

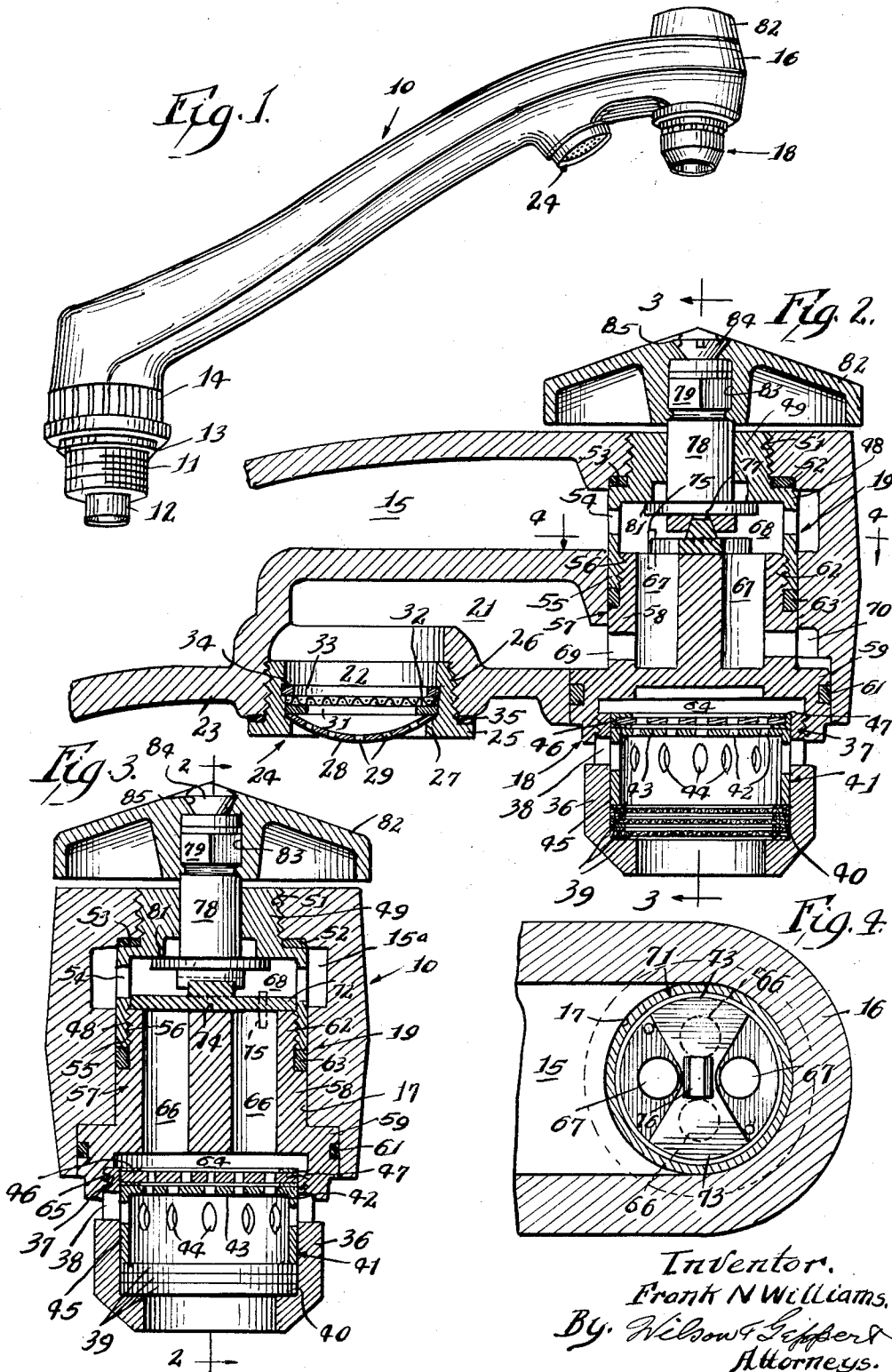
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DIVERTER VALVE ASSEMBLY

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DIVERTER VALVE ASSEMBLY

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The present invention relates to a spout construction for a faucet and more particularly to a novel diverter valve for the spout of a faucet to control the direction of flow of liquid through the spout to one of two separate outlets.

Among the objects of the present invention is the provision of a novel valve assembly for a faucet spout such as used in a kitchen sink for controlling liquid flow between two outlets and includes a rotatable valve member and a housing cooperating with the valve member as a valve seat and containing passages leading to each of the two outlets.

Another object of the present invention is the provision of an aerated outlet from the faucet spout and a separate spray outlet which can be used for washing down the sink or for other suitable purposes.

The present invention further comprehends the provision of a novel valve member having limited movement between two positions where one or the other of the outlets receives liquid flow from a liquid source.

Further objects are to provide a construction of maximum simplicity, efficiency, economy and ease of assembly and operation and such further objects, advantages and capabilities as will later more fully appear and are inherently possessed thereby.

In the drawing:

FIGURE 1 is a substantially side elevational view of the novel faucet assembly having a diverter valve and two separate outlets.

FIG. 2 is a fragmentary enlarged vertical cross sectional view taken on the line 2—2 of FIG. 3 and viewed in the direction of the arrows.

FIG. 3 is an enlarged vertical cross sectional view taken on the line 3—3 of FIG. 2.

FIG. 4 is an enlarged horizontal cross sectional view taken on the line 4—4 of FIG. 2.

Referring more particularly to the disclosure in the drawing in which is shown an illustrative embodiment of the present novel diverter valve assembly in a faucet nozzle or spout, the present assembly is shown as comprising a faucet spout 10 which terminates at one end in an externally threaded fitting 11 having a tubular inlet 12, the fitting being adapted to be detachably connected to a source of liquid supply. A nut 13 cooperates with the threaded fitting 11 to secure the spout to a sink or the like, the spout being provided with a swivel connection at 14 for swinging movement.

The elongated spout 10 extends outward over a sink or the like (not shown) from the fitting 11, and is provided with passageway 15 within the spout 10 communicating with the tubular inlet 12 to allow liquid to flow to the outlet end 16 of the spout. The passageway 15 intersects a depending passage 17 at the outer end of the spout and perpendicular thereto, the passage 17 terminating in a primary and aerated outlet 18 directing liquid flow downwardly to the sink. A novel diverter valve 19 is positioned within the passage 17.

A secondary passage 21 substantially parallel, but separated from the communicating passageway 15, also intersects the vertical passage 17 intermediate the ends thereof, and terminates in a second outlet 22 in the lower surface 23 of the spout 10 spaced rearwardly from the primary outlet 18. A spray fitting 24 is mounted in the second outlet 22 at any suitable angle to the spout to wash down the sink, rinse dishes, or for any other suitable

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purpose. This spray fitting 24 includes a knurled ring 25 having a reduced neck externally threaded at 26 which cooperates with internal threads in the outlet 22, and an interior shoulder 27 supporting a dished spray disc or plate 28 having a plurality of suitably distributed spray openings 29, a washer 31 resting on the upper surface of the disc 28, a circular, relatively fine mesh filtering screen 32 seated upon and having peripheral contact with the washer 31, and these members or components detachably held in fixed assembled relation by an expanding retaining ring 33 cooperating with an undercut surface 34 on the interior of the knurled ring 25. A sealing ring or gasket 35 seals the spray fitting 24 in the outlet 22.

The primary outlet 18 is provided with an aerator of conventional design having a nozzle body 36 which is externally threaded at its upper reduced end 37 for attachment to the diverter valve assembly 19. A plurality of equally spaced elongated peripheral slots 38 are formed in the reduced end 37 of the nozzle adjacent to but spaced below the external threads to provide for the admittance of air to the nozzle and the liquid stream passing therethrough. A series of relatively fine mesh screens 39 are stacked and seat upon an internal shoulder 40 of the nozzle body 36, and an inverted cup-shaped perforated member 41 is positioned on top of the screens. This member 41 has a plurality of uniformly spaced openings 42 in the top surface 43 of the member and a plurality of vertically elongated openings 44 in the depending side wall 45 of the member 41 adjacent the top surface 43 so that when the member 41 is positioned within the nozzle, the openings 44 will be aligned with the elongated peripheral slots 38. A perforated disc or plate 46 having a plastic ring 47 bonded or formed on its periphery is positioned above the member 41 and just below the diverter valve assembly 19.

The diverter valve assembly 19 includes a generally cylindrical body or inlet member 48 having a reduced threaded portion 49 at its upper end which cooperates with internal threads 51 formed in an opening at the top of the spout 10. A sealing ring 52 is positioned on the shoulder 53 formed by the reduced portion 49 to seal the opening at the top of the spout. The depending cylindrical part of the inlet member 48 contains several equally spaced openings 54 (four being in the illustrative embodiment) which are positioned intermediate the edges of the cylindrical portion of the member 48 and are aligned with and opening into the passageway 15, and its connected annular chamber 15^a encompassing the member 48. The inlet member 48 is open at its lower end 55 and internally threaded at 56 to receive the upper externally threaded end of a lower outlet member 57 which has a generally cylindrical portion 58 terminating at its lower end in an annular outwardly extending flange 59. This flange has intermediate its vertical dimension a peripheral groove receiving a sealing or O-ring 61 to seal the valve assembly 19 in the outlet 18 of the passage 17.

The upper end of the outlet member 57 terminates in a reduced externally threaded portion 62 which receives the internal threads 56 of the inlet member 48. A sealing or O-ring 63 is positioned between the adjacent edges of the members 48 and 57 to prevent any leakage from entering the secondary passage 21. The flange 59 is recessed at 64 and internally threaded at 65 to receive the upper reduced end 37 of the aerator body 36. This outlet member 57 is solid except for two pairs of diametrically opposed longitudinal passages 66 and 67 extending at least partially therethrough and opening at the top of this member into a valve chamber 68 formed in the open end of the inlet member 48. One pair of the passages 66 extend completely through the outlet member 57 and open in the recess 64 above the aerator nozzle body 36. The other pair of passages 67 terminate short of the

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recess 64 and communicate each with a radial opening or port 69 in the wall of the outlet member above the flange 59 (see FIG. 2). The spout 10 is recessed at 70 to allow flow from one of the openings 69 around the outlet member to the secondary passage 21.

Within the valve chamber 68 is located a valve member 71 comprising a flat plate 72 enlarged at each end 73 and of a reduced width at the center. The valve member 71 rests upon and slides on the flat and smooth top surface 74 of the outlet member 57. A pair of diametrically opposed upright pins or stops 75 extending upwardly from the flat surface 74 limit and control the rotary movement of the valve member 71 to approximately 90°. An elongated projection 76 extending from the center of the valve member 71 is received in a complementary recess 77 in the lower end of a valve stem 78, the latter projecting upwardly through the reduced portion 49 to terminate in an exposed square shank 79. A flange 81 on the valve stem prevents vertical movement thereof and rotation of the stem is controlled by a knob or handle 82 having a fluted recess 83 at the center thereof to receive the square shank 79. A screw or other suitable securing means 84 projects through a central opening 85 in the knob 82 and engages a threaded recess (not shown) in the square shank 79.

In operation, the valve member 71 normally covers one of the two pairs of diametrically opposed passages 66 or 67. To obtain flow through the aerated outlet 18, the knob 82 is turned so that the valve member 71 covers the passages 67 and flow proceeds from passageway 15, through openings 54, valve chamber 68, passages 66 and the aerator nozzle body 36 to provide an aerated stream of liquid. When the valve member 71 is rotated through an arc of 90° to cover passages 66, the flow proceeds from passageway 15 through the openings 54, valve chamber 68, passages 67, openings 69, recess 70, secondary passage 21 and the spray fitting 24 to provide a wide spray of liquid to wash down the sink, etc.

While the diverter valve assembly has been shown and described as being particularly applicable to a faucet spout for a kitchen sink, it is not my desire or intent to unnecessarily limit the scope or the utility of the features by virtue of this illustrative embodiment.

Having thus disclosed the invention, I claim:

1. In a faucet, an elongated generally horizontal spout having a central passage extending therethrough, a generally vertical passage extending through the spout at one end thereof and terminating in a first outlet, a secondary generally horizontal passage extending parallel to and below said central passage and communicating at one end with said vertical passage and at the other end with a spaced second outlet, a source of liquid under pressure communicating with the opposite end of the spout, a diverter valve assembly including a generally cylindrical valve body conformably fitting within said vertical passage in sealing engagement therewith, said valve body having an outlet at its lower end opening into the first outlet in the spout, a valve chamber in said valve body adjacent the upper end thereof, said spout having an annular recess communicating with said central horizontal passage and substantially surrounding said valve body

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adjacent said valve chamber and a second spaced annular recess substantially surrounding said valve body and communicating with said secondary passage, a plurality of circumferentially spaced, radial inlets in said valve body communicating between said central passage and first annular recess and said valve chamber, a pair of oppositely disposed longitudinally extending passages in said valve body between said valve chamber and said valve body outlet, a second pair of oppositely disposed longitudinally extending passages communicating with said valve chamber and terminating short of said valve body outlet, a pair of outlets extending radially outwardly from and communicating with said last mentioned passages and with said second annular recess and said secondary passage, and a rotatable valve member in said valve chamber adapted to alternately close one pair of passages and open the other pair of passages.

2. A faucet as set forth in claim 1, in which said valve member includes a flat plate having a central narrow portion and diverging end portions extending to the interior wall of the valve chamber and means in said valve chamber limiting movement of said valve member to an arc of approximately 90°.

3. A faucet as set forth in claim 1, in which a valve stem extends through the spout and the top of the valve body into the valve chamber, means connecting the valve stem with said valve member, and a knob adapted to be secured to the valve stem at the exterior of the spout for operation of the valve member.

4. A diverter valve assembly for a faucet spout comprising a generally cylindrical valve body having a valve chamber adjacent the upper end of the body, a plurality of circumferentially spaced radial inlets communicating with a source of liquid under pressure and opening into said valve chamber, a central outlet at the lower end of the valve body, a pair of oppositely disposed longitudinally extending passages in said valve body between said valve chamber and said outlet, a second pair of oppositely disposed longitudinally extending passages communicating with said valve chamber and terminating short of said outlet, a pair of outlets extending radially outwardly through the valve body and communicating with said last named passages, a rotatable flat valve member in said valve chamber extending diametrically across the chamber and adapted to alternately close one pair of passages and open the other pair of passages, and means to limit rotation of said valve member to an arc of approximately 90°.

References Cited in the file of this patent

UNITED STATES PATENTS

166,654	Thomson	Aug. 10, 1875
208,722	Dowling	Oct. 8, 1878
1,133,853	Gold	Mar. 30, 1915
2,302,097	Beckman	Nov. 17, 1942
2,790,632	Mellette	Apr. 30, 1957

FOREIGN PATENTS

602,189	Great Britain	May 21, 1948
519,992	Belgium	May 30, 1953