July 14, 1959 R. E. BLETCHER ET AL 2,894,695

SPOUT FITTING

Filed Aug. 16, 1955

2 Sheets-Sheet 1

FIG. 1.

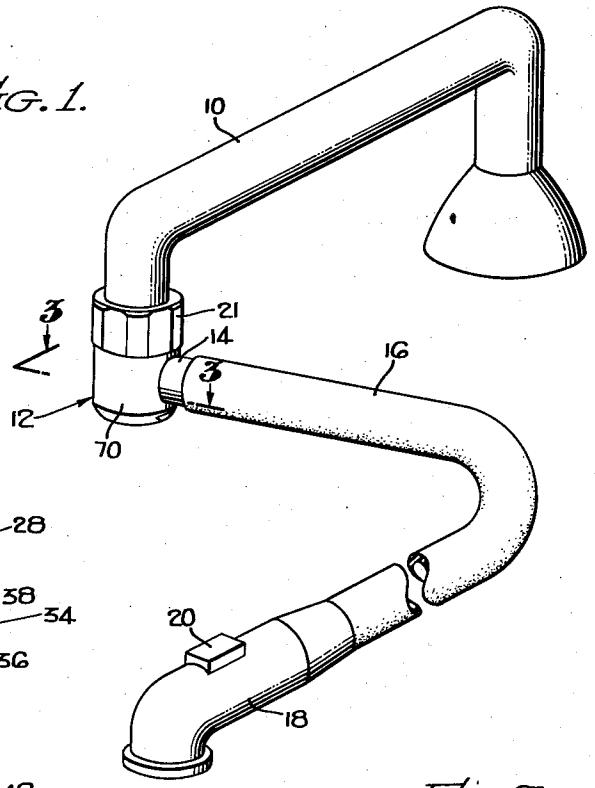


FIG. 2.

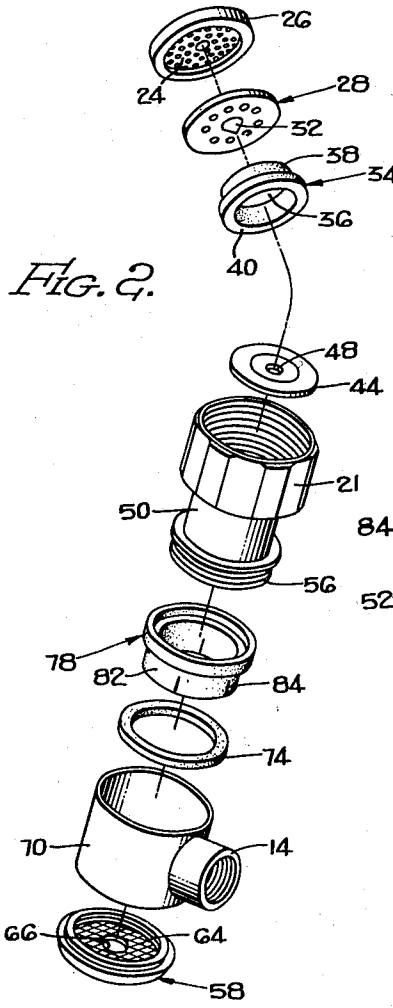
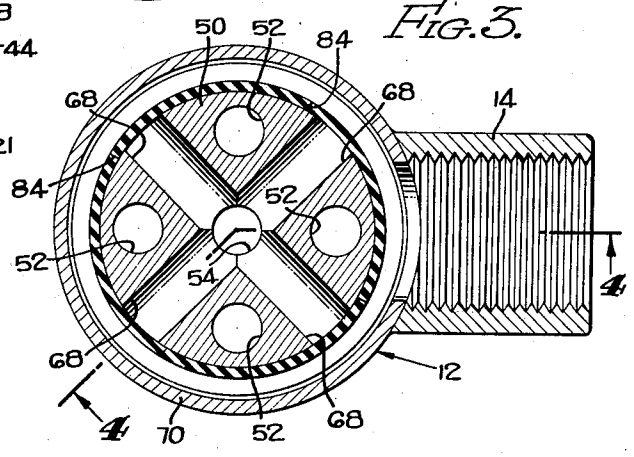


FIG. 3.



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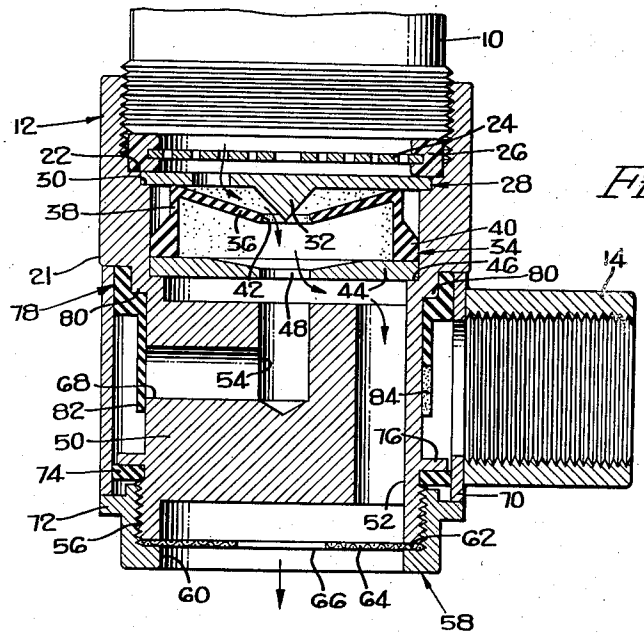


FIG. 4.

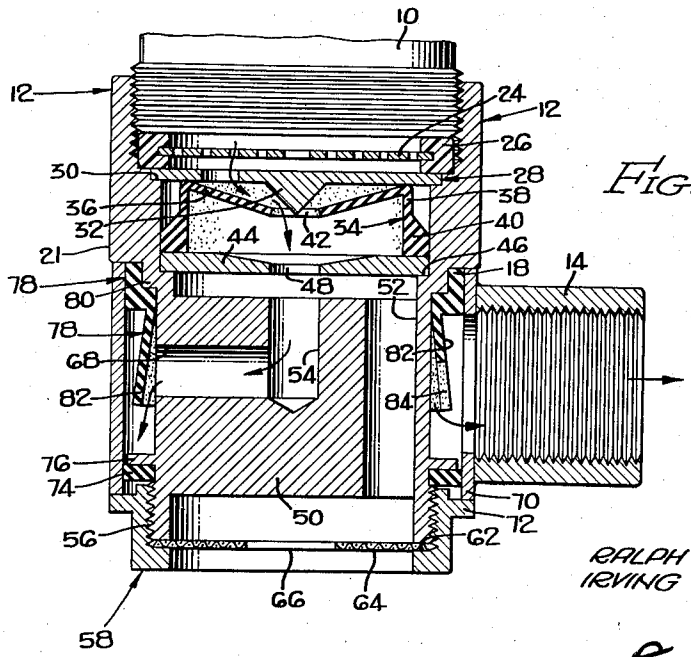


FIG. 5.

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SPOUT FITTING

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Application August 16, 1955, Serial No. 528,678

12 Claims. (Cl. 239—443)

This invention relates to an improved spout fitting.

It is an object of this invention to provide a fitting adapted to be fitted on the end of a sink spout which adapts the spout to be used in conjunction with a hand-spray.

It is a further object of this invention to provide means for incorporating a hand spray into an existing spout eliminating the necessity of removal of the spout and replacement thereof.

It is still a further object of this invention to provide a spout fitting wherein water may be selectively discharged through one of two outlets without any flow as dripping from the outlet not in use.

It is still a further object of this invention to provide a spout fitting which in all respects is anti-siphon in operation.

Other objects and advantages will be readily apparent from the following description.

In the drawings:

Figure 1 is a perspective view of a spout having a spout fitting embodying this invention.

Figure 2 is a diagrammatic view of the component elements.

Figure 3 is a section taken along line 3—3 of Figure 1.

Figure 4 is a section taken along line 4—4 of Figure 3.

Figure 5 is a view similar to Figure 4 illustrating flow through the spray outlet.

Referring first to Figure 1, the spout **10** is such as might be found in any sink and through which hot or cold water or a mixture of the two is directed and controlled by suitable valves. The free end of the spout is externally threaded to receive internally threaded spout fitting **12**, which fitting has two outlets. The first or spout outlet is in line with the direction of water flow through the extremity of spout **10** while the second or spray outlet is in the form of tube **14** normal to the direction of water flow through the extremity of spout **10**. Onto the tube **14** a rubber hose **16** is telescopically fixed which hose at its opposite end has a hand spray **18** actuated by depression of trigger **20**.

Assuming first, flow is desired through the spout outlet, the trigger **20** is released shutting off spray **18** and blocking flow therethrough. As seen in Figure 4, water flows from spout **10** into the spout fitting housing **21** which has an internally threaded upper extremity. The housing has, adjacent its upper extremity, an internal shoulder **22** which supports the outer periphery of the strainer **24** which is formed of a disk having small perforations therein preventing flow of sand and similar foreign matter through the spout fitting. The disk is mounted in a nylon ring **26** which rests upon shoulder **22**, permitting easy removal thereof.

After flow through the strainer, it passes through valve seat **28**. The housing has a second internal shoulder **30** downstream of and of smaller internal diameter, forming a support for valve seat **28**. The valve seat is formed

of a disk having a series of apertures therethrough. On the lower or downstream face, the valve seat carries a conical protuberance **32**.

Immediately below the valve seat is positioned check valve element **34**. In this embodiment the check valve element is formed of a soft rubber material having an upper face **36**, a downwardly projecting circular side wall **38**, and an enlarged annular base **40**. The upper face **36** has a central aperture **42** which receives the conical protuberance **32** of valve seat **28** and whose diameter is slightly smaller than the diameter of the base of the conical protuberance. The outer periphery of the upper face **36** is sufficiently large to assure that each of the apertures in the valve seat **28** will be covered thereby when the valve element is in its normal position.

Upon flow from the spout **10** into the housing and through strainer **24**, the water flows through the apertures in valve seat **28** forcing the upper face **36** of check valve element **34** downwardly away from valve seat **28**. Flow then proceeds through central aperture **42**. In the event of a reduced pressure in spout **10**, backflow is prevented by upward movement of upper face **36** with the conical protuberance **32** sealing off flow through central aperture **42** and upper face **36**, blocking off flow through the apertures in valve seat **28**, thereby providing a double check valve.

The annular base ring **40** of valve element **34** rests upon a nozzle disk **44** which in turn is supported upon internal shoulder **46** of housing **21**. The nozzle disk has a central aperture **48** through which water flows in the form of a jet.

Positioned below or downstream of the nozzle disk **44** is a web **50** in the housing **21**. This web has a series of flow passages **52** therethrough and a central flow passage **54** partially therethrough. The flow passage **54** is axially aligned with respect to central aperture of nozzle disk **44**. When flow passage **54** is closed such as by closing off the valve of spray **18**, as will hereinafter be more fully explained, water from the aperture or nozzle **48** backs up in flow passage **54** and flows through web **50** by means of passages **52**.

The lower or downstream extremity of the housing **21** is externally threaded at **56** to receive an internally threaded cap **58**. This cap has a central opening **60** through which the water discharges into the sink.

Clamped between the extremity of the housing **21** and internal shoulder **62** of the cap **58** is a screen **64** which functions to finely divide the flow of water, forming a coherent discharge column. The screen has a central opening **66** which permits air to flow into housing **21** in the event of development of a back-siphon to break the vacuum. This enlarged hole of course can not become plugged with foreign matter as the remainder of the screen conceivably could.

Assuming now that water is flowing through the spout outlet and it is desired to use the hand spray. The trigger **20** is depressed permitting flow through tube **14** and out the hand spray. This condition is illustrated in Figure 5.

It is to be noted that flow passage **54** terminates before web **50** and is in communication with radial flow passages **68** so that flow is through these radial passages, unless blocked, with air being drawn back through screen **64**, opening **66**, and flow passages **52** from the spout opening by passage of the jet of water from nozzle **48** into passage **54**.

The tube **14** is an integral part of a sleeve **70** which fits over the downstream extremity of housing **21** and is held in position by engagement with an external flange **72** on cap **58**. Thus water flows out radial passages **68** into sleeve **70** to tube **14** and hence to the hand spray.

To prevent leakage, a resilient washer 74 is provided surrounding the lower extremity of housing 21 and supported by external flange 76. Likewise a packing member 78 is supported at the upper extremity of sleeve 70 mounted upon external shoulder 80 of the housing 21. The packing member 78 is preferably formed of a soft resilient material and has depending therefrom a skirt 82. The skirt extends sufficiently low to cover the extremities of radial flow passages 68. When flow is permitted through the hand spray 18, the resilient skirt expands permitting flow through the passages 68. If a back-siphon should develop in the housing 21 by a drop in line pressure and hence in spout 10, the resilient skirt collapses, covering the flow passages 68 and preventing a back-siphon developing. To facilitate the flexing of skirt 82, it is frequently desirable to cut same at intervals between the flow passages as indicated at 84.

While what hereinbefore has been described is the preferred embodiment of this invention, it is readily apparent that alterations and modifications can be resorted to without departing from the scope of this invention and such alterations and modifications are intended to be included within the scope of the appended claims.

We claim:

1. A device attaching a remote hand spray having a valve thereon to a spout comprising a housing, a web in said housing having an unobstructed flow passage therethrough, a further flow passage in said web communicating with said hand spray, and nozzle means upstream from said web directing flow of water into said last-mentioned flow passage, whereby flow therethrough terminates flow through said unobstructed flow passage.

2. A device attaching a remote hand spray having a valve thereon to a spout comprising a housing, a web in said housing having an unobstructed flow passage therethrough, a further flow passage in said web communicating with said hand spray, nozzle means upstream from said web directing flow of water into said last-mentioned flow passage, whereby flow therethrough terminates flow through said unobstructed flow passage, and means forming an air gap between said nozzle means and said last-mentioned flow passage.

3. A device attaching a remote hand spray having a valve thereon to a spout comprising a housing, a web in said housing having an unobstructed flow passage therethrough, a further flow passage in said web communicating with said hand spray, nozzle means upstream from said web directing flow of water into said last-mentioned flow passage, whereby flow therethrough terminates flow through said unobstructed flow passage, means forming an air gap between said nozzle means and said last-mentioned flow passage, and means downstream of said housing venting said housing to the atmosphere.

4. A device attaching a remote hand spray having a valve thereon to a spout comprising, a housing, a web in said housing, an unobstructed flow passageway through said web discharging water flow therethrough from said housing, a second flow passage in said web, means communicating said second flow passage with said hand spray, nozzle means upstream from said web directing flow of water through said housing into a narrow jet flowing into said second flow passage along the longitudinal axis thereof, whereby flow therethrough terminates flow through said unobstructed flow passage.

5. A device attaching a remote hand spray having a valve thereon to a spout comprising, a housing, a web in said housing, an unobstructed flow passageway through said web discharging water flow therethrough from said housing, a second flow passage in said web, means communicating said second flow passage with said hand spray, nozzle means upstream from said web directing flow of water through said housing into a narrow jet flowing into said second flow passage along the longitudinal axis thereof, whereby flow therethrough terminates flow through said unobstructed flow passage, and means forming an air gap between said nozzle means and said last-mentioned flow passage.

6. A device attaching a remote hand spray having a valve thereon to a spout comprising, a housing, a web in said housing, an unobstructed flow passageway through said web discharging water flow therethrough from said housing, a second flow passage in said web, means communicating said second flow passage with said hand spray, nozzle means upstream from said web directing flow of water through said housing into a narrow jet flowing into said second flow passage along the longitudinal axis thereof, whereby flow therethrough terminates flow through said unobstructed flow passage, means downstream from said web finely dividing water flowing through said first mentioned flow passages, and discharging same in a coherent stream.

7. A device attaching a remote hand spray having a valve thereon to a spout comprising, a housing, a web in said housing, an unobstructed flow passageway through said web discharging water flow therethrough from said housing, a second flow passage in said web, means communicating said second flow passage with said hand spray, nozzle means upstream from said web directing flow of water through said housing into a narrow jet flowing into said second flow passage along the longitudinal axis thereof, whereby flow therethrough terminates flow through said unobstructed flow passage, means forming an air gap between said nozzle means and said last-mentioned flow passage, a screen downstream from said web finely dividing flow through said first-mentioned flow passages and discharging same in a coherent stream, and means forming an aperture in said screen.

8. A device attaching a remote hand spray having a valve thereon to a spout comprising, a housing, a web in said housing, an unobstructed flow passageway through said web discharging water flow therethrough from said housing, a second flow passage in said web, means communicating said second flow passage with said hand spray, nozzle means upstream from said web directing flow of water through said housing into a narrow jet flowing into said second flow passage along the longitudinal axis thereof, whereby flow therethrough terminates flow through said unobstructed flow passage, and check valve means between said nozzle means and said spout.

9. A device attaching a remote hand spray having a valve thereon to a spout comprising, a housing, a web in said housing, an unobstructed flow passageway through said web discharging water flow therethrough from said housing, a second flow passage in said web, means communicating said second flow passage with said hand spray, nozzle means upstream from said web directing flow of water through said housing into a narrow jet flowing into said second flow passage along the longitudinal axis thereof, whereby flow therethrough terminates flow through said unobstructed flow passage, check valve means between said nozzle means and said spout, and check valve means between said hand spray and said second flow passages.

10. A device attaching a remote hand spray having a valve thereon to a spout comprising, a housing adapted to be affixed to said spout, a web in said housing transverse to flow therethrough, unobstructed longitudinal flow passages through said web, a screen downstream of said web having a central aperture therein, an additional flow passage extending into said web along the axis of flow of water therethrough and communicating with the exterior of said housing, a sleeve receiving said housing and forming a discharge passage communicating with said additional flow passage, means connecting said hand spray with said discharge passage, and nozzle means directing flow through said housing into said additional flow passage, whereby flow therethrough terminates flow through said unobstructed flow passage.

11. A device attaching a remote hand spray having a

valve thereon to a spout comprising, a housing adapted to be affixed to said spout, a web in said housing transverse to flow therethrough, unobstructed longitudinal flow passages through said web, a screen downstream of said web having a central aperture therein, an additional flow passage in said web, means communicating said additional flow passage with said hand spray, nozzle means directing flow through said housing into said additional flow passage, whereby flow therethrough terminates flow through said unobstructed flow passage, and a resilient check valve surrounding said housing covering said exterior of said additional flow passage.

12. A device attaching a remote hand spray having a valve thereon to a spout comprising, a housing adapted to be affixed to said spout, a web in said housing transverse to flow therethrough, unobstructed longitudinal flow passages through said web, a screen downstream of said web having a central aperture therein, an additional flow passage extending into said web along the axis of flow of water therethrough and communicating with the

exterior of said housing, a sleeve receiving said housing and forming a discharge passage communicating with said additional flow passage, means connecting said hand spray with said discharge passage, nozzle means directing flow through said housing into said additional flow passage, whereby flow therethrough terminates flow through said unobstructed flow passage, and a resilient check valve surrounding said housing covering said exterior of said additional flow passage.

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