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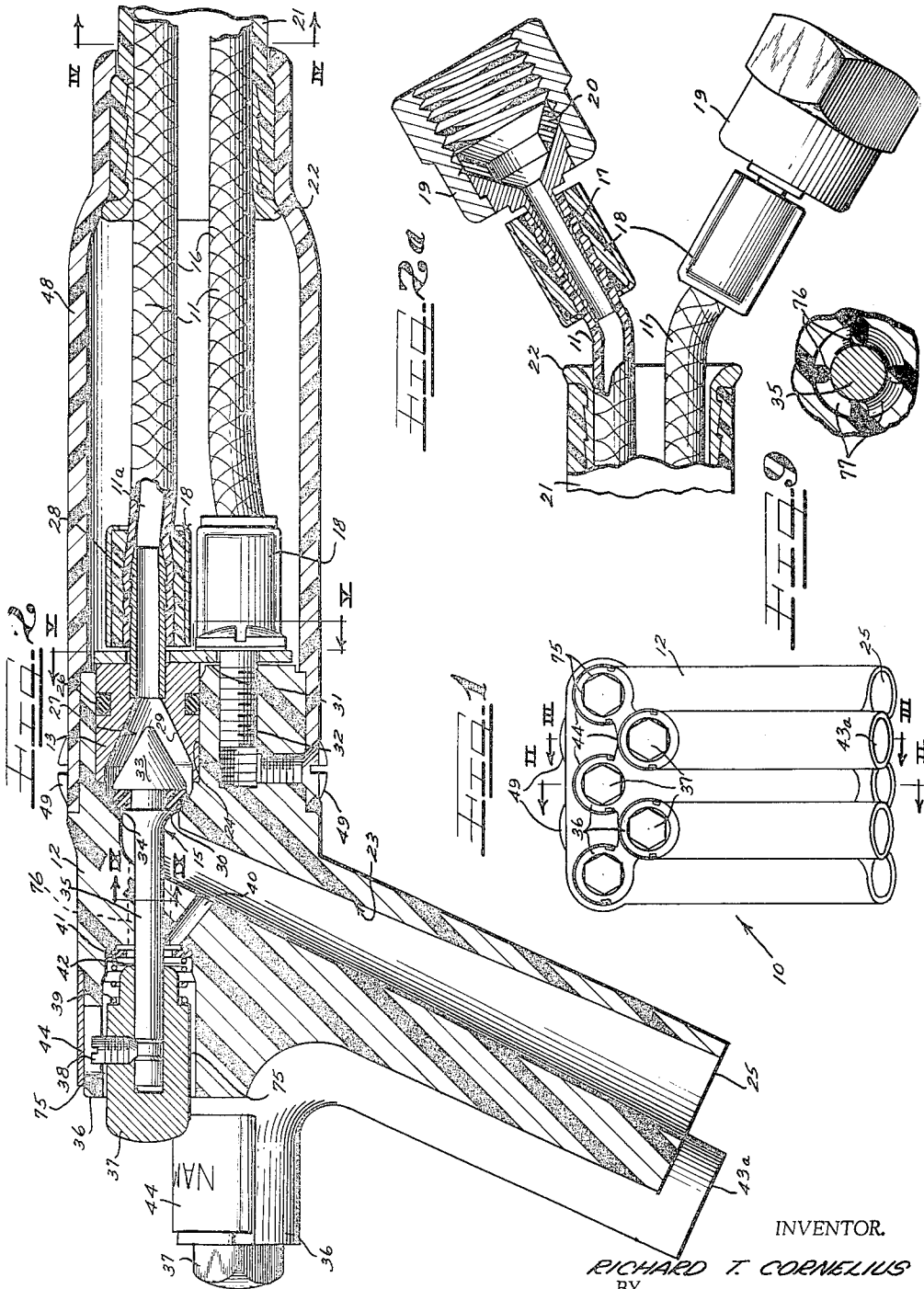
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3,216,445

# BEVERAGE DISPENSING VALVE STRUCTURE

Filed April 4, 1962

3 Sheets-Sheet 1



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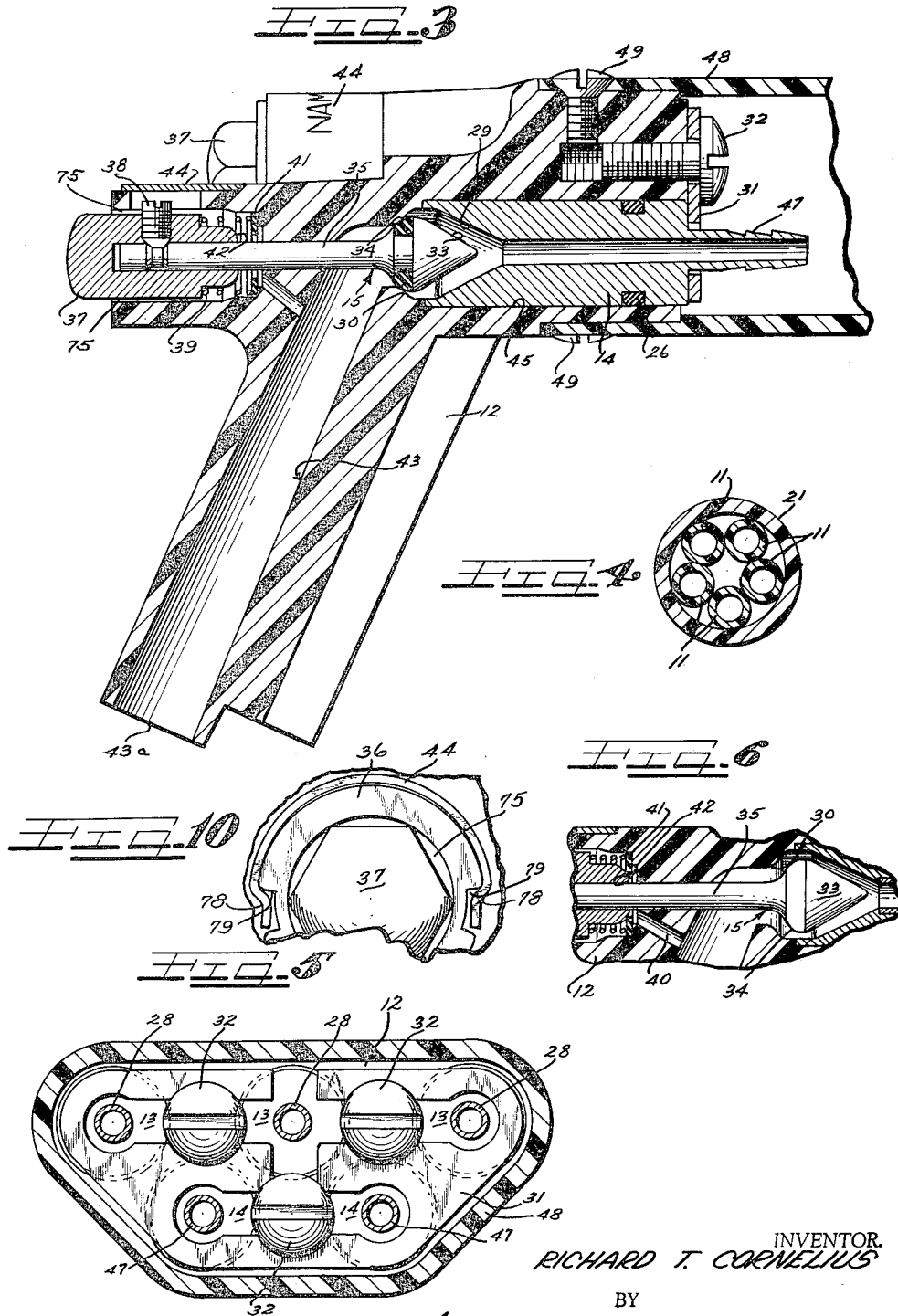
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BEVERAGE DISPENSING VALVE STRUCTURE

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3 Sheets-Sheet 2



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BEVERAGE DISPENSING VALVE STRUCTURE

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3 Sheets-Sheet 3

FIG. 7

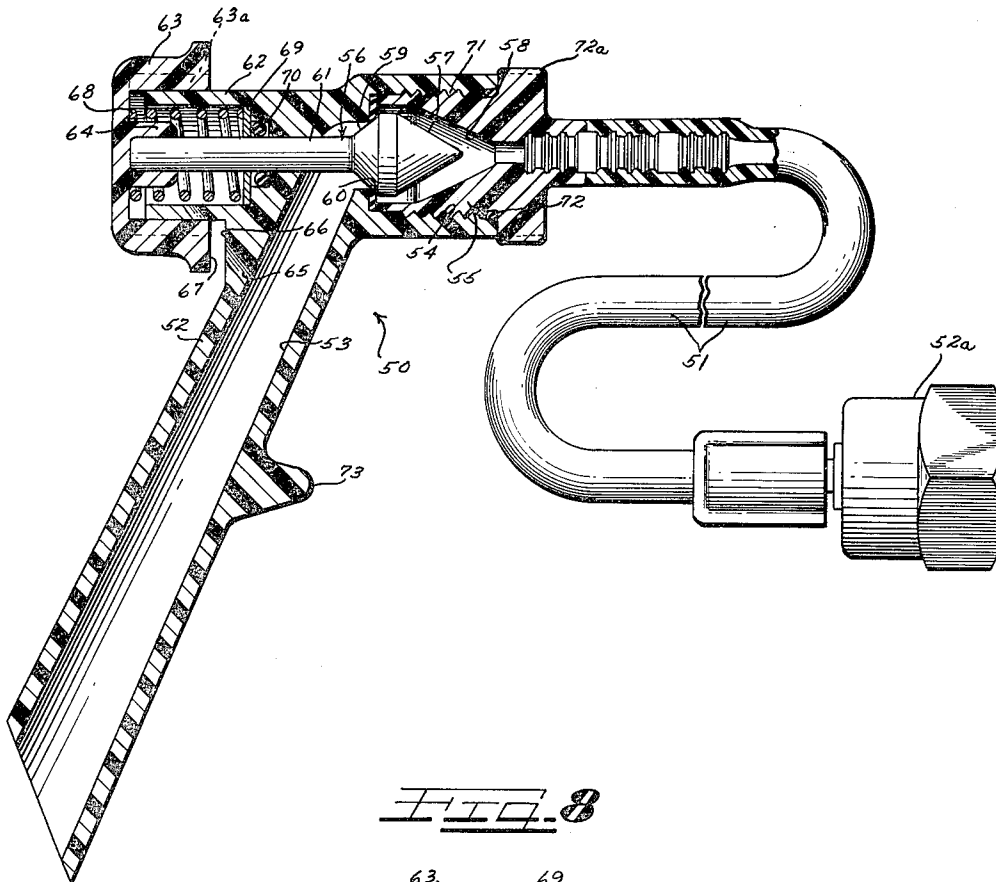
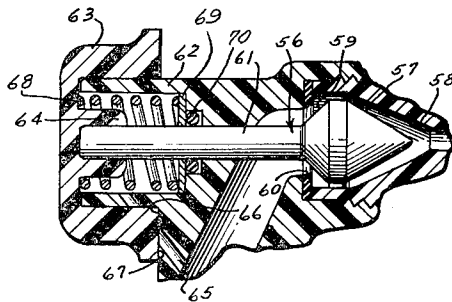


FIG. 8



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3,216,445  
**BEVERAGE DISPENSING VALVE STRUCTURE**  
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 13 Claims. (Cl. 137—594)

This invention relates generally to valve structures, and more specifically to an improved dispensing valve for carbonated beverages.

Although the principles of the present invention may be included in various valves, faucets, or other dispensing devices for liquid, a particularly useful application is made in valves or faucets of the type that are employed with carbonated beverages, such as beer and soft drinks. In particular, when such a liquid is withdrawn through a valve, there is a tendency for the unstable carbon dioxide solution to break up, causing foaming, excessive bubbling, etc. Furthermore, it has been common heretofore to provide a separate valve for each type of carbonated liquid to be withdrawn.

The present invention contemplates the utilization of internal valve structure which enables the carbonated solution to flow smoothly. In that it is able to flow with substantially without any points of localized agitation, and since the internal structure is of such configuration that agitation is largely avoided, the likelihood of the liquid's breaking up or foaming is greatly reduced. In accordance with a further principle of the present invention, structure is provided whereby a plurality of valve sections are accommodated in a single housing in a highly practicable manner, the housing being of a portable hand-held type which is connected to the end of a supply hose or cable.

Accordingly, it is an object of the present invention to provide an improved dispensing valve.

Another object of the present invention is to provide a dispensing valve having an internal configuration which does not break up a carbonated solution during flow there-through.

Yet another object of the present invention is to provide a valve assembly which may be employed on the end of a flexible hose or cable.

A still further object of the present invention is to provide a valve structure which is rugged, durable, and which can be manufactured at a minimum of cost.

Many other advantages, features and additional objects of the present invention will become manifest to those versed in the art upon making reference to the detailed description and the accompanying sheets of drawings in which preferred structural embodiments incorporating the principles of the present invention are shown by way of illustrative example.

On the drawings:

FIGURE 1 is a front elevational view of a dispensing valve assembly provided in accordance with the principles of the present invention.

FIGURE 2 is an enlarged cross-sectional view taken along line II—II of FIGURE 1, and being partially broken away;

FIGURE 2a is a cross-sectional view illustrating the end portion of that which has been broken away from FIGURE 2;

FIGURE 3 is a fragmentary cross-sectional view taken along line III—III of FIGURE 1;

FIGURE 4 is a cross-sectional view taken along line IV—IV of FIGURE 2;

FIGURE 5 is a cross-sectional view taken along line V—V of FIGURE 2;

FIGURE 6 is a fragmentary portion of FIGURE 2 illustrated in the valve-open position;

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FIGURE 7 is an enlarged cross-sectional view of a further dispensing valve provided in accordance with the principles of the present invention;

FIGURE 8 is a fragmentary portion of FIGURE 7, illustrating the valve-open position of the parts;

FIGURE 9 is a fragmentary enlarged cross-sectional view taken along line IX—IX of FIGURE 2; and

FIGURE 10 is an enlarged fragmentary view of a portion of FIGURE 1.

As shown on the drawings:

The principles of this invention are particularly useful when embodied in a dispensing device, valve, or faucet such as illustrated in FIGURE 1, generally indicated by the numeral 10. The dispensing device 10 includes, as best seen in FIGURE 2, at least one elongated flexible hose 11, a single housing 12, a plurality of inlet connectors 13 shown in FIGURE 2 and 14 shown in FIGURE 3, and a plurality of valve members 15.

The elongated flexible hose 11 may comprise plastic, and where strength is needed to withstand internal pressure, a braided wire 16 is also included as shown in FIGURE 2. Each hose 11 has a restricted bore 11a which is somewhat smaller than one might expect for a supply hose. By way of example, when the bore diameter of the hose 11 is about one-eighth inch, about three feet of such hose is needed. Each hose 11 is clamped to a fitting 17 by a resilient clamping member 18, the fitting 17 comprising part of a flexible coupling 19 having a gasket 20, which coupling 19 may be secured to an appropriate source or supply of liquid. There is a number of hoses 11 provided which is equal to the number of valve sections built into the device, and where five valve sections are provided as shown in FIGURE 1, it is to be understood that five of the couplings and hoses illustrated in FIGURE 2a would be provided, those shown being representative of all. The various hoses 11 are contained within a plastic sheath or tube 21 to make up a hose assembly. At each end of the plastic tube 21, there is provided a nipple 22 which protects the ends of the tube 21. It is to be understood that the restricted bore 11a may be made larger if the length of the hose is extended, and must be made smaller when the length of the hose 11 is reduced significantly.

The housing 12 is provided with a number of passageways for fluid flow, one of which is illustrated in FIGURE 2 and is generally indicated by the numeral 23. The passageway 23 includes a relatively larger recess 24 at one end thereof which is of cylindrical configuration and which receives one of the inlet connectors 13. It will be noted that the passageway 23 gradually tapers to provide a larger flow area, beginning substantially at the valve 15 out to its discharge end 25. Such a taper must be quite gradual, as illustrated, so that liquid flowing therethrough will continue to have a smooth non-agitated type of flow. Thus the passageway 23 increases in effective size from the recess 24 to the discharge end 25.

The inlet connectors 13 have a cylindrical outer configuration and are each received in one of the housing recesses 24, and are provided with an O-ring 26, thereby establishing a peripheral seal between the inlet connector 13 and the housing 12 within the recess 24. The inlet connector 13 includes a passageway generally indicated at 27 one end of which is defined by a straight portion 28 which is adapted to be received into one of the hoses 11 about which clamping means 18 are thereafter provided. Downstream from the straight portion of the connector passageway 27, there is provided in the connector as a part of such passageway a diverging recess 29 which blends smoothly with the straight portion of the passageway at one end, and at the other end, blends smoothly into a valve seat 30 on the housing 12, disposed substantially at the juncture of the diverging recess 29 and the upstream

end of the housing passageway 23. A single securing means 31 is attached as by screws 32 to the housing 12 to act between the housing 12 and each of the inlet connectors 13 and 14 to retain the same within the housing recesses, such as 24, thereby precluding withdrawal or movement of the inlet connectors 13 and 14.

The valve member 15 includes an upstream face 33 of tapering sectional area, the sectional area increasing in a downstream direction, the outer surface of the upstream face 33 lying substantially parallel to the interior wall of the recess 29. With the valve 15 disposed in an open position as shown in FIGURE 6, it can be seen that the valve face 33 is substantially parallel to the inner wall of the recess 29. When this relationship is precisely parallel, then the flow area increases gradually along the length of the upstream face 33 by a rate determined by the slope of the recess wall. This rate of divergence can be determined to some extent by the slope of the upstream face 33 which may be either slightly steeper or less inclined than the wall of the inlet connector recess 29. Nevertheless, the effective flow size of the passage about the upstream face 33 is such that it gradually increases, so that the surfaces 33 and 29 jointly define a flow area in the connector recess which gradually increases in a downstream direction when the valve member 15 is disengaged from the seat 30.

The valve member 15 has a downstream face 34 of gradually converging sectional area which coacts with the valve seat 30, both to close the valve, and to continue to define a gradually increasing effective flow area in the passage 23. The valve member 15 includes a stem 35 which is slidably guided and supported on a number of lands or ridges 76 in the housing 12, and is joined to the downstream face 34 at its inner end. The ridges 76 with the stem 35 jointly define a plurality of flushing passages 77, best seen in FIGURE 9, to which a major portion of the circumference of the supported part of the stem 35 is exposed. The valve stem 35 at its outer end extends outwardly of the housing and terminates within a housing extension 36 of generally annular configuration.

At its outer end, the valve stem 35 is provided with an actuator button 37, such as of hexagonal configuration, which is slidably guided within the housing extension 36, thereby defining therewith passages 75 of segmental cross-section, the button 37 being secured to the outer end of the stem 35 by a setscrew 38. It is evident that inward movement of the actuator button 37 opens the valve member 15 to the position shown in FIGURE 6, and that a spring 39 acts to return the valve member 15 to the position illustrated in FIGS. 2 and 3.

The housing 12 is provided with a vent passage 40 which connects a point in the passageway 23 which is just downstream of the valve member 15 or seat 30 with the back side of an auxiliary valve seat 41 which encircles the valve stem 35 in a loose fashion, the auxiliary valve seat 41 being held in place by the spring 39. To coact therewith, the actuator button 37 is provided with an auxiliary valve face 42 which is directed to engage and to close the auxiliary valve seat 41, and hence the vent 40. Such closing also provides a temporary seal against flow of any fluid about the valve stem 35, thus blocking off the passages 77 from the passages 75. The auxiliary valve face 42 engages the auxiliary valve seat 41 just as the upstream valve face 33 reaches its proper position, and thus the auxiliary valve 41, 42 establishes the fully open position of the main valve member 15.

While the valve structure described in FIGURE 2 can advantageously be used alone as shown in FIGURE 7, it is to be understood that certain advantages are obtained when a number of such structures are combined as herein taught. Referring also to FIGURE 3, it will be noted that the housing 12 includes other passageways 43 similar to the passageway 23 but offset therefrom. A particularly advantageous structure for arranging a plurality of such passageways is thus evident from FIGURES 1-3 wherein

a first plurality of passageways 23 are aligned so that their axes lie parallel to each other in a pair of intersecting planes, and so that a second plurality of passageways 43 also lie parallel to each other in a pair of intersecting planes parallel to the other planes and offset therefrom, the passageways in one set of planes being further offset in the direction of the planes (perpendicularly to FIGURE 2) to a position intermediate the axes of the other passageways. By such structure, a number of actuating buttons and valve outlets are provided relatively close together so that the same may conveniently fit into the palm of the hand of the user, the device being on the end of a hose, so that the user can move the same from and between various glasses into which he is drawing liquid.

One advantageous feature of this embodiment is that the discharge ends 43a are so arranged that any drop of beverage clinging to the lowest part of the end will drip directly therefrom, and will not flow into any other discharge end. This feature is achieved by the fact that each discharge end 43a comprises a distinct protrusion beyond the planes of the discharge ends 25. Without this feature, one drop of a "cola" drink could flow generally downwardly to a discharge end 25 and "contaminate" and discolor the next serving of soda water drawn from another valve section.

To identify the contents in the various valves, it is advantageous that identifying means be carried on the housing, and to this end the upwardly directed cylindrical surfaces of the housing extensions 36 are each provided with an arcuate identifying member 44 having appropriate indicia, color coding, etc. In this embodiment, the identifying members 44 comprise resilient clips, all of which are upwardly exposed to display a suitable beverage trademark or trade name carried thereon. Each clip comprises a high grade of spring material, such as precipitation hardened beryllium copper, and is provided with retention means 78, 78 which slidably grip the housing extension 36 in a pair of grooves 79, 79. Each clip 44 can be slid forwardly in the grooves 79 and be thereby removed without use of any tool for obtaining access to the screw 38 or for replacement with one bearing a different trademark, indicia, or name, corresponding to the particular beverage supply associated therewith. However, by the use of a high quality of spring material, the valve assembly 10 will withstand rough handling and shock without likelihood of loss of any such clip, and each clip may be removed and replaced a countless number of times without any perceptible lessening of its grasping power.

The valve section shown in FIGURE 3 is internally substantially identical to that shown in FIGURE 1 except that the passageway 43 communicates with a somewhat longer housing recess 45, and that the inlet connector 14 is correspondingly longer.

The inlet fitting 47 may be made integral with the inlet connector 14 as shown in FIGURE 3, or it may comprise a separate insert thereto as shown in FIGURE 2. Thus the inlet connectors 13 and 14 terminate in substantially a common plane so that the securing means 31 may take the form of a plate lying substantially in a single plane.

To enclose the various fluid connections and the downstream end of the hose assembly, there is provided a housing cover 48 which is secured to the housing as by screws 49. As best seen in FIGURE 2, the nipple 22 coacts with the cover 48 to serve as and to comprise a strain relief means between the housing cover 48 and the hose assembly. The wire braid 16 is captured within the clamping members 18 and is thus protected against unraveling. Such wire can be quite fine, and is therefore too fine to illustrate in FIGURE 4.

When the various couplings 19 are connected to supplies of fluid under pressure, such as a carbonated beverage, it is evident that the fluid will flow smoothly through the restricted bore 11a, and because of friction with the inter-

nal walls, lose some velocity. It is further evident that since the flow area within the dispensing device increases beginning at a point upstream of the upstream side of the valve element, a continued reduction in flow velocity will occur as the liquid passes through the device. Such reduction of flow velocity due to increase of effective flow area occurs all the way to the downstream end of the valve where discharge occurs. Thus, the flow area gradually increases throughout the open device without any substantial reduction or decrease along the length of the flow passage therein. Each successive increment is thus equal to or slightly greater than the flow area of upstream increments, and all changes are gradual so that flow is of the locally smooth type and devoid of local agitation. By such structure, agitation is for practical purposes avoided, along the entire flow path, and the liquid leaves the valve without agitation having been started, and at a relatively low velocity so that it does not break up by impingement with the vessel into which it is being drawn. Stated otherwise, the disclosed structure not only avoids internal agitation, but reduces the velocity of the liquid being discharged so as to substantially avoid agitation in the drinking vessel after discharge, or to greatly minimize the same.

After extended usage, or periodically, it becomes necessary to clean the valve assembly 10, especially where the beverage has a sticky or sugary base; this embodiment is particularly easy to clean. The unit as a whole is on the end of a hose and so it may be easily inverted under a tap water faucet; cleaning water will enter the discharge ends 25 and 43a, will flow through the passages 40 and 77, and will be discharged through the passages 75. The unit may also be immersed in a pail of fresh water and swished around. It is to be noted that the foregoing may be carried out without disassembly and without relieving the pressure of the beverage supplies.

Referring now to FIGURES 7 and 8, there is shown a device embodying the principles described above, generally indicated at 50. This dispensing device 50 likewise employs an elongated flexible hose 51 connected at one end to the dispensing faucet or device 50, and is provided with an appropriate coupling 52a at the other end. The hose 51 has a restricted bore, and by way of example, the bore size may be .100 inch in diameter, the hose 51 having a length of about 18 inches. As before described, the hose 51, because of its restricted bore, acts to reduce the velocity of the fluid to be dispensed by the valve 50.

The device or faucet 50 further includes a housing 52 having a gradually increasing passageway 53 which blends into a recess 54 which receives an inlet connector 55. Similarly, a valve member 56 includes an upstream face 57 which is received within a diverging recess 58 in the inlet connector, and a converging downstream face 59 which coacts with a seat 60 disposed substantially at the juncture between the diverging recess 58 and the upstream end of the passage 53. The valve member 56 includes a stem 61 which is slidably guided by the housing 52, the inner end of which stem is joined to the downstream face 59 of the valve 56, and the outer end of which extends into an annular housing extension 62. An actuator button 63 is slidably guided by the housing extension 62 and has a portion 64 within the annular extension 62 to which the outer end of the stem 61 is secured.

The passageway 53 is provided with a vent 65 which communicates therewith downstream of the valve member 56 and which terminates in an outwardly directed auxiliary valve seat 66 for engagement by an auxiliary valve face 67 on the actuator button 63. The actuator button 63 is urged outwardly by a spring 68 which acts on an annular retaining plate 69 that holds an O-ring 70 in place about the stem 61 of the valve member 56.

The inlet connector 55 is secured to the housing 52 by securing means in the form of cooperating threads indicated at 71. The inner or downstream end of the inlet

connector 55 acts on the periphery of the valve seat 60 to secure the same in position and to form a seal therewith. To insure that deterioration of such valve seat will not cause leakage, it is preferable to include an O-ring 72 between the inlet connector 55 and the housing 52 as a further seal.

The inlet connector 55 may be provided with relatively large knurls 72a so that the same may be manually assembled and disassembled. If desired, a hook 73 may also be formed on the housing 52 for use in disposing the device in a storage position selected. The actuator button 63 may be provided with internal splines 63a to minimize the friction with the annular extension 62 of the housing 52.

Likewise in this structure, the valve member 56 together with the inlet connector 55, and the housing 52, jointly define a flow area which gradually increases in a downstream direction when the valve member 56 is disengaged from the seat. Thus, the flow area increases in a downstream direction beginning at a point upstream of the valve face 57 and continuing through the device. Such increase is accomplished without any substantial decrease of the effective flow area through the open device, and all such increase is gradual. Thus, each successive increment of flow area is equal to or slightly greater than the flow area of upstream increments.

By structure such as disclosed herein, a relatively high storage and discharge pressure may be employed at the fluid supply. If a conventional valve were employed therewith, break-up would occur. However, with the reduction of velocity effected by the restricted bore size hose, and with the further reduction in flow velocity effected by the gradual increase of the effective flow area throughout the device, without the creation of any internal agitation, the fluid can be discharged from the device at a relatively low velocity, thereby minimizing other agitation and subsequent break-up in the vessel into which the fluid is drawn.

Although various minor modifications might be suggested by those versed in the art, it should be understood that I wish to embody within the scope of the patent warranted hereon all such embodiments as reasonably and properly come within the scope of the following claims.

I claim as my invention:

1. A dispensing device for a carbonated beverage comprising in combination:

(a) a housing having a passageway adapted at one end to be connected to a supply of fluid and at the other end to discharge such fluid;

(b) a valve member supported by said housing in said passageway and movable to closed and to open positions; and

(c) said housing and said valve member having such a configuration that, with said valve member in its open position, the flow area of said passageway gradually increases without any diminution from a point upstream of said valve member to the outlet of said passageway.

2. A dispensing device for a carbonated beverage comprising in combination:

(a) an elongated flexible hose of restricted bore size adapted at one end to be connected to a supply of fluid, said restricted bore size being such that the velocity of the supplied fluid is initially substantially reduced by fluid friction due to non-agitated fluid flow through said bore;

(b) a housing having a passageway connected at one end to the other end of said hose, and adapted at the other end to discharge such fluid;

(c) a valve member supported by said housing in said passageway and movable to closed and to open position; and

(d) said housing and said valve member having such a configuration that, with said valve member in its open position, the flow area of each successive in-

crement of said passageway is equal to or slightly greater than the flow area of upstream increments thereof so that such velocity is further reduced in the housing due to the gradual increase of the flow area while such non-agitated flow is maintained.

3. A dispensing device comprising in combination:

(a) a housing having a passageway terminating at one end in a larger recess and adapted at the other end to discharge fluid, the effective flow area of said passageway gradually increasing in effective size from said recess to said other end;

(b) an inlet connector received in said recess and having a passageway adapted at one end to be connected to a supply of fluid;

(c) a separate annular valve seat disposed in said housing recess at said one end of said housing passageway and held firmly in place by said inlet connector; and

(d) a valve member slidably guided by said housing and having a downstream face of converging sectional area coacting with said valve seat.

4. A dispensing device comprising in combination:

(a) a housing having a passageway terminating at one end in a larger recess and adapted at the other end to discharge fluid, the effective flow area of said passageway gradually increasing in effective size from said recess to said other end;

(b) an inlet connector received in said recess and having a passageway adapted at one end to be connected to a supply of fluid;

(c) a separate annular valve seat disposed in said housing recess at said one end of said housing passageway and held firmly in place by said inlet connector, the outer peripheral portion of said seat forming a fluid seal between said housing and said connector; and

(d) a valve member slidably guided by said housing and having a downstream face of converging sectional area coacting with said valve seat.

5. A dispensing device comprising in combination:

(a) a housing having a passageway constructed at its upstream end to be connected to a supply of liquid and at the outlet end to discharge such liquid;

(b) a valve member disposed in said passageway;

(c) a stem slidably supported by said housing and joined to said valve member at its inner end and extending outwardly of the housing at its outer end; and

(d) a manual actuator push-button secured to said outer end of said stem and projecting at all times out of said housing, for moving said valve member to an open position, and having an auxiliary valve face lying in a plane substantially perpendicular to the longitudinal axis of said stem;

(e) said housing having passage means which extends from a point in said passageway downstream of said valve member to an auxiliary valve seat on said housing disposed above said passageway outlet, said auxiliary valve seat lying in a plane parallel to said first-named plane, and being directed to be engaged and closed by said auxiliary valve face when said push-button is in its fully depressed position, said passage means being normally open at both ends to the atmosphere.

6. A dispensing device comprising in combination:

(a) a housing having a passageway adapted at one end to be connected to a supply of fluid and at the other end to discharge such fluid;

(b) a valve member disposed in said passageway;

(c) a stem slidably supported by said housing and joined to said valve member at its inner end and extending outwardly of the housing at its outer end;

(d) an actuator button secured to said outer end of said stem for moving said valve member to an open position;

(e) said housing having an outwardly opening recess surrounding said stem;

(f) an O-ring surrounding said stem in said recess and forming a sliding seal between said stem and said housing;

(g) a retainer plate surrounding said stem and engageable with said O-ring; and

(h) a compression spring acting between said actuator button and said retainer plate and operative to both urge said plate toward said O-ring and to urge said valve member to a closed position.

7. A dispensing device comprising in combination:

(a) a single housing having a plurality of passageways, the axes of which lie parallel to each other, each passageway being adapted at one end to be connected to one of a plurality of supplies of fluid;

(b) a plurality of valve members each supported by said housing in one of said passageways, and each individually movable to closed and to open positions, each of said valve members including an actuator push-button extending at all times outwardly of said housing;

(c) said housing including a plurality of fixed extensions respectively surrounding said actuator push-buttons, each extension having an upwardly directed cylindrical surface; and

(d) a like plurality of arcuate identifying members each secured to a corresponding one of the cylindrical surfaces.

8. A dispensing device comprising in combination:

(a) a housing having a passageway adapted at one end to be connected to a supply of fluid and at the other end to discharge such fluid;

(b) a valve member disposed in said passageway;

(c) a stem slidably supported by said housing and joined to said valve member at its inner end and extending outwardly of the housing at its outer end;

(d) an actuator button secured to said outer end of said stem for moving said valve member to an open position;

(e) an auxiliary valve seat normally exposed to the atmosphere and supported by said housing and encircling said stem;

(f) said housing having a vent passage connecting a point in said passageway downstream of said valve member with one side of said auxiliary valve seat; and

(g) said actuator button having an auxiliary valve face engageable with the other side of said auxiliary valve seat when said button is in the valve-open position.

9. A dispensing device comprising in combination:

(a) a single housing having a plurality of passageways, the axes of which lie parallel to each other, each passageway being adapted at one end to be connected to one of a plurality of supplies of fluid;

(b) a plurality of valve members each supported by said housing in one of said passageways, and each individually movable to closed and to open positions, each of said valve members including an actuator push-button extending at all times outwardly of said housing;

(c) said housing including a plurality of fixed extensions respectively surrounding said actuator push-buttons, each extension having an upwardly directed cylindrical surface; and

(d) a like plurality of spring clips, each of which is removably slidably carried on a corresponding one of the cylindrical surfaces, and each of which has liquid identification indicia on its exposed surface.

10. A dispensing device comprising in combination:

(a) a housing having a passageway adapted at one end to be connected to a supply of fluid and at the other end to discharge such fluid;

(b) a valve member disposed in said passageway;

(c) a stem joined to said valve member at its inner

- end and extending outwardly of the housing at its outer end;
- (d) an actuator button secured to said outer end of said stem for moving said valve member to an open position; and 5
- (e) means slidably supporting said stem on said housing and defining at least one flushing passageway extending along the length of said stem, said flushing passageway enabling a free flow of cleaning liquid from said other end of said housing passageway, adjacent to said inner end of said valve member, and along the entire supported length of said stem. 10
11. A dispensing device comprising in combination:
- (a) a housing having a passageway adapted at one end to be connected to a supply of fluid and at the other end to discharge such fluid; 15
- (b) a valve member disposed in said passageway;
- (c) a stem joined to said valve member at its inner end and extending outwardly of the housing at its outer end; 20
- (d) an actuator button secured to said outer end of said stem for moving said valve member to an open position; and
- (e) a set of ridges on said housing slidably supporting said stem and defining a plurality of flushing passageways extending along the supported length of said stem, said flushing passageways enabling a free flow of cleaning liquid from said other end of said housing passageways, adjacent to said inner end of said valve member, and along the entire supported length of said stem. 25
12. A dispensing device for a carbonated beverage comprising in combination:
- (a) an elongated flexible hose of restricted bore size constructed at its upstream end to be connected to a supply of the carbonated liquid, said restricted bore size being such that the velocity of the supplied liquid is initially substantially reduced by fluid friction due to non-agitated flow through said bore; 30
- (b) a housing having a passageway connected at one end to the other end of said hose, and constructed at its other end to discharge such liquid; 40
- (c) a valve member disposed in said passageway; 45
- (d) said housing and said valve member having such a configuration that, with said valve member in its open position, the flow area of said passageway gradually increases without any diminution from a point upstream of said valve member to the outlet of said passageway so that such velocity is further reduced in the housing due to the gradual increase of the flow area while such non-agitated flow is maintained; 50
- (e) a stem slidably supported by said housing and joined to said valve member at its inner end and extending outwardly of the housing at its outer end; 55
- (f) a manual actuator push-button secured to said stem end, and projecting at all times out of said housing, for moving said valve member to an open position, said push-button having an auxiliary valve face ly-

- ing in a plane substantially perpendicular to the longitudinal axis of said stem; and
- (g) said housing having passage means which extends from a point in said passageway downstream of said valve member to an auxiliary valve seat on said housing disposed above said other end of said passageway adjacent to said manual push-button, said auxiliary valve seat lying in a plane parallel to said first-named plane, and being directed to be engaged and closed by said auxiliary valve face when said push-button is in its fully depressed position, and by such engagement to establish the extent of the fully open position of said valve member, said passage means being normally open at both ends to the atmosphere.
13. A dispensing device comprising in combination:
- (a) a housing having a passageway constructed at its upstream end to be connected to a supply of liquid and at the outlet end to discharge such liquid;
- (b) a valve member disposed in said passageway;
- (c) a stem slidably supported by said housing and joined to said valve member at its inner end and extending outwardly of said housing at its outer end; and
- (d) a manual actuator push-button secured to said outer end of said stem for moving said valve member to an open position and having an auxiliary valve face lying in a plane transverse to the direction in which said valve is moved;
- (e) a housing having passage means which extends from a point in said passageway downstream of said valve member to an auxiliary valve seat on said housing disposed above said passageway outlet, said auxiliary valve seat lying in a plane parallel to said transverse plane to be engaged and closed by said auxiliary valve face when said push-button is in its fully depressed position, and by such engagement to establish the extent of the fully open position of said valve member, said passage means being normally open at both ends to the atmosphere.

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| 2,540,203 | 2/51  | Hatcher .....      | 285—115       |
| 2,692,616 | 10/54 | Glassenhart .....  | 137—637 XR    |
| 2,837,749 | 6/58  | Gross .....        | 285—137 XR    |
| 2,899,170 | 8/59  | Cornelius .....    | 137—600 XR    |
| 2,921,605 | 1/60  | Booth et al. ....  | 137—637 XR    |
| 3,055,350 | 9/62  | Buchi .....        | 137—596.2 XR  |

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