

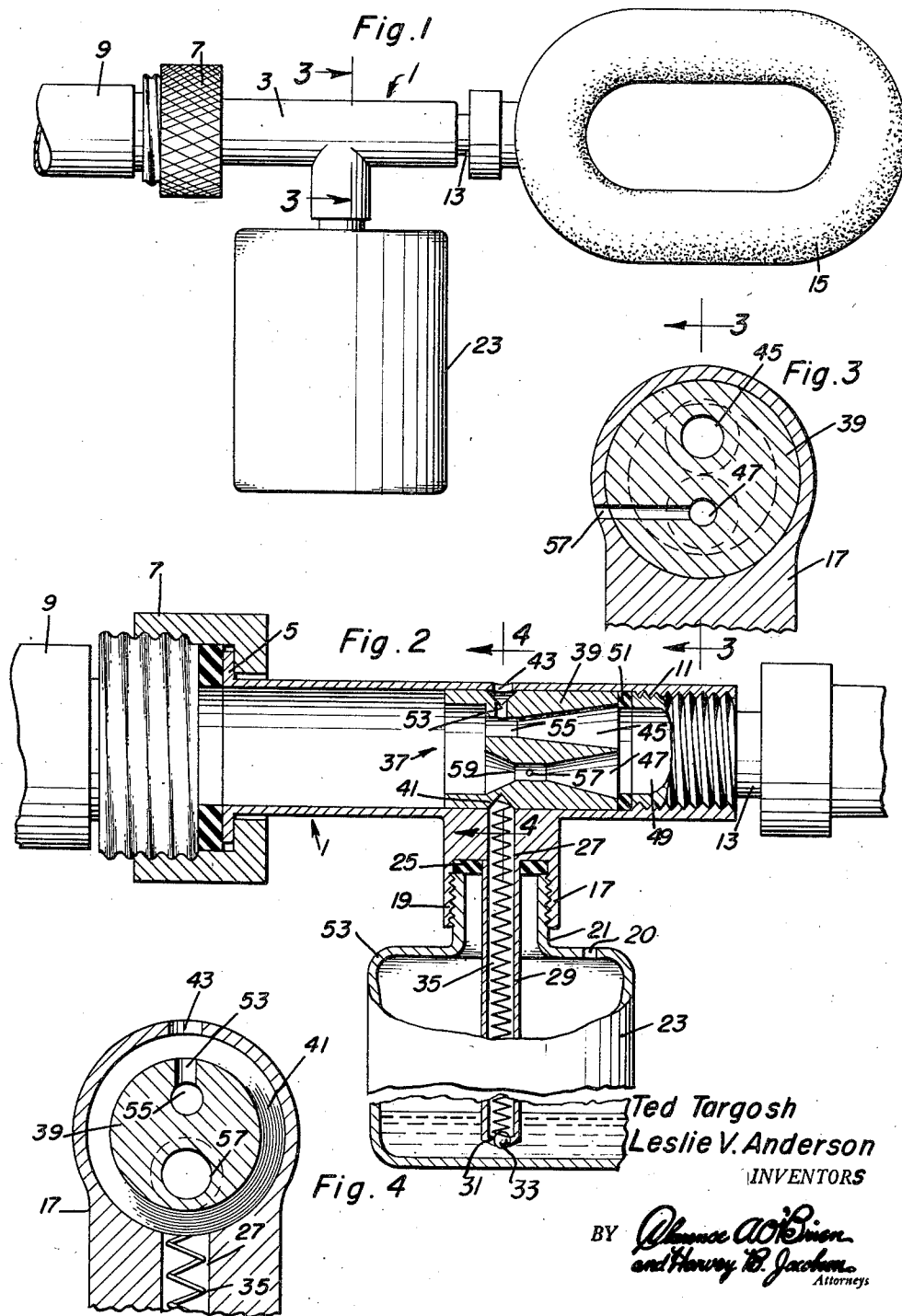
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LIQUID MIXING NOZZLE OF THE ASPIRATOR TYPE

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1

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LIQUID MIXING NOZZLE OF THE ASPIRATOR TYPE

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1 Claim. (Cl. 261—18)

Our invention relates to improvements in liquid mixing nozzles of the aspirator type forming the subject matter of our copending application, Serial No. 362,786, filed June 19, 1953, now Patent No. 2,724,583, dated November 22, 1955.

The primary object of our invention is to provide a nozzle for variably aerating and mixing liquid detergent and water under pressure and ejecting the mixture under increased pressure and high turbulence into a fountain brush, or the like.

Another object is to accomplish the above by an improved aspirator valve comprising a Venturi tube provided with a pair of Venturi passages downstream of a mixing chamber, the passages providing for mixture of water and detergent under high velocity to effect correspondingly high velocity in the mixing chamber with consequent intimate mixing of the water and detergent.

Other objects together with the precise nature of our improvements and advantages thereof will become apparent from the following description and appended claim when read with reference to the accompanying drawing in which:

Figure 1 is a fragmentary view in side elevation of our improved nozzle in the preferred embodiment thereof coupled to a water supply hose, a liquid detergent container and a fountain brush;

Figure 2 is a view in vertical longitudinal section of the same;

Figure 3 is an enlarged fragmentary view in vertical transverse section taken on the line 3—3 of Figure 1; and

Figure 4 is an enlarged fragmentary view in vertical transverse section taken on the line 4—4 of Figure 2.

Referring to the drawing by numerals, our improved nozzle designated generally by the numeral 1 comprises a tubular body 3 having an external circumferential rear end flange 5 coupled by a conventional hose coupling 7 to a water feed hose 9 from a source of water under pressure, not shown. The front end of the body 1 is internally threaded as at 11 for connection to a threaded tubular shank, or handle 13, of a fountain brush 15, preferably although not necessarily.

A radial bottom socket 17 on the body 1 intermediate its ends is internally threaded, as at 19, for turning into the threaded neck 21 of a detergent containing and supply jar 23, or like container, the usual sealing gasket 25 being provided in said socket 17 between the same and neck 21. A back pressure relief vent 20 is provided in the top of the jar 23.

The socket 17 is formed with an axial bore 27 communicating with the interior of the body 1 and formed in part by an axial tube 29 integral with and extending out of said socket 17 and formed with a back pressure ball valve seat 31 for a ball valve 33 in said bore backed by a coil spring 35 in said bore and closing said bore against the escape of liquid into the jar 23 under back pressure of liquid in the nozzle 1.

An aspirator mixing valve designated generally by the

2

numeral 37 comprises a Venturi tube 39 removably secured in the body 1 opposite the bore 27, and having a peripheral suction groove 41 therein, preferably V-shaped and coplanar with and opening into the bore 27 and an air inlet opening 43 in the body 1 diametrically opposite the bore 27. A pair of diametrically opposite upper and lower longitudinal Venturi passages 45; 47, coplanar with the bore 27 and opening 43 are provided for passing detergent and water respectively into a mixing chamber 49 provided downstream of said tube 39 and into which the hollow shank 13 is threaded against a sealing gasket 51 interposed between said shank and tube. The passage 45 passes both water and detergent, whereas the passage 47 passes water only. A radial port 53 in the tube 39 communicates the suction groove 45 and the air inlet opening 43 with a rear throat 55 of the detergent passing passage 45. A lateral air inlet aerating duct 57 extending through the body 1 and tube 39 communicates the throat 59 of the water passing passage 47 with the atmosphere, said throat 59 and duct 57 being downstream of said throat 55.

Referring now to the operation of the nozzle 1, with the opening 43 and duct 57 both open, and water under pressure passing through tube 39, water solely passes through both passages 45, 47 with greatly increased velocity and turbulence into the mixing chamber 49 and suction created in the passage 47 draws atmospheric air through duct 57 into passage 47 for aerating the water in said chamber. By placing a finger of a hand holding the nozzle 1 over the duct 57, the degree of aerating may be varied at will. If the opening 43 is closed by the thumb of the hand suction created in the passage 45 upstream of throat 59 will draw detergent out of jar 23 through bore 27, groove 41 and port 53 into passage 45 to mix with the water in the mixing chamber 49. The degree of suction created in the suction groove 41 may be varied at will by closing or partly closing the opening 43 so that said opening forms a suction control for varying the feed of detergent into the mixing chamber 49.

Some of the advantages of this invention are that a maximum amount of water may flow through the nozzle at high velocity facilitating rinsing action when only water is used.

The higher velocity effected in the nozzle creates a correspondingly greater vacuum in both the passage 45 in which the detergent is passed and the passage 47 in which aeration takes place.

The high velocity created in the nozzle makes it possible to overcome head pressure in the fountain brush 15 and handle or shank 13.

The nozzle will operate efficiently under low water pressure at the source.

With the opening 43 closed aeration has no effect on the suction created in the passage 45 for the detergent which would decrease the velocity of the flow of detergent therethrough.

If the water is shut off and the nozzle held upright water in the brush 15 and shank 13 and mixing chamber 49 cannot drain back past the valve 33 into the jar 23.

Another advantage results from the manner in which the Venturi tube 39 is secured in the body 3. For this purpose the Venturi tube 39 is slidably fitted in said body 3 and suitably secured to the gasket 51 which expands in the body 3 with a friction gripping fit to retain the Venturi tube in proper position. When the nozzle is in use the suction induced in said tube aids in holding said tube in place. As will be seen the Venturi tube 39 may be easily removed for cleaning purposes and replaced by pushing the same out of and into the body 3.

The foregoing will suffice to impart a clear understanding of our invention without further explanation.

3

Manifestly the invention is susceptible of modification without departing from the inventive concept, and right is herein reserved to such as fall within the scope of the appended claim.

What is claimed is:

A mixing nozzle comprising a tubular body having a rear end attachable to a source of water supply under pressure, said body having a mixture chamber in its other end, a Venturi tube in said body in the rear of said chamber and having a pair of separate first and second longitudinal Venturi passages therein parallel to each other with the throat of the second passage being displaced in a downstream direction in relation to the throat of the first passage for passing water therethrough into said chamber and increasing the velocity flow thereof, said tube having a peripheral groove therein communicating with the throat of the first passage to feed liquid detergent thereto under suction created in said first passage by water passing through said first passage,

4

said groove communicating with a source of detergent supply, and a suction control duct in said body and tube extending to the atmosphere through said body opening into said groove and adapted to be opened and closed by the thumb of the hand, and an aerating duct extending through said body and tube to the atmosphere and opening into said downstream throat for aerating water in said second passage, only, to obviate decreasing suction in said first passage.

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