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AUTOMATIC CAR WASHING APPARATUS AND CONTROL DEVICE THEREFOR

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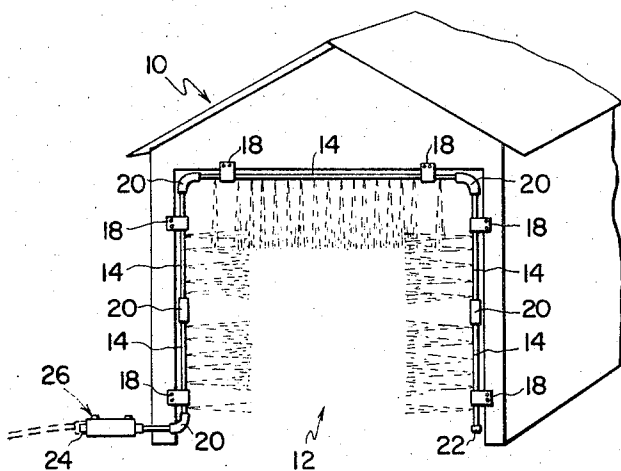


FIG. 1

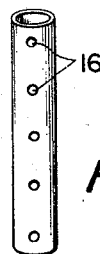


FIG. 2

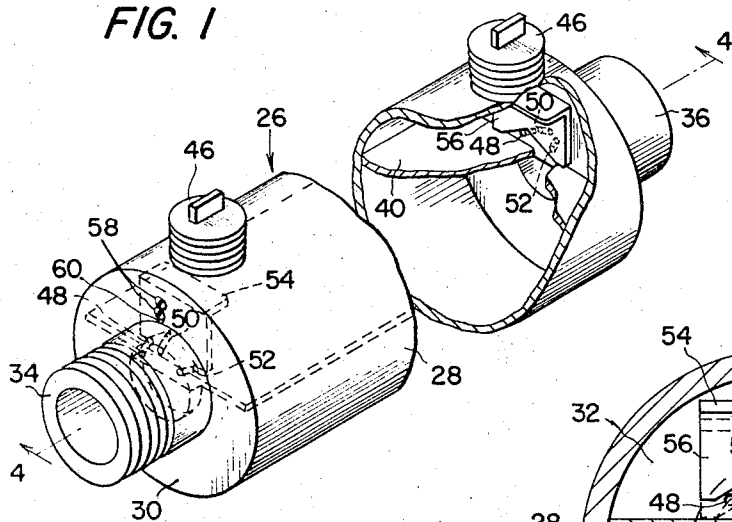


FIG. 3

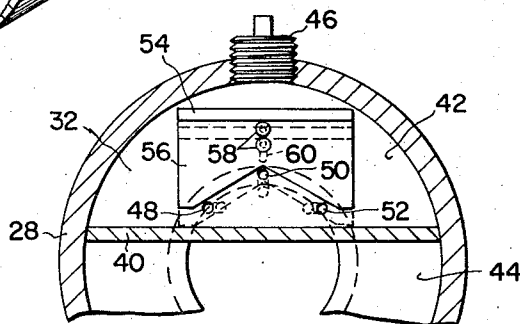


FIG. 5

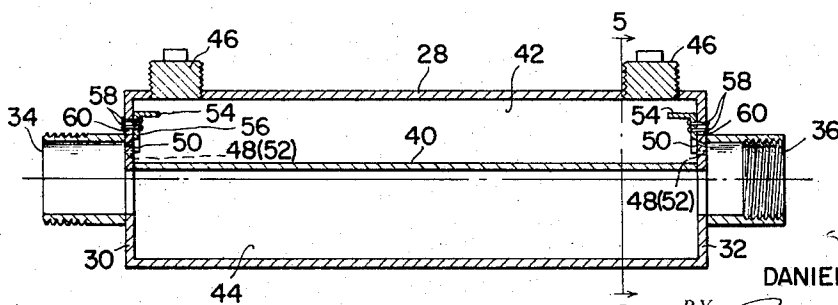


FIG. 4

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AUTOMATIC CAR WASHING APPARATUS AND CONTROL DEVICE THEREFOR

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No. 510,877

6 Claims. (Cl. 134—100)

ABSTRACT OF THE DISCLOSURE

Automatic car washing apparatus having a fluid spray conduit and including a device controlling the rate of flow of a first fluid additive into a pressurized stream of a second fluid, the infused combination thereof being directed for spraying from the conduit.

This application is a continuation-in-part of co-pending application Ser. No. 437,838, filed Mar. 8, 1965, now abandoned, entitled "Automatic Car Washing Apparatus and Control Device Therefor."

This invention relates to an automatic car washing apparatus for installation about any suitable framework and through which an automobile may be driven and more particularly to a car wash apparatus that may be installed about the entrance of any private garage, and to a novel detergent mixing device for use therewith although not limited specifically thereto.

Automatic car washing apparatuses for home use have been known. However, it has been found in the past that such systems have inherent drawbacks. One major disadvantage of such systems is that no economical and efficient device has been provided to control the rate of flow of the detergent into the water stream. Prior systems as disclosed in United States Letters Patent Nos. 2,689,577, 2,698,629, 2,752,925 and 3,079,935 are relatively expensive, requiring a high degree of maintenance and, therefore, unsuited for home use.

The United States Letters Patent to Peters, 2,613,994, and Alpert 2,797,132, illustrate forms of adding a detergent fluid of one characteristic to another fluid that is in constant communication therewith and flowing under pressure. In such devices, the fluid flowing under pressure mixes gradually with the first additive fluid to dilute it gradually such that the initial combination of fluids vary according to the length of the period of use.

Hence, an object of this invention is to provide an apparatus of general utility, but which is peculiarly adapted for the purposes of the present invention whereby a fluid of one characteristic may be contained in constant communication with a fluid of a second characteristic that is flowing under pressure and wherein the pressure of the second fluid is utilized in a novel manner to assure its complete and immediate admixture with and instant dilution of the first fluid while permitting the combined fluid to be dispensed into the stream of the second fluid for mixture therewith such that the content of both fluids in the admixture remains substantially constant throughout their period of use.

An additional disadvantage to prior domestic automatic car wash apparatuses is the need for an expensive and cumbersome external frame to support the spray heads in spaced relation from the car while washing the car. In the past, the provision of such structures increased the cost and complexity of the systems. Accordingly, it is an object of the present invention to provide an automatic car washing apparatus for home use which is easy to assemble, economical to produce and maintain, and one that may be quickly and easily secured in position about any frame-

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work or opening, and in particular about the entranceway of a garage.

Other and further objects of this invention reside in the structures and arrangements hereinafter more fully described with reference to the accompanying drawing in which:

FIG. 1 is a perspective view of the car washing apparatus of the present invention constructed about the entranceway of a home garage in accordance with the teaching of the invention,

FIG. 2 is a front elevational view of a spray head used in the apparatus of FIG. 1,

FIG. 3 is perspective view of the detergent control device utilized in the system illustrated in FIG. 1,

FIG. 4 is a vertical cross-sectional view taken along lines 4—4 of FIG. 3, and

FIG. 5 is an enlarged sectional view of an end portion of the detergent control device.

Referring now to FIGS. 1 to 5 of the drawing, the automatic car washing apparatus of the present invention is adapted to be connected to the peripheral wall adjacent to the entranceway to a home garage generally identified by the numeral 10. The car washing apparatus is generally identified by the numeral 12 and is shown in FIG. 1 as forming a substantially continuous inverted U-shaped conduit.

More particularly, the apparatus 12 of the present invention includes a plurality of similar sections or spray heads 14, each comprising elongated tubes. Each of the tubes 14 is provided with a row of transverse spray holes or bores 16 defined therein (FIG. 2). The spray heads or tube sections 14 are spaced about and connected to the peripheral wall defining the inverted U-shaped entrance of the garage 10 as shown in FIG. 1. Thus, some of the sections 14 will be positioned so their axes lie or are disposed in a vertical plane. These define the legs of the inverted U-shaped conduit while others of the sections 14 are positioned so their axes lie in a horizontal plane, thereby defining the base of the inverted U-shaped conduit.

Sections 14 are preferably made of light weight aluminum and are connected to the garage 10 by any conventional means, as the brackets 18. The spray heads 14 are positioned so their spray bores 16 face into the entrance of the garage 10. Hence, any water issuing or spraying under pressure through and from the bores 16 will project and spray forcefully into the entrance area of the garage 10. The sections 14 may be conveniently made in two foot lengths so they may be positioned to accommodate the shape of any particular garage size and entranceway.

Flexible couplings 20 may be used to interconnect adjacent ones of the sections 14 in water-tight conduit engagement. The couplings 20 may be fabricated from rubber or any other suitable material and may have an internal diameter such that when they are forced over the ends of the sections 14, they will be in water-tight engagement and relationship therewith. In an alternative arrangement, the couplings 20 may be provided with ends of the sections 14, they will be in water-tight engagement with the end sections 14. The couplings 20 may be made in a number of different convenient lengths. The shorter lengths may be utilized to connect adjacent sections 14 lying in the same line and the longer couplings may be utilized to connect together two sections 14 that may be lying in different planes, such as one vertically positioned section 14 and one horizontally positioned section 14 at a corner of the garage entrance. An end closure 22 is connected to the last section 14 to fully close the same. Thus, the spray heads 14 and couplings 20 form a continuous conduit to receive the streaming flow of water therethrough which is closed at one end by the closure 22.

The open or supplying end of the conduit of the apparatus 12 as shown at the left-hand side of the entrance of the garage 10 in FIG. 1, is connected at 24 to a water inlet or source of fluid under pressure, not shown. The connection 24 forms a continuation of the conduit 12 and is adapted to be joined with a source of water that moves under pressure such as a common water outlet or garden tap. A container or detergent control device, generally identified by the numeral 26, is adapted to contain a fluid detergent therein.

The control device or container 26 has a body 28 that is substantially cylindrical in shape throughout its length. The body is elongated and closed at its opposite ends by end walls 30 and 32. Each end wall is provided with a respective pipe-like extension 34 and 36 that extends lengthwise therefrom. The extension 34 has an external or male pipe thread while the female 36 has an internal pipe thread enabling the same to be connected as a continuation of and as an integral part of the spray apparatus 12 and its conduit.

The axes of the pipe extensions 34 and 36 and that of the body 28 are coextensive. Provided within the body 28 and spaced from the axis thereof is a chordal dividing wall 40 that separates the interior of the body 28 into two relatively unequal compartments 42 and 44. The compartment 44 provides a through passage of fluid from the source to the conduit of the apparatus 12. The upper smaller compartment 42 is adapted to contain the liquid detergent to be mixed with water for use in the apparatus 12. For this reason, the upper compartment 42 is provided with at least one filling plug 46, although two are shown. When one of the plugs is unthreaded from the body 28, a liquid or other detergent may be added to the compartment 42.

Each end of the compartment 42, defined by the end walls 30 and 32 has a plurality of apertures 48, 50 and 52. Although only three such apertures are disclosed, the same are intended only to exemplify the teaching of the invention without limiting the scope of the same. The apertures 48, 50 and 52 are uniquely arranged in their respective walls such that water will pass therethrough simultaneously and be caused to enter the compartment 42 in a diffused spray, each aperture providing a separate and additional spray to ensure an immediate and complete mixing of the water with the detergent in a manner to be described. Although the function of the apertures will be described subsequently in greater detail, let it suffice to note that each of the apertures 48, 50 and 52 are disposed in different directions, the side apertures 48 and 52 being disposed in divergent directions toward their respective side walls of the compartment 42, while the central aperture 50 is directed upward toward the roof of the compartment 42.

Mounted within the compartment 42 and on each end wall 30 and 32 thereof is a valve that has an actuating finger 54 extending laterally from a body 56. The body 56 of each valve is secured to a respective end wall for sliding movement by means of suitable securing means or rivets 58 extending through a limiting slot 60 in the valve body. Access to the actuator 54 of each valve is able to be made simply through the opening in which the adjacent plug 46 is threaded.

It will be noted that the dividing wall 40 is positioned above the diameter of each fluid extension 34 and 36 so as to obstruct the passage of fluid therethrough. Each end wall 30 and 32 extends downward into each respective fluid extension 34 and 36 to the dividing wall 40 so that they too obstruct the free passage of fluid. Since the apertures 48, 50 and 52 are provided in the portions of the walls 30 and 32 that obstruct the respective fluid extensions, they receive or dispense fluid under pressure from or into their extensions, in accordance with the direction of the movement or the flow of fluid through the container 26.

In operation, the container 26 is connected in the fluid line of the apparatus 12 as shown in FIG. 1. Because the container 26 is, for practical purposes, substantially symmetrical about a plane drawn vertically through the same intermediate the ends thereof, either end may be the inlet while the other will function as the outlet. One of the plugs 46 may be removed so the compartment 42 can be filled with a liquid detergent. Prior to filling, the valves at each end may be actuated to close, or open, or partially obscure the opening of each of the apertures 48, 50 and 52. In this manner, it is possible to vary the extent or opening of the apertures and thereby vary the rate of flow of fluid therethrough. For this reason, the valve is provided with an inverted V-shaped opening which when the valve is moved up or down, opens or closes the apertures. After filling, the plug or plugs 46 are replaced into the body 28 and the same is ready for use.

The tap water (not shown) is then turned on and supplied to the apparatus 12 and flows under pressure into the inlet extension 34, assuming the same to be the inlet for the purpose of this description. Because a portion of the extension 34 is blocked by the wall 30, the incoming fluid flows under pressure through the apertures 48, 50 and 52 and into the compartment 42. The high pressure of the inlet fluid enters the compartment 42 in a dispersed spray due to the diverging relationship of the apertures. However, the main thrust of each spray is such that the fluid entering the compartment 42 through the apertures 48 and 52 are directed toward their respective sides while the apertures 50 directs the fluid upwardly against the roof of the compartment so it will spray well forward of the center of the compartment. In this manner, the incoming fluid completely and fully admixes with the detergent to immediately dilute the same in all areas of the compartment. This has the benefit of eliminating pockets of high concentrations of detergent and ensures a more continuous flow of evenly concentrated mixture of tap water and detergent.

Only a small volume of tap water can enter into an exhaust from the apertures, and even this volume and its rate of flow may be variably controlled by adjustment of the valves at each end of the compartment. Accordingly, it is possible to control the length of time during which the detergent will be dispensed. The remaining volume of inlet fluid will flow under pressure down through the larger compartment 44 and out through the outlet 36 and along the apparatus 12.

The admixture of pressurized inlet fluid with detergent in the compartment 42 is thorough and immediate and the forceful flow of the same outward into the outlet extension 36 through the apertures adjacent thereto causes it to come and admix with the pressurized tap water emanating from and passing out of the compartment 44. This resultant combination then flows through the remainder of the apparatus 12 and is sprayed out through the bores 16 of each spray head 14 under pressure.

In the use of the embodiments of the invention, the amount of additive contained in the dispensing chamber 42 can be predetermined and/or its rate of flow varied by the valves 54 so that the same will dispense for a specific length of time or for a particular volume of fluid that is desired to be used in the apparatus 12. Thus, the driver of the vehicle may drive slowly through the spray stream while the detergent additive is being supplied to the stream of water. After a period of spray, the detergent will exhaust itself from its dispensing chamber. At that time, the fluid being sprayed under pressure through the bores 16 will no longer contain a detergent additive. In consequence, it need not be necessary for the driver to leave his vehicle to close the valves 54. Rather, he need only drive backward through the spray stream which, now being of clear water, fully washes the vehicle clean. Thus, it need not be necessary for the driver to stop his car or to make any adjustments in the apparatus 12 unless he wishes to terminate the flow of detergent into the

stream before the full amount of detergent has become used up or exhausted.

While there have been shown and described and pointed out the fundamental novel features of the invention as applied to a preferred embodiment thereof, it will be understood that various omissions and substitutions and changes in the form and details of the device illustrated and in its operation may be made by those skilled in the art, without departing from the spirit of the invention. It is the intention, therefore, to be limited only as indicated by the scope of the claims appended hereto.

I claim:

1. An automatic car washing apparatus for attachment to the wall of a framework comprising, in combination,
 - a source of fluid under pressure,
 - a continuous elongated fluid conduit adapted to be connected to the wall of a framework to conform to the shape thereof,
 - means to secure said fluid conduit to the wall of a framework,
 - spray means in said conduit for the exit of fluid therefrom under pressure in spray form,
 - said spray means comprising a plurality of elongated tubes each provided with a row of transverse bores therethrough, each of said tubes being adapted to be connected to the framework in spaced relation from the next adjacent tube, and a plurality of flexible connectors fluid-tightly connecting said adjacent tubes for relative arrangement,
 - means on said conduit to close one end thereof,
 - means on said conduit for connecting the other end of said conduit to said source of fluid under pressure,
 - a container having inlet and outlet means to be connected within said conduit and with said source of fluid under pressure,
 - said container having a passage to conduct fluid there-through along said conduit,
 - said container having a compartment for containing an additive to supply the additive to the fluid as the fluid moves from said passage to said conduit,
 - means communicating with said compartment to admit the additive therinto,
 - a first set of apertures defined in said compartment and communicating with said inlet means to supply fluid from said inlet means under pressure to said compartment in the form of a spray for admixture with the additive in said compartment,
 - and a second set of apertures defined in said compartment and communicating with said outlet means to exhaust the admixture from said compartment into said outlet means for admixture with the fluid moving through said passage, said compartment providing a through uninterrupted passage for the movement of fluid from the first set of apertures to the second set,
 - and valve means on said container to vary the rate of flow of fluid through said compartment.
2. An automatic car washing apparatus as in claim 1, a plurality of apertures in said first set each diverging from the other to direct separate sprays of dispersed fluid from said inlet means into said compartment, and a plurality of apertures in said second set each diverging from the other to exhaust fluid from different areas of said compartment into said outlet means.

3. In a device for controlling the rate of flow of a first characteristic fluid additive into a pressurized stream of a second characteristic fluid flowing through a conduit,

a body having divided first and second compartments,

a fluid inlet and a fluid outlet at opposite ends of said body,

inlet and outlet walls separating said first compartment from said fluid inlet and outlet respectively and extending into partial obstructing relationship with a respective one of said fluid inlet and outlet,

means in said first compartment to admit the first characteristic fluid therinto,

a plurality of apertures defined in each of said inlet and outlet walls,

said plurality of apertures in each of said walls being of equal size to admit and exhaust equal volumes of fluid to and from said first compartment respectively,

said plurality of apertures in said inlet wall being arranged relative to each other to admit said second characteristic fluid into different locations of said first compartment simultaneously in separate and distinct sprays,

said plurality of said apertures in said outlet wall being arranged relative to each other to exhaust admixed first and second characteristic fluids from different locations of said first compartment,

and said second compartment providing a through passage for said second characteristic fluid from said inlet to said outlet.

4. In a device as in claim 3,

valve means on said body and operable to vary the extent of the apertures in said inlet wall to vary the rate of flow of the second characteristic fluid into said first compartment for admixture with the first characteristic fluid therein.

5. In a device as in claim 3,

valve means on said body and operable to vary the extent of the apertures in said outlet wall to vary the rate of flow of the admixed first and second characteristic fluids from said first compartment.

6. An apparatus including a device as in claim 3 and comprising

a source of said second characteristic fluid under pressure,

an elongated fluid conduit adapted to be connected to said fluid inlet and outlet at opposite ends of said body and said second compartment forming a continuation of said fluid conduit,

a plurality of spray means in said conduit for the exhaust of admixed first and second characteristic fluids therefrom under pressure,

flexible means connecting said spray means together in said conduit and for positioning of said spray means in a desired relative arrangement,

means on said conduit to close one end thereof,

and means on said conduit to connect said plurality of spray means to support in said desired relative arrangement.

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