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DISPENSING MACHINE WITH NOZZLE CLEANER

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Fig. 1

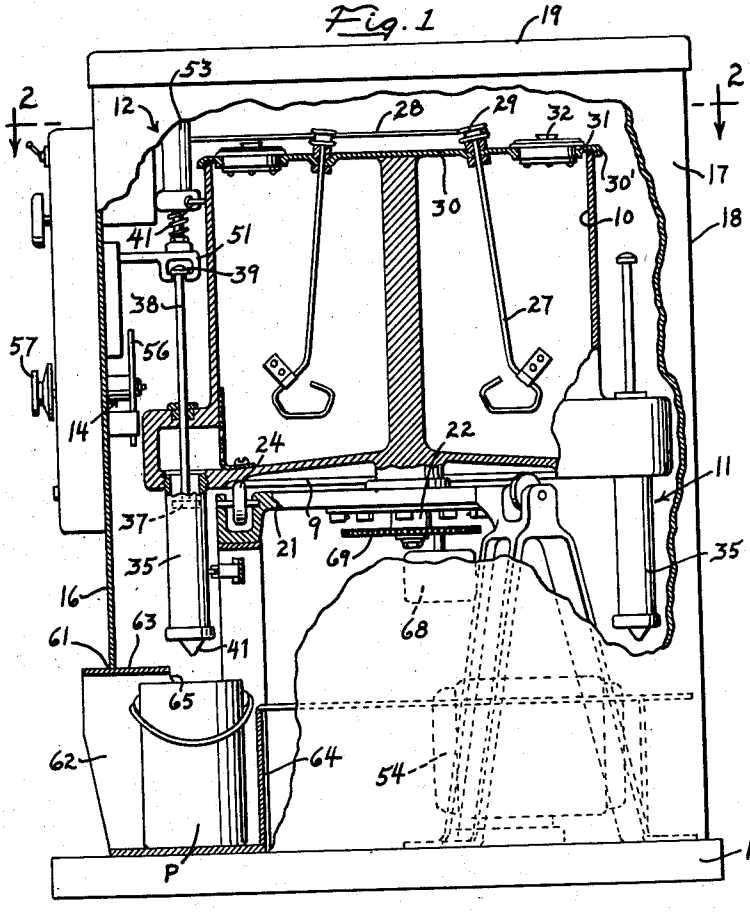


Fig. 3

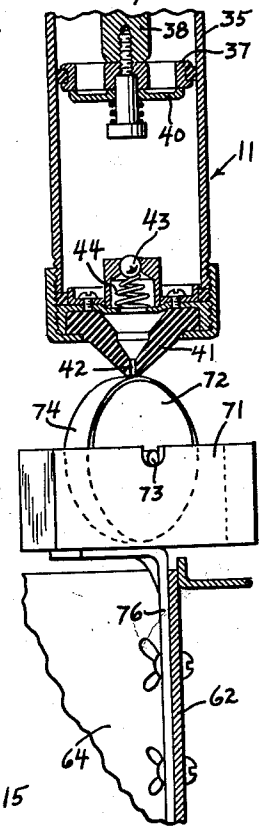
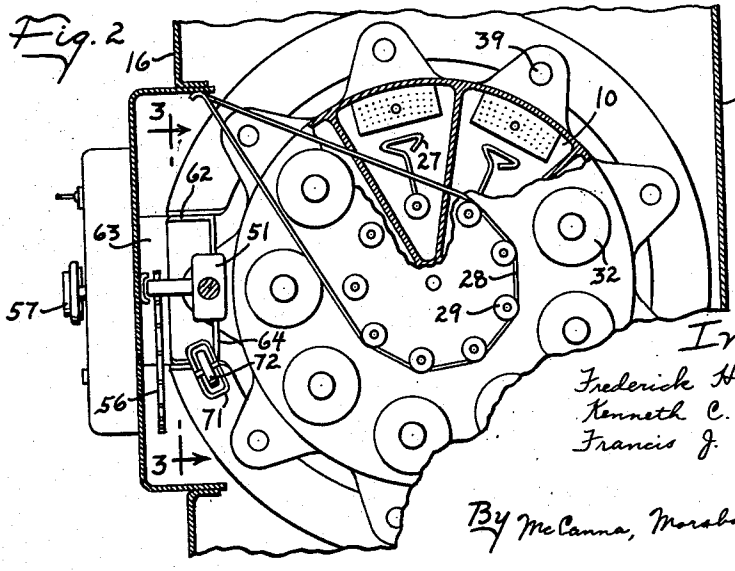


Fig. 2



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DISPENSING MACHINE WITH NOZZLE CLEANER

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Original application Feb. 24, 1958, Ser. No. 717,017, now Patent No. 3,066,830, dated Dec. 4, 1962. Divided and this application Oct. 30, 1961, Ser. No. 148,407

5 Claims. (Cl. 222—135)

This invention relates to dispensing machines for paint colorants, paints and the like, and particularly to a paint colorant dispensing machine having apparatus for cleaning the dispensing nozzles. This application is a division of Serial No. 717,017, filed Februray 24, 1958, and now Patent No. 3,066,830.

The paint colorant dispensing machine of the present invention relates generally to a dispensing machine of the type having a plurality of separate receptacles for receiving different paint colorants or paints, hereinafter generally referred to as paint colorants, and having a plurality of dispensing devices each individually to one of the receptacles for dispensing measured quantities of colorant therefrom. Difficulties have been encountered in such machines in connection with dripping of paint colorant from the dispensing devices, after termination of the dispensing operation. Such dripping of paint not only defaces the machine, but, more importantly, the dripping of the wrong paint colorant into the paint being mixed or colored can produce contamination of the paint. In addition, the paint colorants are generally suspended in a volatile vehicle so that the paint colorant remaining on the dispensing mechanism after termination of the dispensing operation tends to dry and solidify. After a period of operation, the paint colorant residue on the dispensing mechanism tends to build up and may cause clogging of the dispensing mechanism. In addition, lumps of the hardened residue may be discharged during a subsequent dispensing operation. Such hardened lumps of paint colorant do not mix readily with the paint being colored or mixed and, when the mixed paint is thereafter applied to a surface, these lumps tend to smear and produce streaks in the paint finish.

An important object of this invention is to provide a paint colorant dispensing machine of the type described having an improved arrangement for preventing dripping of the paint colorant from the several dispensing devices, when the latter are not being operated to dispense paint colorant.

Another object of this invention is to provide a machine for dispensing a plurality of different paint colorants, and which has mechanism for cleaning the tips of the dispensing nozzles on the several paint colorant dispensing devices to prevent dripping of the colorant therefrom and to also prevent formation of a hardened paint colorant residue on the tips of the dispenser nozzles.

A further object of this invention is to provide a paint colorant dispensing machine having separate dispensing devices for dispensing a plurality of different paint colorants, and a single nozzle cleaner which is so arranged as to clean the tips of the nozzles of all the dispensing devices, and in such a manner as to avoid contamination of the dispenser nozzles with colorant from a different dispensing mechanism.

Yet another object of this invention is to provide a colorant dispensing machine of the type having a plurality of paint colorant dispensing devices mounted for rotation about a generally upright axis to enable positioning of any selected one of the dispensing devices at a dispensing station, with a cleaning mechanism for cleaning the tips of the nozzles on the dispensing devices in response to indexing of the dispensing devices and without requiring a separate drive for the cleaning mechanism.

These, together with various ancillary objects and advantages of this invention will be more readily appreciated as the same becomes better understood by reference to the following detailed description when taken in connection with the accompanying drawings wherein:

FIG. 1 is a side view of the dispensing machine with parts broken away and shown in section to illustrate details of construction;

FIG. 2 is a fragmentary horizontal sectional view through the dispensing machine, taken on the plane 2—2 of FIG. 1; and

FIG. 3 is a fragmentary sectional view taken from the plane 3—3 of FIG. 2.

The present application is a division of the copending application of Frederick H. Heiss, Kenneth C. Rolin and Francis J. Baudhuin for "Dispensing Machine," Serial Number 717,017, filed February 24, 1958.

As disclosed more fully in the aforementioned application, the dispensing mechanism generally includes a carrier **9** mounted for rotation about its axis and having a plurality of annularly spaced receptacles or reservoirs **10** for receiving and storing a plurality of different paint colorant materials. A plurality of dispensing devices **11** are provided, one for each receptacle, and which dispensing devices are operable to dispense measured quantities of paint colorants from the respective receptacle. In the embodiment illustrated, the dispensing devices **11** are arranged to be operated by a common operator **12** which is mounted at one side of the carrier and positioned so as to operate any selected one of the disepnsing devices which is aligned therewith. A selectively adjustable mechanism **14** is provided for adjusting the stroke of the operator **12** to thereby selectively vary the quantity of paint colorant dispensed.

As best shown in FIGS. 1 and 2, the machine includes a case having a rigid front wall **16**, spaced side walls **17**, and a rear wall **18** to define an enclosure for the dispensing mechanism. A cover **19** overlies the front, side and rear walls of the case. A support frame **21** is provided for rotatably supporting the carrier and includes a central hub for supporting an axially extending spindle **22** on the carrier. A plurality of annularly spaced rollers **24** are mounted on the frame and engage the underside of the carrier to support the same. The paint receptacles **10** may be of any suitable construction which provides separate enclosed reservoirs for the colorants, and the receptacles are advantageously arranged in an annular bank. In the embodiment shown, the receptacles are formed as separate compartments in a canister. A top **30** is sealed to the canister by a seal ring **30'** and the top has a plurality of filler openings **31** therein, one for each of the compartments in the canister to enable replenishing of the material in the canister without requiring removal of the top **30**. Removable covers **32** are provided for covering each of the openings **31** to thereby completely enclose the compartments in the canister. Agitators **27** are advantageously provided in each of the receptacles and, as shown, are rotated by means of a stationary belt **28** which engages pulleys **29** on the upper ends of the agitators.

The dispensing devices **11** may be of any construction suitable for dispensing measured quantities of paint colorants from the respective receptacle and, as best shown in FIG. 3, include a cylinder **35** which communicates at one end with a respective receptacle **10**. A piston **37** is slidably disposed in each cylinder and has a rod extending upwardly therefrom. The upper end of the rod **38** terminates in a head **39**. A valve **40** is provided on each piston **37**, which valve is arranged to close when the piston is extended for dispensing material from the cylinder and to open when the piston is retracted to permit material

from the respective receptacle to flow therepast into the cylinder below the piston. A dispensing nozzle 41 is provided at the lower end of each cylinder 35 and, as shown, the nozzle has a generally conical configuration and a dispensing opening 42 adjacent the apex thereof. A check valve 43 is mounted in the cylinder 35 above the dispensing opening, and is arranged to open when the pressure is applied to the paint colorant in the cylinder during a dispensing operation, and to close when the piston is retracted to its initial position. The strength of the spring 44 for closing the check valve is selected as to be at least sufficient to prevent the check valve from opening under the pressure exerted thereon by the column of material and the piston disposed thereof. However, when the piston is extended by the application of pressure to the rod 38, the pressure exerted by the liquid colorant in the cylinder 35 on the check valve is sufficient to overcome the spring and permit paint colorant to flow through the valve.

The common operator 12 is more fully disclosed and claimed in the aforementioned copending application and reference is made to that application for a more complete description of the construction and operation of the operator 12. In general, the operator includes a jaw 51 which is disposed in the path of movement of the heads 39 on the piston rods 38, and is shaped to permit the heads to pass as the carrier is rotated. The operator illustrated herein is fluid operated and includes a cylinder 53 having a piston therein connected to the jaw 51. Fluid is supplied to the operator cylinder 53 from a motor and pump assembly 54 under the control of suitable valves (not shown), and the stop mechanism 14 is arranged to selectively adjust the stroke of the jaw. The stop mechanism 14 includes a cam plate 56 disposed in the path of movement of the jaw 51, and which cam plate is rotatable by means of a knob 57 to provide an adjustable stop for selectively changing the stroke of the jaw.

The case for the dispensing mechanism has an access opening 61 in the front wall thereof below the lower end of the dispensing devices 11, and a shield including opposed side walls 62, a top wall 63 and a rear wall 64 is disposed around the opening 61 and extends into the case to a position below the dispensing devices to define a dispensing station. An opening 65 is provided in the top wall 63 and side walls 62 of the shield to permit dispensing of materials from the dispensing devices 11 into a can P disposed at the dispensing station. The carrier 9 is rotatable to enable positioning of any selected one of the dispensing devices 11 at the dispensing station, and may be rotated by hand or by power operated mechanism such as the motor 68 which is drivingly connected to the carrier through gearing 69.

The colorants to be dispensed from the machine are in readily flowable liquid form and, in order that the colorants not adversely affect the drying characteristics of the base paint when the colorants are added thereto, the colorants are preferably of the so called "drying-type" colorants. Such colorants in general include the coloring pigment, a suitable drying-type oil such as linseed maleic oil and a thinner such as mineral spirits to produce the desired flow characteristics. Such drying-type colorants, however, tend to evaporate and harden when exposed to air.

Although the check valve 43 effectively prevents paint colorant in the dispensing cylinder 35 from flowing through the nozzle 41 when the dispensing mechanism is not in operation, a small amount of the paint colorant which is dispensed through the nozzle does cling to the nozzle around the opening 42 after termination of the dispensing stroke. This paint colorant tends to collect and drip from the tip of the nozzle after completion of the dispensing stroke and during indexing of the carrier and dispensing devices into and out of position at the dispensing station. Any paint colorant which drips onto the machine obviously defaces the machine and may impair operation and impede subsequent servicing of the machine. If the colorant drips from the nozzle as the dispensing mechanism moves past the dispensing station, the colorant can fall into the paint can P and contaminate the paint therein. In addition, as pointed out above, the liquid vehicle of the colorant is generally of the type which evaporates and/or oxidizes upon exposure to air, leaving a solid or semi-solid residue. This residue, if allowed to collect on the tip of the nozzle, can partially or wholly plug the dispensing opening in the nozzle and thus interfere with proper dispensing. Moreover, part of this partially hardened residue may be dislodged in a subsequent dispensing operation, thereby discharging a lump or clot of the colorant into the paint pail. Such a lump will not readily mix with the paint being colored or mixed, and, when the paint is subsequently applied to a surface, the lump will smear and otherwise damage the paint surface.

To overcome these problems, a nozzle cleaner is provided for removing the excess paint colorant from the tips of the nozzle. Although even small quantities of one colorant can markedly contaminate another colorant if mixed therewith, it has been found that a common cleaning apparatus constructed in the manner described hereinafter, can be used to clean all of the nozzles without contaminating different colorants. This nozzle cleaner includes a small container 71 adapted to contain a mineral-type solvent and having a roller 72 disposed therein and rotatably supported on pintles 73. An absorbent cover 74 is provided on the roller and arranged to engage the tips of the nozzles 42, as the carrier is rotated, so that the roller is rotated through a part of a turn each time a nozzle 42 wipes thereacross. The colorant collected on the nozzle is wiped onto the roller 72 and is conveyed by the roller into the mineral solvent in the receptacle or container 71, which solvent dissolves the colorant from the roller and permits the pigment in the colorant to settle into the bottom of the container. Conveniently, the container 71 is removably supported on a bracket 76, herein shown attached to one of the side walls 62 of the shield around the dispensing station, to enable easy removal of the nozzle cleaner through the access opening 61 in the case for cleaning of the container 71. Preferably, the bracket supports the container in a position such that the roller extends generally tangentially of the circle described by the tips of the nozzles as the carrier is rotated.

Thus, as the carrier is rotated to position different dispensing devices at the dispensing station, the nozzles engage the roller 72 and turn the same through a part of a turn. In this manner, successive nozzles engage different peripheral portions of the roller and progressively turn the roller to immerse the periphery of the roller in the solvent. As the roller is slowly rotated through the solvent, the colorant is dissolved and settles to the bottom of the container, and the cleaned portion of the roller moves upwardly to be engaged by succeeding nozzles. The wiper or cleaner not only removes the material from the nozzle to prevent dripping, but also prevents collection of a hard residue around the tip of the nozzle which could impede dispensing or result in a dispensing of a hardened slug of colorant which would not mix properly with the paint.

We claim:

1. A machine for dispensing paint colorants and the like containing colored pigment in a liquid vehicle comprising, means defining a plurality of receptacles for storing a plurality of different paint colorants, dispensing means communicating with each receptacle and having a downwardly facing dispensing nozzle individual to each receptacle, common means for cleaning the tips of all of said dispensing nozzles including a solvent container containing a solvent for paint colorant, a wheel mounted for rotation about its axis with the underside of the wheel projecting into the solvent container to be partially im-

mersed in the solvent therein, and means for effecting relative movement between the wheel and the dispensing nozzles along a path transverse to the axis of the wheel and intersecting the upper periphery of the wheel whereby the wheel wipes the tips of the nozzles and the nozzles engage and turn the wheel through the solvent in the container to dissolve the colorant on the wheel and allow the colored pigment to settle to the bottom of the container.

2. A machine for dispensing paint colorants and the like containing colored pigment in a liquid vehicle comprising, a carrier mounted for rotation about a generally upright axis and having a plurality of receptacles for storing a plurality of different paint colorants, dispensing means communicating with each receptacle and having a downwardly facing dispensing nozzle individual to each receptacle, said dispensing means being movable with said carrier and said nozzles being arranged in an annular bank around the axis of said carrier, common means for cleaning the tips of all of said dispensing nozzles including a container containing a solvent for paint colorant, a wheel mounted for rotation about its axis with the underside of the wheel projecting into the solvent container to be partially immersed in the solvent therein, the tips of said nozzles being movable with said carrier in a path generally tangent to the periphery of the wheel whereby the wheel wipes the tips of the nozzles as they successively move therepast and the nozzles engage and turn the wheel through the solvent in the container to dissolve the colorant on the wheel and allow the colored pigment to settle to the bottom of the container.

3. The combination of claim 2 wherein the wheel has an absorbent peripheral portion adapted to absorb and retain some of said solvent as the wheel rotates through the solvent.

4. A machine for dispensing paint colorants and the like containing colored pigment in a liquid vehicle comprising, a casing, a carrier mounted in said casing for rotation about a generally upright axis and having a plurality of receptacles for storing a plurality of different paint colorants, dispensing means communicating with each receptacle and having a downwardly facing dispensing nozzle individual to each receptacle, said casing having a dispensing opening therein defining a dispensing station for receiving a paint container, said carrier being

rotatable to position any selected one of said dispensing nozzles at said dispensing station and said nozzles being arranged in an annular bank around the axis of said carrier, common means for cleaning the tips of all of said dispensing nozzles including a solvent container containing a solvent for paint colorant, means removably mounting said solvent container in said casing adjacent said dispensing opening in the casing to enable removal of the solvent container through the dispensing opening for cleaning and replenishing the solvent in the solvent container, a wheel mounted for rotation about its axis on said container with the underside of the wheel projecting into the solvent container to be partially immersed in the solvent therein, the tips of said nozzles being movable with said carrier in a path generally tangent to the periphery of the wheel whereby the wheel wipes the tips of the nozzles as they successively move therepast and the nozzles engage and turn the wheel through the solvent in the container to dissolve the colorant on the wheel and allow the colored pigment to settle to the bottom of the container.

5. A machine for dispensing colorants comprising, a rotatably mounted carrier having a plurality of annularly spaced compartments for receiving different paint colorants, a measuring device communicating with each compartment and having a dispensing nozzle, means for rotating said carrier, means for cleaning the tips of said nozzles including a solvent container, a wheel mounted for rotation about a generally horizontal axis and extending part way into said container, said wheel having the upper periphery thereof positioned in the path of movement of the tips of said nozzles to successively engage the same as the carrier is rotated to wipe the excess colorant therefrom and to be rotated thereby through the solvent in the container.

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