March 21, 1967 A. L. ZINMAN ETAL 3,310,204

FLUID DISPENSING MEANS

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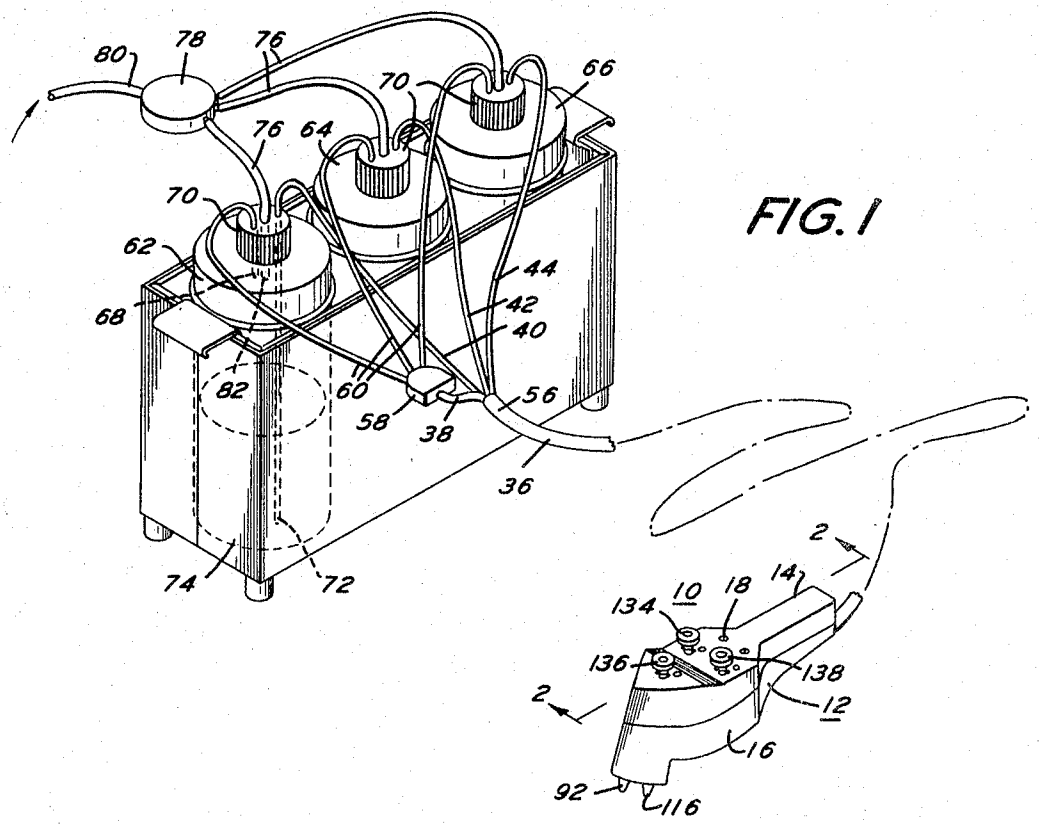
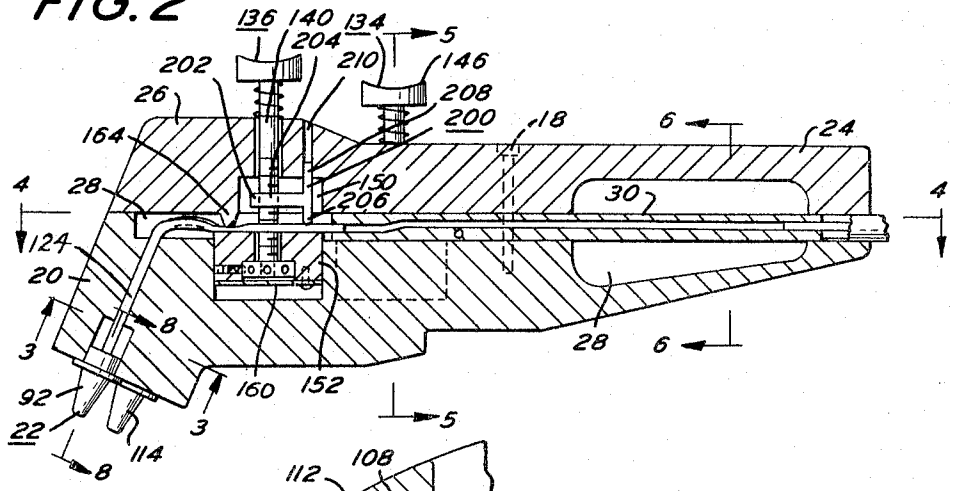


FIG. 1

FIG. 2



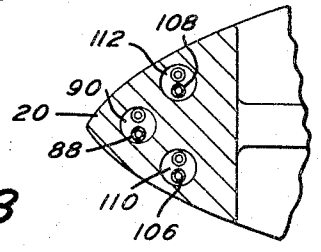


FIG. 3

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FIG. 4

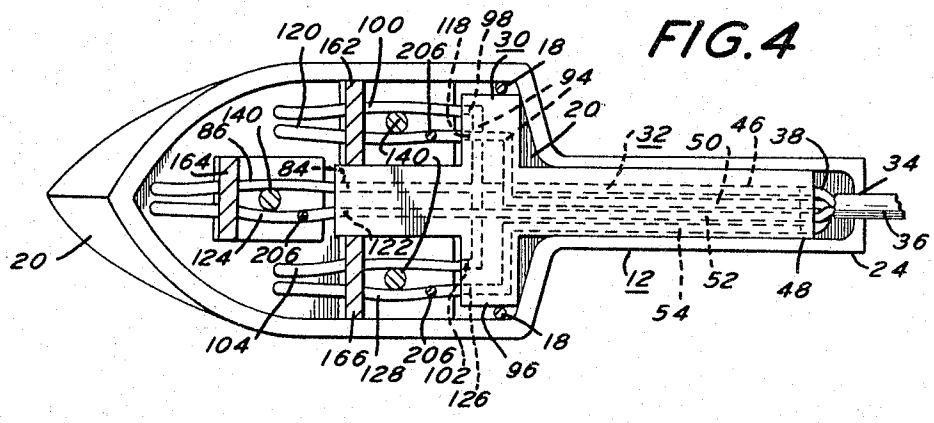


FIG. 5

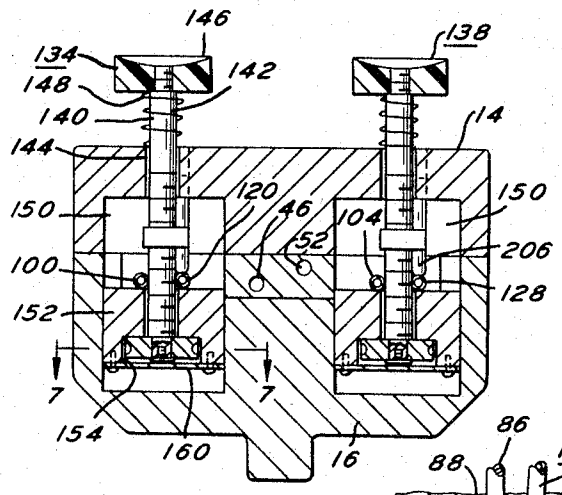


FIG. 6

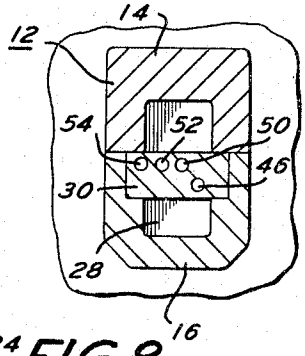


FIG. 7

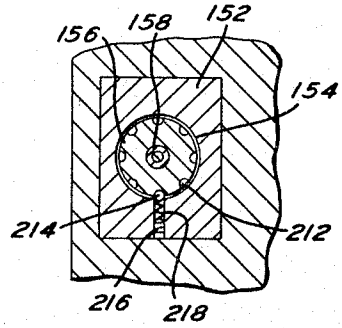


FIG. 8

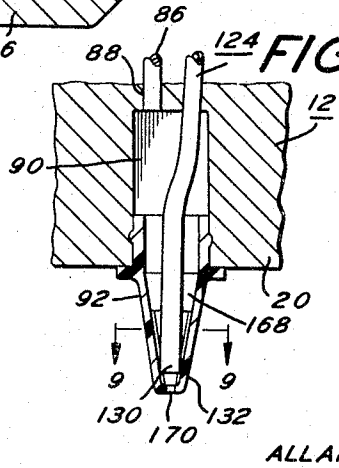
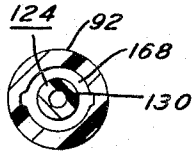


FIG. 9



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3,310,204

FLUID DISPENSING MEANS

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Filed June 8, 1965, Ser. No. 462,182
10 Claims. (Cl. 222—144.5)

The invention relates to a fluid dispensing means, and more particularly to a means for dispensing a plurality of selected fluids.

Although fluid dispensing means have been provided in the past, the fluid dispensing means of the invention provides a structure which allows the selected dispensing of a plurality of different fluids, by use of a compact structure which provides a valve means including fluid rate control adjustment means.

It is therefore an object of the invention to provide a new, and improved fluid dispensing means which may dispense one or more selected fluids by the use of a unitary dispensing means.

Another object of the invention is to provide a new and improved fluid dispensing means having a valve structure which readily controls the dispensing of fluids and allows the adjustment of the rate of fluid flow which rate is not effected by the opening and closing of the valve means.

Another object of the invention is to provide a new and improved fluid dispensing means which is of rugged construction, and may be readily maintained or repaired and has a high degree of utility.

The above objects as well as many other objects of the invention are achieved by providing a fluid dispensing means which has a body provided with a plurality of fluid conducting means and a plurality of valve means for respectively controlling fluid flow through corresponding ones of the conducting means. The body is provided with a plurality of nozzle elements for respectively dispensing fluid passing through associated conducting means when the corresponding valve means is in its opened position. Each of the valve means is provided with an adjusting means for controlling the rate of fluid flow through its corresponding conducting means when the valve means is in its opened position.

The valve means comprises a push rod movable between first and second positions corresponding to the opened and closed positions of the valve, means urging the rod towards the second position, and a clamping block connected with the rod for movement with the rod between first and second positions. The body is provided with an extending edge portion proximate the fluid conducting means and the block for clamping between it and the block the fluid conducting means corresponding to the valve means for preventing fluid flow through the conducting means when the clamping block is in its second position. The adjusting means of the valve means comprises a clamping element having a clamping end positioned proximate to the conducting means for restricting fluid flow through its corresponding conducting means of the valve means. The push rod has a threaded portion threadedly engaging the clamping element for positioning the element along the push rod by rotation of the push rod for adjusting the position of the element with respect to the clamping block for compressing the conducting means therebetween for controlling the rate of fluid flow when the valve means is in its opened position. The adjustment of the adjusting means is uneffected by the movement of the push rod between its first and second positions.

The block means is non-rotationally retained within the body and has a detent means engaging the rod for retaining the rod in its rotational position upon adjustment of the adjusting means of the valve means.

The fluid conducting means comprises a removable block unit having fluid passages therethrough and a plurality of plastic fluid conducting tubes detachably connected between respective passages of the block unit and said nozzle element, respective ones of said tubes being restricted and compressed by corresponding ones of said valve means for controlling and adjusting fluid flow therethrough to the nozzle elements.

The fluid dispensing means includes means for providing air under pressure to each of the nozzle elements of the body through predetermined ones of the conducting means and means for providing respective different fluids through predetermined ones of the conducting means for dispensing by the dispensing means.

The foregoing and other objects of the invention will become more apparent as the following detailed description of the invention is read in conjunction with the drawings, in which:

FIGURE 1 is a perspective view illustrating the fluid dispensing means of the invention connected with fluid supplying means;

FIGURE 2 is a sectional view of the fluid dispensing means taken on a line **2—2** of FIGURE 1;

FIGURE 3 is a sectional fragmentary view taken on the line **3—3** of FIGURE 2;

FIGURE 4 is a sectional view taken on the line **4—4** of FIGURE 2;

FIGURE 5 is a sectional view taken on the line **5—5** of FIGURE 2;

FIGURE 6 is a sectional view taken on line **6—6** of FIGURE 2;

FIGURE 7 is a sectional fragmentary view taken on the line **7—7** of FIGURE 5;

FIGURE 8 is a sectional fragmentary view taken on line **8—8** of FIGURE 2; and

FIGURE 9 is a sectional view taken on the line **9—9** of FIGURE 8.

Like reference numerals designate like parts throughout the several views.

The fluid dispensing means **10** embodying the invention, comprises a body **12**, having top and bottom sections **14** and **16**, which are secured together by appropriate means such as the screw elements **18**.

The body **12** has a first dispensing end **20** provided with a plurality of nozzle elements **22**, a second handle end **24**, and an intermediate portion **26** (see FIGURE 2).

The body **12** provides a cavity **28** therewithin which receives a removable block unit **30** having a cross configuration (see FIGURE 4) and being provided with a plurality of passages **32** therethrough.

The handle end **24** of the body **12** is provided with an opening **34** as shown in FIGURE 4 which receives a cable **36** therethrough, containing therein an air conducting tube **38** and fluid conducting tubes **40, 42** and **44** (see FIGURE 1). The air conducting tube **38** connects with the passage **46** of the passages **32** in the block unit **30** at its end **48**, while the fluid conducting tubes **40, 42,** and **44** connect with respective passages **50, 52** and **54** at the end **48** of the block unit **30**.

The cable **36** at its other end **56**, has its air conducting tube **38** connected by a junction **58** with three air conducting tubes **60** which respectively connect with liquid containers **62, 64** and **66**. The ends **68** of the tubes **60** pass through the removable caps **70** of the containers **62, 64** and **66** and communicate with the air space above the liquid contained within these containers. The tubes **40, 42** and **44** also respectively extend through the caps **70** into the containers **62, 64** and **66** with their ends **72** each positioned within the liquid contained therein proxi-

mate to the bottom **74** of its containers **62**, **64** and **66**. Each of the caps **70** of the containers **62**, **64** and **66** also receives therethrough a respective air conducting tube **76** which are all joined by a connection **78** with a tube **80** which receives air under pressure from a compressed air source such as an air compressor device. The ends **82** of the tubes **76** also extend into the air space at the top of the containers **62**, **64** and **66**.

The passage **46** of the block unit **30** is connected at its forward end **84** with a flexible compressible air conducting tube **86** which has its other end **88** (see FIGURE 8) communicating through the nozzle cavity **90** with the nozzle **92** of the nozzles **22**. The passage **46** of the block unit **30** also connects with the cross-passage **94** extending across the cross arm **96** of the block unit **30**. The end **98** of the passage **94** connects with a flexible compressible air conducting tube **100**, while the end **102** of the passage **94** connects with a similar compressible tube **104** substantially parallel to the longitudinal axis of the body **12**. The tubes **100** and **104** are also provided with respective ends **106**, **108** which communicate with the nozzle cavities **110**, **112** of the nozzles **114**, **116**.

The passage **50** of the block unit **30** extends into the cross arm **96** and has its end **118** connected with a flexible compressible tube **120** which is positioned along side and substantially parallel to the tube **100**, while the passage **52** of block unit **30** is connected at its end **122** with a flexible compressible tube **124** which is positioned along side and substantially parallel to the tube **86**, and the passage **54** of block unit **30** extends into the cross arm **96** and is connected at its ends **126** with a compressible flexible tube **128** which is positioned along side and substantially parallel to the tube **104**. The extending ends of the fluid conducting tubes **120**, **124** and **128** each have an end **130** which extends to the tip ends **132** of its nozzle element **22** as more particularly shown in FIGURE 8 in connection with the nozzle element **92**.

The tubes **100** and **120** are associated with a valve means **134**, while tubes **86** and **124** are associated with a valve means **136**, and tubes **104** and **128** are associated with a valve means **138**. The valve means **134**, **136** and **138** are retained by the body **12** at its intermediate portion **26**, with the valve means **134** and **138** spaced symmetrically apart on each side of the longitudinal axis, and the valve means **136** being positioned on the longitudinal axis ahead of the other two valve means to form a triangular arrangement.

Each of the valve means **134**, **136** and **138** includes a push rod **140** having an upper end **142** which movably extends through an opening **144** in the top section **14** of the body **12**. The top **142** of the push rod **140** has secured therewith a button **146** for manually actuating the push rod **140** in a downward direction for opening its valve means **134**, **136** and **138**. A coil spring **148** is received about the upper end **142** of the push rod **140** between the button **146** and the top surface of the top casing **14** for urging the push rod **140** in the upward direction extending same from the body **12** for normally retaining the valve means in its closed position. The body **12** provides within it a rectangular opening or cavity **150** for each of the valve means **134**, **136** and **138** for receiving therein a respective clamping block **152** of each of the valve means. The block **152** is movable with the push rod **40** in the upward and downward directions along the axial direction of the push rod **140**, and has a rectangular form as clearly shown at FIGURE 7, preventing rotation of same about the axis of the push rod **140**. The bottom of the clamping block **152** is provided with a circular cavity **154** which receives therein a detent wheel **156** which is threadedly secured with the bottom end **158** of the push rod **140**. The detent wheel **156** is enclosed and retained within the cavity **154** by a bottom plate **160**.

The top section **14** of the body **12** provides each of the valve means **134**, **136** and **138**, with a respective depending, tube-compressing edge **162**, **164** and **166** shown in FIGURES 2 and 5. With the valve means **134**, **136** and **138** in their normal closed positions, the spring elements **148** maintain the push rods **140** with their compression blocks **152** in their upward or extended position. When so positioned, each of the pairs of tubes (such as the flexible compressible tubes **86**, **124** shown in connection with the valve means **136** in FIGURE 2) associated with said valve means **134** and **136** and **138**, are compressed between their clamping blocks **152** and the tube compressing edges **162**, **164** and **166**, restricting and preventing the flow of fluid through said tubes to their associated nozzle elements **92**. Upon the depression of any one of the valve means **134**, **136** and **138**, by the application of downward force to its button **146**, its push rod **140** moves the compression block **152** downwardly within the cavity **150** removing the compressing force applied to the associated pair of tubes, allowing air under pressure to flow through its air conducting tubes **86**, **100**, **104** while a fluid delivered from the containers **62**, **64**, **66** is delivered through the tubes **124**, **120**, **128** to its nozzle **22** depending upon the valve means actuated for dispensing fluid by the device **10**.

Referring to the particular nozzle **92** shown in detail in FIGURE 8, when the valve means **136** is manually actuated, the compressed air which is supplied through the tube **86** is delivered through the cavity **92** to the region **168** within the nozzle **92** for being dispensed through the opening **170** of the nozzle **92** with the fluid drawn through the tube **124** to provide a desirable spray of the liquid derived from the container **64**. Similarly, when either of the valve means **136**, and **138** are respectively depressed, a spray of fluid or liquid received from its associated container **62**, **66** is dispensed by its respective nozzle element **114** and **116**. Thus, any one of the liquids stored within the containers **62**, **64** and **66** may be dispensed by the selective actuation of the valve means **134**, **136** and **138**.

It is noted that the compressed air delivered through the lines **76** to the containers **62**, **64** and **66** provides a pressure within the said containers, and allows the delivery of air under pressure through the tubes **60**, the passages **46** and **94** of the block unit **30**, and tubes **86**, **100**, and **104**, to the nozzles **92** for effecting the spray discharge of selected material provided by said containers.

Thus, for example, if the dispensing means **10** is to be utilized by a beautician, the containers **62**, **64** and **66** may contain respectively hair spray solution, lacquer, and hair setting solution. The operator thus, by using the single fluid dispensing means **10** may in desired sequence apply such solutions as may be desired or required in performing his duties. Of course, the containers may be provided with solutions such as shampoo, cream rinse, or other solutions as may be desired by the operator. Although the use of this device has been noted in connection with the treatment of hair by a beautician, the device may find ready application for applying spray action in any sequence desired, various solutions contained in the plurality of containers connected with the fluid dispensing means **10**. Although three valve means have been shown in illustrating the dispensing means **10**, allowing the controlled spraying of three different solutions, more or less valve means may be provided for permitting the selective dispensing of more or fewer solutions.

Each valve means **134**, **136** and **138** is provided with adjusting means **200** for adjusting the rate of flow of fluid through its associated tubes **120**, **124** and **128**, when a valve means is actuated to its opened position. The adjusting means **200** comprises a clamping element **202** having a horizontal portion **204** which threadedly engages the push rod **140** within the chamber **150** of the body **12**. A depending end **206** of the element **202** is positioned above the top surface of the block unit **152** and has an upwardly extending end **208** which is movably received

within a vertical guide slot **210** within the top section **14** of the body **12**.

The adjusting means **200** of each valve means is set by rotating the button **146** of its valve means **134, 136** and **138**. This causes the clamping element **202** to move upwardly or downwardly along the push rod **140** depending upon the direction of the rotation of push rod **140**. Thus, if the push rod **140** is rotated to move the element **202** in a downward direction, its clamping portion **206** which is positioned above a tube **120, 124** and **128** associated with the valve means **134, 136, 138** moves downwardly to compress such tube between it and the top surface of the block unit **152**. Thus, by the degree that the flexible compressible tube is deformed by the clamping action of the adjusting means **200**, the rate of flow of fluid or liquid through such tube will be controlled through the restriction in the opening through said tube.

Thus, each valve means may have its adjusting means **200** independently set by rotation of its push rod **140**. Of course, the adjustment made will depend upon the solution being dispensed, the temperature of the solution and such other factors. The set position of the adjusting means **200** is retained by the detent wheel **156** (see FIGURE 7) which is provided with a plurality of detents **212** about its periphery which co-acts with a ball **214**. The ball **214** is urged into the detents **212** by a spring **216** retained within a passage **218** within the block unit **152**. The detent means, while preventing the undesired rotation of the push rod **140**, yet allows the push rod **140** to be manually rotated when it is desired to readjust the adjustment means **200**.

It is noted that the relative position between the clamping end **206** of the element **202** and the block unit **152** is uneffected by the actuation of the valve means between its open and closed positions. Therefore, the operation of the valve means does not result in the variation or change in the set adjustment provided by the adjusting means **200**.

In operation, when a valve means **134, 136** and **138** is selected for actuation, the downward movement of the push rod **140** of the selected valve means releases from its clamped and restricted condition, the associated pair of tubes allowing compressed air and fluid respectively to flow through said tubes and be dispensed by the associated nozzle element **22**.

The disclosed fluid dispensing means **10** thus provides a high degree of utility by providing means for selectively dispensing a plurality of fluids and solutions from a single dispensing unit, allows the ready selection of fluid to be sprayed by the push button actuation of respective valve means, and provides for easy control of rate of flow of the fluid being dispensed by the rotation of the push rod of the associated valve means. The disclosed fluid dispensing means also provides a construction which may readily be disassembled for quick and efficient repair, and provides a removable block unit contained within the body of the device **10** for positioning and maintaining the flexible compressible tubes in their proper position for clamping and restriction by the associated valve means.

It will be obvious to those skilled in the art that the invention may find wide application with appropriate modification to meet the individual design circumstances, but without substantial departure from the essence of the invention.

What is claimed is:

1. A fluid dispensing means for controllably dispensing a plurality of fluids including a body provided with a plurality of fluid conducting means, and a plurality of valve means for respectively controlling fluid flow through corresponding ones of said conducting means; said valve means each having opened and closed positions and each being provided with adjusting means for controlling the rate of fluid flow through its corresponding conducting means when its said valve means is in its opened position; said body being provided with a plurality of nozzle elements for respectively dispensing fluid passing through an associated one of said conducting means when its corresponding valve means is in its opened position; the adjusting means of said valve means comprising a push rod having a threaded portion, and a clamping element threadedly engaging the threaded portion of said rod and having a clamping end positionable proximate to and for restricting fluid flow through its corresponding conducting means, the position of said element on said push rod being adjusted by rotation of said push rod for adjusting the rate of fluid flow through said conducting means.

2. A fluid dispensing means for controllably dispensing a plurality of fluids including a body provided with a plurality of fluid conducting means; and a plurality of valves for respectively controlling fluid flow through corresponding ones of said conducting means; said valve means each having opened and closed positions and each being provided with adjusting means for controlling the rate of fluid flow through its corresponding conducting means when its said valve means is in its opened position; said body being provided with a plurality of nozzle elements for respectively dispensing fluid passing through an associated one of said conducting means when its corresponding valve means is in its opened position; said valve means comprising a push rod movable between first and second positions corresponding to the opened and closed positions of said valve means, means urging said rod toward the second position, a clamping block connected with said rod for movement with said rod between first and second positions, said body being provided with an extending edge portion proximate said fluid conducting means and said block for clamping between it and said block the fluid conducting means corresponding to said valve means for preventing fluid flow through said conducting means when said clamping block is in its second position; the adjusting means of said valve means comprising a clamping element having a clamping end positioned proximate to said conducting means for restricting fluid flow through its corresponding conducting means of said valve means; said push rod having a threaded portion threadedly engaging said clamping element for positioning said element along said push rod by rotation of said push rod for adjusting the position of said element with respect to said clamping block for compressing said conducting means therebetween for controlling the rate of fluid flow when said valve means is in its opened position, the adjustment of said adjusting means being uneffected by the movement of said push rod between its first and second positions.

3. The means of claim **2** in which said block is non-rotationally retained within said body and has a detent means engaging said rod for retaining said rod in its set rotational position upon adjustment of said adjusting means of said valve means.

4. The means of claim **3** in which said body is provided with a cavity therewithin, and said fluid conducting means comprises a removable block unit having fluid passages therethrough and a plurality of plastic fluid conducting tubes detachably connecting between respective passages of said block unit and said nozzle elements, respective ones of said tubes being restricted and compressed by corresponding ones of said valve means for controlling and adjusting fluid flow therethrough to said nozzle elements.

5. The means of claim **3** including means for providing air under pressure to each of the nozzle elements of said body through predetermined ones of said conducting means, and means for providing respectively different fluids through predetermined ones of said conducting means for dispensing by said dispensing means.

6. A fluid dispensing means comprising a body provided with fluid conducting means; valve means having opened and closed positions for controlling fluid flow through said conducting means; and a nozzle element for dispensing fluid passing through said conducting means

when said valve means is in its opened position; said valve means being provided with adjusting means for adjustably controlling the rate of fluid flow through said conducting means when said valve means is in its opened position; the adjusting means of said valve means comprising a push rod having a threaded portion, and a clamping element threadedly engaging the threaded portion of said rod and having a clamping end positionable proximate to said conducting means for restricting fluid flow therethrough, the position of said element along said push rod being adjusted by rotation of said push rod for adjusting the rate of fluid flow through said conducting means.

7. A fluid dispensing means comprising a body provided with fluid conducting means; valve means having opened and closed positions for controlling fluid flow through said conducting means; and a nozzle element for dispensing fluid passing through said conducting means when said valve means is in its opened position; said valve means being provided with adjusting means for adjustably controlling the rate of fluid flow through said conducting means when said valve means is in its opened position; said valve means comprising a push rod movable between first and second positions corresponding to the opened and closed positions of said valve means, means urging said rod toward its second position, a clamping block connected with said rod for movement with said rod between first and second positions; said body being provided with an extending edge portion proximate said fluid conducting means and said block for clamping between it and said block the fluid conducting means corresponding to said valve means for preventing fluid flow through said conducting means when said clamping block is in its second position; the adjusting means of said valve means comprising a clamping element having a clamping end positioned proximate to said conducting means for restricting fluid flow through said conducting means; said push rod having a threaded portion threadedly engaging said clamping element for positioning said element along said push rod by rotation of said push rod for adjusting the position of said element with respect to the said clamping block for compressing said conducting means therebetween for controlling the rate of fluid flow when said valve means is in its opened position, the adjustment of said adjusting means being uneffected by the movement of said push rod between its first and second positions.

8. The means of claim 1 in which said block is non-rotationally retained within said body and has a detent means engaging said rod for retaining said rod in its set rotational position upon adjustment of said adjusting means of said valve means.

9. The means of claim 8 in which said body is provided with a cavity therewithin, and said fluid conducting means comprises a removable block unit having fluid passages therethrough and a plurality of plastic fluid conducting tubes detachably connecting between respective passages of said block unit and said nozzle element, said tubes being restricted and compressed by said valve means for controlling and adjusting fluid flow therethrough to said nozzle element.

10. The means of claim 9 including means for providing air under pressure to the nozzle element of said body through one of the tubes of said conducting means and means for providing a predetermined fluid through another one of the tubes of said conducting means for dispensing by said dispensing means.

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