

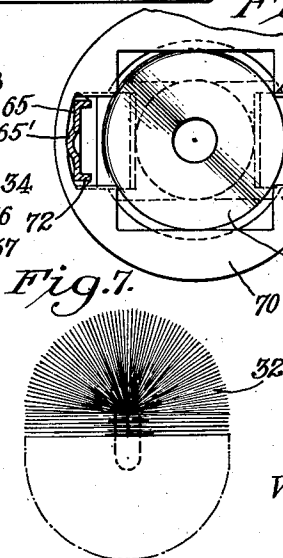
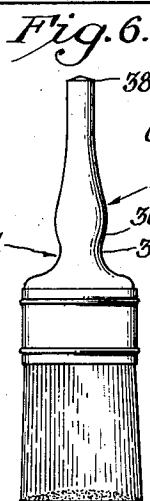
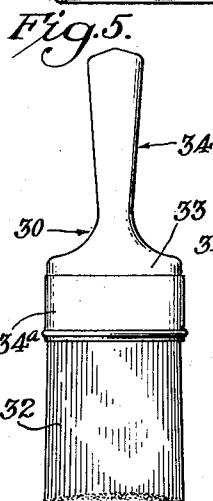
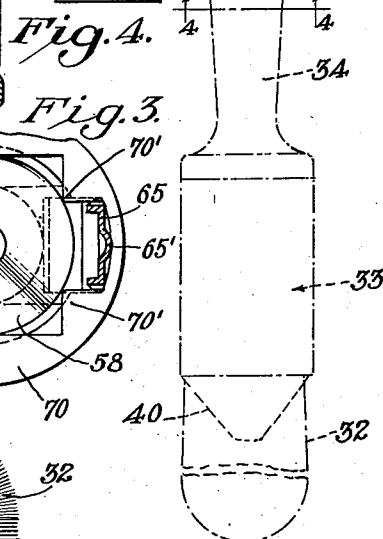
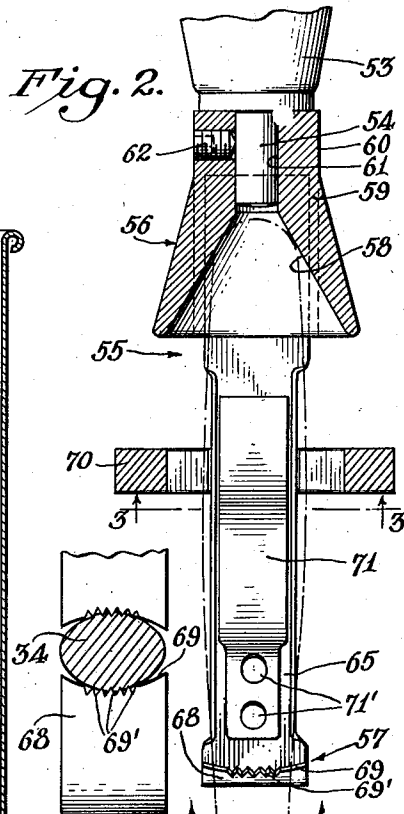
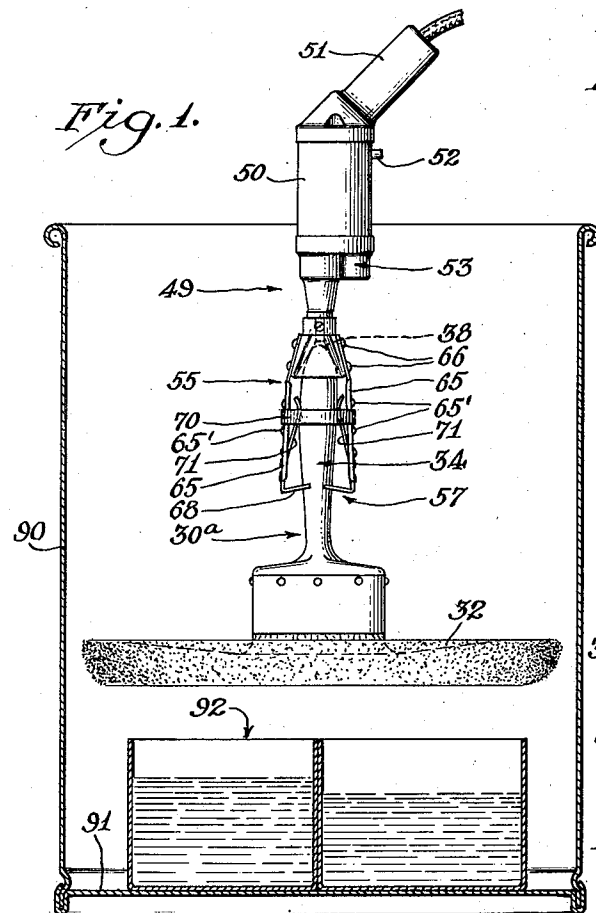
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RENOVATING OF PAINT BRUSHES

Filed Nov. 10, 1939



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RENOVATING OF PAINT BRUSHES

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5 Claims. (Cl. 141—1)

The invention relates generally to the renovating of paint brushes and more particularly to the art of removing encrusted paint from such brushes and preserving the maximum usefulness of paint brushes of the type ordinarily used in applying paint, varnish, or like materials.

In the use of paint brushes it is well recognized that the ease and perfection of the painting operation depends in a large measure upon the thoroughness with which the brush has been cleaned. So far as the preventing of discoloration of a particular paint or painted surface is concerned, by particles of oil or a previously used paint remaining in the brush, the importance of proper brush-cleaning is, of course, obvious. It is also well known that the finish obtained in a particular painted surface varies with the effective length of the bristles of the paint brush, and where inefficient cleaning of the brush has allowed paint to harden in the base of the bristles of the brush, the effective length of the bristles is reduced so that it often produces an undesirable effect on the paint finish.

In prior practice it has been customary for the painter, after soaking a brush in a solvent, such as turpentine, to endeavor to work the paint and the solvent out of the bristles by rubbing the brush back and forth over a waste board or other surface in a manner generally similar to a painting stroke, but with a greater flexure of the bristles; or by beating the brush over an edge of some solid structure such as a fence or post. Such manipulation of the brush tends to loosen and remove the accumulated paint particles and the excess solvent from the base of the brush, but the operation is a tedious, laborious and time-consuming one which at its best does not remove all of the oil, dissolved paint or encrusted paint from the brush base. Furthermore, the use of the "beating" method causes breaking of the bristles, and often results in breakage of the metal ferrule which holds the brush tuft in place on the handle. One of the major difficulties experienced with a brush thus treated arises in subsequent use of the brush in overhead painting. In such overhead use the solvent or oil remaining in the brush base tends to run down the brush handle onto the painter's arms and hands, carrying with it the paint which has been dissolved therein. This causes great inconvenience to the painter and necessitates frequent descent from the ladder or scaffold for the purpose of removing the paint from the painter's arms, hands and clothes. Such retained solvent in the brush base also tends to thin out the first few brushfuls

of paint, so that there is danger of producing undesired variation in the finished surface. This trouble is quite serious where a brush which has been kept in linseed oil overnight is used to apply flat wall paint. In such use the oil, which cannot be completely removed by prior methods, causes glossy spots to be formed on the otherwise dull or flat coated surface.

With respect to the paint which cannot be removed by prior cleaning methods, it is well known that there is a gradual hardening and stiffening within the base of the brush and that a crust of thick paint is formed about and within the base of the brush. This crust of paint becomes relatively hard in the outer layers of the bristles adjacent to the base of the brush and it is common practice for painters, in an endeavor to remove the stiffness thus imparted to the brush, to cut off the stiffened outer layer of bristles, thereby reducing the thickness and width of the brush and resulting in an early discard of the brush. This hardened paint within the base or heel of the brush also reduces the effective length of the bristles so as to have an adverse effect upon the quality of the painted surface.

Since good quality long bristle brushes are relatively expensive, this gradual cutting away of the bristles and the gradual and sometimes uneven reduction in the effective length of the bristles is objectionable and costly.

The aforementioned prior methods of cleaning brushes are such as to require considerable expenditure of time, for example, ten to twenty minutes per brush, and the results of such cleaning are quite unsatisfactory, as above pointed out. An important object, therefore, of the present invention is to enable paint brushes to be cleaned in but a small fraction of the time heretofore required, and with such efficiency as to avoid encrustation and consequent deterioration and reduction in the usefulness or life of the brush.

A further object is to effect an economy in the amount of solvent required in the cleaning of paint brushes, through the provision of a method and means for cleaning brushes whereby the solvent used for rinsing is saved for use as a soaking solution for other brushes.

Another object is to enable paint brushes to be thoroughly cleaned by simple and easily performed operation in which the slight exertion required upon the part of the painter differs radically from the exertion required in normal painting operation, thereby to avoid fatigue which might tend to reduce the painter's efficiency in his normal painting work.

A further object is to enable the painter to clean his brushes rapidly and effectively within the building in which he is performing his work.

Another object is to enable a painter to change from one color, or type of paint, or surface coating to another without the necessity of having a different brush for each type or color which he intends to use, thereby reducing the investment heretofore required in brushes.

Other objects and advantages will become apparent from the following description, taken in connection with the accompanying drawing, in which:

Fig. 1 is an elevational view showing a paint brush cleaning and renovating device embodying the invention, the view being such as to show the device in a sectionally illustrated container in the position employed in the practice of my novel method.

Fig. 2 is a sectional view showing the brush holder of the device of Fig. 1.

Fig. 3 is a sectional view taken through the device on the line 3—3 of Fig. 2.

Fig. 4 is a fragmental sectional view taken along the line 4—4 of Fig. 2.

Figs. 5 and 6 are side views of different types of brushes which may be renovated in accordance with the present invention.

Fig. 7 is a bottom view of the brush shown in Fig. 1 showing the bristles in similar extended positions.

This application is a continuation in part of my co-pending application, Serial No. 263,937 filed March 24, 1939, and abandoned Feb. 28, 1940.

In accordance with the present invention paint brushes such as the large brush 30 of Fig. 5 or the relatively small brush 31 of Fig. 6, or brushes of intermediate or smaller sizes, may be cleaned thoroughly and quickly even though long periods of improper cleaning have produced a crust of hardened paint therein. Brushes such as the brushes 30 and 31 have their bristles 32 secured to and projecting in parallel relation to each other from a wide flat brush head 33, there being a metallic ferrule 34a surrounding a part of the head 33 and base portion of the bristles 32. The bristles are secured within the ferrule 34 by various methods, such as by vulcanizing the base of the brush tuft into a hard rubber body or block, which block is interlocked or nailed to the ferrule. From the opposite side of the head 33 an elongated handle 34 projects parallel to the normal positioning of the bristles 32 and substantially centered with relation to the side and end surfaces of the head 33. The handle 34 is conventionally formed to provide a grip portion 35, adapted to be conveniently grasped by the worker, and in the form shown in Fig. 6 this grip portion tapers outwardly or toward a large diameter as at 36 from a narrow neck portion 37 adjacent the head 33 to an enlarged central portion and then inwardly toward the end 38 remote from the head 33. The end 38 may be rounded as shown in Fig. 1 or may take a more pointed form of Fig. 6, or in some cases may be relatively broad and flat. In such conventional brushes the shape and length of the handles may vary to some extent but in most cases such variation is slight, and the tapered surface 37 is located at substantially the same distance from the end 38 of the handle.

When such a paint brush is used in the normal way, the manipulation or bending of the bristles back and forth with the reversal of the painting

stroke causes an accumulation of paint to occur in the base of the bristles. This accumulation is generally confined to that portion or zone (generally triangular in cross section) of the base of the bristles defined by the dotted lines 40 in Fig. 2, this portion of the bristles being subject to the least amount of flexure in the painting operation. Moreover, when the usual cleaning methods or operations are used upon such a brush, this same lack of appreciable flexure in the zone 40 permits this accumulation of paint to remain in a large measure within the brush. If this encrusted paint in the zone 40 is allowed to harden, there is, of course, a corresponding reduction in the possible flexure of the base portion of the bristles with the result that in subsequent painting operations the zone 40 tends to enlarge in the same manner and for the same reasons as caused its original formation.

In accordance with the present invention paint brushes are cleaned through a series of soaking and rinsing operations in connection with which I apply centrifugal force to the bristles of the brush, and to the paint and solvent in the brush, in such a manner as to loosen and break up the hardened or stiff paint and discharge such paint and solvent from the bristles thereof; and in attaining this result, the brush is preferably so mounted and is rotated at such a speed that flexure of the bristles under the influence of centrifugal force induces a breaking up of the paint in zone 40 and facilitates the discharge of dissolved paint as well as encrusted paint particles from the brush. This desired flexure of the bristles is preferably such as to be, in a measure, the reverse of the flexure which takes place during the building up of the encrusted or hardened paint zone 40 in the base, thereby to cause such flexure of the bristles in my improved cleaning method to break up or tend to break up the encrusted paint in zone 40 and thereby facilitate its removal or discharge from the brush.

Thus, in the practice of my improved method of cleaning paint brushes, in its preferred mode, I soak the brush in a suitable solvent such as turpentine until the paint in the brush has been softened and dissolved at least in part; and thereafter the brush is rotated within a protective enclosure substantially about the axis of the brush handle, and at a rapid rate such that the bristles are caused to bend outwardly toward a generally radial relation to the axis of rotation, with the bend in the bristles extending down into the zone 40. It will be evident, of course, that in such an operation the speed of rotation will increase, relatively gradually, from zero to the maximum or final speed, and that as the speed increases, the bristles most remote from the rotative axis will first be bent or flexed, and that the flexure of the bristles will progress toward the axis as the speed increases. Thus the first flexed bristles will tend to separate from the still unflexed or less flexed bristles which are closer to the rotative axis, thereby to separate or tend to separate from the main body of encrusted paint any paint which is attached to such first flexed bristles. As a consequence there is a progressive separating or breaking up of the encrusted paint, and during such progressive action the discharge of the paint particles, or solvent carried by or attached to the progressively flexed bristles is facilitated by the separation of such bristles from each other or from the less flexed bristles.

Where the axis of rotation passes through the base of the bristle mass, as where the brush is rotated about the axis of the handle, the ultimate speed of rotation must be such that the bristles adjacent the rotative axis will be flexed in a substantial degree at their base portions or within the zone 40. The ultimate speed required to effect such flexure in the base portion of the central bristles varies with the effective length of the bristles, the speed required to properly flex a long bristle brush being considerably less than the ultimate speed required with a short bristle brush. As the speed of rotation of a brush is increased, it will be observed that there will be a hollow cone-shaped void formed centrally of the brush tuft, indicating flexure of all of the bristles away from the rotative axis. Thus, when the paint within the brush has been sufficiently softened, a large part of such paint will be discharged from the bristles by rotation at a speed sufficient to produce such a conical void in the brush tuft. At this speed, however, a considerable period of rotation is required; and the separating or breaking force applied to the central portion of any encrusted paint in the zone 40 is practically negligible, so that the desired breaking up of the paint in zone 40 will not be attained; and since it is desirable to reduce the time required both as to soaking and as to the rotative operation, and since the destruction of the stiffening paint mass in zone 40 is desired, I prefer to employ speeds considerably in excess of the speed defined by the initial formation of a conical void in the brush tuft, or defined by flexure of all the bristles where other axes of rotation are employed. By the use of such higher speed of rotation, the outwardly flexed bristles are caused to exert a substantial lateral pull on any encrusted paint in the zone 40, thereby causing quick and effective destruction and removal of this objectionable brush-stiffening mass. Moreover, the added centrifugal force causes quicker and more complete discharge of the paint and solvent from the brush. In practice it has been found that where a properly soaked brush of a five inch bristle length is rotated about the axis of its handle from zero speed up to 780 revolutions per minute, substantially all of the solvent and most of the encrusted or hardened paint from the zone 40 will be discharged during a sustained rotational period of less than 30 seconds. In the commercial practice of my invention this initial cleaning of the brush is followed by from one to three relatively short rinsing operations each of which involves dipping the bristles in a relatively clean solvent, and then discharging the solvent by a short period of rotation, say 5 to 15 seconds, as in the initial cleaning operation. If an ultimate speed of less than 780 revolutions per minute is employed with a brush of this bristle length, the time allowed for each operation, including the preliminary soaking of the brush, must be considerably lengthened in order to attain the desired degree of paint removal. Similarly, an increase in the ultimate speed of rotation of the brush about its handle axis makes it possible to reduce the operating periods to a slight extent, but I prefer to avoid undue speed because of the accompanying necessity for increased accuracy of mounting and balancing of the brush with relation to the rotative axis.

The minimum speed required for various brush or bristle lengths varies in substantially predetermined relation to such bristle length, although

it is possible that in some cases the portion of the bristles within the stiffened zone 40 may be so firmly held in place as to introduce a slight variation in the required minimum speed. This variation is most noticeable, of course, in brushes having relatively short bristles, such for example as a brush having bristles two inches long, where a half inch of stiffened bristle in the zone 40 will reduce the effective or initially bendable length of the bristles to one and one-half inches. Theoretically this relatively large reduction in the initially bendable length of the bristles would require a considerable increase in the minimum speed, but in practice, this is not necessary since those brushes which are in a badly caked or stiffened condition may be soaked for longer periods and in more active solvents than are usually used. The caked or stiffened portion is thereby removed in the rotation of the brush as above described, and after the brush has thus been restored to a substantially normal degree of flexibility, substantially the full bristle length will become effective in the cleaning operation.

From various tests to determine the minimum operating speed for several bristle lengths, an approximate algebraic formula for the minimum effective speed may be derived from the fundamental formula for centrifugal force. In deriving this formula I have taken the minimum effective speed to be that speed which attains the desired flexure of the most central ones of the bristles of a brush. The formula for centrifugal force is:

$$(A) \quad CF \text{ equals } \frac{W}{g} (2\pi N)^2 r$$

Upon the assumption that the same centrifugal force or outward pull on the central bristles is required for any bristle length, we may equate a known and satisfactory set of conditions in the above formula against a second set of conditions where all factors are known except the required minimum speed. In setting up such an equation, the varying stiffness of various types of bristles is disregarded, and the weight of the bristles per unit of length is taken as uniform and equal in the two brushes under consideration; and the term W is therefore replaced by the term KL, representing the bristle length in units, such as inches, multiplied by a constant K representing the weight per unit of length. Thus we have the following equation:

$$(B) \quad \frac{KL_1 (2\pi N_1)^2}{g} \cdot \frac{1}{60} \cdot r_1 \text{ equals } \frac{KL_2 (2\pi N_2)^2}{g} \cdot \frac{1}{60} \cdot r_2$$

Assuming further that the radius of gyration in each case is a function of the bristle length, such as a constant C multiplied by the bristle length, the formula becomes:

$$(C) \quad \frac{KL_1 (2\pi N_1)^2}{g} \cdot \frac{1}{60} \cdot CL_1 \text{ equals } \frac{KL_2 (2\pi N_2)^2}{g} \cdot \frac{1}{60} \cdot CL_2$$

and cancelling,

$$(D) \quad (L_1)^2 \cdot (N_1)^2 \text{ equals } (L_2)^2 \cdot (N_2)^2$$

$$(E) \quad N_2 \text{ equals } \frac{L_1 \cdot N_1}{L_2}$$

By use of the foregoing formula, a speed known to be satisfactory for a particular bristle length may be used to derive a constant, which, when substituted for the quantity $L_1 N_1$ will define the approximate minimum speed in terms of bristle length.

Thus, it has been found that a speed of 1300

R. P. M. is satisfactory for a bristle length of 2 3/4 inches, and substituting these values, we have

$$(F) \quad N \text{ equals } \frac{3575}{L}$$

In other tests it has been found that as the speed and bristle length are varied, the proper and desired removal of the encrusted paint is attained for all situations where the constant in the above formula is substantially 3500; and that the efficiency of paint removal falls off very rapidly as the constant varies from about 3300 down to 3000. Thus it is desirable to maintain this constant above 3300.

It has also been found that as the speed for a particular bristle length is increased so that this constant increases above 3700, very little added efficiency of paint removal is attained; while the danger due to high speed rotation with a slight eccentricity in the mounted brush is materially increased. This danger is relatively slight so long as the speed for each particular bristle length is maintained at such a figure that the constant in the above formula is relatively close to 3500.

Therefore, I prefer to maintain the constant at between 3300 and 4000; although there may be some variation from these figures. Thus the preferred speed for brushes of different bristle lengths may be defined as

$$(G) \quad N \text{ equals } \frac{3500}{L}$$

where N represents the speed in revolutions per minute and L represents the bristle length in inches.

In accordance with the present invention, the brush cleaning operations may be performed on the job through the use of the compact, portable tool 49 illustrated in Fig. 1, which tool forms a part of the present invention and is designed in view of the foregoing analysis to impart the required minimum rotative speed to various sizes or weights of brushes without unduly exceeding such minimum for any size or weight of brush. By maintaining the speed relatively close to the minimum for each particular bristle length, danger due to improper centering or clamping of the brush is minimized. In the tool 49 a universal motor 50 of elongated narrow form is provided, having a pistol grip 51 and control switch 52 at one end, and a reduction gear mechanism 53 at the other end with a terminal or output shaft 54. On the output shaft 54 is a brush holder 55, as shown in Figs. 1 to 4, being constructed to receive and clamp any one of the usual size paint brushes with the longitudinal axis of the handle thereof centered on the axis of the output shaft 54. In attaining such centered mounting of a brush, such as the brush 30a of Fig. 1, the brush holder 55 is provided with a first centering means 56 (Fig. 2) adjacent to the end of the shaft 54 and operatively engageable with the end 38 of the brush handle 34 to center the same on the shaft axis, and a cooperating centering and clamping means 57 spaced axially from the centering means 56 and adapted to clamp and center the portion of the brush handle adjacent to the neck 37 or the head 33. The centering means 56 is such that it may be engaged by the handle 34 in an endwise approaching movement of the handle, and in the form shown in Fig. 2 constitutes a substantially conical recess 58 centered on the axis of the shaft 54 and facing away from said shaft. With such a conical surface, the ends of various handles

may be readily and easily engaged to attain the desired centering action. The centering recess 58, as shown in Figs. 2 and 3, is formed in one end of a generally conical hub 59, the other end of which is reduced, as at 60, and has an axial bore 61 formed therein to embrace the end of the shaft 54. The hub 59 is secured to the shaft 54 by means such as a radial set screw 62 passing through the reduced portion 60 of the hub 59.

The clamping and centering means 57 is also mounted on the shaft 54, for rotation therewith, and where a relatively large body such as the hub 59 is used in the centering means 56, the clamping and centering means 57 is mounted thereon. Thus as shown in Figs. 1 to 4, the clamping and centering means 57 comprises a pair of similar arms 65 secured as by screws 66 on flattened opposite sides of the hub 59 so as to extend along opposite sides of the shaft axis. At a considerable distance from the hub 59 the arms 65 have inwardly bent jaws 68 with handle-engaging arcuate ends 69 at their ends adapted to embrace and properly center a brush handle adjacent to the neck thereof. Preferably these arcuate ends 69 are toothed as at 69'. As herein shown the jaws 68 are bent to an acute angle relation with the main body of the arms 65, and the arms 65 as well as the jaws are formed from a resilient metal such as strips of spring steel. The arms 65 normally diverge from their clamped positions shown in Fig. 1, so that the jaws 68 are separated by a distance sufficient to allow insertion of a brush handle therebetween. Means is provided for urging the jaws 68 to clamped relation to a brush handle, and in the form shown in Figs. 1 to 3, this means comprises a clamping ring 70 embracing the two arms 65 and adapted to be slid away from the hub 59 and toward the extreme ends of the arms 65. In this movement, the ring 70 forces the diverging arms toward each other to engage the jaws with the handle thereby centering the brush in the holder. It has been found that the jaws 68 then act with a resilient force to hold the brush handle in the desired endwise engagement with conical centering means 56.

In the form shown in Figs. 1 to 4, the arms 65 have leaf springs 71 secured thereto adjacent their free ends of the arms, as by rivets 71', and the free ends of these leaf springs 71 are located relatively close to each other near the recess 58. When the end of a brush handle is moved into the recess 58, this handle is first gripped or held between the leaf springs 71 so as to aid in holding the brush in place while the arms 65 are moved to their clamping positions. The springs 71 also aid in centering the end of the brush handle in the event that the user does not properly seat the handle in the recess 58. If desired, the inner surface of the ring 70 may be cruciform in shape so as to provide interengagement with the arms and thereby prevent rotation of the ring. With this form, the inwardly projecting corners 70' engage the end of the hub 59 to limit the retraction of the ring 70. Preferably the arms 65 are inwardly flanged as at 72 along the major portion of their side edges, as shown in Figs. 1 to 3, thereby stiffening the arms and assuring proper and efficient application of the clamping force when the ring 70 is advanced toward the ends of the arms 65. It will be noted, however, that the arms 65 are unflanged immediately adjacent to their point of connection with the hub 59, and it is in this unflanged portion that the flexure of the arms takes place.

The arms 65 and the jaws 68 are so proportioned that the clamping faces 69 are relatively close together when the ring is advanced the full length of the arms, thereby to clamp brushes with slender handles while in various intermediate positions of the ring 70, thicker brush handles are clamped between the jaws. To prevent rearward displacement of the ring 70 in case its forward clamping movement has been insufficient, I provide a series of three or more outward projections or buttons 65' disposed at spaced points along the arms 65 so as to have a slight engagement with the ring 70 as it is moved along the arms 65. These projections or buttons 65' may be formed in the same stamping operation as the flanges 72 of the arms 65.

The clamping and centering means 57 and the conical centering recess 56 of the tool shown in Figs. 1 to 4 are so spaced axially of the shaft 54 that they may be operatively engaged with brush handles of various commercial shapes, the operative ends of the jaws 68 preferably being spaced from the bottom of the recess 56 a distance of approximately 5 inches. This spacing is of course related to the steepness of the angle of the sides of the recess, and the dimension herein given is predicated upon the use of the angle or proportioning herein shown for the recess 56.

Where a high speed universal motor such as the motor 50 of Fig. 1 is employed, I prefer in the commercial application of the invention, to use a gear reduction which produces an unloaded speed of substantially 1400 revolutions per minute in the shaft 54. Such speed is somewhat less than would be indicated as a minimum for short bristle brushes, say 2 inch, and is used advisedly by reason of various commercial considerations. This speed of 1400 R. P. M., however, operates to properly clean brushes of a 2½ inch bristle length. Such deviation, in practice, from the indicated minimum speed, is one of practicability, involving the relative cost and importance of short bristle brushes which are the only ones affected. As compared with large brushes having three inch to five inch bristles, the first cost of small or short bristle brushes is relatively small; and hence the most important use of the present method and apparatus is with these larger and more expansive brushes. Even with a tool having an initial or unloaded speed of 1400 R. P. M., the smaller brushes are cleaned quite thoroughly, and by reducing the initial or unloaded speed of the tool as above suggested the problems of properly clamping and centering the brushes are materially simplified.

In practice, which a gearing which gives an output shaft speed of 1400 R. P. M. from an unloaded motor speed of 20,000 R. P. M., the placing of a brush in the holder causes a reduction in speed which is dependent upon the weight and size of the brush. With such a gearing and such an unloaded motor speed, a relatively small and inexpensive motor may be used, and this reduction in speed is such that the various larger sizes of brushes, such as those having 3, 4 and 5 inch bristles, are in every instance rotated at a speed exceeding that indicated by the formula as the minimum speed for proper cleaning.

By employing, with the gearing above described, a series wound universal motor known commercially as Type 69, having an unloaded speed of 20,000 R. P. M., and made by Speedway Manufacturing Co., of Cicero, Illinois, I have found that with the various sizes of commercial paint brushes between 2½ and 5 inch bristle length, the

rotation speed imparted to the brush is in every instance at or above the minimum speed indicated in the foregoing formula, but is sufficiently close to said satisfactory minimum to avoid danger due to improper centering of the brush.

It must be contemplated that the brush will in many cases be mounted with its center of gravity slightly eccentric with respect to the axis of rotation of the brush holder, but so long as the speed of rotation is maintained relatively close to the figure indicated by the foregoing formula, such slight eccentricity will be found to be immaterial.

Such eccentricity will, of course, cause a slight wobbling of the tool, and this wobbling would, in a stationary mounting of the shaft 54 cause a constantly increasing vibration to be set up which would eventually cause breaking of the brush handle, or displacement of the brush. In the portable tool of the present invention, this is avoided, since the energy of such wobbling of the brush is dissipated by producing a wobbling of the entire tool. In practice it is found that the painters normally grasp and support the tool at the gear casing 53, and that any wobbling of the tool is thereby rendered unobjectionable. Thus, with the present tool, absolute accuracy of mounting of the brush is rendered immaterial, and its use is rendered practical.

In the practice of my invention, with the tool herein shown, the several brushes to be cleaned are first soaked in a solvent such as turpentine for a period depending on the stiffness or hardness of the paint in the brush. A brush is then mounted in the brush holder and the tool is positioned as shown as Fig. 1 of the drawing within a shield or container 90. This container 90 may be of the size or type usually sold as garbage receptacles, the width of the can being sufficient to allow the bristles of a large size brush to be thrown to radial positions as shown in Fig. 1 without touching the sides of the container. The motor 50 is then started so as to rotate the brush about its axis at high speed within the receptacle, and in such rotation the paint and solvent are thrown outwardly from the brush against the side wall of the container, so that the discharged solvent is collected at 91 in the bottom of the container. This collected solvent may then be re-used for subsequent brush soaking operations.

After a period of rotation of about 30 seconds at the proper speed, as hereinbefore indicated, it will be found that the brush will be practically dry and that most of the paint will have been removed therefrom. The brush is then rinsed by a similar operation, and to facilitate such rinsing I place a multiple compartment receptacle 92 centrally in the bottom of the container 90. In the compartments of the receptacle 92 a suitable rinse solution such as turpentine is contained, and after the initial cleaning operation the brush is dipped into the relatively clear solvent of the rinse receptacle, and is then rotated within the container 90 as before for a period of from 5 to 20 seconds. Thus the rinse solution is also collected and conserved in the bottom of the large container for subsequent brush soaking operations. After from one to three rinsing operations the brush is found to be clean and relatively dry so as to be ready for use with another type or color of surface coating.

I have found in practice that in normal commercial painting work the brushes can be cleaned in from 90 seconds to two minutes each, including the time required to load and unload the

brush, and that in every instance the brushes are in far better condition than when from 10 to 20 minutes has been spent in endeavoring to clean them by prior methods. In fact, with the present method, a brush used with green paint may be so thoroughly cleaned, within less than two minutes, that it may be used immediately and satisfactorily with clear lacquer or clear varnish, a result which has heretofore been impossible.

From the foregoing it will be apparent that the present invention provides a method and means for cleaning paint brushes whereby higher quality work is assured in the painting operations performed with such brushes. Such higher quality performance is due in part to the fact that through the use of the present invention all of the encrusted paint from the brush is effectually removed thereby preventing the deposit of such particles on the painted surface. Moreover, the thorough removal of the hardened paint at the base of the brush also restores the bristles of the brush to their full effective length so as to cause a more even and desirable application of the paint.

In addition to the foregoing advantages the present invention prevents the formation of undesired blemishes in the painted surface such as are often caused by the retention of paint of an undesired color in the base of the brush. Where brushes are cleaned in accordance with the present invention substantially all of the solvent is removed from the brush, thereby preventing thinning of the paint and also avoiding the marked inconvenience which often results when such solvent runs down the handle of a paint brush used in overhead work on to the workers' hands and clothes. The present invention is particularly valuable in enamel and varnish work where absolute cleanliness of the brush is desirable; and it makes it unnecessary for the painter to carry special brushes for each color of enamel and for each type of varnish.

It will also be apparent that the present invention results in a great economy of time insofar as the cleaning operation per se is concerned, for the present invention enables the brushes to be cleaned much faster than has heretofore been possible. The cleaning operation of the present invention is particularly advantageous by reason of the fact that it may be carried on within the building in which the painting operation is being performed thereby saving the time usually required when the painter performs the cleaning operation outside of the building. The economy effected by the present invention also extends to the brushes themselves since it is apparent that cleaning of the brushes by the method and apparatus herein described does not damage the bristles. In addition the present invention obviates the need for trimming the outer layer of bristles to remove the encrusted paint, and by its use prevents dried or stiffened paint from accumulating in the heel or base of the brush. The life of the brush is thereby materially increased and the brushes are maintained in their maximum state of usefulness with the maximum bristle length available at all times. In many instances the present invention has been, and may be, utilized to restore old and discarded brushes to a useful state through the removal of stiffened and hardened paint from the heel thereof.

In addition to the foregoing features of economy with relation to the brushes it will be noted that the present invention also reduces the in-

vestment required in brushes since the painter may carry a relatively small number of brushes with him and yet be able to change from one color or coating material to another at will. This avoids the necessity for having an individual brush for each color or type of paint which is to be used.

Through the use of the present invention a marked economy of solvent is also effected since the solvent used as a rinse is collected as an incident to the cleaning operation so that it may serve as a soaking solution for further cleaning operations.

Hence, while I have illustrated and described a preferred embodiment of tool for the practice of my invention, and while I have described the preferred mode of practice of my invention in considerable detail, it is to be understood that these are capable of variation and modification and I therefore do not wish to be limited to the precise details set forth, but desire to avail myself of such changes, alterations and variations as fall within the purview of the following claims:

I claim as my invention:

1. The method of cleaning accumulated paint or like surface coating material from a paint brush having an elongated handle carrying bristles normally extending substantially parallel to the longitudinal axis of the handle which consists in soaking the brush in a suitable solvent until the paint in said brush has been softened and dissolved at least in part and rotating said brush about substantially the axis of its handle so that the bristles assume positions approximating a radial relation to the axis of such rotation and at such a speed that the dissolved paint and the solvent will move along the bristles and be discharged from the ends thereof.

2. The method of cleaning paint brushes which consists in soaking the brush in a suitable solvent until the paint or other surface coating material has been softened and dissolved at least in part and rotating said brush about substantially the longitudinal axis of its handle at a rotative speed of substantially

$$\frac{3500}{L}$$

L

revolutions per minute, where L equals the length of the bristles in inches.

3. The method of cleaning and removing accumulated paint or like surface coating material from a paint brush which consists in soaking the brush in a suitable solvent until the paint in said brush has been softened and dissolved at least in part and rotating said brush about substantially the longitudinal axis of its handle at a rate of rotation sufficient to bend all of the bristles outwardly away from said axis.

4. The method of cleaning accumulated paint or like surface coating material from a paint brush having an elongated handle carrying bristles normally extending substantially parallel to the longitudinal axis of said handle which consists in soaking the bristles of the brush in a suitable solvent until the paint in said brush has been softened and dissolved at least in part, and rotating said brush about substantially the axis of its handle from a zero speed up to a speed of substantially

$$\frac{3500}{L}$$

L

revolutions per minute, where L equals the length of the bristles in inches, so that as the rotative

speed of the brush increases the bristles adjacent the outer edge of the brush are first bent outwardly so as to break up the paint about such bent bristles and whereby the bristles are successively bent outwardly away from said axis until finally all of the bristles including the bristles located at said axis are bent outwardly so as to progressively break up the paint in the brush and

discharge the solvent and paint from the brush.

5. The method of cleaning paint brushes as defined in claim 4 wherein said rotation of the brush is terminated after a short period and the brush is again dipped in a solvent and again rotated as defined in claim 4.

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