

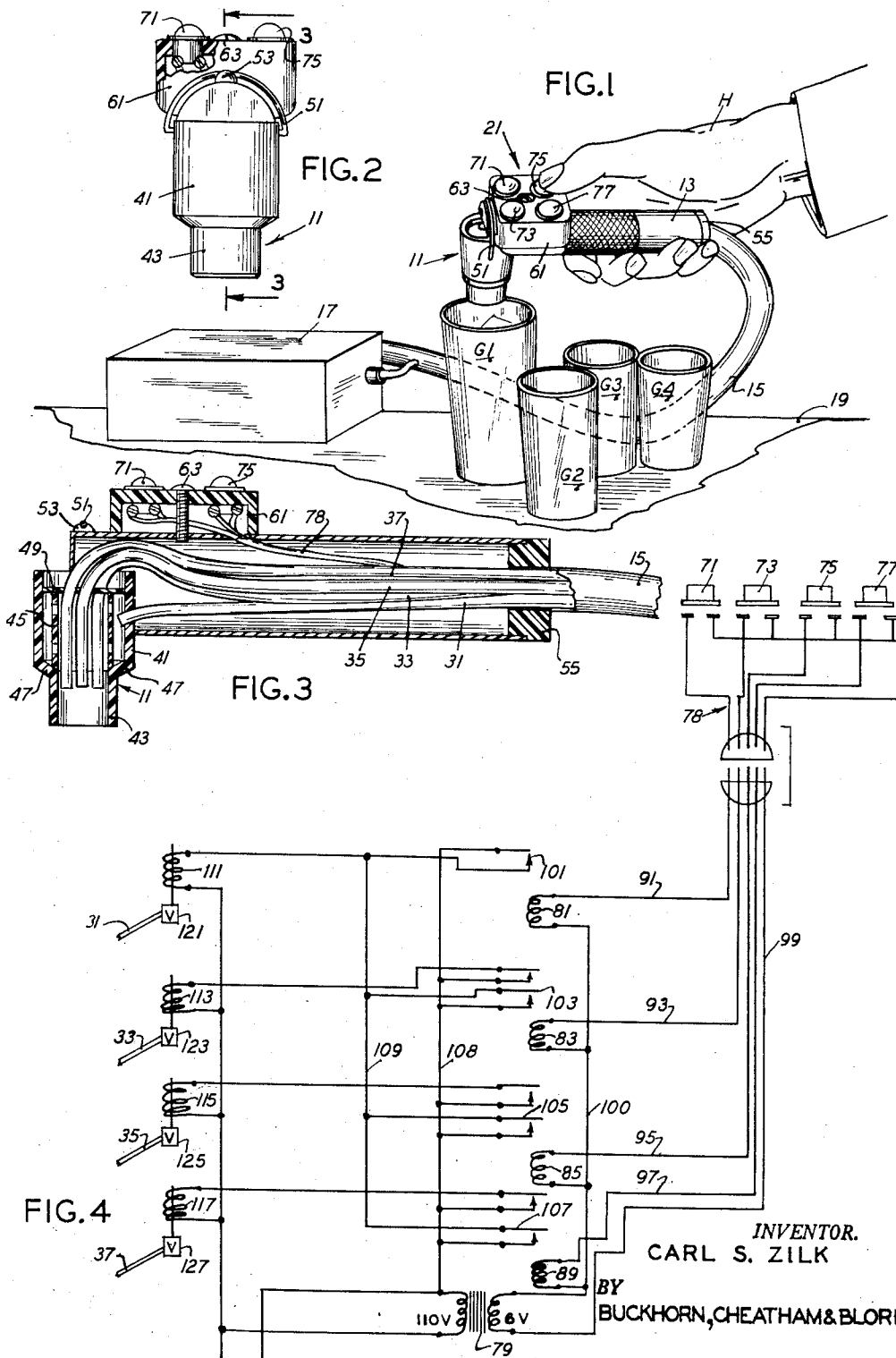
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DISPENSING APPARATUS

2,887,250

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2 Sheets-Sheet 1



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2 Sheets-Sheet 2

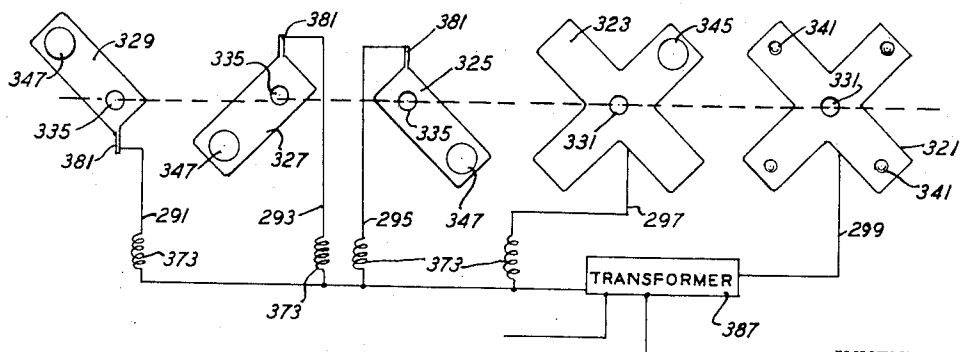
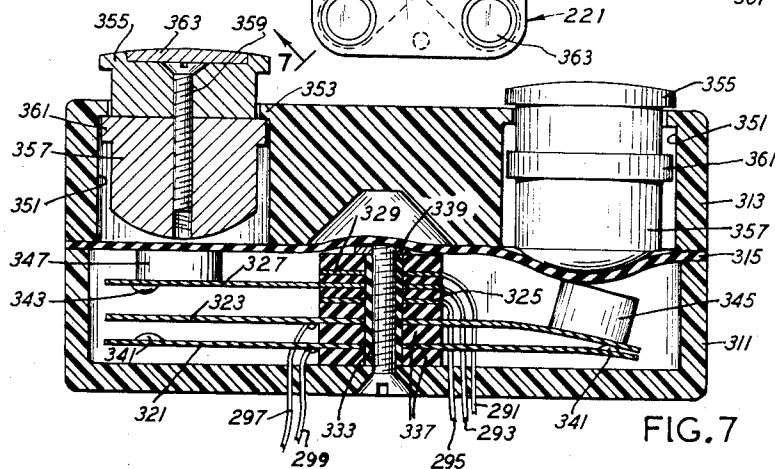
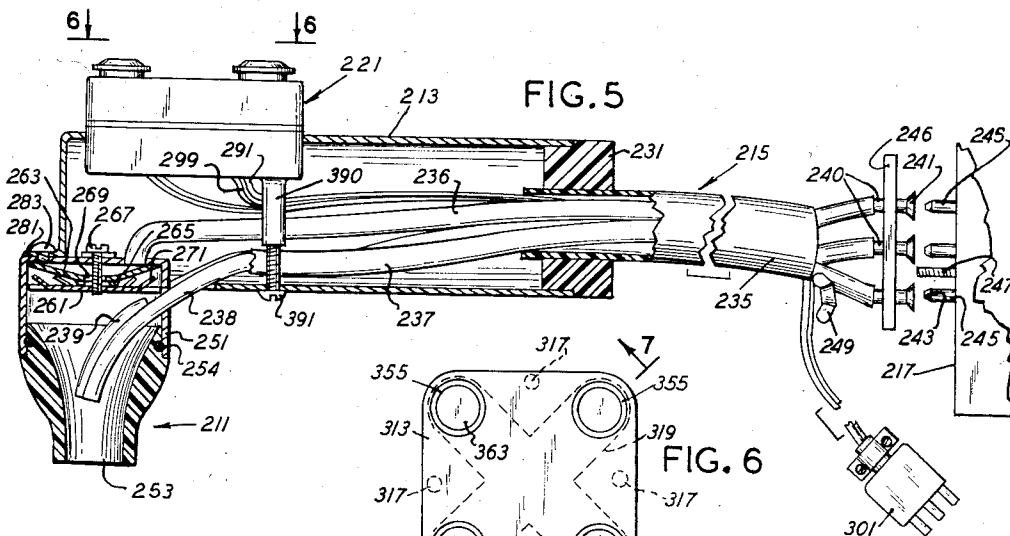


FIG. 8

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DISPENSING APPARATUS

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8 Claims. (Cl. 222—76)

This invention relates to dispensing apparatus, and more particularly to dispensing apparatus for a fountain or bar. This application is co-pending with and forms a continuation-in-part of my prior co-pending application entitled "Dispensing Apparatus," Serial No. 695,870, filed November 12, 1957, now abandoned.

With movable head dispensers, that is, dispensers in which the head is connected by flexible hose to the supply, it has in general been necessary to use one hand for supporting the head and the other hand for operating a valve or control means for a valve to supply fluid to the head. Frequently, it is desirable to leave the other hand of the operator free for such uses as manipulating glasses and for other purposes, and it is a main object of the invention to provide a dispensing apparatus of the movable head type in which the valves may be controlled by the hand of the operator which supports the head.

It is a more particular object of the invention to provide a movable head type dispenser in which there is a stationary and remotely located valve means for controlling the supply of fluid to the head through the hose to the head, and in which there is a control means carried by the head in a position to be engaged by the thumb or fingers of the hand supporting the head to enable the valves to be operated by such hand.

Various other objects and advantages of the invention will be apparent from the following description taken in connection with the accompanying drawing wherein:

Fig. 1 is a perspective view of a dispensing apparatus of the present invention showing the same in use;

Fig. 2 is a front view of the head unit on a scale slightly enlarged from that in Fig. 1, parts being broken away for convenience;

Fig. 3 is a longitudinal vertical section taken along line 3—3 of Fig. 2 through the head unit and more fully showing the details of construction;

Fig. 4 is a wiring diagram showing the manner in which the control unit is connected to the valve means;

Fig. 5 shows a modified form of the invention, with certain parts shown in section;

Fig. 6 is a plan view of the switch control unit;

Fig. 7 is a vertical section taken along line 7—7 of Fig. 6 on an enlarged scale; and

Fig. 8 is a diagrammatic view showing the relationship of certain parts of the switch unit and showing the wiring to these parts.

Referring to the accompanying drawing, the dispensing apparatus includes a head unit including a head 11 having a handle 13 by which the head may be supported, there being a flexible hose unit 15 for supplying fluids through the handle to the head from a valve assembly 17 shown mounted on a counter 19. Normally, the valve assembly is concealed beneath the counter, but is shown on the counter for convenience in illustration.

A control unit 21 is mounted on the left-hand end of the handle 13 in position to be operated by the thumb of the hand H of the operator in which the handle 13 is grasped. On the counter 19 are four glasses G1, G2, G3

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and G4 which are to be supplied with different fluids. In the particular form of the invention disclosed, the dispensing apparatus is adapted to dispense three syrups and carbonated water, although it is to be appreciated that this is merely illustrative. For convenience, the term "soda" will be used hereinafter instead of carbonated water.

The flexible hose 15 comprises a sheath enclosing four flexible tubes 31, 33, 35 and 37, as best shown in Fig. 3, which tubes supply three syrups and soda to the head 11.

The head 11 includes a tubular body including an upper portion 41 and a smaller lower portion 43. A perforated tubular member 45 is secured in place within the head and at its lower end engages a shoulder 47 between the upper and lower portions of the head. The member 45 has a top disk 49 through which the tubes 33, 35 and 37 extend in sealed relation. The flexible tubes 33, 35 and 37 are adapted to be supplied with syrups under relatively low pressure, for instance, 20 or 30 pounds, from compression vessels of conventional form (not shown). A set of valves, to be referred to presently, controls the supply of fluids from the compression vessels to the flexible conduits 33, 35 and 37.

The soda conduit 31 enters through a side wall of the upper portion 41 of the head 11 to supply fluid to the annular space between the perforated tubular member 45 and the interior of the upper portion 41 of the head. The soda is initially under much greater pressure, but the valve which controls the flow of soda from the soda vessel to the flexible conduit 31 reduces the pressure. The soda entering the annular space is thoroughly broken up by passage through the perforations of the member 45 and is thus rendered in a suitable foaming state.

As will be presently explained, soda alone can be dispensed, or soda along with any one of the syrups, in which latter case the soda will entrain the syrup and carry it in intermixed relation into the appropriate glass or other container.

The tubular handle 13 has a cut-out portion at its lower left-hand end, as shown in Fig. 3, within which the head 41 is accommodated. The head is supported by having a bail 51 fitting on a retaining element 53 provided on the left-hand end of the handle. The right-hand end of the handle has a grommet 55 through which the hose 15 extends.

The control unit 21 includes a hollow block 61 provided with recesses in the opposite end walls thereof so that it conveniently fits to the contour of the handle 13, as clearly shown in Fig. 2. A screw 63, which passes through the top wall of the block, threads into the handle to retain the block in place.

In the particular form of the invention shown, the block is equipped with four push-button switches 71, 73, 75 and 77, of conventional construction, which are connected by suitable leads generally entitled 78 to the valve assembly 17. The leads 78 are flexible and are contained within the sheath of the hose 15, and thus permit the control unit 21 to be moved in unison with the head 11 without interference by the leads.

It will be appreciated that the head, together with the control box and the handle 13, will not infrequently be immersed in water, such as when washing the head or when the head unit is accidentally dropped in the sink conventionally provided behind the bar, and thus it is desired that the operator not be placed in danger nor subjected to annoying shocks because of such wetting or immersion. Therefore, a six-volt control arrangement is provided by a voltage step-down transformer 79, as shown in Fig. 4, which supplies six-volt current to the push-button circuit and to a plurality of relay coils 81, 83, 85 and 87 connected by leads 91, 93, 95 and 97 to the associated push buttons 71, 73, 75 and 77, respec-

tively. A common line 99 connects one side of each push-button switch to one side of the secondary of the transformer 79, and a common line 100 connects the coils to the other side of such secondary.

Controlled by the relay coil 81 is a single-throw, single-pole switch 101, and controlled by the coils 83, 85 and 87 are double-pole, single-throw switch units 103, 105 and 107, respectively. The bottom contact, as the parts are shown in the drawing, of each of the switches 103, 105 and 107 and the upper contact of the switch unit 101 are connected by a common line 108 to one side of the primary of the transformer 79. The next higher contact of each of the switch units 103, 105 and 107 is connected by a common line 109 to the lower contact of the switch 101.

The switch 101 and the upper switches of the switch units 103, 105 and 107 are connected to and control the supply of current to four 110-volt solenoid coils 111, 113, 115 and 117 which control the operation of four valves 121, 123, 125 and 127. The valves control the flow of fluids from pressure vessels to the flexible conduits 31, 33, 35 and 37.

It is apparent that, if the push button 71 is depressed, the circuit through relay coil 81 will be completed to close the switch 101 to energize the solenoid coil 111 to operate the valve 121 to supply, in this case, soda to the head 11 through the conduit 31. If the push button 73 is depressed, the relay coil 83 will be energized to close both of the switches of the switch unit 103, the lower switch serving to energize the solenoid coil 111 and the upper switch serving to energize the solenoid coil 113 to open both the valves 121 and 123. It may be assumed that the valve 123 controls the flow of syrup through a flexible conduit 33 to the head. Under such circumstances, a supply of syrup will be ejected from the end of the conduit 33, and the soda injected into the head through the conduit 31 will serve to entrain the syrup and intermix with the syrup and inject it into the appropriate container.

It is further pointed out that pressing the push button 75 will serve to supply another syrup and soda to the head, and pressing the push button 77 will serve to supply still another syrup and soda to the head.

It is apparent that, by using a low voltage six-volt circuit arrangement to the head itself, there is no danger of the operator receiving dangerous shocks because of the head becoming wet as it would naturally become during use.

Of course, the disclosure of a system based on dispensing four fluids is only illustrative, and the invention has equal applicability to such a system for dispensing any number of fluids.

Referring to Fig. 5, the modified form of the invention in general includes a head unit having a head 211 secured to a tubular handle 213 which is of a size to be gripped in the hand of the user. There is a flexible hose unit 215 for supplying fluid through the handle 213 to the head 211. The supply of fluid is controlled by a valve assembly mounted in the casing 217. A valve control switch unit 221 is mounted on the left-hand end portion of the handle 213 in position to be operated by the thumb and/or fingers of the hand holding the handle to leave the other hand free for other uses.

More specifically, the handle 213 is of cylindrical form having a grommet 231 of rubber or other elastomer material fitted in the right-hand end of the handle. The grommet has a hole through which the hose unit 215 extends.

The hose unit includes a flexible tubular sheath 235 through which extends a plurality of flexible tubes 236, 237, 238 and 239 for carrying fluids from the housing 217 to the head 211. Specifically, the tube 236 is to carry carbonated water, and the remaining tubes are to carry syrup.

At their right-hand end, each tube snugly receives a

tubular fitting 240 having a flared internally conical end 241 to fit in complementary fashion on the external conical end 243 of a tubular outlet member 245 projecting from the housing 217. A clamping plate 246 slidably receives the fittings 240 and fits on a pair of studs 247, one of which is shown. Wing nuts 249, one of which is shown, thread on the studs to clamp the flared ends 241 against the outlet members 245.

At their left-hand ends, the tubes project through suitable openings formed in a cup-shaped casing 251 of the head 211. The soda tube 236 projects through an opening formed in the top of the casing whereas the remaining tubes project through openings formed in the side walls of the casing and depend downwardly into the central portion of a nozzle piece 253. The nozzle piece and the casing have a telescopic fit at the adjacent portions thereof and are grooved to accommodate an elastomer O-ring 254 which acts as a connector and also as a fluid seal.

Arranged within the upper end of the casing 51 are a pair of disks 261 and 263. The upper disk 263 has a plurality of circumferentially spaced depending projections 265 engaging the upper face of the disk 261. The disks are held in contact with one another and the upper disk is held against the top of the casing 251 by a screw 267 which passes through a clearance opening 269 in the upper disk and threads into the lower disk.

The upper disk 263 is of generally conical shape and the lower disk has portions 271 struck upwardly to provide openings for the passage of fluid from the space between the disk to the space below the lower disk. Soda entering the upper end of the casing passes through the opening 269 and outwardly between the projections 265 and then downwardly through the openings in the periphery of the lower disk 261. This soda shoots downwardly around the ends of the syrup tubes and entrains the syrup leaving the syrup tubes to intermix the syrup and soda. The disks perform a pressure-reducing function embodying the concepts of my invention disclosed in my United States Patent 2,820,675.

A tubular handle 213 is cut out at the lower left-hand corner to accommodate the upper end of the head 211 and also to accommodate the syrup tubes 237, 238 and 239. The tubular handle has a flange 281 to which the casing 251 of the head 211 is clamped by a screw 283.

Five flexible wires, best shown in Fig. 8 and numbered 291, 293, 295, 297 and 299, pass through the sheath 235 of the flexible hose unit. The right-hand ends of the wires are connected to a male plug 301, and the left-hand ends of the wires extend into the switch control unit 221.

The control unit comprises two main sections, a lower section 311 and an upper section 313 separated by an elastomer diaphragm 315. Screws 317, which are best shown in Fig. 6, clamp the sections in tight engagement with the diaphragm 315.

The lower section is formed with a cross-shaped recess 319, which is best shown in Fig. 6. Arranged within this recess are a lower cross-shaped switch element 321, an upper cross-shaped switch element 323, a lower straight switch element 325, an intermediate switch element 327 and an upper switch element 329. The switch elements are formed of a suitable metallic material, such as, Phosphor bronze or copper coated stainless steel. The switch elements are arranged within the recess 319 in the general relationship shown in Fig. 8. That is, the straight switch elements are arranged in different arms of the recess.

The cross-shaped switch elements are centrally apertured at 331 to receive a tubular insulating member 333 which also extends through openings 335 formed in the straight switch elements 325, 327 and 329. Suitable ring-type insulating wafers 337 fit on the tubular insulating member 333 in interleaved relation with respect to the

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switch elements to insulate each from the other. That is, to insulate the central portions of each from the other. A nut 339 threads on the upper end of the screw to hold the assembly of switch elements and insulating pieces together.

The lower cross-shaped switch element has upwardly projecting dimples 341 at the outer ends of the legs thereof whereas each of the straight switch elements has a depending dimple 343 in its outer end as best shown in Fig. 7. The dimples provide better contact between the ends of the switch elements, which ends may be brought into engagement by flexing the switch elements in desired directions.

One leg of the upper cross-shaped switch element 323 is provided at its outer end with a button 345 and each of the straight switch elements is provided at its outer end with a button 347. The button 345 is provided on that leg of the upper cross-shaped switch element 323 occupying the leg of the recess 319 not receiving a straight switch element. The button 345 is thicker than the buttons 347 so that the upper faces of the buttons are substantially at the same level, and as a matter of fact are disposed in contiguous relationship with the diaphragm 315.

The upper section of the control unit is formed with four bores 351 coinciding with the outer ends of the legs of the recess 319, each bore being provided with an inwardly extending retaining flange 353 at the upper end thereof. Movable in each bore is a button including a top piece 355 and a bottom piece 357 secured together by a screw 359. The bottom piece 357 of each button has an outwardly projecting flange 361 at its upper end to engage the associated flange 353 on the section 313 to limit upward movement of the button. A colored disk 363 may be secured over the head of the screw, different colored buttons indicating the various fluids.

The lower ends of the buttons rest on the diaphragm 315 so that when a button is pressed downwardly, the switch elements thereunder are brought into engagement to selectively operate the solenoid-operated valves in the casing 217. Solenoid coils 373 are shown in Fig. 8 for the various wires. The wire 299 is a ground line and thus the cross-shaped switch element 321 is the ground switch element. The cross-shaped switch element 323 is the soda switch element and the remaining switch elements are for the various syrups.

The lower section 311 of the switch control unit is provided with suitable holes to receive the wires 291, 293, 295, 297 and 299, and each wire is connected to the proper switch element as indicated in Fig. 8, the straight switch elements being provided at their inner ends with projecting lugs 381 to which the wires may be soldered or otherwise connected. There is sufficient length of wire for the cross-shaped switch elements to enable the legs of the elements to readily flex without interference by the wires. That is, there is sufficient length within the section 311. This may be accomplished by leading a wire from its hole in a circumferential direction around to a connection to its cross member.

A transformer 387 is provided for receiving 110 volt electrical energy and supplying a six-volt output, so that even if the switch elements get wet there is no danger. However, it is pointed out that the elastomer diaphragm 315 seals the recess 319 from the entrance of water from above, and a suitable sealing compound is used in the holes in the section 311 and around the screw passing through the bottom wall of the section 311 to prevent fluid from entering the section 311 from below. Nevertheless, if fluid does accidentally enter the section there is no danger of electrical shock to the user.

The operation of the unit is believed obvious from the foregoing description. If soda alone is desired, the right-hand button as the parts are shown in Fig. 7 is depressed to bring one leg of the cross-shaped switch element 323 into engagement with the corresponding leg of the

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cross-shaped switch element 321 to operate the solenoid-actuated valve for the supply of soda. If the left-hand button in Fig. 7 is depressed, it is seen that the intermediate switch element 327 is flexed downwardly to engage the leg of the switch element 323 therebeneath and this element is bent downwardly to engage the leg of the switch element 321 therebeneath. This means that a proper connection is made for the supply of electrical energy to the coils associated with the switch element 327 and 323 to supply a syrup and also carbonated water to the head 211. If two syrups and a soda are desired, two of the syrup buttons may be depressed at the same time. It is pointed out that carbonated water is automatically furnished by depressing any of the switch buttons, and in the case of the syrup buttons, syrup and carbonated water are supplied. It is further pointed out that the syrup cannot be supplied before the carbonated water is supplied since the switch elements for the group and the carbonated water would simultaneously make contact with the switch element 321 connected to the ground line 299 so that no power circuit is completed through any of the valve actuating solenoids until contact is made between the switch element 323 and the lower switch element 321. Thus there is no danger of syrup being supplied before the soda is supplied and thus no danger of supplying syrup which is not intermixed with soda.

Referring to Fig. 5, it is apparent that the tubular handle 213 is cut away at the left-hand portion thereof to accommodate the switch control unit 221. The lower section 311 of the switch unit is formed with a downwardly projecting portion 390 which is internally threaded to receive a screw 391 passing through a suitable opening formed in the handle. By this simple arrangement, the switch control unit is mounted on the handle.

Having illustrated and described a preferred embodiment of the invention, it should be apparent to those skilled in the art that the invention permits of modification in arrangement and detail. I claim as my invention all such modifications as come within the true spirit and scope of the appended claims.

I claim:

1. A dispensing apparatus comprising a dispensing head having a nozzle, a handle for said head, a remotely located valve means to selectively regulate the supply of a plurality of fluids to said head, a plurality of flexible conduits extending from said valve means to said head and communicating with said nozzle to deliver said plurality of fluids to said nozzle, electric power means for said valve means for operating said valve means to selectively supply said fluids to said head, switch means carried by said handle to control the supply of electrical energy to said power means, flexible electrical conductors extending from said power means to said switch means to enable said control, means holding said conduits and flexible conductors together in contiguous relationship to provide a single flexible member enabling said head to be moved freely relative to said valve means, said handle having a shape fitting in one hand of the operator with the nozzle located adjacent such hand, said switch means including a plurality of independently operable push buttons, each push button being operable when actuated to control operation of the valve means to cause a supply of at least one selected fluid to said nozzle through said conduits, said push buttons being grouped on said handle to provide for operation of any push button by the thumb or a finger of said one hand of the operator without changing the grip of such one hand on the handle thus freeing the other hand of the operator for other uses while permitting the selective discharge of a plurality of fluids from said nozzle.

2. An apparatus as set forth in claim 1 in which said handle is of tubular form with said nozzle and switch means disposed at one end and said single flexible member entering the opposite end.

3. An apparatus as set forth in claim 2 in which said nozzle is directed to project laterally away from one side of said handle, and in which the buttons of said switch means are exposed on the opposite side of said handle.

4. An apparatus as set forth in claim 3 in which said nozzle and said switch means are detachably secured to said handle.

5. An apparatus as set forth in claim 1 in which said switch means is in the form of a separable unit detachably secured to said handle. 10

6. An apparatus as set forth in claim 1 in which said switch means includes a separate switch for each push button.

7. An apparatus as set forth in claim 6 in which at least certain of said switches are connected to said elec-

tric power means for said valve means to cause the delivery of at least two fluids upon the closing of any one of the last mentioned switches.

8. An apparatus as set forth in claim 6 in which at least certain of said switches have at least certain elements thereof electrically connected together at the location of said switch means to lessen the number of conductors required for said switch means.

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