United States Patent

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[73] Assignee General Electric Company

[54] ANTISIPHON FLUID INLET MEANS
10 Claims, 5 Drawing Figs.

[52] U.S. Cl. 137/216
[51] Int. Cl. F16l 55/06, E03c 1/10
[50] Field of Search 137/215, 216, 216.1, 216.2, 217, 218; 68/207

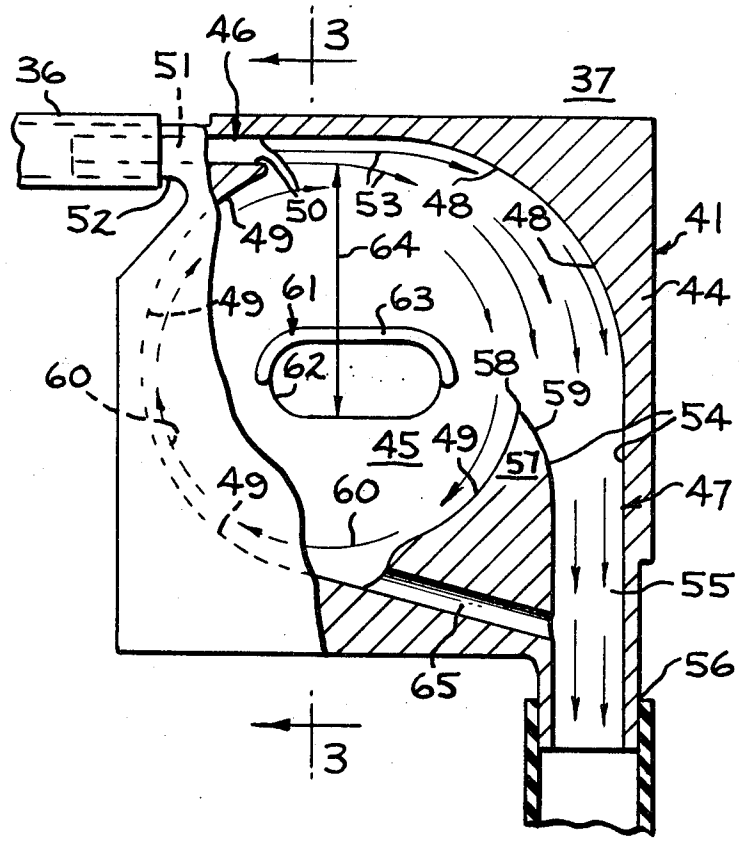
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ABSTRACT: An antisiphon fluid inlet means is provided to minimize the possibility of reverse flow of washing liquid from an automatic washer into the water piping of the building in which the washer is installed. The means comprises a housing defining an arcuate chamber therein having a tangential inlet and a tangential outlet thereto, and a vent to the atmosphere formed centrally within the housing. A flow direction means, which, in one embodiment includes a cusp formed adjacent the outlet opening from the chamber, directs a substantial portion of the fluid circulating within the chamber to the outlet opening, and directs the remainder of the fluid into the chamber for continued circulation therein. The vent is positioned out of the path of fluid circulating within the chamber and is adapted to admit air from the exterior of the housing should a suction force be exerted on the inlet, and to drain to the exterior of the housing a sufficient amount of any fluid which may backflow through the outlet to prevent fluid discharge from the chamber back through the inlet and into the water supply connected thereto.



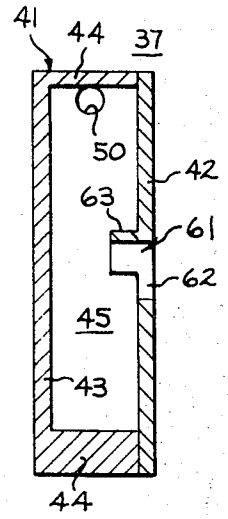


FIG.3

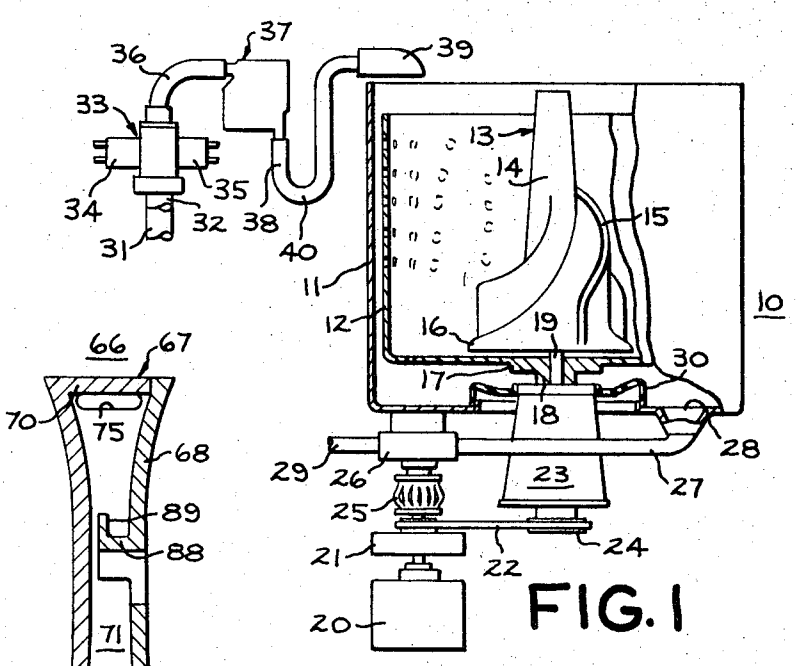


FIG.1

FIG.5

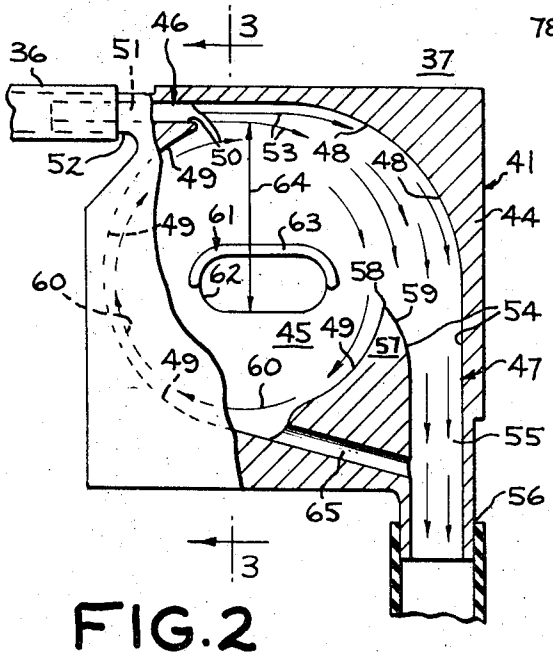


FIG.2

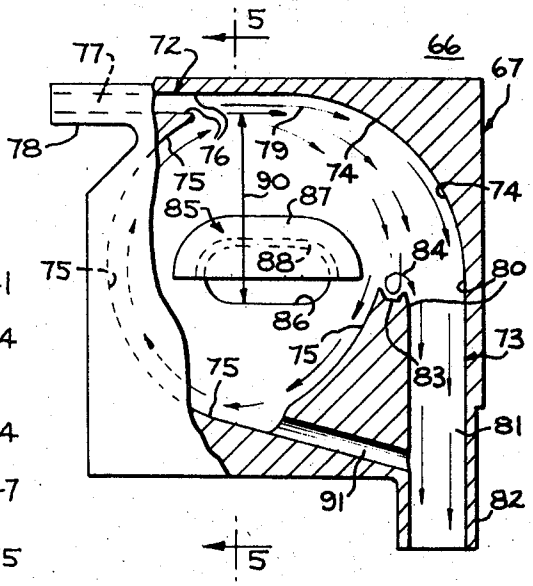


FIG.4

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ANTISIPHON FLUID INLET MEANS

BACKGROUND OF THE INVENTION

This invention relates generally to a fluid inlet means for supplying water to a washing machine or the like, and in particular, relates to a fluid inlet means having an improved vacuum break or antisiphon feature to minimize the possibility of reverse flow of washing liquid from the automatic washer to the water piping of the building in which the washer is installed.

It has long been recognized that when a plumbing fixture or the like is connected to the water supply of a building there is a danger reverse flow of contaminated water from the fixture to the water piping when the inlet to the fixture is below the overflow level of the fixture. Such a reverse flow is known in the art as a "cross connection." Clothes washing machines, and particularly those designed for automatic operation, present opportunities for the establishment of a cross connection because the nozzle for discharging water to the tub or washing basket in which the washing is done is frequently positioned below the overflow level thereof. Consideration must also be given to the substantial thickness of the suds which may rise well above the overflow level causing contaminates to surround a discharge nozzle positioned well above the overflow level of the washing container.

With automatic washing machines, cross connections may be caused by the onset of low or below atmospheric pressure within the water supply system connecting with the washer or by high suds pressure within the washer itself. Low transient supply system pressures frequently occur in the complex plumbing systems of large apartment buildings due to the opening and closing of values by the occupants. Furthermore, below atmospheric pressure situations may occur in almost any plumbing system due to conduit failure or inadvertent draining. For example, consider a house in which an automatic washer is in operation on the first floor. As may commonly occur, assume that the washer is in the agitation cycle and its water admission control valve, as well as all other faucets in the house, are closed. Should a plumbing failure occur in the basement of this house, due to the fact that all the water outlets are closed, water will only drain from the upper portion of the water supply system, forming a vacuum therein. When the washer's water admission control valve opens to admit water for rinsing and the like, the vacuum of the household water supply system will cause the washer water inlet system to experience a suction force tending to draw contaminants from the washing basket into the household water piping. In somewhat similar manner, some detergents may also induce cross connections by causing increased pressure within the washing container resulting the suds and other contaminants being forced to backflow into the water supply piping.

It recognition of these problems, most plumbing codes now require that water inlets to automatic washers incorporate an antisiphon or vacuum break provision providing an airgap upstream of the water discharge nozzle. By this arrangement, should the building's water supply system experience an internal pressure less than that within the washing basket, no direct suction force will be exerted through the discharge nozzle and no contaminates will be exerted through the discharge nozzle and no contaminates will be drawn from the washing basket and into the water supply system. Furthermore, most such plumbing codes specify, in substance, that the vacuum break should have an inlet opening, an outlet opening, and a chamber having a vent or opening to the atmosphere, and that the vent opening should be positioned at least 1 inch below the inlet opening. By this arrangement, should washing fluid backflow from the outlet into the chamber, it will drain from the chamber through the vent opening rather than backflow into the inlet and the water supply system connected thereto.

A number of vacuum break configurations corresponding with plumbing code requirements are now being incorporated by the various manufacturers in their automatic washers. However, because the codes specify that the vacuum break must be positioned upstream from the discharge nozzle, it is essential that the vacuum break be designed to retain as much of the momentum of the inlet water flow as is possible in order to overcome the downstream flow resistance of a discharge nozzle designed to directionally deliver a gentle flow of water to the washing basket. Such a design requirement has commonly been met by restricting the inlet opening of the vacuum break to form somewhat of a nozzle to shoot the water through the chamber past the atmospheric opening and into the outlet opening with minimal momentum loss. The restricted inlet opening, however, has been found to be subject to calcium deposits as small quantities of water tend to settle therein or discharge therefrom on a slow, drop by drop, basis during periods of nonuse. Such deposits tend to deter the operation of the inlet opening and frequently cause the formation of a nonlaminar flow within the chamber of the vacuum break with consequential splashing and discharge results not only in ineffective delivery of water to the washing basket discharge nozzle but also in undesirable venting of substantial water basket discharge nozzle but also in undesirable venting of substantial to the interior of the washer cabinet through the atmospheric opening.

It is, accordingly, an object of this invention to provide an improved fluid inlet means for use in a washing machine or the like and having a vacuum break to minimize cross connection even though the washing basket discharge nozzle may become submerged in water or in suds floating thereon.

It is a further object to provide such a fluid inlet means which is simple and inexpensive in design, and which will overcome the problem of splashing due to the formation of impurity deposits within the inlet opening to the vacuum break.

It is still another object to provide such a device which prevents unnecessary discharge of water through the atmospheric opening as may be caused by splashing by recirculating any nonlaminar discharge from the inlet opening through the chamber of the vacuum break and toward the outlet thereof.

SUMMARY OF THE INVENTION

Briefly stated, in accordance with one aspect of the present invention, there is provided fluid inlet means comprising a housing defining a chamber therein. An inlet means directs fluid from a source of fluid under pressure into the chamber for circulation therein in one rotational direction, and an outlet means tangentially discharges at least a portion of the fluid circulating within the chamber. A vent means is positioned out of the path of the circulation fluid to provide communication between the chamber and the exterior of the housing. The vent means is adapted to admit air from the exterior of the housing should a suction force be exerted on the inlet means. Furthermore, should a suction force be exerted on the inlet means, the vent means is adapted to drain to the exterior of the housing a sufficient amount of any fluid backflowing through the outlet to prevent such fluid from backflowing into the inlet means and the source of fluid associated therewith.

BRIEF DESCRIPTION OF THE DRAWING

While the specification concludes with claims particularly pointing out and distinctly claiming the subject matter which is regarded as the invention, it is believed the invention will be better understood from the following description of the preferred embodiments taken in connection with the accompanying drawing, in which:

FIG. 1 is a partial, schematic, elevational view of a clothes washing machine including one embodiment of the fluid inlet means of the present invention;

FIG. 2 is a sectional view of the fluid inlet means of FIG. 1;

FIG. 3 is a view taken along line 3–3 of FIG. 2;

FIG. 4 is a sectional view of an alternate embodiment of my device; and

FIG. 5 is a view taken along line 5–5 of FIG. 4.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring now to the drawing, and initially to FIG. 1 thereof, there is illustrated an agitator-type vertical-axis automatic clothes washer **10**. The washer **10** normally includes a suitable appearance and protective outer cabinet which, in the interest of clarity, has been omitted from the drawing. The washer may include a rigidly mounted imperforate tub **11** having a perforate washing basket or container **12** rotatably supported therein for washing and rinsing clothes therein and for centrifugally extracting liquid therefrom. At the center of basket **12** there is provided an agitator **13** which includes a center post **14** having a plurality of curved water circulating vanes **15** joined at their lower end to form an outwardly flared skirt **16**. Normally a resilient gasket (not shown) is provided between the upper edge of tub **11** and the appearance cabinet to prevent moisture from escaping into the space between the tub and the cabinet.

Both the clothes basket **12** and the agitator **13** are rotatably mounted. The basket is mounted on a flange **17** of a hub **18** and the agitator **13** in mounted on a shaft **19** which extends upwardly through the hub **18** and through the center post **14** and is secured to the agitator so as to drive it. During one possible cycle of operation of the washer **10**, liquid is introduced into the tub **11** and basket **12**, and the agitator is then oscillated around its axis to wash the clothes within the basket. After a predetermined period of this washing action, basket **12** is rotated at high speed to centrifugally extract the washing liquid from the fabrics. Following this extraction operation, a supply of clean liquid is introduced into the basket for rinsing the fabrics and the agitator is again oscillated. Finally, the basket is once more rotated at high speed to extract the rinse liquid.

The basket **12** and agitator **13** may be driven by any suitable means. By way of example, I have shown them as driven from a reversible motor **20** through a drive mechanism including a clutch **21** mounted on the motor shaft. A suitable belt **22** transmits power from clutch **21** to a transmission assembly **23** through a pulley **24**. Thus, depending upon the direction of motor rotation, the pulley **24** of transmission **23** is driven in opposite directions. The transmission **23** is so arranged that it supports and drives both the agitator drive shaft **19** and the basket mounting hub **18**. When motor **20** is rotated in one direction, the transmission causes agitator **13** to oscillate and, when motor **20** is driven in the opposite direction, the transmission rotates the clothes basket **12** and agitator **13** together at high speed for centrifugal fluid extraction. Because the specific type of transmission used does not form a part of the present invention, reference is made to U.S. Pat. No. 2,844,225 issued July 22, 1958 to Mr. James R. Hubbard et al. and assigned to the assignee of the instant invention. That patent disclosed in detail the structural characteristics of a transmission assembly suitable for use in the illustrated machine.

In addition to operating the transmission **23** as described, motor **20** also provides a direct drive through a flexible coupling **25** to a pump structure **26** having an inlet connected by conduit **27** to an opening **28** formed in the lowermost part of tub **11** and an outlet connected to by a conduit **29** to a suitable drain (not shown). With this structure, when the motor is operating so as to provide agitation, pump structure **26** is rotated in reverse direction and is substantially inoperative. Conversely, when the motor is reversed so as to rotate the basket **12** and agitator **13** together at high speed to centrifugally extract fluid from fabrics in the basket, pump structure **26** will draw liquid in from opening **28** through conduit **27** and discharge it through conduit **29** to drain.

In order to accommodate the movement which occurs between transmission **23** and tub **11**, which also represents vibrational movement between basket **12** and tub **11**, without any danger of fluid leakage between them, the stationary tube **11** is joined to the upper part of transmission **23** by a flexible boot member **30**. A member of this type is described and claimed in U.S. Pat. No. 2,959,966 issued Nov. 15, 1960 to Mr. John Bochan and assigned to the assignee of the instant invention.

Hot and cold water may be supplied to the machine through conduits **31** and **32** which are adapted to be connected respectively to sources of hot and cold water (not shown). Conduits **31** and **32** extend into a conventional mixing valve structure **33** having solenoids **34** and **35** and being connected to a hose **36**. In a conventional manner selective or concurrent energization of solenoids **34** and **35** will provide the passage of hot, cold or warm water from the mixing valve **33** through the hose **36**. Hose **36** connects with a fluid inlet means **37** which is the subject of my invention, the construction and operation of which will be described below in detail. Inlet **37**, in turn, connects with another hose **38** which communicates with a discharge nozzle **39**. Nozzle **39** is designed to break up and spread out the flow of fluid from hose **38** and to discharge the resulting gentle stream directionally into basket **13**. A water trap **40** may be formed within hose **38** to provide a liquid barrier to suds tending to enter nozzle **39** and travel down hose **38** toward vacuum break **37**.

It will be understood that, while the description of the machine thus far excludes a substantial amount of detail relating to the supporting structure and the drive, and does not shown all the valves and particular controls normally provided on modern domestic washing machines, the elimination and simplification of these items are primarily for the purpose of permitting a clear explanation of the inventive concept set forth below. It will be recognized that the omitted details are conventional items included in virtually all domestic washing machines, whose structure and positioning is well known to these skilled in the art.

Referring now more particularly to FIGS. **2** and **3** wherein one embodiment of vacuum break **37** is illustrated, it will be seen that the outer structure of the vacuum break comprises a housing **41** having first and second end walls, **42** and **43** respectively, and a sidewall **44** connecting with end walls **42** and **43** to define a chamber **45** therein. Formed integral with housing **41** is an inlet means **46** and an outlet means **47**. In cross section, sidewall **44** is of substantially circular configuration exposing toward chamber **45** a first arcuate wall portion **48** extending between inlet means **46** and outlet means **47**, and a second arcuate wall portion **49** continuing from outlet means **47** back to inlet means **46**.

Inlet means **46** is adapted to direct fluid from a source of fluid under pressure tangentially into chamber **45**, and comprises a tangential inlet opening **50** formed substantially adjacent the uppermost point of chamber **45**. A passageway **51** extends inlet opening **50** through an elongated cylindrical formation **52** adapted to engage hose or flexible conduit **36** which, previously described, connects through appropriate valving to a source of fluid under pressure. Fluid entering chamber **45** through inlet opening **50** circulates in the direction of flowstream arrows **53** along arcuate wall portion **48** toward outlet means **47**.

Outlet means **47** is adapted to discharge tangentially from chamber **45** at least a portion of the fluid circulating along wall portion **48** in the direction of flowstream **53**, and comprises an outlet opening **54** formed tangential to wall portion **48** at a position lower than that of inlet opening **50**. In order to provide minimal flow resistance to the fluid discharging through outlet means **47**, and to provide for some measure of expansion of flowstream **53** within chamber **45**, outlet opening **54** is a larger cross-sectional area than inlet opening **50**, and connects with a circular passageway **55** of larger cross-sectional area than inlet passageway **51**. Outlet opening **54** and passageway **55** are directed substantially vertically downwardly. Passageway **55** terminates in an elongated cylindrical formation **56** adapted to engage hose or flexible conduit **38** which, as previously described, connects with discharge nozzle **39** positioned to deliver fluid to washing basket **12**.

Ideally, in one embodiment of my invention, the above described path of fluid flow from inlet means **46** along wall portion **48** and out through outlet means **47** is the only flow which occurs when water is being admitted to the washing basket **12**. However, due to the fact that deposits of calcium or other minerals may tend to form within inlet passageway **51** and inlet opening **50**, the flowstream **53** may be only partially laminar and include spitting offshoots or turbulent layers which tend to widen flowstream **53** such that it is of greater cross-sectional area than outlet opening **54**. To provide for a significant measure of this widening flowstream effect, a flow direction means may be incorporated adjacent outlet opening **54**. In the embodiment of FIG. **2**, such flow direction means comprises flow splitter **57** having a pointed portion **58** and a funnel-shaped arcuate wall portion **59** which operate to funnel the portion of flowstream **53** to the outside of point **58** into outlet opening **54**, and to redirect the portion of flowstream **53** which is inside point **58** back into chamber **45**, as is indicated by flowstream **60**. Flowstream **60** is directed in an arcuate path through chamber **45** along arcuate wall portion **49** toward the region of inlet opening **50** where flowstream **60** rejoins inlet flowstream **53** at such an angle as to greatly enhance its chances of discharge from chamber **45** through outlet opening **54**, and to reduce the expansion of inlet fluid **53** due to spitting offshoots or turbulence. In this manner, the flow path of fluid through my device tends to remain laminar, and turbulent offshoots of fluid quickly become self-correcting permitting very little splashing of fluid within the central region of chamber **45**.

Formed within this central region of chamber **45** is a vent means **61** comprising an opening **62** formed in end wall **42** to the exterior of housing **41**. As housing **41** is mounted within a portion of the machine appearance cabinet which is assured of exposure to atmospheric pressure, vent means **61** exposes chamber **45** and the fluid flowing therein to atmospheric pressure. A drip lip **63** is formed adjacent the upper portion of opening **62** to prevent entry into opening **62** of any fluid which may fall from inlet opening **50** during the initiation or termination of fluid flow to washing basket **12**.

Opening **62** is positioned a distance **64** beneath inlet opening **50**, the distance **64** at least 1 inch as required by plumbing codes. Furthermore, opening **62** is of greater area than outlet opening **54**. By this arrangement, should any fluid backflow from outlet means **47** into chamber **45**, a sufficient amount thereof will be drained to the exterior of the housing through opening **62** to prevent such fluid from backflowing into inlet means **46**. The distance **64** being at least 1 inch is to assure that backflowing fluid will not rise within chamber **45** sufficiently for suds floating thereon to enter inlet opening **50**. Opening **62** also serves in a second way to prevent cross connections. Should a suction force be exerted on inlet means **46** through hose **36**, opening **62** will admit air from the exterior of housing **41** thereby alleviating the transmittal of such suction force to outlet means **47** and the consequential drawing of washing fluid into chamber **45** at such a rate as to cause the backflowing fluid to be directed by arcuate wall portion **48** into inlet opening **50**.

In order to drain noncirculating fluid from chamber **45** which may tend to collect therein due to gradual drop by drop flow from inlet opening **50** during periods of nonuse, or due to fluid backflow, a conduit means **65** is formed within housing **41** to connect with the lowermost point of chamber **65** and drain therefrom into outlet means **47**.

Reference is made to FIGS. **4** and **5** wherein another embodiment of my device is illustrated. In this embodiment, vacuum break **66** comprises a housing **67** having first and second inwardly concave end walls, **68** and **69** respectively, and a sidewall **70** connecting therewith to define a chamber **71**. Formed integral with housing **67** is an inlet means **72** and an outlet means **73**. Sidewall **70** exposes toward chamber **71**, a first arcuate wall portion **74** and a second arcuate wall portion **75**.

Inlet means **72** is adapted to direct fluid from a source of fluid under pressure tangentially into chamber **71**, and comprises a tangential inlet opening **76** formed substantially adjacent the uppermost point of chamber **71**. Inlet opening **76** is shown as comprising a slot which connects with a passageway **77** extending through an elongated cylindrical formation **57** adapted to engage a flexible conduit. Fluid entering chamber **71** through inlet opening **76** circulates in the direction of flowstream arrows **79** along arcuate wall portion **74** toward outlet means **73**.

Outlet means **73** comprises an outlet opening **80** formed tangential to wall portion **74** at a position lower than that of inlet opening **76**. Outlet opening **80** is of larger area than inlet opening **76**, and connects with a passageway **81** of larger area than inlet passageway **77**. Outlet opening **80** and passageway **81** are directed substantially vertically downwardly, passageway **81** terminating in an elongated, cylindrical formation **82** adapted to engage a flexible conduit. As will be readily apparent, inlet opening **76**, passageway **72**, outlet opening **80** and passageway **81** may take any of a variety of cross-sectional configurations, so long as the relative areas thereof provide minimal flow resistance to the fluid discharging from chamber **71**.

In the embodiment of FIGS. **4** and **5**, a flow direction means in the form of a cusp **83** is incorporated adjacent outlet opening **80**, whereby a portion of flowstream **79** will be caused to assume a vortical flow directed toward outlet opening **80** as indicated by arrow **84**. Such flow direction means provides for a widening of the flowstream **79** during its travel through chamber **71** and encourages a substantial portion of flowstream **79** to discharge from chamber **71** through outlet opening **80**. The remainder of flowstream **79** which does not exit through discharge opening **80** is redirected back into chamber **71** where it flows in an arcuate path therethrough along arcuate wall portion **76** toward the region of inlet opening **77**.

Formed within the central region of chamber **75** is a vent means **85** comprising an opening **86** through end wall **68** to the exterior of housing **67**. A drip lip **87** is formed adjacent the upper portion of opening **86** to prevent entry into opening **86** of any fluid which may fall from inlet opening **76** during the initiation or termination of fluid flow. Drip lip **87** is seen to comprise a horizontal portion **88** adjoining a vertical wall portion **89** extending upwardly and downwardly therefrom. As will be evident, drip lip **87** may be designed to perform its function by assuming various configurations wherein vertical wall portion **89** may extend only downwardly from horizontal portion **88**, or only upwardly from horizontal portion **88** or wherein vertical wall portion **89** is nonexistent as in the embodiment of FIGS. **2** and **3**.

Opening **86** is positioned at a distance **90** of at least 1 inch beneath opening **76**, where so required by plumbing codes. Furthermore, opening **86** is of greater area than outlet opening **80**. As will be readily apparent, opening **86** may take the form of one or more openings disposed in either of the end walls **68** and **69**, the total area of which should be greater than that of outlet opening **80** in order to assure adequate drainage capacity from chamber **71** to prevent the filling of chamber **71** upon backflow of fluid from outlet means **73**. In order to drain noncirculating drain fluid from chamber **71**, a conduit means **91** is formed within housing **67** to connect with the lowermost point of chamber **71** and drain therefrom into outlet means **73**.

It is within the scope of my invention to so modify the flow direction means associated with the outlet opening from the chamber of my vacuum break so as to insure that a portion of the inlet flow to the chamber will be caused to circulate therein. Such an alteration of the flow direction means may be advantageous in some applications wherein it is desirable to maintain a high inlet pressure.

The vacuum break of my invention is adapted to be constructed from any of a variety of materials. For example, either of the embodiments illustrated may be molded from two or more pieces of polypropylene plastic heat bonded together.

As we previously mentioned, my system is particularly adapted for use with an automatic washer wherein it is desireable to provide a vacuum break to minimize the possibility of a cross connection between the washer and the water supply system in the building in which it is mounted, and wherein it is desirable to minimize splashing from the atmospheric opening thereof as may be caused by deposits forming in the inlet thereto. From the foregoing description it should now be apparent that the present invention provides a circulating fluid flow within a vacuum break chamber wherein spitting fluid offshoots or turbulent flow is self-correcting and the flow therein tends to remain laminar whereby splashing is minimized with a minimal decease in fluid momentum passing therethrough.

As will be evident from the foregoing description, certain aspects of the invention are not limited to the particular details of the construction of the examples illustrated, and it is contemplated that various other modifications or applications will occur to those skilled in the art. It is therefore intended to cover such modifications and applications as do not depart from the true spirit and scope of the invention.

I claim:

1. An antisiphon fluid inlet means comprising:
a housing defining a chamber therein;
inlet means positioned to direct fluid from a source of fluid under pressure tangentially into said chamber for circulation therein in one direction;
said inlet means comprising at least one inlet opening into said chamber, said inlet opening being directed substantially horizontally and positioned adjacent to the uppermost point of said chamber;
outlet means positioned to discharge tangentially from said chamber at least a portion of the fluid circulating therein in said one direction;
said outlet means comprising at least one outlet opening into said chamber, said outlet opening being directed substantially vertically downwardly and being positioned below said inlet opening, the area of said outlet opening being greater than the area of said inlet opening;
vent means venting said chamber to the exterior of said housing, said vent means being positioned out of the path of fluid circulating in said one direction to admit air from the exterior of said housing should a suction force be exerted on said inlet means, and to drain to the exterior of said housing a sufficient amount of any fluid backflowing through said outlet to prevent such fluid from backflowing into said inlet means and the source of fluid associated therewith; and
flow direction means to direct at least a portion of the circulating fluid flow into said outlet opening and to recirculate the remainder of said flow within said chamber.

2. The vacuum break of claim 1 additionally comprising conduit means to drain noncirculating fluid from the lowermost point of said chamber.

3. The vacuum break of claim 2 wherein said conduit means drains into said outlet means.

4. The vacuum break of claim 1 wherein said flow direction means includes a cusp formed adjacent said outlet opening.

5. A vacuum break comprising:
a housing comprising first and second substantially vertically disposed end walls and an arcuate sidewall connecting with said end walls to define an arcuate chamber therein;
inlet means adapted to connect to a source of fluid under pressure, and comprising an opening through said arcuate sidewall to direct fluid tangentially into said chamber for circulation therein in one rotational direction;
outlet means comprising an opening through said arcuate sidewall to discharge tangentially from said chamber at least a portion of the fluid circulating therein in said one rotational direction;
flow direction means to direct a substantial portion of the circulating fluid flow within said chamber into said outlet opening and to recirculate the remainder of said flow within said chamber;
conduit means formed within said housing to drain noncirculating fluid flow from the lowermost point of said chamber into said outlet means; and
at least one opening to the atmosphere from said chamber positioned out of the path of the circulating flow at a location spaced upwardly from said lowermost point of said chamber and downwardly from said inlet means.

6. The vacuum break of claim 5 wherein the area of said opening to the atmosphere is at least as large as the area of said outlet opening which, in turn, is greater than the area of said inlet opening.

7. The vacuum break of claim 6 wherein said inlet opening is directed substantially horizontally and said outlet opening is directed substantially vertically downwardly, said outlet opening being positioned at a location below said inlet opening.

8. The vacuum break of claim 7 wherein said opening to the atmosphere is formed through at least one of said end walls substantially centrally thereof.

9. The vacuum break of claim 8 wherein said flow direction means includes a cusp formed adjacent said outlet opening.

10. The vacuum break of claim 8 additionally including a drip lip to prevent fluid falling from said inlet opening from entering said opening to the atmosphere.