

Nov. 21, 1967

F. J. FUCHS, JR

3,353,716

FLUID DISPENSER

Filed Oct. 11, 1965

3 Sheets-Sheet 1

FIG. 1

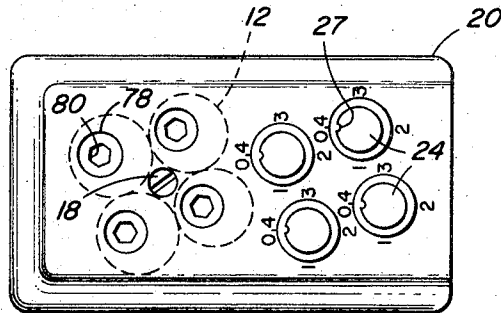
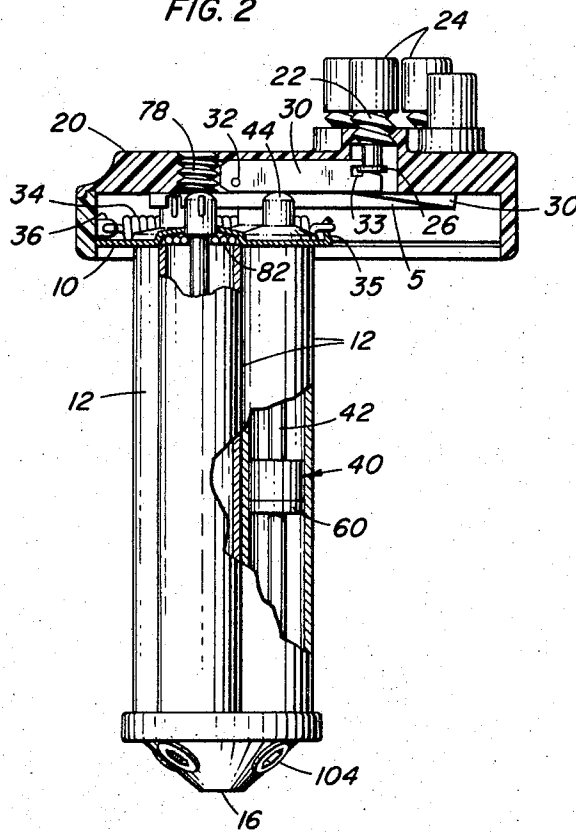


FIG. 2



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FIG. 3

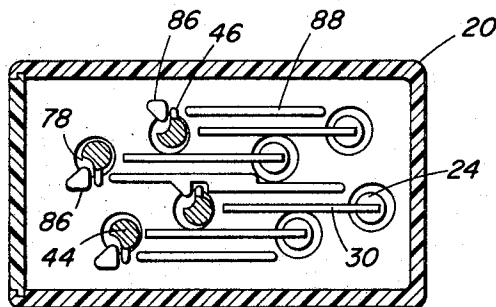


FIG. 4

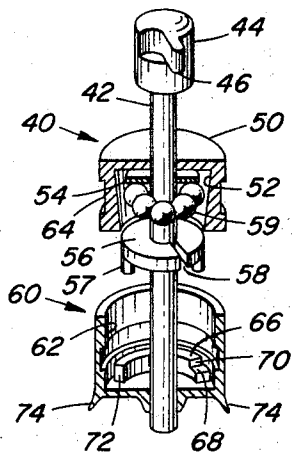


FIG. 5

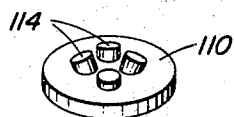
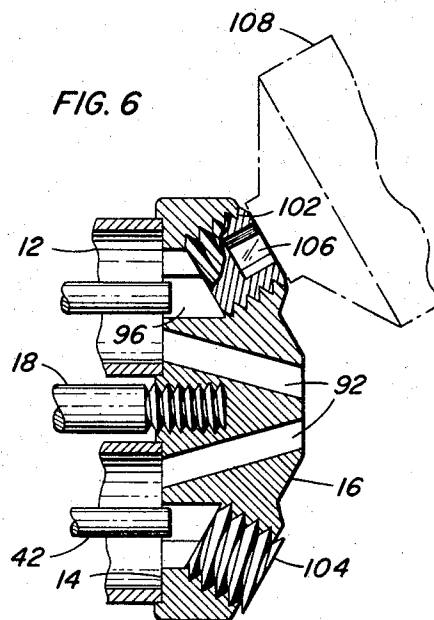


FIG. 6



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FIG. 7

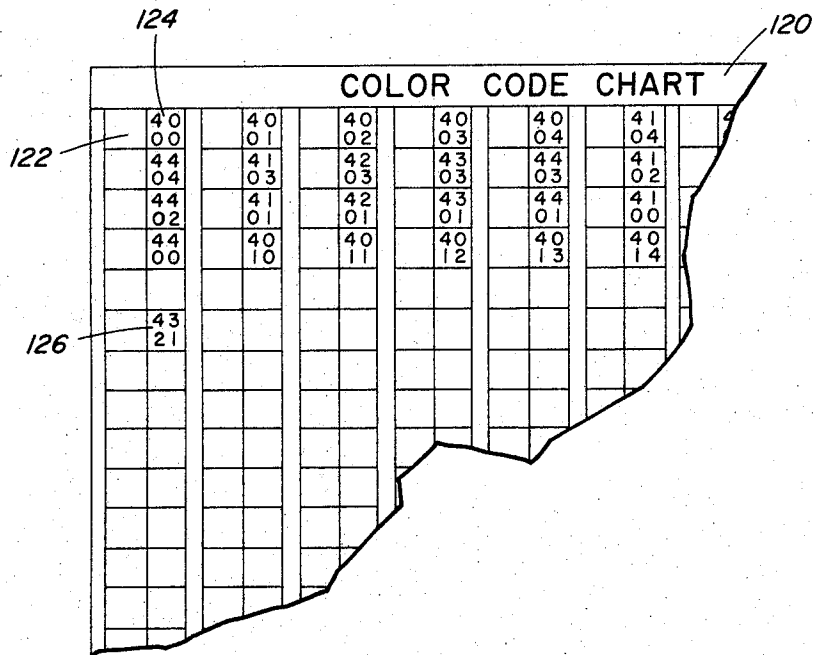
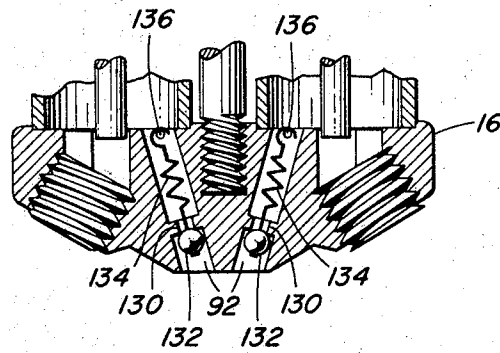


FIG. 8



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3,353,716

FLUID DISPENSER

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6 Claims. (Cl. 222-132)

The present invention relates to a fluid dispenser and, more particularly, to a fluid dispenser for controllably dispensing a combination of paints of several different colors in a precise volumetric relation, regardless of the total volume dispensed, so as to provide a predetermined ratio between all component paints dispensed and therefore to produce a desired color and quantity.

It will be understood that the term "fluid" is used not only in its generally understood sense, but is also used with the intent of including viscous, or semi-viscous, mixtures, such as, but not limited to, paints, syrups, lubricants, etc.

The primary method of mixing artists' paints to obtain a desired color, has for centuries consisted of placing a quantity of basic colors on a palette in different locations and then using a brush or palette knife to experimentally take small amounts of several basic colors and scrub them together on the palette until the desired color appears. This method is not only extremely time consuming, but also has a number of other disadvantages: it is very difficult to arrive at the desired color precisely, and only very proficient artists can closely duplicate an observed color; the amount of paint in the mix at the time the desired color is reached may be too small, making it necessary to mix another batch, or the amount may be too great, making it necessary to wastefully discard paint. Furthermore, when painting a large area of one color, it is often necessary to leave the painting and come back several days later to continue. This necessitates setting up a new palette and remixing a color. Since the paint has dried on the painting, it is now virtually impossible to arrive at a duplicate color as the paint changes slightly in color on drying.

In the past, the major effort made to overcome these difficulties has been to produce more and more different colors of paints packaged in individual tubes. Such proliferation of numbers of colors has resulted in the use of many different compounds, many of which are incompatible with each other. This incompatibility has been the cause of yellowing and cracking of many valuable works of art.

Accordingly, it is the primary object of the invention to provide a new and improved fluid dispenser.

Another object of the invention is to provide a new and improved artist paint dispenser for controllably dispensing a combination of only a small number of different colored artist paints in a precise volumetric relation so as to provide a predetermined ratio between the dispensed paints regardless of the total volume dispensed, and therefore, produce the desired color.

A still further object of the invention is to provide a fluid dispenser for varying the amounts dispensed from the dispenser in accordance with the requirements of a particular formulation, such as, a particular paint formulation.

An embodiment of the present invention includes a four-compartment paint dispenser which can be easily loaded with paint without any more preparation and activity than the mere removal of the cap from the paint tube and the plug from the paint compartment, the insertion of the tube into the paint compartment, and squeezing. Only four paint compartments can yield satisfactory results since any and all colors from the most delicate shades of off-whites to black, can be obtained from only four basic colors: white, ultramarine blue, cad-

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mium red, and cadmium yellow, all of which are compatible colors.

The color and quantity of the paint to be dispensed is precisely determined by adjusting control dials individually associated with each paint compartment. The dispenser is then operated to feed out the proper paint mixture in any quantity from zero to the entire amount of paint stored in each compartment.

A further object of the invention is to provide a paint dispenser capable of accurately controlling the amount of each color of paint dispensed regardless of any differences in viscosity between the colors of paint.

Various other objects of the invention will be apparent from the following detailed description thereof given in connection with the accompanying drawings, which show the construction of one embodiment of the invention.

FIG. 1 is a view of the top of the sliding cap of the dispenser showing the volume control dials and the calibration numbers.

FIG. 2 is an elevation of the paint dispenser with portions cut away to reveal the working parts.

FIG. 3 is a sectional view of the bottom of the sliding cap showing the cam structure.

FIG. 4 is an isometric view of the rod and piston assembly with parts broken away.

FIG. 5 is an isometric view of a cap used to cover the dispenser nozzles.

FIG. 6 is a sectional view of the dispenser nozzle block.

FIG. 7 is an illustration of a color-code chart.

FIG. 8 is a sectional view of a modified dispenser nozzle block which may be used with the present invention.

Referring now to FIG. 2, there is shown a base member or plate 10 to which are suitably secured the upper ends of four tubular members 12. The lower ends of the tubular member 12 reside within counterbores 14 formed in a nozzle block 16, as may be best seen in FIG. 6. The nozzle block 16 is secured to the plate 10 by a rod 18 which extends through the plate and is provided with threads at its lower portion for threaded engagement with the nozzle block 16. The tubular members 12 provide chambers or paint compartments for receiving the different colored paints.

A cap 20 is mounted slidably on the plate 10 and is provided with four internally threaded bores 22 which receive, in threaded engagement, four volume control knobs 24. Each volume control knob is provided at its lower extremity with a circular or flange-like portion 26, as may be seen in FIG. 2, and with an indicating mark or groove 27 for alignment with any one of four numbers formed on the cap 20 located circumferentially of the knob. Each number is indicative of a different volume or amount of paint to be dispensed. The volume control knobs are rotatable within the threaded bores 22 for alignment with any one of the surrounding numbers.

Four lever-like cams 30 are mounted pivotally within the cap 20 by dowel pins 32 extending through the sides of the cap 20 and apertures formed in the leftward end of the cams 30, as viewed in FIG. 2. The rightward end of each cam is provided with a groove or cut-out portion 33 for receiving the flange-like portion 26 of a volume control knob 24; the lower portion of each groove, the portion on which the flange is seated, being rounded as shown in FIG. 2. Thus, as the adjustment knobs 24 are rotated, they move upwardly or downwardly within the cap 20 and, correspondingly, position the rightward ends of the cams 30 upwardly or downwardly.

The plate 10 is provided with a detent 35 to which is secured one end of a tension spring 34; the other end of the spring being secured to a detent 36 provided on the cap 20. Thus, when the cap 20 is moved to the left with respect to the base member 10, or from its initial right-

ward position as shown in FIG. 2, for example, by the application of a suitable and manually applied force, the spring 34, upon the removal of such force, will be effective to return the cap to its initial position.

Referring now to FIGS. 2 and 4, a rod and piston assembly, indicated generally by the numerical designation 40, is provided within each tubular member 12. The assembly is comprised of a piston rod 42, and piston 50 and a seal 60. The piston rod 42 is provided with an enlarged head 44, the top of which is rounded, and projecting outwardly from the head, is a radial projection 46.

Surrounding the piston rod 42, slidably, is the piston 50 made, for example, of hardened steel. The piston 50 is shaped generally like an inverted cup, and is provided with an inverted conically tapered inner bore 52.

Also surrounding the rod 42, are discs 54 and 56, made of some suitable material, such as plastic, and provided with a radial cut-out portion, or split, such as the split 58 of disc 56. The radial split permits each disc to lightly pinch the rod 42 such that frictional forces cause the discs to move with the rod. The diameters of the discs are dimensioned such that the discs can be accommodated within the tapered bore 52 of the piston 50.

Disc 56 is provided with downwardly extending and diametrically opposite, projections or bosses 57, whose utility will be set forth fully infra.

A plurality of spherical members or balls 59, made of some suitable material such as steel, are assembled circumferentially around the rod 42 within the tapered piston bore 52 and between the discs 54 and 56. The balls are of such diameter that when the rod 42 is rotated and moved downwardly, the balls are moved downwardly by the disc 54 against the disc 56, and are pinched or wedged between the rod 42 and the inwardly tapered inner wall of the piston 50. This pinching or wedging action locks the piston 50 to the piston rod such that downward motion of the rod 42 is imparted to the piston 50. When the balls are not so wedged, i.e., when they are loosely or freely residing within the tapered bore 52, no locking action occurs and, hence, the motion of the rod 42 is not imparted to the piston 50.

Encircling the rod 42, below the disc 56, is the main piston seal indicated by the general numerical designation 60; the seal 60 being made of some suitable material such as a relatively soft elastomer material. The upper portion of the seal is provided with an inwardly formed shoulder 62 which snaps into a complementary groove 64 formed in the piston 50. The seal 60 is provided internally with stepped shoulder portions 66 which define surfaces 68 and walls 70 and 72. (It being understood that only one-half of the seal is shown in FIG. 4 and that the other half, not shown, is also provided with a stepped shoulder 66, but with its surface 68 and walls 70 and 72 diametrically opposite to the surface 68 and walls 70 and 72, of the half shown in FIG. 4). The lower portion of the seal is flared slightly outwardly at 74 to provide a scraping action against the inner walls of a tubular member 12.

When the piston 50 and the seal 60 are assembled, the bosses or projections 57 of the disc 56, rest either upon the surfaces 68 and against the walls 70, or if the disc is rotated clockwise, as viewed in FIG. 4, the projections will clear the surfaces 68 and, when the disc is moved downwardly, the projections will rest against the walls 72. Thus, when the projections are in the counter-clockwise position and resting upon the surfaces 68, the disc 56 will be raised sufficiently to prevent the balls 59 from being wedged against the inner walls of the piston 50 and, hence, prevents locking action to occur between the piston 50 and the piston rod 42. However, when the disc 56 is rotated clockwise by the piston rod 42, and the projections 57 are not resting upon the surfaces 68, the disc 56 can crop downwardly a distance sufficient to allow the balls 59 to lock the rod 42 and piston 50 together.

Downward movement is imparted to the piston rods 42 by the cams 30 as the cap 20 is moved leftwardly from

the position shown in FIG. 2. As the cap is moved leftwardly, as described above, the cams 30 engage the piston rod heads 44 and force the piston rods downwardly at rates and distances determined by the respective downward positionments imparted to the right ends of cams 30 by the volume control knobs 24. Thus, it will be understood that the cams 30 impart variable translational movement to the rod and piston assembly.

Summarizing briefly the action of the piston assembly 40, when the piston rod 42 is rotated clockwise and moved downwardly slightly, the piston 50 and rod 42 are locked together by the balls 59, and pumping action can take place upon continued downward movement of the rod. When the rod is raised upwardly and rotated counter-clockwise, the rod and piston are not locked together and the seal and piston can be moved upwardly along the rod to permit filling of the tubular members 12 with paint. The paint filling operation will be covered more fully infra.

It will be understood that the terms "clockwise" and "counter-clockwise," when used in describing the directions of rotation imparted to the piston rods 42, are merely used in the relative sense for purposes of description, and that the piston operation described, with suitable modifications, would work exactly the same with the directions of rotation reversed.

Referring now to FIGS. 2 and 3, the piston rod heads 44 reside upwardly against zero-set, threaded plugs which determine the upward positionment of the rods 42. The plugs 78 reside within complementary threaded bores formed in the cap 20 directly over the tubular members 12, and are provided with hexagonal recesses 80 which are adapted to receive complementarily-shaped hexagonal tools which may be employed to rotate and, hence, raise or lower the plugs 78. The zero-set plugs are adjusted such that at such time the pivot point of the cams 30 are over the centerline of the piston rod heads 44, the balls 59 will have been moved downwardly the precise distance required to lock the rods 42 to the pistons 50. Thus the zero-set plugs permit mass production of such dispensers by permitting individual adjustment of the rods to their associated cams 30.

Conically wound springs 82, FIG. 2, are mounted between the plate 10 and the underside of the piston rod heads 44. Thus, as the piston rod heads are depressed by the leftward movement of the cams 30, the springs 82 are depressed downwardly, and as the cams 30 retreat under the influence of spring 34 to the rightward position as shown in FIG. 2, the springs 82 will return the piston rod heads, and hence the rods 42, to their upward positions. Adjustment of the zero-set plugs 78 controls the upper positioning of the rods 42 and, hence, determines the amount of free downward movement of the rods 42 before the balls 59 lock the rods to the pistons 50.

Referring now to FIG. 3, the manner in which the alternate clockwise and counter-clockwise movement, or reciprocating rotational movement, is imparted to the piston rods 42, will be set forth. The underside of the cap 20 is provided with a plurality of cams 86 and 88 which extend downwardly a distance sufficient for the cams to engage the radial projections 46 formed on the piston heads 44. When the cap 20 is moved to the left as viewed in FIG. 1, the cams 88 will engage the radial projections 46 and rotate the piston rods 42 clockwise approximately 30°. Such clockwise rotation of the piston rods, and associated discs 56, will, as described above, move the disc projections 57 off the surfaces 68 of the seals 60, and will permit the initial downward movement of the rods and discs 54 to wedge the balls 59 against the inwardly tapering inner walls of the pistons 50, and, hence, lock the pistons to the piston rods and thereby cause pumping action to occur by the downward movement of the seals 60. As the cap 20 and cams 30 are returned by the spring 34 to the rightward positions shown in FIG. 2, the springs 82 move the piston rods 42 upwardly, and the rods move

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the discs 54 and 56 upwardly within the tapered bores 52 of the pistons 50. The upward movement of the discs 56 move the balls 59 upwardly within the tapered bores and thereby unwedge the balls from between the piston rods 42 and the inwardly tapering walls of the pistons 50, and thus unlock the pistons from the piston rods. Furthermore, the upward movement of disc 56 is sufficient to raise projections, 57 above the level of surfaces, 68.

Near the end of the rightward movement of the cap 20, the cams 86 engage the radial projections 46 and rotate the piston rods counter-clockwise as viewed in FIG. 1. This counter-clockwise movement is imparted to the discs 56 and the projections 57 are moved back upon the raised surfaces 68 of the seals 60.

Referring now to FIG. 6, the nozzle block 16, shown in cross section, is provided with paint discharge passages 92 which lead from the bottom of the tubular members, or paint compartments 12, to the exterior of the paint nozzle 16. The paint discharge passages 92 are directed toward each other at convergent angles and emerge in close proximity to each other on the surface of the nozzle such that streams of paint emerging from the paint passages will tend to impinge and partially mix with each other.

The paint nozzle 16 is also provided with bores 96 which receive freely the ends of pistons rods 42, keeping them central of the tubular members 12, and which bores are in communication with threaded openings 102. The openings 102 receive complementary threaded plugs 104 which may be provided with, for example, hexagonal recesses 106 for receiving a suitably shaped tool to impart rotation to the plugs and, hence, insert or remove the plugs 104 from the openings 102. The threads of openings 102 are complementary to the thread size and length of the threaded ends of a standard 37 cc. artist's oil paint container 108, shown in dashed outline in FIG. 6, and such as is generally produced by the various paint manufacturers and sold at art and paint stores.

Referring now to FIG. 5, there is shown a nozzle cap 110 provided with partially spherical shaped protuberances 114, and which cap may be utilized to prevent drying of paint within the dispenser while it is not being used and which prevents paint from emerging from the tubular members 12 during the paint loading operation. More specifically, the protuberances 114 of the nozzle cap 110 are dimensioned so as to snap tightly up into the paint discharge passages 92.

Referring now to FIG. 7, there is shown a paint color code chart 120 which is comprised of a large number of horizontally associated pairs of squares, such as, for example, the squares 122 and 124. Typically, the square 122 would be colored a predetermined color and its associated square 124, would contain a code number of four numerical digits arranged quadrantly or in a square pattern, with each digit representing the setting of an associated adjustment knob 24 provided on the cap 20. For simplicity and ease of setting, the numerical digits in square 124 are arranged quadrantly, or in a square pattern, corresponding to the quadrant or square pattern arrangement of the volume control knobs, as shown in FIG. 1. Thus, it will be seen that a simple numerical code can be utilized to define a particular color.

It has been found that after only moderate use of the dispenser, the various color codes bring quickly to the users mind a particular color. Further, changes in a particular code of one or two digits provides interpolation between colors and thereby provides shades of more colors than would ordinarily appear on such a color chart as chart 120.

Utilizing four digits to define a color, the color chart 120 would consist of 364 different colors ranging from black to white. It is manifest, that the adjustment knobs 24 could be calibrated for greater numbers of settings, for example, if the knobs were calibrated from zero to nine, the colors possible would number in the thousands.

A typical chart may be readily made with colors pro-

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duced from various color settings corresponding to the loading of various colored paints into the dispenser. Furthermore, blank color charts, provided with no colors in the squares 122, but with numbers in the squares 124, could be utilized by an artist to record samples in the appropriate squares whenever the artist uses a color made from paints of his own choosing and loaded into the dispenser.

Referring now to FIG. 8, there is shown a modified nozzle block 16 which may be used with the present invention. The paint discharge passages 92 are provided with restricted portions 130 and check valves comprised of spherical members or balls 132 and springs 134. One end of each of springs 134 is anchored by a pin 136 spanning the discharge passage 92, and the other end of the spring extends through the constriction 130 and is suitably secured to the ball 132.

When paint is not being discharged through a passage 92, the tensional force of the spring is sufficient to pull the ball 132 tightly against the constriction 130 such that paint cannot leak or drip out through the passage.

However, when pumping action is taking place as described above, the paint is forced through the paint passages with sufficient force to overcome the tensional force of the spring 134. The paint engages the ball 132 with sufficient force to extend the spring 134 and move the ball downwardly into the lower enlarged portion of the paint passage, thereby, permitting the paint to flow around the ball and out of the paint discharge passage.

Loading and operation

The loading and operation of the fluid dispenser will now be explained in detail.

The loading of the paints into the fluid dispenser may be done quite simply and very neatly. Typically, each paint compartment is loaded with a different colored paint and in the following manner.

Preliminarily, it will be understood that the cap 20 will be in its rest, or rightward position, under the influence of spring 34, as shown in FIG. 2, with the cams 86 having rotated the piston rods 42 to the counter-clockwise positions such that the discs 56 are residing on the surfaces 68 and, hence, holding the balls 59 upwardly in the tapered bores 52 and in a non-locking position. Thus, the seals 60 and pistons 50 are freely movable upwardly of the piston rods 42. Also, the nozzle cap 110 will be in place on the nozzle 16 with the protuberances 114 plugging or stoppering the paint passages 92.

A plug 104 will be removed, as described above, and the threaded end of a tube of paint, such tube 108 of FIG. 6, well screwed into a threaded opening 102. The tube is then squeezed manually to cause paint to emerge from the tube and flow through a paint passage 96 into a paint compartment or chamber 12, and thence up against the bottom of a piston seal 60; the seal will be resting near to the bottom of a paint compartment having been moved there by the prior paint pumping action of the dispenser. The pressure of the paint entering the paint compartment will cause the piston and seal to move upwardly until the paint compartment is filled, and, since the piston was initially near the bottom of the paint compartment, very little, if any, air will be trapped in the paint compartment. In fact, if on the completion of the previous paint dispensing operation, paint is residing within the paint passages 92, and the nozzle cap is snapped into place at such time, virtually all air will be displaced and the paint loading operations can take place without the entrapment of virtually any air in the paint compartment 12.

It will now be assumed that each of the four paint compartments of the fluid dispenser is loaded with a paint of a color corresponding to one of the four digits, one through four, or numbers used on the color code chart 120 of FIG. 7. The operator would now inspect the chart to find the desired paint color which, it will be assumed, is to be found in square 122 of FIG. 7. The operator will

observe the color code contained in square 124 and will rotate the volume control knobs 24 to set them correspondingly. It will be noted that since each number or digit of the color code in the present example is different, each volume control knob 24 will have a different setting and, hence, each knob and associated cam 30, will be adjusted downwardly different amounts or distances.

The nozzle cap 110 will be removed and the fluid dispenser will be grasped with one hand with the fingers encircling the tubular members 12, and with the thumb placed against the rightward end of the cap 20; the thumb will then move the cap leftwardly, FIG. 2. The cams 88 will engage the piston head projections 46 rotating the piston rods and discs 56 clockwise and causing the projections 57 to move off the surfaces 68, thereby moving the balls 59 downwardly against the inwardly tapering inner walls of the pistons 50, thereby wedging the balls between the piston rods and the inner walls of the pistons and locking the pistons to the piston rods. The cams 30, having previously been individually and selectively rotated downwardly predetermined distances corresponding to the individual selective adjustment of the volume control knobs 24, will engage the piston heads 44 and move the piston rods downwardly at different rates and different distances corresponding to the different cam settings. The pistons 50, now locked to the piston rods 42, will be moved downwardly corresponding distances, and will move the piston seals correspondingly downward to force different volumes of paints out of each paint compartment corresponding to the amounts of downward movement of the piston assemblies 40. Thus, the different paint colors will be dispensed in precise volumetric relation, regardless of individual viscosity, so as to provide a predetermined ratio between the component colors and, therefore, a desired color. The quantity desired is readily controlled by the number of times, or the fractional portion of one time, the cap is operated leftwardly in the manner described above.

Furthermore, it will be noted that the ratio of the dispensed paint volumes will be constant regardless of the total volume dispensed. More specifically, it will be noted that the ratio of the respective downward positionments of the cams 30, and hence the ratio of the respective downward movements imparted to the piston rods 42, will remain constant regardless of the amount of leftward movement of the cap 20, as viewed in FIG. 2.

Upon the release or removal of the thumb from the cap 20, the spring 34 will return the cap and associated structure to the rightward or initial position shown in FIG. 2. The cams 30 will be moved off the rods, heads 44, the springs 82 will return the rods 42 (not the pistons 50 and seals 60 as described above) to their upward or initial positions, and the cams 86 will engage the rod head projections 46 rotating the rods counter-clockwise to move the disc projections 57 back over the surfaces 68.

The paints will be forced through the paint passages 92 at convergent angles tending to impinge and mix, and will be directed onto, typically, an artists' palette where they may be further mixed together.

Since the pistons are now unlocked from the piston rods, and since the pistons are mounted loosely on the rods 42, and the disc 54 and 58 and seals 60 are only in light frictional engagement with the piston rods 42, the pistons and seals will remain at their downward positions within the paint compartments while the piston rods are moved upwardly of the pistons, discs and seals, by the spring 82.

Thus, it will be understood, that as the cap 20 is moved successively leftwardly and rightwardly, the pistons, discs and seals will be moved downwardly within the paint compartments in successive steps or increments.

Thus, if after using the present fluid dispenser, several days elapse before the artist returns to the canvas, the identical color used days before can be reproduced by filling the paint compartments with the same component

colors, setting the volume control knobs as before, and operating the fluid dispenser as described above.

It is manifest that many changes and modifications may be made in the present embodiment without departing from the spirit and scope of the invention.

What is claimed is:

1. A fluid dispenser which comprises:

a fluid compartment provided with a fluid discharge passage;

a rod and piston assembly positioned in said compartment;

means for imparting reciprocating rotational movement including a pair of cams alternately engageable with said rod; and

selectively adjustable means for selectively imparting variable translational movement to said assembly to cause said assembly to force variable amounts of fluid out of said discharge passage, including a selectively pivotable cam, and a selectively adjustable member operatively connected to said cam for selectively pivoting said cam in accordance with the amount of fluid to be forced out of said discharge passage;

upon movement being imparted to said cam, said cam being engageable with said rod to impart said variable translational movement thereto.

2. A fluid dispenser according to claim 1 wherein said rod and piston assembly includes, means for alternately placing said piston into and out of operative engagement with said rod upon said alternate rotational movement being imparted to said rod.

3. A fluid dispenser according to claim 1 wherein said rod and piston assembly includes:

a piston surrounding loosely said rod and having formed therein an inverted conically shaped bore providing inwardly tapering inner walls;

said piston having a groove formed in the outer wall; a pair of discs residing within said bore and surrounding said rod in light frictional engagement;

said discs being positioned on said rod in upper and lower relationship;

said lower disc being provided with a pair of downwardly extending, diametrically opposed projections;

a plurality of spherical members arranged circumferentially around said rod within said bore and normally held loosely between said discs;

a seal surrounding said rod below said piston and being in light frictional engagement with said rod;

said seal being provided with a shoulder for frictional engagement with said piston groove and with inwardly formed shoulder portions defining raised surfaces;

said disc projections normally residing upon said raised surfaces;

upon said rod being rotated in one of said alternate directions, said disc having said projections formed thereon, being rotatable with said rod to move said disc projections off said raised surfaces thereby permitting said upper disc to move downwardly with said rod within said tapered bore and to force said spherical members downwardly against said lower disc and outwardly against said inwardly tapered walls of said piston so as to wedge said spherical members between said rod and said inwardly tapered walls and thereby lock said piston to said rod;

upon downward translational movement being imparted to said rod by said cam, said piston and said seal being movable downwardly with said rod to force fluid out of said fluid discharge passage;

upon said rod being rotated in the other of said alternate directions, said lower disc being rotatable with said rod to return said disc projections up onto said raised surfaces and to force said spherical members and said upper disc upwardly in said tapered bore

thereby unwedging said spherical members and unlocking said piston from said rod; and
 said piston, upon being unlocked from said rod and having upward translational movement being imparted thereto, being movable upwardly of said piston and seal. 5

4. A fluid dispenser, for dispensing a plurality of volumes of different fluids in precise volumetric relation regardless of the total volume dispensed which comprises:
 a plurality of fluid compartments each provided with a fluid discharge passage; 10
 an assembly, including a rod and piston, positioned in each compartment;
 means for imparting reciprocating rotational movement to said rod; 15
 means, responsive to said reciprocating rotational movement, for alternately connecting said piston into and out of operative engagement with said rod; and
 selectively adjustable means operatively associated 20
 with each rod and for selectively imparting variable translational movement to said rods and to said pistons, when operatively connected to said rods, to cause said pistons to force variable amounts of fluid out of said fluid passages. 25

5. A paint dispenser for dispensing a plurality of volumes of different colored paints in precise volumetric relation regardless of the total volume dispensed, and in accordance with a predetermined formulation so as to provide a predetermined ratio between said dispensed paint volumes and produce a predetermined color of paint, which comprises:
 a base plate;
 a cap slidably mounted on said base plate;
 a nozzle block; 35
 a plurality of paint compartments secured between said base plate and said nozzle block;
 said nozzle block being provided with a plurality of paint discharge passages directed toward each other at convergent angles and placing said paint compartments in communication with the exterior of said nozzle block; 40
 an assembly, including piston rod, piston and seal, provided within each of said paint compartments; 45
 said piston surrounding loosely said rod and having formed therein an inverted conically shaped bore providing inwardly tapering inner walls, and said piston having a groove formed in the outer wall;
 a pair of discs provided within said bore surrounding said rod in light frictional engagement and being positioned on said rod in upper and lower relationship; 50
 a plurality of spherical members arranged circumferentially around said rod within said bore and normally held loosely between said discs; 55
 said seal surrounding said rod below said piston and being in light frictional engagement with said rod;
 said seal being provided with a shoulder for frictional engagement with said piston groove, and with inwardly formed shoulder portions defining raised surfaces; 60
 said disc projections normally residing upon said raised surfaces;
 a plurality of pairs of fixed cams secured to said cap with each pair being engageable with a rod and for imparting alternate rotational movement thereto up-

on said cap being slid in opposite directions on said base plate;
 upon said rods being rotated in one of said alternate directions, said discs having said projections formed thereon being rotatable with said rod to move said disc projections off said raised surfaces thereby permitting said upper discs to move downwardly with said rods within said tapered bores and to force said spherical members downwardly against said lower discs and outwardly against said inwardly said tapered walls so as to wedge said spherical members between said rods and said inwardly tapered walls and thereby lock said pistons to said rods;
 a plurality of cams pivotally secured to said cap and individually associated with said rods;
 a plurality of volume control knobs rotatably secured within said cap and individually operatively associated with said pivotable cams;
 said knobs being individually rotatable settable in accordance with a predetermined paint color formulation, and upon being rotated, being movable upwardly and downwardly predetermined distances within said cap and operable to individually pivot said cams predetermined distances;
 said pivotable cams being engageable with said rods, upon sliding movement of one direction being imparted to said cap, and for individually imparting downward movements of predetermined distances to said rods, and to said pistons and seals when said pistons are operatively connected to said rods, to cause said pistons to force said seals downwardly predetermined distances corresponding to the settings of said knobs, and hence, to force volumes of paint out of said paint compartments and through said paint discharge passages in precise volumetric relation so as to provide a predetermined ratio between all component paints dispensed from said paint dispenser;
 upon said rods being rotated in the other of said alternate directions, said discs having said projections formed thereon being rotatable with said rods to move said disc projections back upon said raised surfaces thereby forcing said spherical members and upper discs upwardly within said bores so as to unwedge said spherical members and thereby unlock said pistons from said rods; and
 a return spring surrounding each rod and operable to move said rods upwardly of said pistons and said seals and return said rods to their initial upward positions within said paint compartments.

6. A paint dispenser according to claim 5 wherein each said paint discharge passage is provided with a check valve comprised of a spring and ball.

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