

[54] VALVE SYSTEM

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251/9, 251/138

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[58] **Field of Search** 137/607, 627, 630.2;
251/4, 7, 9; 222/145

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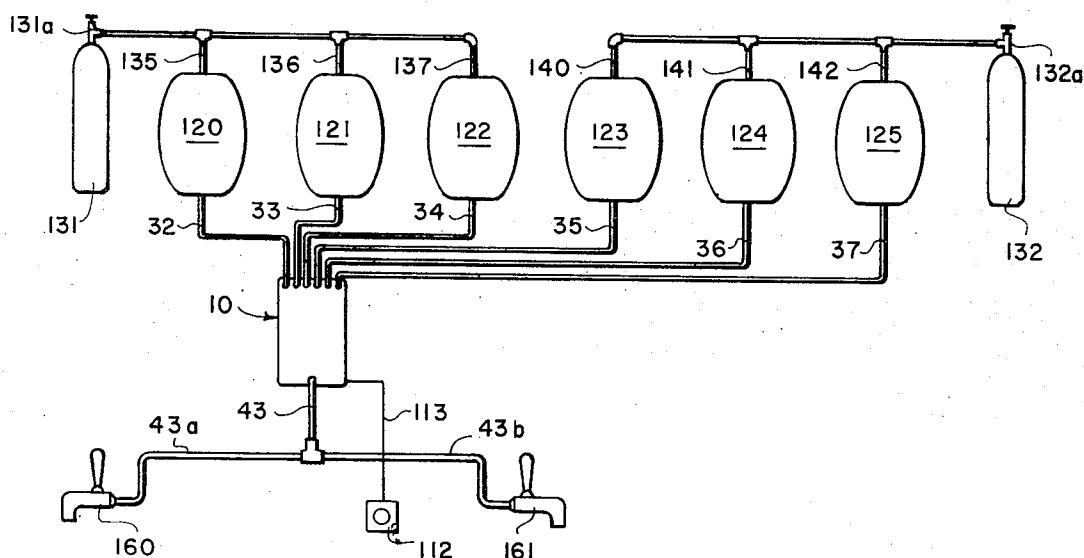
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[57] **ABSTRACT**

A valve system for selectively connecting a single dispensing tap or outlet with a selected one of a plurality of fluid supply sources. The valve system has plastic tube sections equal in number to the number of fluid sources and aligned in generally parallel relationship and connected with a manifold having a single outlet. A pivotally supported valve finger is secured over each plastic tube section and movable between positions at which the tube is open and squeezed closed. The valve fingers are actuated by a rotatable cylindrical cam having cam surfaces which hold all but one of the valve fingers at closed positions at any selected position of rotation of the cam. The cam is rotatable manually or by a remotely controlled solenoid. The valve system is useful, for example, with a plurality of beer kegs for individually communicating each of the kegs one at a time, as desired, with a single outlet tap from the system.

8 Claims, 7 Drawing Figures



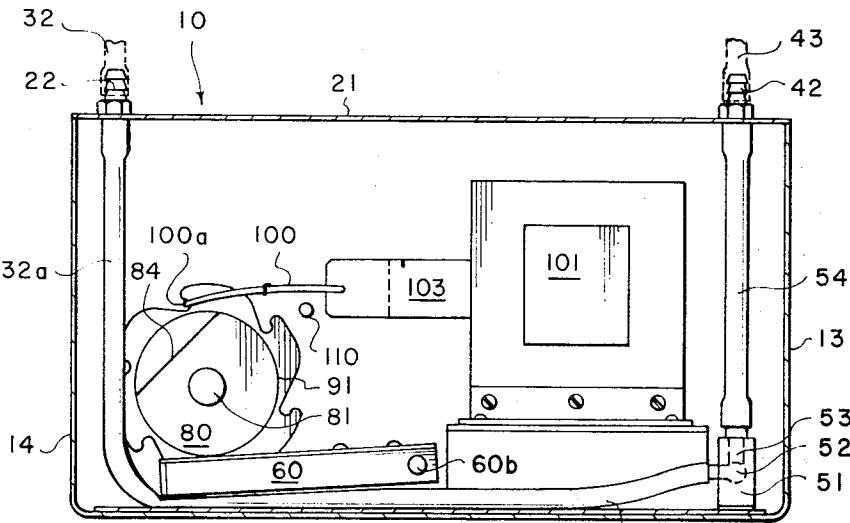


FIG. 4

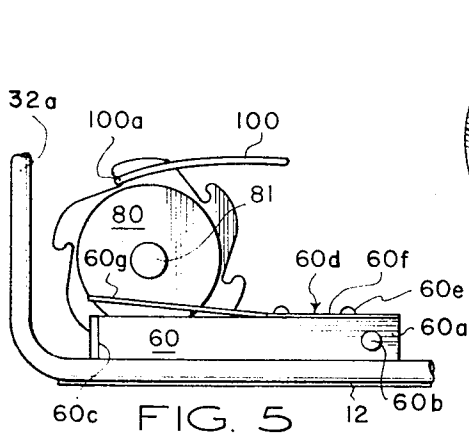


FIG. 5

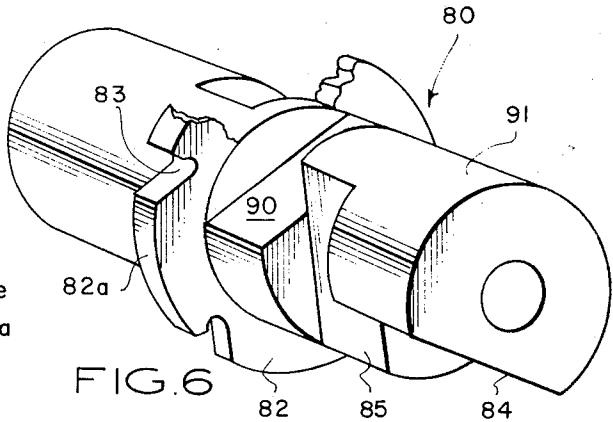


FIG. 6

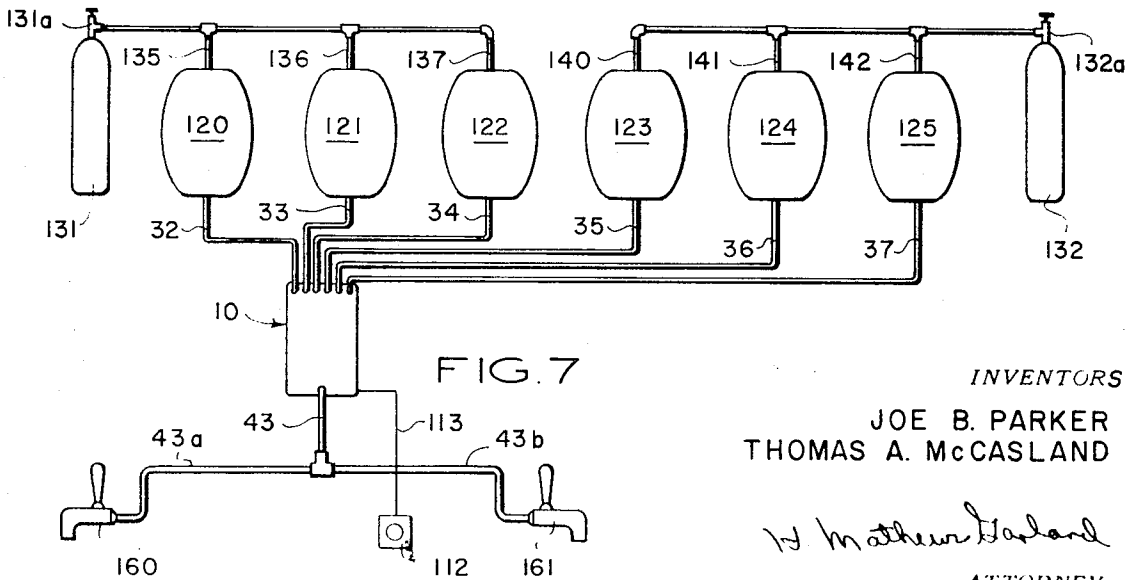


FIG. 7

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VALVE SYSTEM

This invention relates to valves and more particularly relates to a valve system for connecting a single outlet or tap with a selected one of a plurality of fluid sources.

In the dispensing of beer, soft drinks, and other similar liquid products, the liquid is often stored in a number of different vessels from which it is preferred that the liquid flow to a lesser number and frequently a single outlet or tap. For example, in the dispensing of beer, especially what is generally referred to as "draft" or "on-tap" beer, the beer is stored in kegs which are kept in a cold room remote from the bar or such other location at which the beer is actually dispensed in mugs or glasses. Generally, a pressurized drum of carbon dioxide is connected with the beer keg to provide carbonation and pressure for flowing the beer to the outlet tap. In present practices with available valve and manifold equipment, several beer kegs are connected in series with a carbon dioxide cylinder connected with a first of the kegs in the series and a dispensing tap connected with the last of the kegs. In this arrangement, the gas and beer must flow along all of the kegs in the assembly to reach the dispensing tap. If one of the kegs proves to be bad, one or more of the other kegs of good beer may be contaminated by mixing with the bad keg. So far as is presently known, no valve system is available which permits individual kegs in a group to be separately connected with a dispensing tap and selectively selected, as desired, so that beer flows from each individual keg one at a time directly to the tap. Additionally, the beer kegs which are kept in a remotely located cold room cannot be readily handled for changing the connections with the dispensing tap without a great deal of labor involving going from the dispensing area to the cold room. Accordingly, it is a particularly important object of the invention to provide a new and improved valve system which permits a plurality of fluid sources such as beer kegs to be located in a remote location and to be individually connected, as desired, with a single outlet or dispensing tap controlling the system from the area of the tap.

In accordance with the invention, there is provided a valve system which includes a plurality of flexible tube sections connected at first ends with a single manifold provided with an outlet conduit and connectible at opposite ends with individual sources of fluid supply, such as separate kegs. A valve finger is associated with each of the tubes for pinching it closed responsive to a cam surface on a gang-type cylindrical cam supported above the valve fingers. The cam is operable manually or by a solenoid actuated lever which engages an indexing wheel formed with the cam for rotating the cam for selecting the particular keg for connection to the dispensing tap. The cam surfaces are aligned to hold all but one of the tubes closed at any one position of rotation of the cam.

The objects and advantages of the invention will be apparent from reading the following detailed description of a valve system constructed in accordance with the invention taken in conjunction with the accompanying drawings wherein:

FIG. 1 is a perspective view of a valve system embodying the invention adapted to couple six sources of fluid supply to a single outlet;

FIG. 2 is a top plan view of the valve system of FIG. 1 with the top cover plate of the valve system housing removed;

FIG. 3 is an end view in elevation along the line 3—3 of FIG. 2;

FIG. 4 is a side view in elevation as seen along the line 4—4 of FIG. 2;

FIG. 5 is a fragmentary side view in elevation and section showing the cam at a position releasing one of the valve fingers to move to an open position for permitting flow through the tube section associated with the finger;

FIG. 6 is a perspective view of the cam of the valve system used for actuating the valve fingers; and

FIG. 7 is a schematic flow diagram showing a beer keg system connected with a valve system embodying the invention for selectively coupling the kegs with the pair of dispensing taps.

Referring to the drawings, a valve system 10 constructed in accordance with the invention has a housing 11 comprising a bottom 12, end panels 13 and 14, side panels 15 and 20, and a top 21. A plurality of inlet nipples 22, 23, 24, 25, 30, and 31 are connected through the top 21 for coupling with an equal number of conduit tubes 32, 33, 34, 35, 36, and 37 for connection with six separate fluid supply sources, such as beer kegs. A single outlet nipple 42 is connected through the top 21 for coupling the system with a single conduit tube 43 leading to a dispensing tap, not shown. The valve system is electrically connectible to a suitable power source, not shown, by a cord 44 which couples into a socket 45 in the end panel 13. A knob 50 is supported through the side panel 15 for alternate manual operation of the valve system as explained hereinafter.

Within the housing 11 the nipples 22—25, 30, and 31 are connected, respectively, to separate flexible tube sections 32a, 33a, 34a, 35a, 36a, and 37a. Each of the nipples is a double-ended tapered coupler on which the flexible conduit tubes are readily secured in fluid-tight relationship. While the connections between the nipples and the flexible conduit tubes are made up and broken by hand, the seal is sufficiently tight to prevent leakage even under moderate pressures. The flexible tube sections 32a—37a within the valve system are disposed in parallel relation with each other, each following a gently bending curve of about 90 degrees at the end 14 of the housing and extending along the top face of the bottom 12 a major portion of the length of the housing. The tubing conduit sections connect into a transverse manifold 51 located at the corner between the bottom 12 and the end 13 of the housing. The manifold has an internal longitudinal flow passage 52 extending substantially the length of the manifold across the full width of the tubing conduit sections, as best seen in FIG. 3. The flow passage 52 communicates with an upwardly opening outlet passage 53 which opens into a central, upwardly extending tubing conduit section 54 connected at its upper end with the lower end portion of the outlet nipple 42 so that flow from any one of the parallel tubing sections 32a—37a in the housing into the manifold 51 is directed to the outlet flow passage 53 and through the tubing conduit section 54 to the outlet nipple 42.

A plurality of valve fingers 60, 61, 62, 63, 64, and 65 are pivotally supported in parallel spaced relationship from a shaft 70 aligned longitudinally with the tubing conduit sections 32a—37a. Each of the valve fingers is supported over a separate tubing section for controlling flow through that particular tubing section. The shaft 70 runs transverse of the housing between side frame

members 71 and 72. All of the valve finger assemblies are identical in structure and, thus, only the single end valve finger 60 associated with the tubing section 32a shall be described in detail.

Referring to FIG. 5, the valve finger 60 comprises an elongated rectangular-shaped member 60a having a transverse bore 60b through which the shaft 70 extends for pivotally supporting the finger above the tubing section. The finger has a lower rounded end lip portion 60c which tightly engages the top surface of the tubing section when the tubing is pinched closed, as shown in FIG. 4. The rounded lip portion aids in more tightly squeezing the tubing together to insure complete closure of the tubing to prevent flow through it without cutting the tubing. A flat leaf spring 60d is secured along the top face of the finger by a pair of spaced brads or bolts 60e. The spring has a straight portion 60f resting on the finger surface and an upwardly bent free portion 60g which facilitates finger action and minimizes wear on the finger. The finger and spring are preferably made of a material such as stainless steel which will provide long wear, is readily cleaned, would remain sanitary and be non-corrosive. The valve finger 60 is movable between an upper released open position, as shown in FIG. 5, at which fluid may flow through the tubing conduit section 32a, and a depressed or lower closed position, as shown in FIG. 4, at which the finger squeezes the conduit section 32a closed along the lower tip portion 60c of the finger.

The valve fingers 60-65 are selectively and individually operated by a cylindrical cam 80 rotatably supported across the free end portions of the fingers on a shaft 81 to which is also connected the hand control knob 50 for hand rotation and indexing of the cam. The cam is basically a cylindrical member having a central, radially-protruding, circumferential flange or drive wheel portion 82 provided with a plurality of circumferentially spaced notches 83 for rotating the cam and properly indexing it to the correct positions of rotation. A plurality of flat cam faces are formed on the cam for operation of the valve fingers. The cam faces are longitudinally spaced along the length of the cam, three on each of the opposite sides of the drive flange 82 and each positioned to revolve in alignment with one of the valve fingers. Specifically, the flat cam surface 84 coacts with the end valve finger 60 while the next cam surface 85 functions with the next valve finger 61, and the cam surface 90 with the valve finger 62. Similarly, the other end of the cam is provided with three flat cam faces for operation with the valve fingers 63, 64, and 65. The face of each of the flat cam surfaces extends in a plane parallel with the longitudinal axis of the cam and along a line of a chord of a circle defined by a plane intersecting the cam body perpendicular to its longitudinal axis. The cylindrical surface 91 functions with the flat faces to provide the complete action of the cam. The shaft supporting the valve fingers and the shaft 81 supporting the cam are parallel, and, thus, the flat cam face for each of the valve fingers is rotatable by the cam to a position at which the cam face is parallel with the face of the spring portion 60g, as in FIG. 5. The six flat cam faces are positioned at 60-degree spacing around the cam face so that each 60 degrees of rotation of the cam aligns one of the cam faces with one of the valve fingers. Only one flat cam face may be aligned with one of the six valve fingers at a single position of rotation of the cam. Actually, the complete cam function is per-

formed relative to each valve finger by the cylindrical side face 91 of the cam and the particular flat cam face aligned with the finger. The shaft 81 supporting the cam is critically positioned with very close tolerances across the valve fingers above the top surface of the housing bottom 12 so that when the cam forces a valve finger downwardly to the closed position, the finger fully pinches off the tubing section beneath the finger without cutting or otherwise damaging the tubing; and when the cam is rotated to release the finger to the open position for allowing flow through the tubing conduit, the finger is supported on the tubing at its uppermost position for allowing full flow through the tubing. The general relationship of the cam and the fingers is such that when the cylindrical cam surface 91 engages the finger, the finger is at its lower closed position; and when the flat cam face aligned with the finger is positioned as shown in FIG. 5, the finger is released or free to spring upwardly, allowing the tubing to expand to an elliptical shape for permitting fluid flow through the tubing.

In addition to being spaced 60 degrees apart around the cam and longitudinally spaced along the cam to align with the several valve fingers, the circumferentially positioning of the flat cam faces sequentially operates the valve fingers so that the fingers are at the open position beginning progressively from one end of the cam. For example, referring to FIG. 6, when the end cam flat face 84 is properly positioned relative to the valve finger 60, the finger 60 is permitted to move to the open position, and when the cam is rotated counter-clockwise 60 degrees, the next finger 61 is permitted to move to the open position. Continued rotation of the cam sequentially releases the fingers, one only at a time, until the last of the fingers 65 is allowed to open.

The cam 80 is driven and correctly indexed by a U-shaped lever 100 connected with and actuated by a suitable solenoid 101. The lever 100 has a pair of inwardly turned hooked end portions 102 which engage end portions of a solenoid plunger 103. A pair of biasing springs 104 are connected between the plunger and the lever 100 for biasing the lever downwardly toward the cam so that the bight portion 100a of the lever rides along the peripheral edge 82a of the cam drive flange 82 when the lever is moved between positions by the solenoid plunger and when engaged with the cam slots. Each of the springs 104 has a first bent end portion 104a latched to the plunger 103 and the other bent end portion 104b latched over the lever 100. The central portion of each of the biasing springs is wrapped around the adjacent inwardly turned lever portion 102 in a direction causing the spring end portion 104b to always to urged downwardly for biasing the lever 100 downwardly. A solenoid plunger return spring 105 is connected between a cross bar 110 extending between the side members 71 and 72 of the frame beneath the lever 100 between the solenoid and the cam. The other end of the return spring is connected with a cross bar 103a of the solenoid plunger. The coil of the solenoid is arranged to drive the solenoid plunger to the right, as viewed in FIG. 2, away from the cam and to release the plunger for return to the left toward the cam by the spring 105.

The solenoid is suitably electrically connected through an electrical overload switch 111 to an operating button 112 which completes the circuit to the solenoid to energize it for moving the solenoid plunger

through one cycle. The electric power is applied to the solenoid through a standard wiring circuit, not shown, coupled with the line 44 connected at the socket 45 into the valve assembly housing. The bight portion of the lever 100 is engageable with the drive slots 83 around the edge of the cam drive flange with the lever angle and the drive slot angle being so related that each cycle in which the lever is returned to the left toward the cam and bight of the lever latches into the next drive slot for engaging the cam drive flange and remains so engaged while the solenoid plunger moves the lever away from the cam driving the cam through approximately 60 degrees rotation for indexing the cam between an "on" position of one valve finger to the "on" position for the next finger.

A typical arrangement of the valve system 10 in a beer storage and supply system is illustrated in FIG. 7. Six beer kegs 120-125 are located in a cold room or locker, not shown, and connected with a pair of carbon dioxide-filled cylinders 131 and 132. The cylinder 131 has a control valve 131a to which the kegs 120-122 are connected by gas supply lines 135, 136, and 137, respectively, for individually supplying each of the kegs with carbon dioxide under pressure. Similarly, the kegs 123-125 are connected with a valve 132a on the cylinder 132 by pressure lines 140, 141, and 142, respectively, so that all six of the kegs are individually supplied with carbon dioxide under pressure. The valve system 10 of the invention also is located in the cold room connected by the tubing conduits 32-37 to the outlets of the kegs 120-125, respectively, so that all of the kegs are each individually connected by a separate flow line to a separate inlet nipple of the valve system 10. The outlet nipple 42 of the valve system 10 is coupled by the tubing conduit 43 to a pair of branch lines 43a and 43b connected with beer dispensing taps 160 and 161 located at a serving area such as a bar for dispensing beer from the storage area into glasses or mugs, as desired. The electric lead 113 extends from the valve system 10 in the cold room to the operating button 112 located at the bar adjacent to the dispensing taps 160 and 161 so that the bartender may operate the valve system 10 for changing between the beer kegs without moving away from the vicinity of the dispensing taps.

In operation, the valve system 10 functions to connect the dispensing taps 160 and 161 to any one of the beer kegs 120-125 and to shift to another of the kegs, as desired, by remote control of the valve system located in the cold room from the actuating button location at the bar. For purposes of illustration, it may be assumed that the kegs 120-125 are all filled, the carbon dioxide cylinders 131 and 132 are connected with the kegs, and the dispensing valves of the cylinders are open to supply all of the kegs with carbon dioxide under pressure. The outlets of the kegs are open so that the several tubing conduits 32-37 are filled with beer under pressure to the valve system 10 at which five of the tubing conduit sections through the valve system are closed and one is open. The dispensing taps 160 and 161 are closed with beer under pressure being supplied through the lines 43a and 43b from the open tubing section in the valve system to the taps.

Presuming the beginning of the complete operating cycle of the valve system, first, the cam 80 is positioned rotationally so that the first valve finger 60 is released or open to permit the tubing section 32a to be open for flow to the dispensing taps. At this position of the first

valve finger, as illustrated in FIG. 5, beer under pressure from the keg 120 is present in the line 32 through the inlet nipple 22 of the valve system, in the tubing section 32a in the housing 11 and in the flow passage 52 of the manifold 51. The beer passes through the outlet 53 of the manifold in the short tubing conduit section 54 to the outlet nipple 42 of the valve system 10 from which the beer flows through the tubing conduit 43 to the branch sections 43a and 43b to the dispensing nozzles 160 and 161, respectively. In initially hooking up the valve system with the beer kegs and aligning the system for flow from the first of the kegs, the hand knob 50 may be rotated until the pointer on the knob is aligned with the numeral 1 on the side panel 15 of the valve system housing. At this cam position the first of the flat cam faces 84 is disposed at an angle, as shown in FIG. 5, to the top surface of the valve finger 60 at which the flat cam face is spaced angularly from the valve finger top face and the valve finger spring portion 60g is sprung upwardly to its normal angular position with the top surface of the valve finger substantially engaging the flat cam face 84. At this first operating position of the cam and the flat cam face 84, the valve finger 60 is released for movement upwardly to the position of FIG. 5. The resilience of the tubing section 32a aided by the force of the beer under pressure within the tubing holds the tubing open and the valve finger 70. The tolerances and the positioning of the components supporting the valve finger relative to the base 12 of the valve system permit this free movement of the valve finger with the cam positioned, as shown in FIG. 5, to permit maximum flow through the tubing conduit section 32a. The cross section of the tubing conduit section, particularly along the lip portion 60c of the valve finger is approximately elliptical. The valve system parts remain in the relative positions of FIG. 5 so long as beer flow is desired from the first keg 120 to the dispensing taps.

At such time as the keg 120 empties or for some other reason a change of keg is desired, the control button 112 is pressed by the bartender. The button energizes the electrical circuitry to the valve system supplying energy to the solenoid 101 causing the plunger arm 103 to be pulled by the coil of the solenoid toward the solenoid away from the cam 80. The springs 104 hold the cam drive lever 100 downwardly against the flange 82 of the cam with the bight 100a of the lever engaged in one of the drive slots 83 of the cam drive flange 82. As the solenoid plunger arm is pulled away from the cam, the lever 100 pulls on the cam drive flange rotating the cam clockwise, as viewed in FIG. 5, until the plunger arm reaches the end of its power stroke. When the arm 103 arrives at the end of the power stroke, the solenoid is de-energized releasing the arm for a return stroke, and the arm is pulled back to the left, as seen in FIGS. 2 and 5, toward the cam by the return spring 105. The biasing action of the springs 104 holds the drive lever 100 downwardly against the edge 82a of the cam drive flange so that the bight of the lever travels counterclockwise along the drive flange edge to the next notch 83 into which the bight of the lever snaps due to the spring action, preparatory to the next cycle of operation. The power stroke of the solenoid plunger rotated the cam approximately 60 degrees clockwise, as viewed in FIG. 5. As the cam is rotated, the flat cam face 84 was revolved out of operating alignment with the valve finger 60 with the spring portion 60g being compressed

downwardly tightly against the top face of the valve finger when the face 80 is revolved away from the valve finger and the spring is engaged by the cylindrical surface 91 of the cam around the cam from the flat face 84, which occurs when the relative positions of the cam and the valve finger align the face 84 approximately 90 degrees with the cam face. The spring end portion 60g cushions the flat cam face action relative to the valve finger so that there is some resilience in the movement of the valve finger downwardly as distinguished from a sudden, non-cushioned, snap action of the valve finger. Also, the spring receives wear which may occur between the cam and the valve finger. At the cam position at which the face 84 passes through the perpendicular position relative to the valve finger and the circular cam face is engaged with the spring portion 60g, the spring is held tightly against the top face of the valve finger and the valve finger is pivoted counter-clockwise downwardly, as seen in FIG. 5, to the closed position at which the lip 60c on the valve finger, which is aligned perpendicular to the longitudinal axis of the tubing portion 32a, pinches the tubing closed under the valve finger. The walls of the tubing conduit section are squeezed tightly together as the tubing is trapped between the bottom 12 and the lip of the valve finger fully shutting off flow through the tubing section so that beer may no longer flow from the keg 120 through the valve system to the dispensing taps. As previously discussed, the tolerances between the valve finger and the bottom 12, along with the nature of the tubing section, its wall thickness, and related characteristics, fully shuts off the tubing holding it closed against the normal pressures encountered during storage and flow of beer through the valve system, without damage to the tubing material.

As the cam is rotated for depressing the valve finger 60 downwardly from the open position of FIG. 5 to the closed position of FIG. 4, the next flat cam surface in the sequence of operation of the system moves into the open position alignment of FIG. 5 relative to its respective valve finger. Such sequence is, of course, determined by the relative positions of the several flat cam faces on the cam 80. For example, if the next keg 121 is to be the next keg to be communicated with the dispensing taps, the configuration of the cam 80 is such that the flat cam face 85 is 60 degrees around the cam from the face 84 in a counter-clockwise direction of positioning so that as the cam is rotated clockwise, the face 84 is brought into alignment with the next valve finger 61 which then is released to open the tubing section 33a for flow from the keg 121 through the system to the dispensing taps. The automatic indexing of the cam by the solenoid plunger and the cam drive lever 100 brings the cam face 85 into proper alignment for allowing the valve finger 60 to be released for opening of the tubing section beneath the valve finger. At such valve finger position, the beer from the keg 121 flows through the system including the manifold 51 to the line 43 and thence to the dispensing taps.

At all of the cam positions at which one of the cam flat faces is aligned to release one of the valve fingers for opening one of the tubing conduit sections, all of the remaining flat cam faces are mis-aligned from the respective valve fingers sufficiently that the cylindrical cam surface is engaged with the valve fingers holding them downwardly at the position of FIG. 4, shutting off flow through the tubing conduit sections associated

with the valve fingers. Thus, in the particular arrangement of the valve system illustrated herein, one of the beer kegs is communicated to the dispensing taps while the other five at all times are closed off. The system is sequentially indexed by simply actuating the button 112 at the bar location for remote control of the cam so that all six kegs may be sequentially coupled with the dispensing taps without the necessity of manually making any reconnections or adjustments in the cold room. Since all of the kegs are always coupled directly with the valve system and the lines all remain liquid filled except when a keg empties, there are a minimum of problems with air or gas pockets in the lines, particularly if the shift between kegs is made immediately upon determination that the particular keg being used is empty. While a void may occur between the valve system and the dispensing tap, if desired, a suitable standard fluid detector may be connected with the system to advise when a keg has been emptied prior to entry of a slug of gas into the line from the emptying keg.

The overload component 111 serves a safety function to cycle the system off momentarily in the event of some overload problem. Standard components are used for this purpose, and generally they are re-activated after a few seconds of remaining off the line.

The beer flows individually from the kegs through separate lines to the manifold 51 with the only possible mixing occurring in the small volume of the lines between the manifold 51 and the dispensing taps. Thus, if problems occur, such as a bag keg or the like, the other kegs are not contaminated and the lines may be quickly drained with a minimum of loss of fluid.

It will be seen that a new and improved valve system for fluid coupling of a plurality of fluid sources through individual separate lines to a single outlet has been described and illustrated. It will be particularly appreciated that the system permits selected connection with a desired fluid source and a given sequence of connection and change between such sources without intercommunication of the sources and thus possible contamination between the sources.

The system may be automatically or manually operated, if necessary. For example, if the power fails, the bartender may go to the cold room and manually index the system by way of the knob 50 to select the desired barrel to be communicated with the dispensing taps. Additionally, if desired, an automatic telemetering system may be installed between the valve system in the cold room and the dispensing tap location for providing an indication to the operator with respect to which of the fluid sources is connected through the valve system to the dispensing taps. The unit is readily constructed of material such as stainless steel to provide maximum sanitary conditions, while the lines are formed of long-wearing, flexible, synthetic plastic materials which withstand a substantial number of cycles of operation at the temperature variations incurred, both in the cold room and through the normal temperature areas, such as in the dispensing area and between such area and the cold room. It will be further appreciated that while the system has been described in the context of its employment in dispensing beer, it is equally applicable to any dispensing function where a plurality of liquid sources are desired to be connected to a single outlet for selective supply to the outlet from any one of the sources.

What is claimed and desired to be secured by Letters Patent is:

1. A valve system for selectively coupling a single fluid outlet with any one of a plurality of fluid inlets comprising: a fluid manifold coupled with said outlet; a plurality of deformable tubing sections connected from said inlets to said manifold whereby each of said inlets communicates through one of said tubing sections to said manifold for flow from each of said inlets through said manifold to said outlet; a plurality of valve members, each comprising a finger pivoted at one end and having an opposite end adapted to engage and pinch a single separate one of said deformable tubing sections together to shut said tubing sections off to flow therein, for selectively opening and closing each of said tubing sections individually for controlling flow through said tubing sections; a cam for actuating said valve members comprising a cylindrical member having flat cam surfaces longitudinally spaced along the length of said cam, each flat surface being aligned with a separate one of said valve members and being circumferentially spaced around said cam whereby when one of said flat cam surfaces is circumferentially positioned for releasing the valve member aligned with said cam surface to an open position the remainder of said flat cam surfaces are circumferentially mis-aligned relative to the remainder of said valve members whereby said valve members are held at closed positions by the cylindrical surface of said cam, said flat cam surfaces being arranged to release said valve members to open said tubing sections in a predetermined order; a drive flange formed on said cam having drive recesses therein for rotating said cam; a lever for releasably engaging said drive recesses for driving said cam and indexing said cam sequentially to desired positions of rotation for opening selected ones of said tubing sections; and means for moving said lower to drive and index said cam.

2. A valve system in accordance with claim 1 including a solenoid having a plunger coupled with said cam lever for driving said cam responsive to an electric impulse to said solenoid.

3. A valve system in accordance with claim 2 including a spring member on each of said valve members engageable by the surfaces of said cam aligned with said valve member for applying a valve member operating force from said cam to each said valve member.

4. A valve system for selectively and separately coupling one of a plurality of fluid inlets into said system with a single fluid outlet from said system comprising: means providing a single fluid outlet from said system; means providing a plurality of fluid inlets to said system; a plurality of deformable tubing conduits connected between said inlets and said outlet for separately flowing fluid from each of said inlets to said outlet, said conduits being disposed in side-by-side spaced

relationship; a plurality of valve members equal in number to the number of said conduits pivotally supported above said conduits, each of said valve members being aligned with one of said conduits and each comprising an elongated member pivotally secured at one end and free for movement at the other end thereof and engageable at said other end with the conduit aligned with said valve member for pinching said conduit together to preclude fluid flow therethrough; a valve member actuating cam supported across said valve members, said cam having a cylindrical cam surface extending the length of said cam and flat cam surfaces equal in number to the number of said valve members and aligned along the length of said cam disposing one flat cam surface in alignment with each of said valve members, said flat cam surfaces being circumferentially spaced around said cam to release one of said valve members at a time for movement to a position permitting the conduit aligned with said valve member to expand to an open flow relationship while the cylindrical cam surface along the remainder of said valve members holds said valve members at closed positions squeezing the conduits aligned with said valve members to a closed no-flow relationship; a peripheral drive flange having circumferentially spaced drive slots therein secured with said cam for rotating said cam and indexing said cam to selectively position said cam for permitting each of said valve members to be released for movement to an open position separately while the remainder of said valve members are held at closed positions; a drive lever engageable with said drive flange on said cam and receivable in each of said drive slots of said drive flange for rotating said cam to selectively open and close said valve members; and means for actuating said drive lever.

5. A valve system in accordance with claim 4 including a spring means on each of said valve members disposed between said cam and said valve member for minimizing wear on said valve member and cushioning the force between said cam and said valve member.

6. A valve system in accordance with claim 5 wherein each of said flat cam surfaces is spaced from the valve member aligned therewith when said cam is at a position for said valve member to move to open position permitting a portion of said spring to lift to a spaced relation above said valve member along said flat cam face.

7. A valve system in accordance with claim 6 wherein said means for actuating said cam lever comprises a solenoid.

8. A valve system in accordance with claim 7 including a hand knob coupled with said cam for manually rotating said cam to selected positions.

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