May 22, 1956 R. E. GROSSMAN ET AL 2,746,648

APPARATUS FOR DISPENSING MEASURED VOLUMES OF PAINT

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Fig. 1

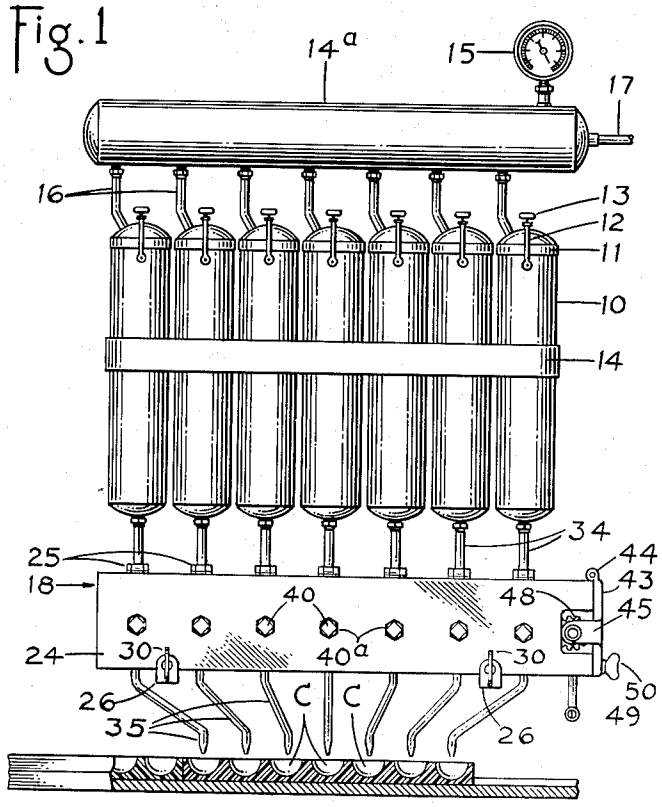


Fig. 2

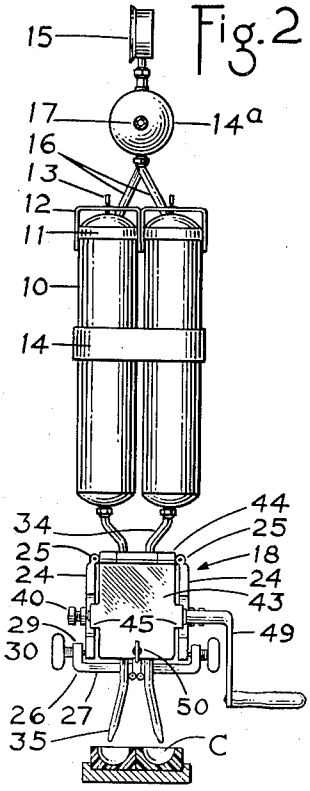


Fig. 7

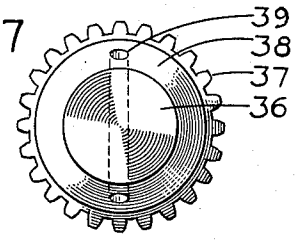


Fig. 8

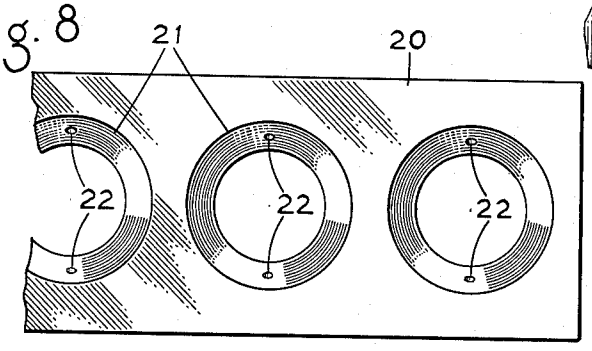
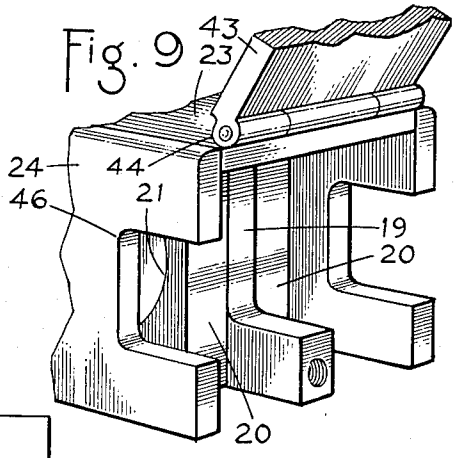


Fig. 9



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Fig. 4

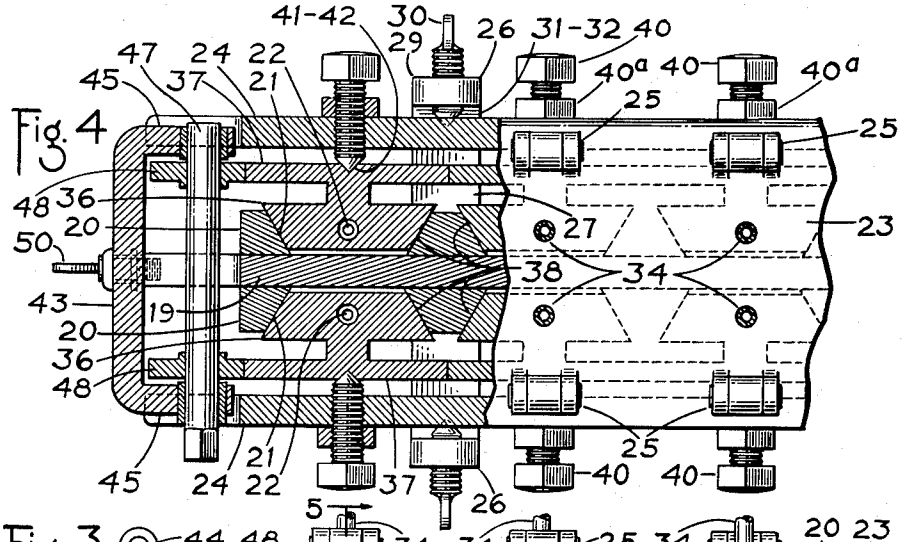


Fig. 3

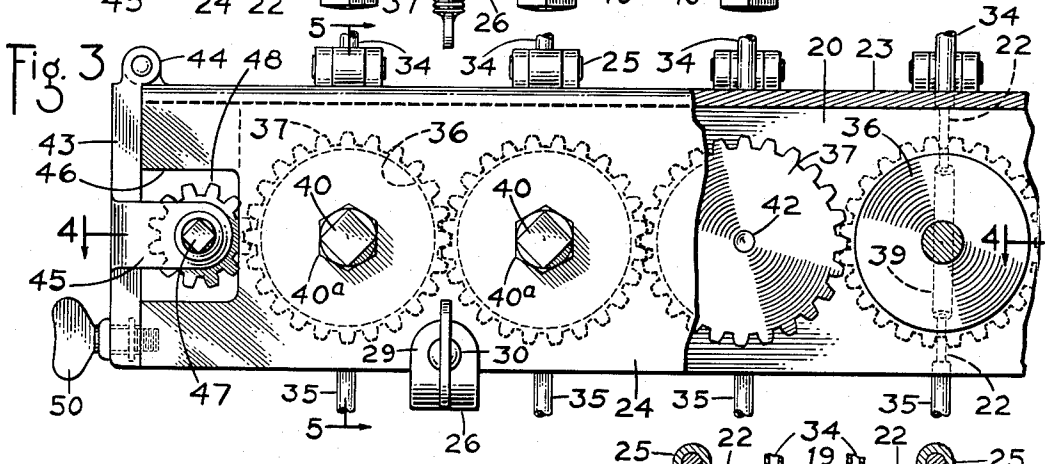


Fig. 5

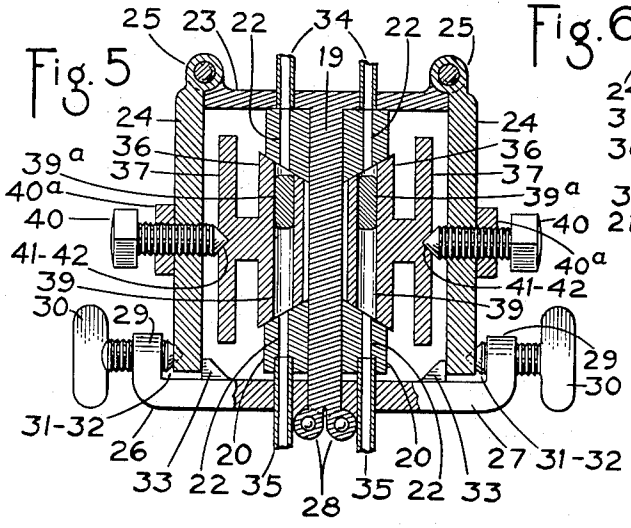
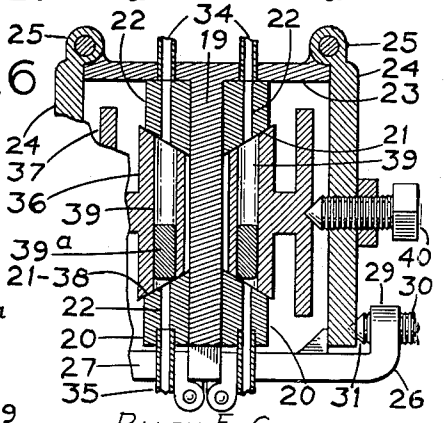


Fig. 6



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APPARATUS FOR DISPENSING MEASURED VOLUMES OF PAINT

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Application January 8, 1954, Serial No. 402,988

9 Claims. (Cl. 222—136)

This invention relates to apparatus for dispensing measured volumes of paint.

The invention is more particularly concerned with an improved apparatus which is manually operable and which is adapted to simultaneously fill a plurality of paint receptacles with different colors of paint and which receptacles are adapted for use in painting kits.

A primary object of the invention is to provide a paint dispensing apparatus which is characterized by a plurality of reservoirs having different color paints therein and which reservoirs are subjected to air pressure above the paint supplies therein and wherein each reservoir has associated therewith conduit and rotary valve means for simultaneous discharge of paint from the several reservoirs under the said air pressure.

A further object of the invention is to provide a paint dispensing apparatus of the general character above referred to which is relatively simple in construction and which is capable of quick dis-assembly and assembly for facilitating the cleansing thereof as in preparation for use of other colors of paint.

Other objects and advantages of the invention will become apparent in the course of the following detailed description, taken in connection with the accompanying drawings, wherein—

Fig. 1 is a side elevational view of the improved apparatus in accordance with a preferred embodiment thereof.

Fig. 2 is an end elevational view as observed from the right of Fig. 1.

Fig. 3 is a fragmentary view partly in side elevation and partly in section of a rotary valve housing forming part of the apparatus and in which the volumes of paint are measured and from which such volumes are discharged into individual paint receptacles.

Fig. 4 is a fragmental view partly in top plan and partly in horizontal section.

Fig. 5 is a transverse sectional view as observed in the plane of line 5—5 of Fig. 3.

Fig. 6 is a fragmental view similar to Fig. 5 but showing the valves in paint dispensing position.

Fig. 7 is an inner elevational view of one of the unitary valve and gear elements.

Fig. 8 is a fragmental outer side elevational view of one of the valve seat plates.

Fig. 9 is an isometric view of one end of the rotary valve housing with the pinion supporting end plate in elevated position and partly broken away.

Referring now in detail to the drawings, the apparatus will be seen to comprise a plurality of paint reservoirs **10** which as shown are preferably of elongated cylindrical form and disposed vertically. While the reservoirs are shown as to comprise two longitudinal series of seven each, they may be less or greater in number.

The reservoirs **10** are each provided with a lid **11** which is held in position by a pivoted bail **12** having a set screw **13** removably engageable with the center of the lid and the two series of reservoirs are preferably bound together by a looped strap **14**.

The apparatus further comprises a compressed air tank **14a** which is provided with a pressure gauge **15** and a

conduit **16** is in communication with the tank and each reservoir at the top thereof.

The tank **14a** is adapted for connection with an air-compressor as through a conduit **17** fragmentally indicated in Fig. 1.

The apparatus further comprises a rotary valve housing **18**, or what may aptly be termed a paint measuring and delivering housing. This housing is of elongated rectangular form and extends horizontally in parallel relation with the tank **14a** with the vertically disposed reservoirs **10** therebetween.

As is more clearly indicated in Figs. 3 to 6, this housing comprises a frame including a central vertically disposed plate **19** to each of whose two opposite side walls is suitably secured a valve seat plate **20** which is provided with a plurality of frusto-conical seats **21**.

The valve seat plates are provided with vertically aligned pairs of ports **22** so arranged that each pair thereof is disposed diametrically of a valve seat **21** and opens through the bearing wall thereof, as is clearly indicated in Figs. 5, 6, 7 and 8.

The frame further includes a top horizontal plate **23** which is rigid with plate **19** and disposed at right angles thereto.

The housing **18** further comprises a pair of opposite side walls **24** whose upper edges are pivotally connected to the lateral edges of plate **23** by means of hinges **25** and the walls **24** are normally retained in vertical operative position by means of a plurality of clamps **26**. Each of the clamps includes an elongated body portion **27** whose inner end is pivotally connected to the lower edge of plate **19** as indicated at **28** and the outer end thereof includes a right angularly disposed portion **29** in which is threaded a wing bolt **30** having a conical end **31** for seating engagement with a corresponding recess **32** in the adjacent wall **24**.

The clamp body portions **27** are preferably provided with lugs **33** for limiting inward movement of the walls **24** under the action of bolts **30**.

The upper ports **22** are in communication with individual reservoirs **10** through conduits **34** which extend through the bottom walls of the reservoirs and through the plate **23**.

Paint delivery nozzles **35** depend from the housing **18** and whose upper ends communicate with the lower ports **22** and the lower free ends of the nozzles are disposed for delivery of paint into cups C suitable for use in painters' kits.

Co-operating with each valve seat **21** is a valve **36** which is integral with a gear **37**. The valve is rotatable within the seat and is provided with a frusto-conical bearing wall **38** for seating engagement with a corresponding seat **21**.

Each valve **36** is provided with a diametrical bore **39** whose opposite ends open through the bearing wall **38** and a piston **39a** is freely supported in each bore.

In the operative positions of the valves, the bores **39** are in the vertical planes of the upper and lower ports **22** and are adapted to communicate therewith in a manner later to appear.

The gears **37** are rotatably supported by means of the bearing engagement of the valves **36** with the seats **21** and by means of adjusting screws **40** which are threadedly engaged in the walls **24** and whose inner conical ends **41** engage with corresponding seats **42** in the outer walls of the gears **37**.

As will be seen, there is a longitudinal series of valves and gears at each side of the plate **19** and the various elements are so proportioned that the gears of each series are in mesh.

The housing **18** further includes an end plate **43** whose upper end is pivotally connected to one end of the hori-

zontal frame plate **23** as by means of a hinge **44**. The end plate is provided with a pair of ears **45** which project inwardly from its opposite side edges and into recesses **46** in the housing walls **24**.

A shaft **47** is rotatably journalled within the ears and a pair of pinions **48** are secured to said shaft adjacent its opposite ends for meshing engagement with the adjacent gears **37** of the two series thereof, whereby all of the gears rotate in unison.

One end of the shaft is engageable by a crank **49** for manually rotating the shaft, pinions and the two series of gears.

The end plate is retained in vertical operative position by means of a wing bolt **50** which is threadable into one end of the frame plate **19**.

It is to be observed that the pinions **48** are provided with one-half the number of teeth on the gears **37** whereby the gears will be rotated through an angle of 180° for each complete rotation of the pinions.

In operation of the apparatus as above described, the reservoirs **10** are supplied with paint of any desired colors which can be readily introduced into the reservoirs upon removal of the lids **11**.

The bodies of paint in the reservoirs **10** are constantly subjected to air pressure from the tank **14a** and the communicating conduits **16** with the result that the paint from each reservoir is maintained within the conduits **34** and in contact with the frusto-conical bearing walls **38** of the valves **36** at all times except when the bores **39** are aligned with the ports **22**.

The gears and valves are so assembled that the bores **39** in the various valves **36** are always parallel and assume a vertical paint dispensing position in unison.

The gears **37** are rotated in unison by means of the pinions **48** which are manually rotated by means of the crank **49**. Upon each rotation of the crank, measured volumes of paint are dispensed into the cups C.

Referring to Figs. 5 and 6, it is to be observed that the pistons **39a** move from an upper position (Fig. 5) to a lower position (Fig. 6) each time the bores **39** are aligned with the upper and lower ports **22**.

As indicated in these figures, when the bores **39** and ports **22** are initially aligned, the pistons **39a** are at the tops of the bores **39** with the lower portions of the bores not occupied by the pistons filled with measured volumes of paint. In this position however, the pistons **39a** are instantly forced downward under air pressure to the position of Fig. 6 with a corresponding discharge of paint through the lower ports **22** and nozzles **35** and into the cups C.

While the pistons **39a** are moving downwardly in the dispensing of paint, the upper portions of the bores **39a** as in Fig. 6 are filled with paint and the pistons **39a** are at the upper ends of the bores **39** as in Fig. 5 upon the next rotation of the crank **49**.

Due to the substantially heavy body or consistency of the paint used in the apparatus, and the regulated and substantially low air pressure utilized, no air penetrates the paint while in the apparatus, since the air pressure is just sufficient to cause the natural flow of the paint therethrough, and not enough to cause it to spurt out as though under high pressure. Furthermore, the consistency of the paint is such that it will not gravitationally drip from the nozzles **35**.

By the provision of the hinged side walls **24** and the hinged end plate **43**, the valves and gears may readily be removed for cleaning preparatory to the change in color of the paints or at the close of a day's work.

After replacement of the valves and gears the side walls **24** are locked in vertical position by the clamps **27** after which the valves **26** are brought into proper engagement with the valve seats **21** by means of the adjusting screws **40** which are thereafter locked in position by means of locknuts **40a**.

While we have disclosed our invention in accordance with a single specific structural embodiment thereof, such is to be considered as illustrative only, and not restrictive, the scope of the invention being defined in the sub-joined claims.

What we claim and desire to secure by U. S. Letters Patent is:

1. Apparatus for dispensing measured volumes of paint, comprising a plurality of vertically disposed elongated paint reservoirs, an elongated horizontal housing disposed below said reservoirs, means for introducing air pressure into the upper ends of said reservoirs, an elongated valve plate in said housing provided with a series of frusto-conical valve seats equal in number to that of the reservoirs, upper and lower vertically aligned ports in said plate opening through the wall of each valve seat in diametrical relation thereto, a conduit connecting each upper port with one of said reservoirs, a paint discharge nozzle communicating with each lower port and depending from said housing, a paint measuring and dispensing valve rotatably supported in each of said seats, and manual means for simultaneously rotating all of the valves.

2. The structure according to claim 1, wherein each of said valves comprises a circular body member having a frusto-conical periphery for seating engagement with a corresponding valve seat, a bore extending through said body member diametrically thereof and opening through said periphery, and a free floating piston disposed within said bore for the purpose set forth.

3. The structure according to claim 2, wherein said manual means comprises a gear unitary with each valve, said gears being in meshing engagement, a pinion in driving engagement with one of said gears, and a crank operatively connected to the pinion for imparting rotation thereto, with a resulting rotation of said gears and associated valves.

4. The structure according to claim 3, wherein said gears each have a number of teeth which is twice the number of teeth on the pinion for alignment of the bores with the upper and lower ports upon each full rotation of the pinion and each half rotation of the gears for the purpose set forth.

5. The structure according to claim 1, wherein said first means comprises a compressed air tank, and a conduit communicating with each reservoir and said tank.

6. The structure according to claim 1, together with an elongated housing including a vertical central plate, said valve plate being disposed in contact with and secured to one side of the first plate.

7. The structure according to claim 6, together with a second valve plate disposed in contact with and secured to the opposite side of said first plate, said second valve plate being provided with frusto-conical valve seats, a paint measuring and dispensing valve rotatably supported in each of said last seats, and said last valves being rotated with said first valves by said rotating means.

8. The structure according to claim 7, wherein said housing further includes a horizontal top plate, opposite side walls having their upper edges pivotally connected to opposite edges of said top plate and clamp means pivotally connected to the lower edge of said vertical plate and engageable with the lower edges of the side walls.

9. The structure according to claim 8, wherein each of said valves is unitary with a driven gear, and adjusting screws threaded through said side walls and engageable with said gears for the purpose set forth.

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