, and impart upwardly and downwardly to provide an air suction area peripherally inwardly of the top of the sleeve to suck air to the deflected jets to be intermingled therewith as the same pass through the sleeve to provide a thoroughly smooth aerated stream of water emanating therefrom.

It is another object of this invention to provide such a device which when installed will be relatively tamper-proof so that it cannot be removed from a faucet without the utilization of a special tool provided therefor.

It is an additional object of this invention to provide in such a device means for shutting off the arerator or varying the amount of liquid flow therethrough.

It is still another object of this invention to provide such a device having means available for regulating the aerated stream to be able to convert the same from a straight aerated stream to a needle spray stream as desired.

The invention accordingly comprises an article of manufacture possessing the features, properties, and the relation of elements as exemplified in the articles hereinafter described and the scope of the application of which will be indicated in the claims.

An aerating device for faucets and the like embodying the invention and the manner of using the same is described herein with references to the drawings in which:

FIG. 1 is an exploded perspective view of one form of the device embodying the invention;

FIG. 2 is an enlarged vertical section view of the device of FIG. 1 in assembled relation illustrated as being coupled, for example, to the end of an internally threaded faucet, and portions of the assembly are broken away to disclose the internal elements thereof;

FIG. 3 is an enlarged vertical section view of an alternate embodiment of the device in assembled relation and illustrated as being coupled, for example, to the end of a threaded faucet with the portion thereof to the left of a line shown in phantom illustrating the device in closed position and the portion to the right of the center line illustrating the device in the open position;

FIG. 4 is an elevation of a component of the device illustrated in FIG. 3 separated from the remaining portions thereof;

FIG. 5 is a sectional view taken along the line 5—5 in the direction of the arrows as indicated in FIG. 4; and

FIG. 6 is an enlarged vertical section view of another embodiment of the invention in assembled relation illustrated as being coupled, for example, to the end of an internally threaded faucet with the portion thereof to the left of the center line illustrating the position of the components when a straight aerated stream is desired and the portions to the right of the center line illustrating the relationship of the elements when the device is arranged for a needle spray.

Referring more particularly to the drawing, there is shown a casing or housing **10** having a circular slot or groove **11** formed in the internal surface thereof approximately midway between its upstream and downstream ends. The extreme downstream end of casing **10** is beveled inwardly at **10***a*. A second housing section **12** is provided and like housing section **10** it is substantially cylindrical with a bore extending therethrough. Casing **12** is formed with a circular slot or groove **13** in its external surface and has a ledge **14** therein adjacent its upstream end. Ledge **14** is formed on the inner surface of casing **12** and performs the function of supporting certain of the internal components of the assembly. It is noted that in the figures ledge **14** is shown above or on the upstream side of groove **13**. As will become apparent, this relative positioning is not necessary for the proper functioning of the device. The casing **12** is provided above the ledge **14** with external threads **15** whereby the same can be coupled with the internal threads of the faucet as illustrated in the drawing. It will be understood, of course, that the casing **12** may likewise be provided with internal instead of external threads for faucets having external threads thereon; or any other suitable coupling means may be provided depending upon the construction of the faucet.

The lower or downstream end of casing section **12** is formed with a plurality of downwardly and inwardly extending lugs or projections each of which is designated by the numeral **16** in the figures. Lugs **16** are circumferentially arranged and spaced from one another. Each of the lugs has a surface thereon **16***a* which is faced upwardly and substantially perpendicular to the longitudinal axis of casing **12** so that it provides a ledge upon which certain portions of the internal structure of the device can be supported. The lugs **16** perform an additional function, that is, they enable the aerating device to be easily attached or disengaged from the faucet with the use of a wrench as will become apparent below.

Ring **17** formed of a spring material is provided. Ring **17** has a diameter of sufficient magnitude so that the ring can be held in groove **11** of housing section **10** and also groove **14** of housing section **12**. Hence, as seen in the drawings, spring ring **17** performs the function of maintaining housing sections **10** and **12** free of relative longitudinal movement while allowing relative rotational movement. The provision of such a connection or coupling of sections **10** and **12** renders the embodiment of the invention shown in FIGS. 1 and 2 vandal-proof and tamper-proof since such a combination results in the section **10** performing the function of a sleeve freely rotatable overlying the exposed portions of the aerator so that the remaining functional portions of the aerator cannot

be tampered with when the aerator is in position upon a faucet. This feature is not only highly desirable but becomes essential in certain installations.

An aerator and water flow guide sleeve **18** rests on the ledge **16***a* of housing section **12**. The major portion of sleeve **18** is cylindrical and hollow with longitudinal channels **19** formed on the internal surface thereof by pressing portions of the sleeve **18** outwardly so that each channel **19** is formed with a corresponding longitudinal projection **20** on the external surface of the sleeve. In the embodiment shown in FIGS. 1 and 2, six of the longitudinal channels **19** are provided with six corresponding projections **20**. It is noted that each of the channels **19** opens at the top or upstream end of sleeve **18** so that when sleeve **18** is viewed from above the distorted or non-circular periphery thereof is evident. Channels **19**, however, terminate short of and above the extreme lower or downstream end of sleeve **18** and the extreme end itself of sleeve **18** is formed with a decreased circumferential diameter **18***a*. Sleeve **18** performs the function of a stream straightener flow guide. Sleeve **18** extends downwardly within the housing and spaced therefrom projections **20** maintain sleeve **18** in spaced relation with housing **12** and the lugs **16** of housing **12** support sleeve **18** at the lower or downstream end thereof as shown in the figures. This assembly provides a passageway **21** between the housing **12** and the sleeve **18** for the upward or reverse flow of air between the projections **20** and the downward flow of aerated water passing through the sleeve. The flow through the sleeve is aided in direction by the channels **19** provided in the sleeve **18**.

It will be understood that the spaces between lugs **16** allow the passage of air upwardly into passageway **21** and that sleeve **18** which is constricted at its lower end at **18***a* preferably extends below the bottom or lower end of the main portion of casing **12**.

A jet air reverse member **22** in the form of an inverted cup is disposed in a position overlying sleeve **18**. Member **22** is formed with a downwardly extending cylindrical skirt **23**, the inner surface of which lies adjacent projections **20** of sleeve **18** and the outer surface of which has a portion adjacent the inner surface of housing section **12** beneath ledge **14** thereof. Above skirt **23** the member **22** is formed with a conical section projecting inwardly at an angle and terminating in a circular portion which is depressed at the center so that it is substantially concave inwardly. The conical section is indicated in the figures by the numeral **24** and the concave section is indicated by the numeral **25**. The concave section has a circular central opening formed therein indicated in the figures by the numeral **26** and the conical section has formed therein a series of smaller circular openings or holes indicated by the numeral **27**. Openings **27** are formed on a circumference and are spaced from each other. The member **22** is dimensioned so that the skirt **23** does not extend below the lower or downstream end of the main portion of casing **12** when the member **22** is supported by sleeve **18** since the juncture of sections **23** and **24** of the reversing cup encounter the upper edge of sleeve **18** which supports the reversing cup in position. The conical section **24** provides a deflecting surface laterally to deflect air inwardly of the sleeve as the air flows upwardly through the passageway **21** to enter a suction zone or chamber around the upper peripheral area of the sleeve as indicated generally at **28**. As will become evident below as the operation of the device is considered, the air passes upwardly through the passageway **21** and is deflected inwardly while the water which is intermingled with the air at zone **28**, enters zone **28** through the openings **27** in section **24** of the reversing cup. The spaced openings **27** provide a plurality of converging jets of water under pressure as the water comes from the faucet.

A second deflecting member comprising a splash plug **29** is coaxially suspended from the central portion of the cup **22** and is secured in this position by a rivet **30** passing therethrough which is upset as at **31** over the section **25** of the inverted cup **22**. Screens **32** and **33**, separated by spacer **34**, are preferably secured to the bottom of the splash plug by means of the head **35** of the rivet **30**.

It will be observed that splash plug **29** has a straight walled cylindrical section **36** which terminates in an increased diameter substantially spherical section **37** with a sloping side of continually decreasing diameter. Screen **33** lies adjacent the lower surface of the splash plug. A compression ring **38**, preferably made of a suitable plastic, rests on the shoulder **14** of housing section **12** and conical section **24** of cup **22** and is in abutting relation with the faucet to maintain the internal structure of the aerator in tightly sealed relation.

Briefly, the operation is as follows and arrows are utilized to aid in the description of the operation. Water passing through the faucet builds up pressure as it comes in contact with surface **24** of cup **22**. In order to escape, it is injected through the openings **27** in surface **24** of cup **22** in a series of peripheral converging jets under pressure. A portion of these jets impinge upon the top side of plug **29** as illustrated by the arrows and are laterally directed to the sides of sleeve **18** and then downwardly and are guided by the plurality of channels **19** in sleeve **18**; other portions of the jets are directed to strike the side of the sleeve above spherical portion **37** of the plug and are then deflected downwardly. It is the action of these jet streams that creates a suction zone or chamber in the area **28** and produces a vacuum of considerable magnitude in a constricted area because of the lack of water immediately flowing therethrough. This jet action sucks into this area a considerable amount of air, also as shown by the arrows, coming from between the sleeve **18** and the side of cup **22** between the projections **20** of the sleeve **18** above the passageway **21**. This air is forcefully injected into the turbulence of the downstream flow of the jets after they have been deflected by the splash plug to be intermingled with the lateral jets striking the inner sidewalls of the sleeve **18**. Upon reaching the screen **33** the aerated stream is broken up and the aeration characteristics considerably amplified and smoothed out as the stream passes through the second screen **32** and the constricted portion **18***a* of the sleeve to provide a thoroughly smooth aerated stream of water emanating therefrom.

The utilization in this design of a sleeve member **10** cooperating with the mounting section **12** and joined therewith by means of spring member **17** provides an aerating device which is vandal-proof since the components of the device are not exposed where they can be tampered with. The device is applied to a faucet by utilization of a wrench or any implement which can be injected beneath sleeve **10** to grasp the lugs **16** to allow turning of the device so that the threads can be coupled with the threads of the faucet. The outer sleeve being rotatably mounted allows it to be freely rotated without affecting the engagement of the device with the faucet.

In FIGS. 3–5 an alternate embodiment of the invention is shown. This form of the invention is in many respects superior to the form of the invention disclosed in FIGS. 1 and 2. In this second embodiment the components thereof which are identical in structure to components found in the first embodiment are designated by the numerals used in the description of the first embodiment but are followed in each instance by a "prime." Hence, in the first embodiment, the inverted cup is designated by the numeral **22** and, in the second embodiment, the inverted cup is designated by the numeral **22'**. The second embodiment discloses an aerator of the type shown in FIG. 1 but the aerator of the second embodiment is a so-called shut-off aerator, or an aerator having two extreme positions; a position where the valve is closed so that no water can pass therethrough and a second extreme position where the valve is open and the maximum quantity of water can pass therethrough. Intermediate positions, of course, are available. In the second embodiment, the

housing section, which is analogous to the housing section 12 of the first embodiment, is indicated by the numeral 40 since in the second embodiment the housing section differs in that it contains two inclined grooves indicated by the numeral 41. Each of these inclined grooves has one of its ends closer to the downstream or lower end of housing 40 than its other end and the purpose of the groove will become evident as the description of the second embodiment proceeds. Housing 40 differs from housing 12 in several other respects; namely, the groove 13 is lacking since the coupling of the members in the second embodiment differs from that of the coupling in the first embodiment. The housing 40, however, is like housing 12 in that lugs 16' are provided as well as shoulder 14' and external threading 15'. It will be noted, however, that lugs 16' differ in construction from lugs 16 in that there is no shoulder such as shoulder 16*a* provided in lugs 16.

The reason for the absence of shoulders 16*a* in lugs 16' is that the mounting or means for supporting the assembly in the second embodiment differs from the means for supporting the assembly in the first embodiment. In the second embodiment, reversing cup 22' and flow guide 18' are formed with circular openings to receive the end of screw 42 which passes through sleeve or knob 43, through one of the grooves 41 formed in housing 40, in order to be received in the circular openings formed in the reversing cup and the flow guide. In all other respects reversing cup 22' and flow guide 18' are identical with reversing cup 22 and flow guide 18, respectively. The circular opening formed in the reversing cup is indicated by the numeral 44 in the figures and the circular opening formed in flow guide 18' is indicated by the numeral 45 in the figures. It should be noted that the screw 42 preferably has an end portion 46 thereof which is not threaded and it is this end portion which is disposed within groove 41 and openings 44 and 45 in the final assembly. Knob 43 which is circular surrounds housing 12 much as did sleeve 10 of the first embodiment.

The device disclosed in the second embodiment is attached to a faucet much in the manner as the device disclosed in the first embodiment. However, since the second embodiment is not vandal-proof as was the first no special tool is required to place it on the faucet. It will be noted that in the second embodiment the sealing ring is formed slightly differently than the sealing ring 38 of the embodiment disclosed in FIGS. 1 and 2. The sealing ring of the second embodiment is indicated in the drawings by the numeral 47 and it is noted that it is formed with a top or cover portion 48 which presents to the water flowing from the faucet a smaller diameter entrance 49 to the aerator than was presented in the first embodiment. It should be noted that the opening 49 is formed in cover section 48 so that in the closed position which is the left position as shown in FIG. 3 the uppermost portion 50 of the jet air reversing cup 22' is in abutment with cover 48 of the sealing ring 47.

The operation of the device disclosed in FIGS. 3–5 when the device is in the position shown on the right of the center line in FIG. 3 which is the open position is precisely the same as the operation of the device disclosed in FIG. 2. In this embodiment, however, the rotation of sleeve 43 about the central longitudinal axis of the aerating device will move the screw 42 and the portion 46 thereof from one position in groove 41 to another. In other words, by rotating knob 43 screw section 46 can be made to traverse groove 41 in which it is disposed. The traversal of groove 41 by screw section 46 will result in the raising or lowering of the reversing cup and the flow guide. Such longitudinal movement from the position shown on the right in FIG. 3, which is the open position, to the position shown on the left in FIG. 3, which is the closed position, brings shoulder 50 of the reversing cup in abutting relation with section 48 of the sealing ring. A seal therefore is created by the abutment of shoulder 50 with section 48 of the sealing ring so that the water flow from the faucet passing through opening 49 in the sealing ring cannot flow through the openings 27' formed in the reverse cup. The flow of water, therefore, is completely cut off and the aerator acts as a valve in the closed position. Rotation of the sleeve 40 again can cause the section 46 of screw 42 to traverse slot 41 lowering the reversing cup and flow guide and the associated assembly so that there no longer is a seal between shoulder 50 and sealing ring 48 thereby allowing water from the faucet to flow through opening 49 and openings 27'. Intermediate positioning of the reversing cup between the position shown on the left in FIG. 3 and the position shown on the right in FIG. 3 will result in the flow of an aerated stream through the device which is less than the full flow which can be achieved in the valve open position.

Thus, in the second embodiment of this invention as disclosed in FIGS. 3–5, an aerating device is presented which can be easily manipulated by an operator to cause the device to act as a valve whereby the flow of water therethrough can be completely cut off or lessened to a degree desired.

A third embodiment of the invention is shown in FIG. 6. In this embodiment an aerating device is provided which, like the device of the second embodiment, is a device having two extreme positions. In the device of the embodiment of FIG. 6, however, one extreme position, that to the right of the center line in FIG. 6, results in a needle spray emanating from the aerating device, whereas, in the extreme position as illustrated to the left of the center line in FIG. 6, a straight aerated stream is available. Like the embodiment of FIGS. 3–5, intermediate positioning of the device results in a flow which is a combination of the two extreme positions.

The embodiment illustrated in FIG. 6 is shown attached to a faucet by means of a swivel arrangement so that the user of the device can direct the flow through a radius if it is desired. The swivel arrangement consists of coupling member 50 which mounts ball 51 which in turn projects through an opening in coupling member 50 which contains coupling ring 52. Coupling member 50 is externally threaded at 54 so that it can be fastened to the internal threads of a faucet. Ball 51 which is rigidly mounted to coupling 50 provides with coupling 52 and seal 53 a ball and socket connection with the faucet so that a swiveling of the aerating device illustrated in FIG. 6 can be accomplished. It should be understood that the ball and socket arrangement provided in this embodiment can be utilized with the embodiments of the invention previously shown and described. It further should be pointed out that the use of the ball and socket for swiveling arrangement presents a minimum resistance to the flow of water from the faucet due to the large diameter channels provided in the components of the swivel device. In the device of the embodiment shown in FIG. 6 a knob or sleeve 60 is provided with an opening to receive screw 61. The knob or sleeve 60 contains a slot 62 wherein a sealing O-ring 63 is disposed. This is provided to prevent leakage through the device if it is desired. Cylindrical casing 64 containing external threads 65 for coupling with a faucet if it is desired to use the device without the swiveling attachment, contains an inclined slot 66 which is substantially identical to slot 41 formed in the casing 40 of the second embodiment. In the embodiment shown in FIG. 6 only one inclined slot 66 is provided. Splash plug 67 in the embodiment of FIG. 6 differs from the splash plugs illustrated in the preceding embodiments principally in that the expanded portion thereof is somewhat more regular having a uniform curvature so that the incline away from the body thereof at the upper portion is substantially the same as the incline toward the body thereof at the lower portion. The expanded portion of the splash plug is indicated in the figures by the numeral 68.

The jet air reversing cup 69 of the embodiment shown in FIG. 6 differs from jet air reversing cups previously

described in general construction but the reversing cup 69 has an inclined section 70 containing openings 71 which function as did like sections and openings in the first two embodiments. The cup 69 is modified in an additional respect in that it has a peripheral portion 72 formed to seat on shoulder 73 formed in the casing 64, and seal 74 is provided to maintain the reversing cup in position and to seal and prevent the flow of water in such a way that it will by-pass the opening 71 provided in the cup.

The guide flow member provided in this embodiment is indicated by the numeral 75 and contains a substantially regular straight cylindrical section 76 provided with projections 77 longitudinally disposed on the external surface thereof in the manner of projections 20 in the first embodiment. Threaded section 78 of screw 61 is received in a circular opening 79 provided in body 76 of the flow guide. The upstream or top portion of the flow guide is provided with a decreased internal diameter section circumscribed by portion 80 of the flow guide. The internal portion or inwardly disposed periphery of section 80 is formed with an arcuate surface. The extreme lower or downstream end of the flow guide is internally formed with decreased diameter portion or shoulder 81 which can be an integral portion of the guide or which can be separately formed and rigidly attached thereto by gluing or otherwise. Section 81 serves to present a decreased diameter flow path and also to maintain in position within the guide screen 82. The lower end of the flow guide is also formed with a portion 83 which projects outwardly at the extreme lower end of the flow guide to provide an increased external diameter section. The increased external diameter section cooperates with an inclined surface of the knob 60 to provide a passage 84 into chamber 85 formed between the flow guide and the housing section 64. The chambers 85 actually are a series of parallel longitudinally extending chambers since the projections 77 are present. Further projections 83*a* are provided on projections 83 to form in passage 84 a series of needle spray orifices. Projections 83*a* are radially spaced abutments which are separated from one another and which in turn separate projection 83 from the inclined surface of the knob 60 opposite it.

In operation, the embodiment illustrated in FIG. 6 can be utilized to obtain a flow of the type which can be obtained from either of the devices of the first two embodiments. When the device shown in FIG. 6 is in the position shown to the left of the center line, a straight aerated stream is achieved. The flow of air through passage 84 into chamber 85 and into the stream is indicated by the arrows. In the second extreme position of the device shown in FIG. 6, the position illustrated to the right of the center line, a straight aerated stream is not achieved but rather a needle spray is achieved. It is noted that rotation of sleeve 60 from the position illustrated to the left in FIG. 6 to the position illustrated on the right in FIG. 6 causes the flow guide member 76 to be lowered so that the projection 80 thereof is in abutting relationship with enlarged portion 68 of the splash plug thereby preventing flow of water over the splash plug and out through the screen. The water then in order to be released from the aerating device must flow down through chamber 85 and out the needle spray orifices provided by openings 84.

This embodiment, therefore, gives the operator an aerating device which can be utilized for achieving a straight aerated stream or a needle spray, whichever is desired.

Thus, among others, the several objects of the invention as specifically noted above are achieved. Obviously, numerous changes in construction and rearrangement of the parts may be made without departing from the scope of the invention as defined by the claims.

I claim:

1. In a water aerating device for a faucet including a housing having a section to support the upstream end of the device in coupled position with said faucet; a jet air cup within said housing, a cylindrical skirt of said jet air cup, a port section of said jet air cup disposed above said skirt and inclined inwardly and upwardly therefrom, a cylindrical guide sleeve, a plurality of longitudinal channels formed on the internal surface of said guide sleeve, a plurality of longitudinal projections formed on the external surface of said guide sleeve and disposed toward the internal surface of said skirt providing therewith a plurality of longitudinal passages between said skirt and said guide sleeve, a splash plug projecting downwardly within said cup and said guide sleeve to provide a chamber between said splash plug and said port section, and a plurality of openings formed in said port section to provide a series of jets whereby water forced through said openings can be deflected by said splash plug and intermingled within the chamber with air drawn through the passages between said skirt and said guide sleeve to provide an aerated stream of water guided downwardly by said longitudinal channels.

2. A water aerating device in accordance with claim 1 in which first and second screens are disposed vertically from one another and permanently connected to the lower end of the splash plug and perpendicular to the axis thereof disposed in the path of the aerated stream of water.

3. A water aerating device in accordance with claim 1 in which the cylindrical guide sleeve is formed with the lower end thereof of restricted diameter and said restricted diameter end lies below the lower end of the cylindrical skirt.

4. A water aerating device in accordance with claim 3 in which a series of spaced lugs depend downwardly and inwardly from said housing to form upwardly facing shoulders whereby to support said guide sleeve at the restricted diameter end.

5. A water aerating device in accordance with claim 4 in which a cylindrical sleeve is provided having its lowermost end overlying said lugs and wholly concealing the same from view, said sleeve having a channel formed on its internal surface for cooperating with a spring ring disposed in a like channel formed in the external surface of the housing whereby said sleeve and said housing are prevented from longitudinal movement.

6. A water aerating device in accordance with claim 1 in which the splash plug is provided with a regular vertical cylindrical surface defining a portion of the chamber between the splash plug and the port section and an increased diameter section beneath said regular surface.

7. A water aerating device in accordance with claim 6 in which the increased diameter portion is substantially spherical with a lower sloping side of continually decreasing diameter.

8. A water aerating device in accordance with claim 1 in which means are provided within said housing to block the passage of water therethrough.

9. In a water aerating device for a faucet including a housing having a section to support the upstream end of the device in coupled position with said faucet, a jet air cup within said housing, a cylindrical skirt of said jet air cup, a port section of said jet air cup disposed above said skirt and inclined inwardly and upwardly therefrom, a cylindrical guide sleeve, a plurality of longitudinal channels formed on the internal surface of said guide sleeve, a plurality of longitudinal projections formed on the external surface of said guide sleeve and disposed toward the internal surface of said skirt providing therewith a plurality of longitudinal passages between said skirt and said guide sleeve, a splash plug projecting downwardly within said cup and said guide sleeve to provide a chamber between said splash plug and said port section, means coupling said jet air cup, said guide sleeve and said splash plug together for unitary longitudinal movement within said housing, first and second positions of said jet air cup,

said guide sleeve and said splash plug, moving means provided for moving said jet air cup, said guide sleeve and said splash plug from one of said positions to the other, a water flow entrance into said device, blocking means preventing flow of water through said entrance when said jet air cup, said guide sleeve and said splash plug are in said first position, and a plurality of openings formed in said port section to provide a series of jets whereby water forced through said openings when said jet air cup, said guide sleeve and said splash plug are in second position can be deflected by said splash plug and intermingled within the chamber with air drawn through the passages between said skirt and said guide sleeve to provide an aerated stream of water guided downwardly by said longitudinal channels.

10. A water aerating device in accordance with claim 9 in which the water flow entrance consists of a sealing ring formed with an opening interposed between said device and said faucet, and a circumference is provided on said sealing ring, and the jet air cup is formed with a circular shoulder which abuts said circumference and forms a seal therewith blocking the flow of water to said jets when jet air cup, guide sleeve and splash plug are in said first position.

11. A water aerating device in accordance with claim 9 in which the housing is formed with an inclined slot, a cylindrical sleeve overlying said slot, an elongated member movably disposed in said slot and attached at one end to said sleeve and at its remaining end to said jet air cup, said cylindrical guide sleeve, and said splash plug, whereby rotation of said sleeve can cause said elongated member to traverse said slot and cam against the edges thereof to move said jet air cup, said cylindrical guide sleeve and said splash plug longitudinally within said housing.

12. A water aerating device in accordance with claim 9 in which the splash plug is provided with a regular vertical cylindrical surface defining a portion of the chamber between the splash plug and the port section and an increased diameter section beneath said regular surface.

13. A water aerating device in accordance with claim 12 in which the increased diameter portion is substantially spherical with a lower sloping side of continually decreasing diameter.

14. In a water aerating device for a faucet including a housing having a section to support the upstream end of the device in coupled position with said faucet; a jet air cup within said housing, a cylindrical skirt of said jet air cup, a port section of said jet air cup disposed above said skirt and inclined inwardly and upwardly therefrom, a cylindrical wall depending vertically from said skirt, a cylindrical sleeve, a plurality of longitudinal projections formed on the external surface of said sleeve and disposed toward said cylindrical wall providing therewith a plurality of longitudinal passages between said cylindrical wall and said sleeve, a splash plug projecting downwardly within said sleeve to provide a chamber between said splash plug and said port section, and a plurality of openings formed in said port section to provide a series of jets whereby water forced through said openings can be deflected by said splash plug and intermingled within the chamber with air drawn through the passages between said cylindrical wall and said sleeve to provide an aerated stream of water guided downwardly internally of said sleeve.

15. In a water aerating device for a faucet including a housing having a section to support the upstream end of the device in coupled position with said faucet; a jet air cup within said housing, a cylindrical skirt of said jet air cup, a port section of said jet air cup disposed above said skirt and inclined inwardly and upwardly therefrom, a cylindrical wall depending vertically from said skirt, a cylindrical sleeve, a plurality of longitudinal projections formed on the external surface of said sleeve and disposed toward said cylindrical wall providing therewith a plurality of longitudinal passages between said cylindrical wall and said sleeve, a splash plug projecting downwardly within said sleeve to provide a chamber between said splash plug and said port section, said cylindrical sleeve being longitudinally movable within said housing, first and second positions of said cylindrical sleeve, moving means provided for moving said cylindrical sleeve from one of said positions to the other, blocking means preventing flow of water through said cylindrical sleeve when said cylindrical sleeve is in said first position, and a plurality of openings formed in said port section to provide a series of jets whereby water forced through said openings when said cylindrical sleeve is in said first position can be emitted from said device in a needle spray through the passages between said cylindrical wall and said sleeve and can be deflected by said splash plug and intermingled within the chamber with air drawn through the passages between said cylindrical wall and said sleeve when said sleeve is in said second position to provide an aerated stream of water guided downwardly internally of said sleeve.

16. A water aerating device in accordance with claim 15 in which the cylindrical sleeve is provided with a circumferential inwardly projecting bead and the splash plug is provided with an increased diameter portion constructed and arranged to abut said bead and form therewith a seal when said sleeve is in said first position.

17. A water aerating device in accordance with claim 15 in which the housing is formed with an inclined slot, a cylindrical encasing member overlying said slot and encasing said housing, an elongated member movably disposed in said slot and attached at one end to said encasing member and at the remaining end thereof to said sleeve whereby rotation of said encasing member will cause said elongated member to traverse said slot and cam against the edges of said slot to move said sleeve longitudinally within said housing.

18. A water aerating device in accordance with claim 14 in which the splash plug is provided with a regular vertical cylindrical wall defining a portion of the chamber between the splash plug and the port section and is further provided with an increased diameter section beneath said regular wall.

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