July 24, 1951 M. D. McCAULEY 2,561,525

APPARATUS FOR PROPORTIONAL MIXING OF PAINTS

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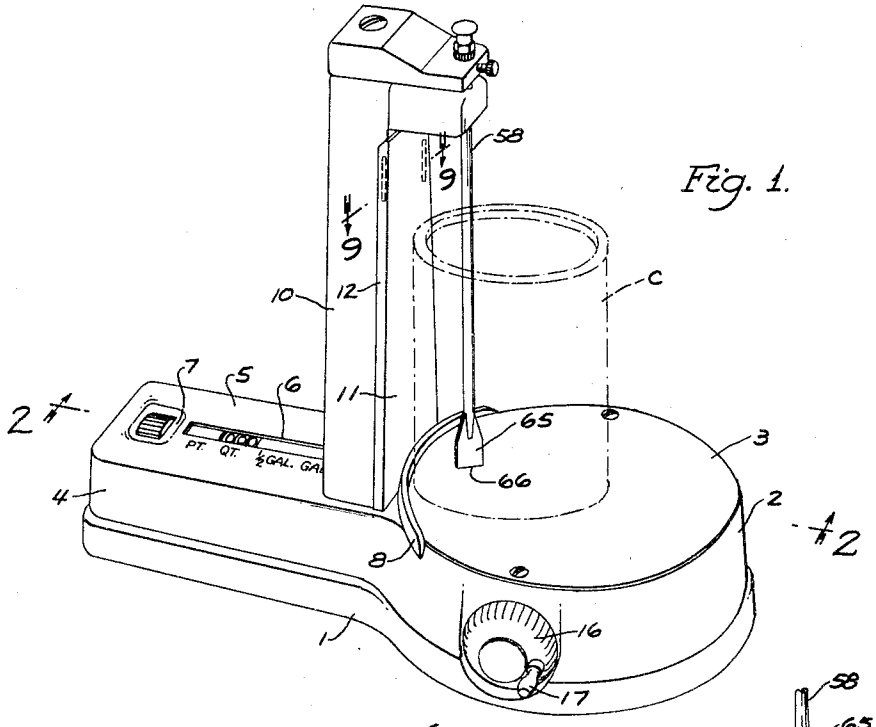


Fig. 1.

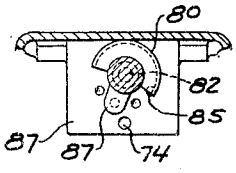


Fig. 3.

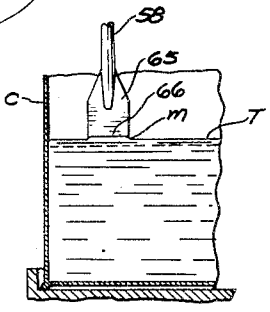


Fig. 4.

Fig. 2.

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Fig. 5.

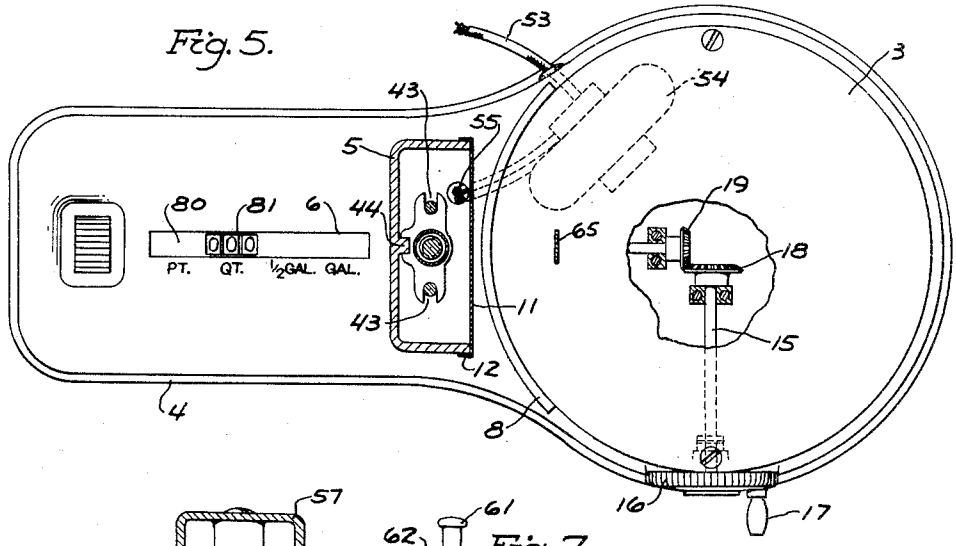


Fig. 6.

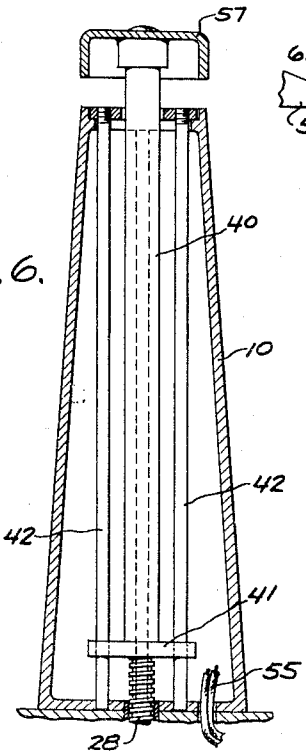


Fig. 7.

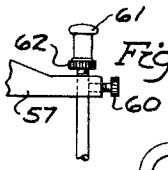


Fig. 8.

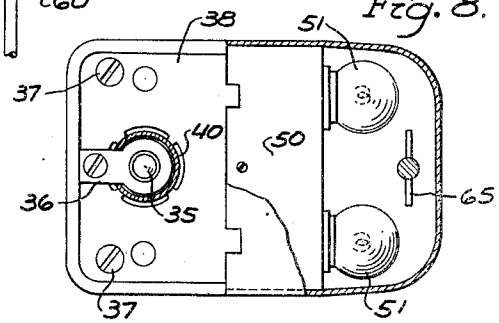


Fig. 10.

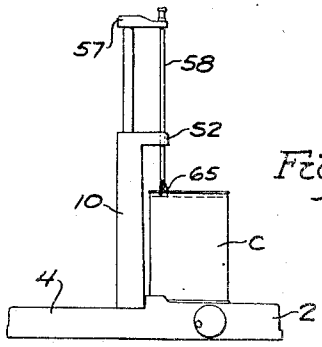
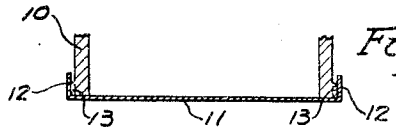


Fig. 9.



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Patented July 24, 1951

2,561,525

UNITED STATES PATENT OFFICE

2,561,525

APPARATUS FOR PROPORTIONAL MIXING OF PAINTS

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Application January 19, 1949, Serial No. 71,677

2 Claims. (Cl. 33—126.7)

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This invention relates to an apparatus for mixing together two or more liquids, and it has to do particularly with mixing such materials as paints, lacquers, varnish, oil, thinners, and other like preparations.

More specifically, the invention is concerned with the provision of an improved apparatus for mixing together a plurality of paints or paint ingredients to thus obtain certain desired colors or shades. For convenience and brevity, the material will be referred to by the broad term "paint." In a paint job shop, which is in the business of painting or repairing automobiles or parts thereof and painting repaired parts thereof, a difficult situation is encountered because of a vast variety of colors, or tints or shades. The ordinary job shop, and particularly one of small size or one in a small community cannot be expected to carry a complete stock of all colors. The colors of automobiles are not only considerable for a given year's production, but automobiles of some considerable age require painting and repaint jobs thereto. Accordingly, a system has been devised whereby a paint shop may have in stock a relatively few base colors and by mixing these colors through the means of a formula supplied by paint manufacturers, the desired color, shade or tint may be obtained.

The invention aims to provide an improved device by means of which paints may be proportionally mixed. Generally speaking, a can or container of known size may be used and when this can is properly filled with the correct proportions of the specified base colors, and the contents thoroughly mixed, the desired paint mixture is obtained. The invention aims to provide improved level indicator to indicate the level of the contents of the container and also an improved illuminating means for illuminating the contents of the container to thus aid in the ascertaining of the level of the contents. The invention also aims to provide an improved arrangement whereby all mechanism and all electrical conductors are completely enclosed. The invention also aims to provide an improved device possessing a high degree of accuracy so that the colors may be quickly and correctly made.

An apparatus constructed in accordance with the invention is shown in the accompanying drawings:

Fig. 1 is a perspective view of the apparatus showing a phantom illustration of a container in place on the platform of the device.

Fig. 2 is an enlarged cross sectional view taken through the apparatus substantially on line 2—2

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of Fig. 1 with some parts broken away and some parts in section.

Fig. 3 is a sectional view taken substantially on line 3—3 of Fig. 2 showing some of the counter mechanism.

Fig. 4 is a view illustrating the action which occurs in determining the level of the liquid in the container.

Fig. 5 is a view taken on line 5—5 of Fig. 2 illustrating some of the parts in plan and showing other parts in section and with some parts cut away.

Fig. 6 is a sectional view taken substantially on line 6—6 of Fig. 2 showing the post construction.

Fig. 7 is an enlarged detail view illustrating an adjustment feature of the level indicator.

Fig. 8 is an enlarged sectional view taken substantially on line 8—8 of Fig. 2 illustrating the top construction of the post and showing the illuminating lamps.

Fig. 9 is a sectional view taken substantially on line 9—9 of Fig. 1 showing a closure piece for the post.

Fig. 10 is an ensmalled side elevation illustrating the apparatus as it is conditioned when a container is substantially full.

The apparatus, as shown in Fig. 1, comprises a hollow base 1 which is somewhat of banjo shape having an enlarged portion 2 with a platform 3 and an extending portion 4 with a top surface 5 provided with an elongated opening 6 and an opening 7. A partial flange 8 rises from the platform 3 and a container, such as a can C, may be positioned against the flange. Rising from the base is a post 10. This post, as shown in Fig. 5, is of channel form so that the open channel faces the platform 3 and the open side of the channel is closed by a closure piece 11. The piece 11 may advantageously be formed of sheet metal with side flanges 12 which engage over the sides of the post and snap or lock behind projections 13 thereon, as shown in Fig. 9.

Operating mechanism is mounted in the base and this mechanism includes a shaft 15 (Fig. 5) which projects through the wall of the housing portion 2 and is provided on its outer end with an operating wheel 16 preferably provided with a handle 17. A bevelled gear or pinion 18 meshes with a gear 19 mounted on a shaft 20 and, in turn, coupled to a shaft 23. A gear 24 on shaft 23 turns a gear 25 for rotating a vertical screw member in the post. This screw member is shown at 28 and its lower end is coupled as at 29 to a stub shaft 30 journalled in the housing and connected to gear 25 and which stub shaft is provided

with vertical thrust resisting means 31. Therefore, it will be seen that if the shaft 15 be rotated that the screw 28 is rotated.

The upper end of the screw, as shown at 35, is journalled in a supporting member 36 secured to the top of the post, and the top of the post has a supporting plate 38 which is fastened in position by screws 37.

There is a split tube member 40 which surrounds the screw and has at its lower end a nut member 41 which is threaded to the screw. A pair of guide rods 42 with lower ends anchored at the bottom of the post and the upper ends anchored in the plate 38 lie on opposite sides of the tube 40 and the nut 41 has extending parts, notched at 43, for slidably engaging the guide rods and the nut may also engage a rib 44 formed in the back of the post.

The split guide tube is arranged to extend slidably through the plate 38, as indicated in Fig. 8, and the member 36 extends between the edges of the split tube and thereby constitutes a key to prevent rotary movement of the tube while the member 36 is enlarged at its inner end and thus forms and internal guide for the tube. It will be seen from this construction that as the screw is rotated, the nut and the tube 40 may be raised and lowered with the nut accurately guided by the rods 42 and rib 44 and with the tube guided also by the plate 38 and the member 36.

At the top of the post is a body 50 for sockets for receiving electric lamps 51 which are covered by a shield 52 arranged to direct the light downwardly. The current for the lamps may be provided by electrical conductors 53 which pass into the housing 2 and the current may be reduced as by means of a transformer 54 extending from which are wires 55 which extend upwardly in the post 10.

On the top of the tube 40 is a head 57 which partially overhangs the platform 3 and depending from this head is a rod 58 for indicating the level of the liquid in the container. The rod freely slides through an opening in the head and may be set by a set screw 60. The upper end of the rod is screw threaded and mounted thereon is a head shaped nut 61 and a lock nut 62.

The lower end of the indicator rod has a blade 65 thereon. This blade is formed of relatively thin sheet metal and the lower edge 66 is straight and positioned horizontally. Thus, the lower edge presents an elongated narrow knife-like formation.

Operated by the shaft 20 are a series of counting mechanisms visible through the opening 6. As indicated there are four of such counters 70, 71, 72 and 73 which are respectively for use with cans of pint, quart, half gallon and gallon sizes, and indicia preferably are placed on the top wall 5 as indicated in Figs. 1 and 5. The counters are driven by shaft 74 and it will be noted that the driving gears therefor are of different sizes, as indicated at 75, 76, 77 and 78.

A shield arrangement is provided so that only one counter is visible at a time through the elongated opening 6. This shield has an elongated curved body 80 with a series of offset openings 81 therein and the shield is pivotally mounted on an axis 82. An operating finger piece 83 projects partially through the opening 7 and it is attached to the shield and in cooperation with the shield is a detent arrangement for holding the shield in any one of its selected positions. This detent may comprise a series of recesses 85 in a plate 86, the plate also serving to provide a

journal support for the shaft 74 and an arm 87 provided with a spring pressed ball 90 for snapping into any of the recesses 85.

The operation of the device is effected by the turning of the handle 17 and this, as above described, rotates the screw, causes an elevation or a lowering of the tube 40 and the head 57 and also operates all four of the counters. In the use of the apparatus an empty can of selected size is placed on the platform 3, as shown by the drawings. If the can is a quart size, the shield 80 is adjusted so that the counter 71 is visible and the other counters are shielded. The counter selected will be the one which corresponds to the size of the container. The counters are preferably arranged to indicate the contents of the containers in one thousand increments. With the can empty the handle is turned until the counter shows a zero reading. At this time, the rod 58 is adjusted so that the blade 65 rests on the bottom of the container and then it is locked in this position as by means of the said screw 60. The operator now refers to the formula for the paint to be mixed and to demonstrate this operation, a sample formula will be given. This sample formula calls for 100 parts of lacquer thinner. The operator turns the handle until the counter 71 shows 100. This elevates the gauge rod 100 increments. Thinner is now poured into the can and the operator watches the rising surface of the thinner and when the surface approaches the blade edge 66 a meniscus is formed as the thinner contacts the blade and as diagrammatically represented at M in Fig. 4. This occurs quickly and the curvature of the surface of the thinner gives a definite light reflection so that the operator can easily see it and the operator immediately discontinues the pouring of the thinner. It will be understood that the two lamps 51 cast light into the container on both sides of the blade so that the operator can notice the formation of the meniscus from almost any position so long as he can see into the can.

The formula shows 816 parts of Chinese blue. So the operator turns the handle until the counter shows 916. The blue paint or lacquer is now poured into the can and as this is done the thinner represented at T in Fig. 4 stays on the surface and rises as the paint is poured into the can. The thinner will contact the blade and the operator then knows that he is to discontinue pouring the Chinese blue. The formula calls for 50 parts of permanent maroon, so the operator elevates the gauge rod until the counter shows 966 and the permanent maroon is poured into the can until the stop indication as the thinner engages the blade. Finally, the formula calls for 34 parts of fine iridescent and the gauge rod is adjusted upwardly until the counter reads 1000, or rather comes back to the zero reading since only three digits may be provided on each counter and the iridescent is poured into the can until the level indicating blade shows that 1000 parts of material has been poured into the can.

The proper ingredients having been placed in the can, the same is removed and the ingredients mixed and the desired color, shade or tint is obtained. It is preferred that the thinner be placed into the can first as this material will ride on the surface of the other liquids and does not substantially wet the blade so that in the successive steps of pouring different materials into the container the blade does not need to be wiped.

Cans of different manufacturers vary as to their construction and it follows that if the next

can differs from the one previously filled, that the gauge rod may be set at the zero reading by the set screw **60**. However, if it be known that several identical cans are to be filled, the nut **61** and lock nut **62** may be used to suspend the gauge rod so that the edge of the blade **66** just rests upon the bottom of the can when the selected counter reads zero. In this way a gauge rod does not have to be set at the beginning of each filling.

I claim:

1. In a device for the proportional mixing of paint, lacquer or the like, comprising, means for supporting a container, a vertically adjustable member, a gauge rod slidably mounted in the member and arranged to depend into the container, a set screw for clamping the gauge rod in fixed position relative to said member and adapted for use with containers of different types, and adjustable nut means threaded on the upper end of the gauge rod for engaging said member and holding the gauge rod depending therefrom in adjusted position relative to said member and adapted for use with containers of the same type.

2. In an apparatus for the proportional mixing of paint, lacquer or the like, a platform having a part for receiving and supporting a container, a raised portion on the platform for positioning the container, a channel shaped post mounted on the platform adjacent said part of the platform and extending upwardly therefrom with its channel opening toward the said part of the platform, means carried at the top of the post for carrying illuminating means in a position which overlies said part of the platform, a hood on the post for covering the illuminating means and directing light downwardly into the container, a screw journalled in the post, means for operating the screw, a shiftable member threaded to the screw and having a head positioned above the post and above the said hood, said head projecting laterally from the post and in substantial alignment with said hood, a gauge element secured to the head and depending therefrom and adapted to depend into the container for gauging the material in the container, and a cover plate detachably secured to the open side of the channel shaped post.

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