

March 21, 1961

A. G. RUSSELL ET AL
LIQUID DISPENSING APPARATUS

2,975,939

Filed Dec. 9, 1958

3 Sheets-Sheet 1

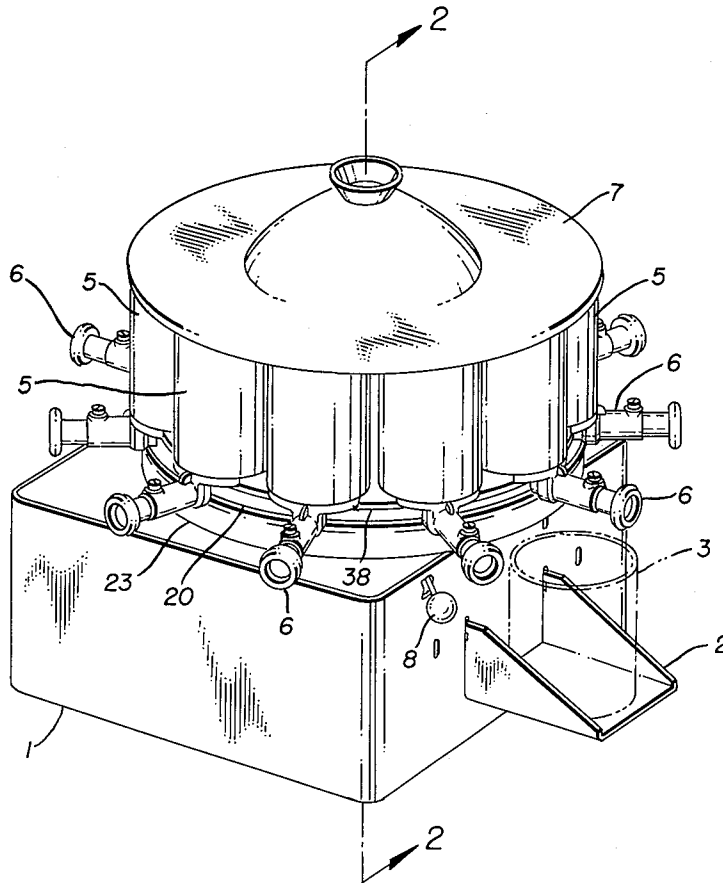


FIG. 1

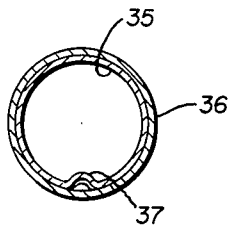


FIG. 3

INVENTORS
ARTHUR G. RUSSELL &
GRANT NOBLE WILLIS
BY

Robert A. Stinger
ATTORNEY

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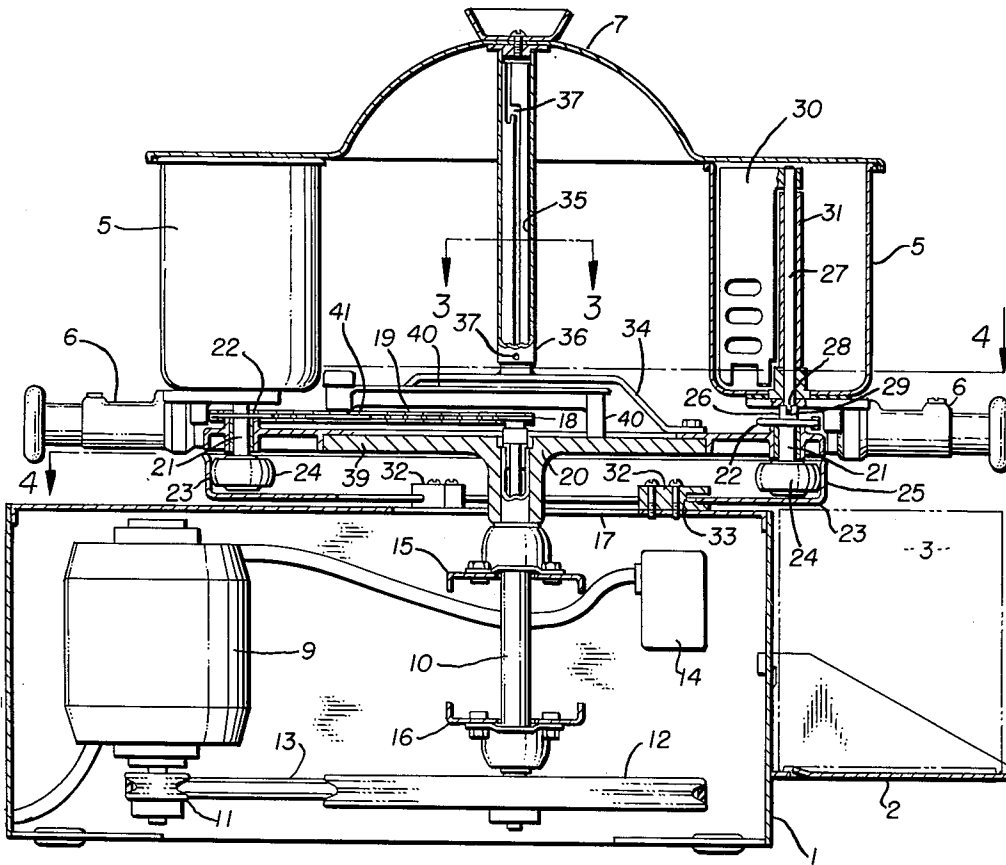


FIG. 2

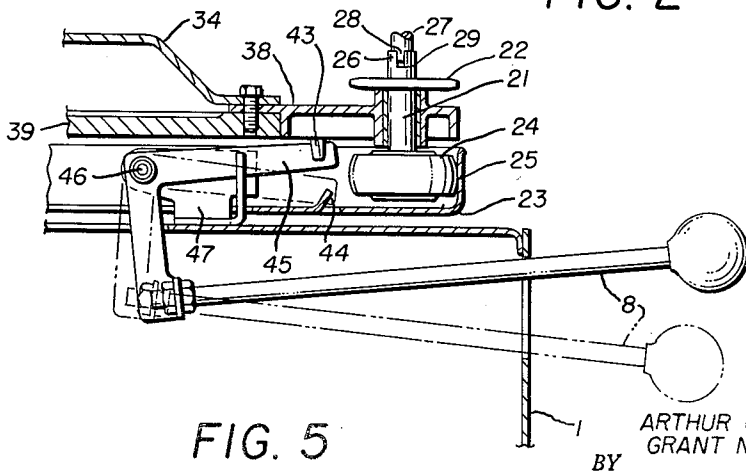


FIG. 5

INVENTORS
ARTHUR G. RUSSELL &
GRANT NOBLE WILLIS

BY

Robert A. Sturges
ATTORNEY

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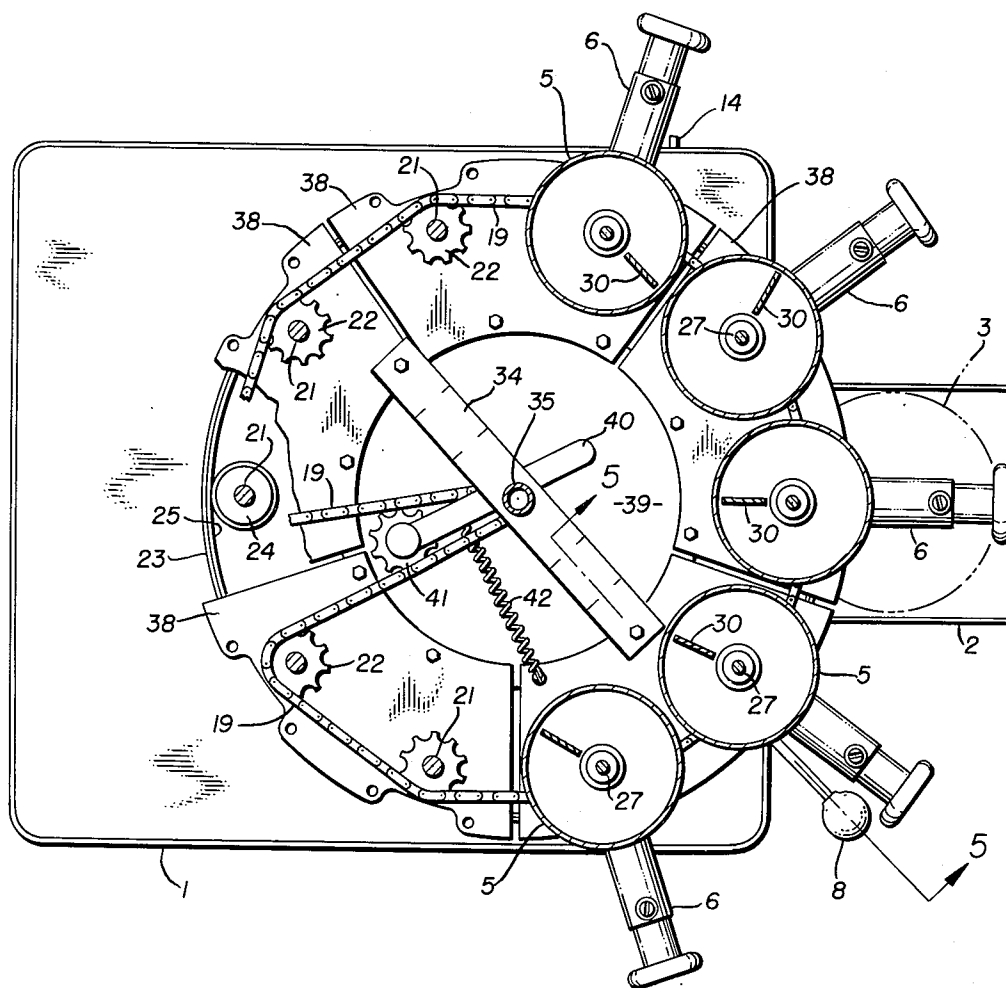


FIG. 4

INVENTORS
ARTHUR G. RUSSELL &
GRANT NOBLE WILLIS
BY

Robert A. Sturges
ATTORNEY

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2,975,939

LIQUID DISPENSING APPARATUS

Arthur G. Russell and Grant Noble Willis, Bristol, Conn.,
assignors to The Sherwin-Williams Company, Cleveland,
Ohio, a corporation of Ohio

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4 Claims. (Cl. 222—142)

This invention relates as indicated to an apparatus for dispensing liquids, and more particularly to an apparatus especially adapted for singly dispensing tinting colors from a plurality of individual tinting color reservoirs into a base paint for the production of colored or tinted paints.

That portion of the coatings industry primarily concerned with the custom blending of colors for trade sales purposes has recently undergone a rather marked change in the methods of marketing such coating compositions. Heretofore, a paint store has found it mandatory to maintain a large stock of colors packed in the usual containers and ready for delivery to a customer on demand. The trend toward pastel shades and tints in recent years has greatly multiplied the stock or inventory which must be maintained by a dealer to best service his trade. This has led to the development of very complex tinting and shading systems involving tinting colors, and one or several base paints and formulas stipulating the quantities of such colors as may be necessarily added to a base paint to produce a desired shade. Installation of such a system, while greatly alleviating the problem of large inventory, has, nevertheless, given rise to many other problems, to the solution of one of which the present invention is primarily directed.

As currently and increasingly practiced, custom colors are being produced by adding to a base white paint carefully controlled amounts of one or more tinting colors. Since these tinting colors are generally used in amounts of four ounces or less for each color per gallon of custom blended paint, it can be readily observed that the very substantial part of the inventory maintained by the dealer for this phase of his trade is composed of white paint, with or without a few base paints, and the balance is a relatively small amount of vari-colored tinting bases. These so-called tinting bases are conveniently maintained in vessels equipped with dispensing devices capable of dispensing measured quantities of the tinting base as may be demanded by a particular formula.

It is a principal object of this invention, therefore, to provide an apparatus for dispensing liquids singly from a plurality of storage reservoirs.

Other objects of the invention will appear as the description proceeds.

To the accomplishment of the foregoing and related ends, said invention, then, consists of the means hereinafter fully described and particularly pointed out in the appended claims, the following description and annexed drawing setting forth in detail certain illustrative embodiments of the invention, such disclosed means constituting, however, but a few of the various forms in which the principle of this invention may be employed.

Broadly stated, this invention is in the provision of an apparatus for dispensing liquids comprising a plurality of individual liquid retaining vessels disposed about the periphery of a rotatable turret, each of said vessels having a vertical shaft extending to the exterior of said vessel, a plurality of spindles vertically disposed in said turret adapted to coact with each vertical shaft, means for driv-

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ing said spindles, planetary drive means including a drive ring and means coacting with at least one of said spindles for driving said drive ring, and means for alternatively selectively preventing rotation of said turret and said drive ring.

In the annexed drawings:

Fig. 1 is an illustration of one form of apparatus in accordance with the present invention.

Fig. 2 is a cross-sectional view taken on the line 2—2 of Fig. 1.

Fig. 3 is a cross-sectional view taken on the line 3—3 of Fig. 2.

Fig. 4 is a cross-sectional view of an apparatus in accordance herewith taken on the line 4—4 of Fig. 2.

Fig. 5 is a cross-sectional view of one embodiment of the present invention taken on the line 5—5 of Fig. 4.

Referring more particularly to Fig. 1, there is here illustrated a preferred embodiment of the present invention. In general, there is provided a base 1 having a shelf 2 attached to one side thereof and adapted to hold a receiver such as a paint can 3 shown in dotted lines. Above the base 1 is a rotatable turret 20 having disposed about its periphery a plurality of individual liquid retaining vessels 5, each of which is equipped with a suitable metering dispensing valve 6. For complete details of the structure of a suitable metering dispensing valve mechanism which may be used, among others, for withdrawing and dispensing measured quantities of the liquids contained in the vessels 5, reference may be had to copending application Ser. No. 780,548 filed December 15, 1958 by Joseph Giordano and Arthur Russell entitled "Metering Dispensing Valve." Suitable cover means 7 may be provided, if desired, to prevent foreign matter from entering the vessels 5. Also shown in Fig. 1 is a selector lever 35 which will be more particularly described with reference to Fig. 5.

Fig. 2 shows in greater detail a preferred embodiment of the present invention. There is here shown in cross-section the device illustrated in Fig. 1. The base 1 contains means for driving the apparatus which may comprise, as here shown, a motor 9 adapted to drive a main shaft 10 through drive pulley 11, shaft pulley 12 and belt 13. Switch means generally indicated at 14 control the motor 9. The shaft 10 is suitably journaled in upper bracket 15 and lower bracket 16 attached to the side walls of the base 1 for rotation therein. The shaft 10 extends through a suitable aperture 17 in the base 1. The upper end of shaft 10 is provided with suitable means for transmitting the rotatory motion thereof, such as a sprocket 18 and a chain 19 in engagement therewith. Journaled about the upper end of the shaft 10 for relative rotation with respect thereto is a turret generally indicated at 20 through which the shaft 10 passes. The outer periphery of the turret 20 is provided with vertical spindles 21 suitably journaled therethrough. The upper portion of said spindles 21 is provided with a sprocket 22 adapted to engage the chain means 19. The lower end of the spindle 21 is fitted with means coacting with a planetary drive ring 23 to drive the same, which means in the present embodiment is composed of a rubber wheel 24 in frictional engagement with an upstanding wall 25 on said drive ring 23 and constitutes drive means for causing relative rotation of said spindles with respect to said drive means.

The upper end of the spindle 21 is provided with suitable means for engaging a vertical shaft 27 in the liquid retaining vessel 5. Tongue 28 on the vertical shaft 27 and groove 29 in the upper end 26 of the spindle 21 constitute a suitable coupling means for transmission of the rotary movement of the spindle 21 to the vertical shaft 27. Such means permits removal of the individual vessels 5. Fixedly attached to the upper end of the vertical shaft 27 is a paddle 30 which serves to agitate the contents of

the vessel 5. Suitable sleeve means 31 are provided around the shaft 27 to obviate the necessity of sealing means where the shaft 27 extends to the exterior of the vessel 5, in the embodiment shown, through the bottom thereof.

Also attached to the bottom of each container is a suitable metering dispensing valve 6 adapted to dispense from the bottom of the container 5 measured quantities of liquid.

The peripheral drive ring 23 in the embodiment shown in Fig. 2 is an annulus having an upstanding peripheral wall 25. The annulus or drive ring 23 is supported from the base 1 by means of slotted blocks 32 having slot 33 therein adapted to embrace the inner periphery of the drive ring 23 and permit sliding movement of such periphery therethrough. Usually three of such blocks disposed at 120° angular relationship to each other are sufficient for the purposes of this invention. More or less of such blocks 32 may be employed.

Also shown in Fig. 2 is a bracket 34 suitably affixed to the turret 20 and adapted to support a vertical column 35 over which is received a depending sleeve 36 carrying a cover plate 7 providing common covering means for each of the containers 5. Individual covering means for each of the containers 5 may be used, if desired.

Fig. 3 is a cross-sectional view showing the inner tube 35 and the outer sleeve 36. Suitable guide and locking means 37 may be provided.

Fig. 4 is a top cross-sectional view taken on the line 4—4 of Fig. 2. As shown in Fig. 4, the turret 20 may be composed of a number of segments 38 suitably affixed to an inner disc 39. The individual containers 5 are mounted in pairs on each of the segments 38, the latter each having journaled therethrough two spindles 21. Attached to the disc 39 is an arm 40 carrying an idler sprocket 41 retained against the chain 19 and spring 42. The purpose of the idler is to take up any slack in the chain 19. Instead of sprockets 22 and chain 19, any suitable means for transmitting the rotatory motion of the shaft 10 to the spindles 21, such as a belt-pulley means, may be used.

Referring now more particularly to Fig. 5, the control means for rotating the apparatus to bring the desired fluid into registry above the receptacle 3 on the bracket or shelf 2 is shown in greater detail. Projecting downwardly from the bottom of the segment 38 is a detent 43 so arranged and disposed with respect to a given vessel 5 and the arresting arm 45 as to cause registration of a vessel 5 with the receiver 3; and projecting upwardly from the peripheral drive ring 23 is a stop 44 each adapted to be alternatively selectively engaged by the arm 45 pivoted at 46 on the supporting block 47 affixed to the upper face of the base 1. The lever 8 operates the arm 45 and extends through the base 1 in position for manual operation. Thus when a detent 43 is engaged by arm 45, the stops 44 pass freely thereunder. Alternatively, when a stop 44 is engaged by the arm 45, the detents 43 pass freely thereover.

The preferred embodiment illustrated in the annexed drawings operates in the following manner. When the motor 9 is energized through the switch 14, the shaft 10 is rotated. Assuming the lever 8 to be in the position shown in solid lines in Fig. 5, the rotatory motion of spindle 10 is transmitted through the sprocket 18 to the chain 19 causing the same to move and revolve all of the spindles 21 carrying sprockets 22. The rotatory motion of the spindles 21 is imparted to vertical shafts 27 through a suitable coupling means such as shown in Fig. 5 as tongue 28 in locked engagement with groove 29 in the spindle 21, causing rotation of the paddles 30 in each vessel 5. The coupling means is desirably adapted to permit removal of the container 5 with its metering dispensing valve 6 from the apparatus for cleaning or replacement. With the lever arm 8 in the position shown in Fig. 5, rotation of the turret 20 (composed of disc 39 and segments 38 suitably affixed thereto) is prevented,

and the fit of the journal of the turret 20 about the shaft 10 is such as to allow relative rotation of one with respect to the other. As the spindles 21 rotate, one or more rubber wheels 25 frictionally engaging the upstanding wall 25 of the planetary drive means 23 cause the drive means 23 to revolve. The radial displacement of opposite rubber wheels 24 is desirably such as to hold the drive means 23 in centered relationship with respect to the shaft 10. The blocks 32 suitably spaced about the inner periphery of the drive ring 23 and the slots 33 therein embracing such inner periphery prevent vertical displacement of the drive ring 23.

When the lever arm 8 is lowered into the position shown in dotted lines in Fig. 5, the arm 45 is released from engagement with the depending dog or projection 43 and brought into engagement with a projection 44 upstanding from the base of the drive ring 23. This arrests rotation of the drive ring 23 and causes, through the frictional engagement of the rubber wheel 24 with the upstanding wall 25, the turret 20 to rotate about the axis of the shaft 10. Thus, a new vessel 5 is brought into registry above the opening in the receptacle 3 resting on the shelf 2. The operator of the apparatus after having dispensed a measured amount of fluid from one of the containers into the receptacle 3 and desiring to dispense a second measured amount of a different liquid from one of the supply containers 5 displaces the lever arm 8 to the lower position shown in Fig. 5, allowing the lever 8 to remain in this position until the next desired vessel is nearly in registry with the receptacle at which point he then raises the lever 8 to the position shown by the solid lines in Fig. 5. This operation causes the arm 45 to engage the projection 43 depending from the turret 20 and arrest the rotatory motion of the turret 20 to bring into position a desired liquid supply container 5, simultaneously releasing the drive ring 23 to permit rotatory or idling motion thereof. During the relocation of vessels step and during the color or liquid dispensing operation, agitation of the contents of each of the vessels 5 is maintained. These steps are repeated until the desired quantities of the selected liquids have been dispensed in response to a given formula.

Other modes of applying the principle of this invention may be employed instead of those specifically set forth above, changes being made as regards the details herein disclosed, provided the elements set forth in any of the following claims, or the equivalent of such be employed.

It is, therefore, particularly pointed out and distinctly claimed as the invention:

1. In an apparatus for dispensing liquids the combination comprising a rotatable turret, a plurality of individual liquid-retaining vessels disposed about the periphery of said rotatable turret, each of said vessels having a vertical shaft extending to the exterior thereof, means coacting with each of said shafts for agitating the contents of said vessels, a plurality of spindles vertically disposed in said turret adapted to coact with each vertical shaft, means for driving at least one of said spindles, drive means for causing relative rotation of said spindles with respect to said drive means including a drive ring in coaxial relationship with said turret and means coacting between said drive ring and said spindles for transmitting relative motion therebetween, and means coacting between the turret and the drive ring for alternatively selectively preventing rotation of said turret and said drive ring while simultaneously alternatively selectively permitting the rotation of the drive ring and the turret, respectively.

2. An apparatus in accordance with claim 1 in which the planetary drive means including a drive ring is characterized by an upstanding peripheral wall and the means coacting between said drive ring and said spindles for transmitting relative motion therebetween includes a rubber wheel in frictional engagement with said drive ring.

3. An apparatus in accordance with claim 1 in which

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the means for alternatively selectively preventing rotation of the turret in said drive ring includes radially spaced projections from said turret and radially spaced projections protruding from said drive ring, and an arresting arm adapted to move into arresting engagement with the projections from the surface of one of said turret and said drive ring and out of engagement with the projections from the other.

4. An apparatus for dispensing liquids comprising a plurality of individual liquid retaining vessels disposed about the periphery of a rotatable turret, each of said liquid retaining vessels having in its lower portion a metering dispensing valve, and a rotatable paddle in the interior thereof, each of said vessels having a vertical shaft extending to the exterior of said vessel to which said paddle is affixed, a plurality of spindles vertically disposed in said turret adapted to coact with each said vertical shaft, and separably coupled thereto, means for driving said spindles including individual spindle sprockets, a centrally disposed driving sprocket, a chain engaging each of said spindle sprockets and said central sprocket,

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and means for rotating said central sprocket, planetary drive means including a drive ring having an upstanding peripheral wall, and means coacting with at least one of said spindles and in frictional engagement with said upstanding peripheral wall of said drive ring for relatively rotating said drive ring with respect to said turret, and means for alternatively selectively preventing rotation of said turret and said drive ring, including a plurality of radially disposed projections from said turret and a plurality of radially disposed projections from said drive ring and an arresting arm for selective engagement with a projection from either one of said turret and said drive ring and out of arresting engagement with any projection of the other.

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