

May 5, 1959

M. M. KRUGER

2,884,709

PAINT BRUSH AND ROLLER COVER CLEANING APPLIANCE

Filed April 25, 1957

FIG. 2.

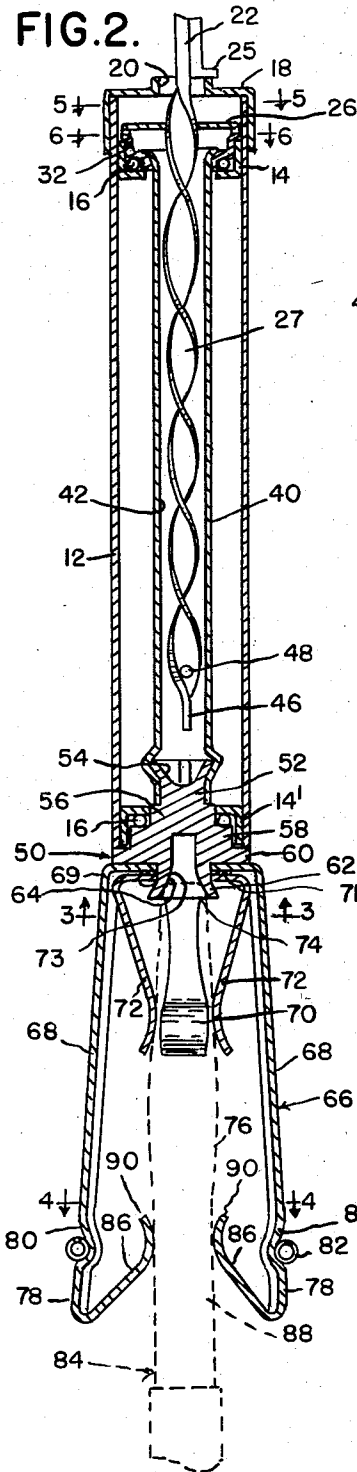


FIG. 7.

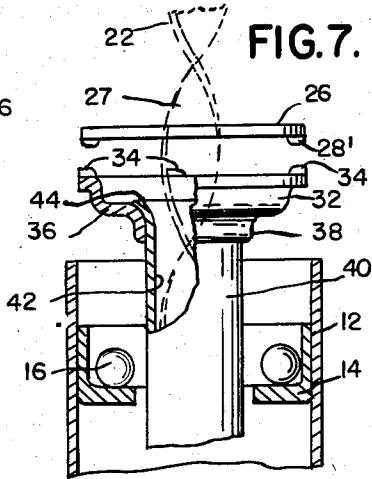


FIG. 5.

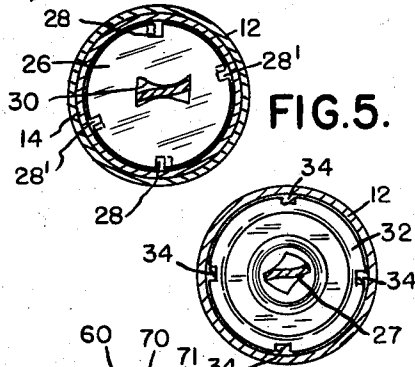


FIG. 6.

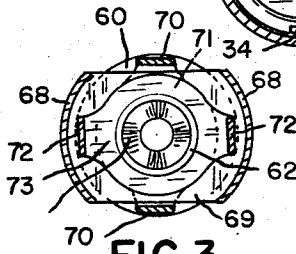


FIG. 3.

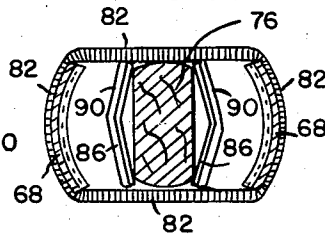
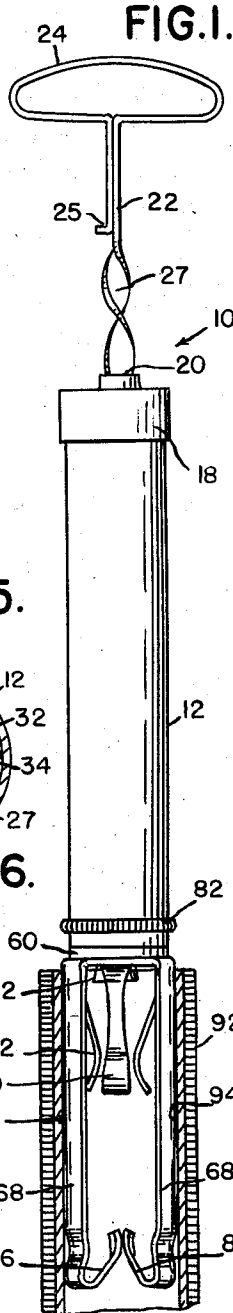


FIG. 4.



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2,884,709

PAINT BRUSH AND ROLLER COVER CLEANING APPLIANCE

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Application April 25, 1957, Serial No. 665,619

(Filed under Rule 47(b) and 35 U.S.C. 118)

5 Claims. (Cl. 34—58)

This invention relates to a novel and inventive paint brush and roller cover cleaning appliance, and more particularly to an appliance in which the brush or roller cover is mounted longitudinally of the appliance at one end thereof and rotated by a drive mechanism that is actuated by thrusts along the axis of the appliance at the other end thereof.

It has long been known that centrifugal force can be employed to extract paint from paint brushes and paint roller covers. The instant invention involves one type of device or appliance that utilizes such force in a most efficient and efficacious manner. The usual practice is to first soften and dissolve and loosen the paint in the bristles of the brush or in the fibrous cover of the roller by soaking with a paint solvent. The brush is then subjected to a spinning action on its longitudinal axis at a speed so that the bristles are flared outwardly. The spinning speed depends on a large number of factors, any one of which may control the rate of paint extraction. Therefore, it is not particularly significant that one factor or another is of importance. The best way known to applicant is to make a visual examination from time to time of the results of the spinning of the brush or roller cover.

The device here disclosed employs the principle of centrifugal spinning in a novel and unique construction which can be produced economically and in an arrangement widely acceptable by the painting trade and the general public.

The invention comprises a barrel, a push rod operated at one end of the barrel to drive a tubular shaft in one direction only, the shaft being connected at its opposite end to an adaptor arranged at the end of the barrel to support a set of fingers for holding either a paint brush or a paint roller cover.

The push rod operates against a freely movable butterfly disc that engages projections on a collar or wheel mounted at the upper end of the tubular shaft. The adaptor rotates upon movement of the shaft to rotate the finger mechanism whereby the paint brush or roller cover is swiftly rotated upon thrusts of the push rod to centrifugally disperse entrapped paint or solvent from the brush or roller cover.

This invention includes improvements over my previously filed United States patent application, Serial No. 424,587, filed April 21, 1954, for "Paint Brush and Roller Cleaning Appliance," now Patent No. 2,794,265.

It is an object of the invention to provide a new and improved butterfly drive disc that will increase the period of effective use thereof. Another object is to provide a new unitary adaptor that anchors the finger mechanism to the drive shaft, provides a race for ball bearings, and firmly anchors the finger gripping mechanism at the end thereof. Still another object is the provision of a compact simple and highly effective device to clean paint from brushes or roller covers with a minimum of effort and by the use of centrifugal force.

These and other objects of the invention and features of construction will become clearly apparent from the

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description below, in which the terms are used for purposes of description and not of limitation. Referring now to the drawing annexed hereto and forming an integral part hereof, and in which the reference numerals refer to the same parts in the various views:

Fig. 1 is a front elevational view of a preferred embodiment of the appliance of this invention.

Fig. 2 is a vertical sectional substantially central view of the appliance shown in Fig. 1.

Figs. 3 and 4 are horizontal sectional views at the lower end of the appliance taken on the lines 3—3 and 4—4 of Fig. 2.

Figs. 5 and 6 are horizontal sectional views at the upper end of the appliance taken on the lines 5—5 and 6—6 of Fig. 2.

Fig. 7 is an enlarged vertical view, partially in section, at the upper end of the appliance, showing the drive mechanism.

As shown in the several views of the drawing, in the preferred embodiment of the invention, the paint brush and roller cover cleaning appliance 10 comprises a barrel 12 in which are mounted, at each end, two cups 14 and 14', to receive and contain balls 16, which serve as bearings. At the upper end of the barrel 12 is a cap 18 provided with a round opening 20 through which a uniformly twisted driving push rod 22 will easily pass. Push rod 22 is provided with a manual grip portion 24 so that it can be easily operated, i.e. withdrawn upward and then pushed downward through cap 18. Push rod handle 24 is provided with a stop flange 25 to limit the forward movement of push rod 22.

A butterfly disc 26 is located freely slidable on the twisted portion 27 of the push rod 22, under cap 18. The disc 26 is a round metallic disc rather than a rectangular piece, or other shape. It has been found that a driving member, which acts as a clutch to engage with a driven member and to disengage therefrom, in a configuration substantially other than round has tended to jam or lock, albeit momentarily, upon action by the push rod 22. This will be appreciated when it is understood that the clutch element, represented by the disc 26, is a freely moving part on the twisted driving portion 27, and that the amount of clearance between the two parts must be such as to provide a free and easy movement between them. As use of the device increases, the amount of wear does also, and a point is reached when a smooth and easy operation is interrupted by twisting or cocking of a rectangular or similar clutch element on the push rod blade 27. This defect is avoided by the design of the disc 26, here disclosed, which is round in form so that it seats freely within the barrel, about its internal periphery, and the danger of cocking or twisting to interrupt a smooth operation is avoided. This disc is provided with four downwardly projecting nicks or driving fingers 28 and a central opening 30 through which push rod 22 is freely movable. Opening 30 is substantially rectangular in shape, conforming closely, but not exactly to the cross-section of the twisted push rod portion 27. It was found that a sort of butterfly shape was especially effective as the configuration for opening 30. The disc lugs or drive fingers 28 are not uniformly spaced, as shown, but rather are arranged so that one pair of lugs, 28'—28', is less than 90° with respect to the other pair of lugs 28—28. In this way, only one pair of the disc driving fingers will engage the driven member or wheel 32, located directly below the disc 26, at any one time. In such event, the life or effective period of use of the butterfly disc is increased at least two-fold, for only one pair of the lugs operates at a time. This is more clearly understood when it is observed that the wheel 32 is provided with upwardly projecting lugs 34 spaced equally, 90° apart, on the

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peripheral edge thereof to engage with the downwardly disposed lugs or driving fingers 28—28 or 28'—28'.

The driven wheel 32 is provided with a base portion 36 and a hub 38 that seats upon the balls 16 as a race therefor, so that upon being driven by the push rod 22 through the clutch butterfly disc 26 the wheel 32 will turn easily and freely in the cup 14 at the top end of barrel 12. A tubular drive shaft 40, having an internal bore 42 adapted to receive the twisted portion 27 of the push rod 22 in a sliding fit, is fixedly mounted at its upper end 44 to the hub 38 of the driven wheel 32 by peening and swaging at the hub 38.

It will be noted in Fig. 2 that the lower end 46 of push rod portion 27 is provided with a stop pin 48 that limits upward or reverse travel of the push rod. This occurs when the push rod 22 is drawn back through shaft bore 42, butterfly disc bore 30, and cap opening 20 until stop pin 48 contacts the butterfly disc 26, where the push rod is stopped in its rearward travel, bringing the disc 26 up against the cap 18.

At the lower end of barrel 12, cup 14' provides an upper raceway for balls 16 which roll upon an adaptor or coupling member 50. As shown in Fig. 2, this adaptor is arranged with an upper portion 52 that is flared into the tubular shaft 40 by a punch driven down into the tapered hole 54, to fixedly mount the adaptor in the drive shaft. A hub 56 is rotatable in cup 14' and a race 58 for balls 16 seats in the cup, the adaptor terminating with an annular flange 60 and a lower hub 62 having a blind hole 64 therein.

At the lowermost end of adaptor 50 is the paint brush or roller cover gripping mechanism 66, which comprises a unitary pair of outer fingers 68—68 of heavy section connected by a web 69, and two unitary pairs of inner fingers 70—70 connected by a web 71 and 72—72 connected by a web 73 of substantially lighter section arranged at right angles to each other. Each unitary pair of fingers is provided with a bore through which the adaptor hub 62 will pass. When arranged as shown in the several views, Figs. 1, 2, 3 and 4, the hub 62 is flared out by a punch passed into blind hole 64 to mount and affix the unitary pairs of fingers to adaptor 50, at flange 60, in a firm and positive manner.

The inner unitary pairs of fingers 70—70 and 72—72 are arranged to seat the upper tip end 74 of a paint brush handle 76, so that the handle tip 74 will rest in the flared out blind hole 64 in alignment with the longitudinal axis of drive shaft 40, to prevent eccentric spinning of the paint brush.

At the lower ends 78 of the heavier brush handle gripping fingers 68—68, each finger is arranged with an outer groove 80 to seat a coiled annular spring 82 which applies a compressive force to the fingers about the brush handle 76 so that the fingers will not relax their grip upon the handle at excessively high centrifugal spinning speeds of the paint brush 84. It should be noted that the outer groove 80 in fingers 68—68 is arranged with a tapered upper portion so that the coiled spring 82 will ride upward more easily out of the groove and will roll downward to a more positive stop in the groove. By virtue of this construction, the spring 82 can be slipped upward more easily to facilitate release of the paint brush handle 76. The fingers 68—68 are also provided with inturned flanges 86—86 to closely grip the lower portion 88 of the brush handle 76. The outer fingers 68—68, made preferably of spring metal stock having a good tensile strength, is resistant to spreading apart under most centrifugal spinning speeds. The spring 82 serves as an aid in holding the fingers 68—68 closely about the brush handle 76 and holding it central in the fingers, when high spinning speeds are developed by the push rod action. Thus, the spring 82 also serves as a restrainer against eccentric spinning of the brush, because when the brush handle 76 is inserted between the finger portions 86—86, the handle is close to or against

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the spring 82 which exerts its restricting effect on the side edges of the handle, holding the brush central in the fingers. The inner edges 90 of inturned finger flanges 86 are bent outwardly to prevent marring of the handle 76 and to permit more facile insertion and removal of the handle.

In addition to holding a paint brush 84, the outer unitary pair of fingers 68—68 are also adapted to hold a cylindrical paint roller cover 92, as shown in Fig. 1, having an internal bore 94 which grips the fingers 68—68. In such case, spring 82 is removed from grooves 80 on the outer fingers by rolling it back onto barrel 12 to permit more facile insertion thereof into paint roller cover bore 94, wherein the fingers are slightly compressed by the roller cover to provide a firm grip for centrifugal spinning. The lower inturned portion of the fingers 68—68, shown at 86—86, are arranged so that the distance across the fingers, i.e. the outside diameter, will be such as to effect a compressive force upon the bore 94 of roller cover 92. In the event that the bore of a roller cover should be less than the distance across the fingers, the finger portions 86—86 will meet and be compressed by the smaller bore of the roller cover, thereby increasing the gripping force of the fingers 68—68 upon the roller cover 92.

In operation, the appliance 10 is designed to centrifugally spin paint out of the bristles of paint brush 84 or the paint roller cover 92 which have been loosened by soaking and/or spinning in a suitable solvent or cleaning solution. The handle 76 of the brush 84 is then inserted between the finger flanges 86 and the fingers 70—70 and 72—72 until the tip end 74 of the handle comes to rest in the flared hole 64 of adaptor hub 62. The handle 76 is then positioned substantially coaxially with the tubular drive shaft 40. Or the paint roller cover 92 is slipped over the outer fingers 68—68, after removing coiled spring 82, substantially up to the adaptor flange 60, whereby the roller cover is coaxially positioned with respect to the drive shaft 40.

The push rod 22 is then drawn upward until it comes to a stop with pin 48 meeting the butterfly disc 26, which is drawn up to the top of cap 18. Reversing the stroke, push rod 22 is then pushed downwardly, causing the butterfly disc lugs or driving fingers 28—28 or 28'—28' to come into engagement with a pair of the driven wheel lugs 34. As the twisted portion 27 of push rod 22 is advanced, the butterfly disc 26 is driven around, causing the wheel 32 to rotate. Since tubular drive shaft 40 is affixed at its upper end to wheel 32, and at its lower end to adaptor 50, the three pair of fingers mounted on the adaptor hub 62 are also rotatably driven to centrifugally spin the loosened and softened paint out of the paint brush 84 or the paint roller cover 92. The forward stroke of push rod 22 comes to a halt when stop flange 25 meets the cap 18 at its opening 20.

The push rod 22 is then drawn upward, as above described, to continue the cycle of rotative spinning. It will be noted that upward movement of the push rod does not reverse the cycle of rotation, as the butterfly disc 26 is not in constant engagement with driven wheel 32, but rather is freely movable and rotatable on the push rod portion 27, the disc lugs 28—28 or 28'—28' being allowed to slide over the wheel lugs 34 upon the back stroke of the push rod, so that the disc 26 acts like a clutch engageable only on the forward stroke of the push rod.

Rapid downward strokes of the push rod 22 cause the paint brush or roller cover to spin at high speeds, or at least at such speeds whereby they are easily and quickly freed of paint by centrifugal force. It should be noted that the paint brush or roller cover may be rotated at progressively accelerated speeds by an increase in the frequency of downward thrusts of the push rod.

The device 10 has been proven by thorough testing

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and experimentation, and is acknowledged to a valuable tool for both professional and amateur painters.

Having described the invention in its simplest terms, it is to be understood that the features of construction may be varied in greater or lesser degree without departing from the essence of the invention which is defined by the appended claims.

What I claim as new and inventive is:

1. In a manually operated paint brush and roller cover cleaning appliance designed to free said brush and said roller cover of paint by centrifugal spinning, in combination, a manually held barrel, manually operable drive means arranged at the upper end of said barrel, a tubular drive shaft rotatably driven by said means and coaxially arranged in said barrel, said drive means comprising a push rod having a uniformly twisted spiralling blade portion, a circular disc member freely slidable on said blade portion and arranged to be rotated by said blade portion as it is passed through said disc member, said disc member having downwardly projecting driving fingers peripherally arranged in pairs at less than right angles to each other, a rotatable driven member fixedly mounted at one end of said drive shaft operatively engageable for rotation by said disc member, said driven member having upwardly projecting lugs spaced equally apart about the upper peripheral edge of said driven member and arranged for engagement with less than all of said disc member fingers when said disc member is rotated in one direction and for slipping contact with said disc member when the latter is rotated in the reverse direction, means adjacent the lower end of said barrel fixedly mounted by a coupling member to the other end of said drive shaft to compressively hold the handle of a paint brush and alternatively a tubular cylindrical paint roller cover in coaxial alignment with the longitudinal axis of said drive shaft for centrifugal spinning to discharge paint from said brush and alternatively from said roller cover by centrifugal force.

2. The structure defined in claim 1, in which said latter means comprises three pairs of web connected resilient parallel fingers longitudinally extending below said barrel and in coaxial alignment therewith and fixedly mounted at their webs to said drive shaft by a coupling member, one of said pairs of fingers being substantially longer than said other two pairs of fingers and arranged outwardly about the latter to provide a compressive grip upon the shank of a paint brush handle and alternatively the bore of a cylindrical paint roller cover, said two pairs of fingers encircled by said outer fingers being arranged symmetrically to provide a center for the tip end of said paint brush handle under compression axially of said appliance, whereby to minimize eccentric spinning of said paint brush.

3. The structure defined in claim 1, in which said latter means comprises a pair of web connected resilient fingers longitudinally extending in parallel relationship to each

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other below said barrel and fixedly connected at said web to said drive shaft by a coupling member, said coupling having a lower terminal hub provided with a blind opening arranged to receive and seat the upper tip end of said brush handle, said hub being arranged to pass through an opening in said web and peened back to secure said fingers positively on said coupling.

4. In a paint brush and roller cover cleaning mechanism designed to free said brush and said roller cover of paint by centrifugal spinning, that improvement wherein means to compressively hold the handle of a paint brush and alternatively a tubular cylindrical paint roller cover for centrifugal spinning to discharge paint therefrom comprises three pairs of web connected resilient parallel fingers longitudinally extending from and fixedly mounted on a rotatable paint applicator support means, said fingers being arranged in coaxial alignment with said support means, one of said pairs of fingers being substantially longer than said other two pairs of fingers and arranged outwardly about the latter to provide a compressive grip for the shank of a paint brush handle and alternatively the bore of a cylindrical paint roller cover, said two pairs of fingers encircled by said outer fingers being arranged symmetrically to provide a center for the tip end of said paint brush handle under compression axially of said mechanism, whereby to minimize eccentric spinning of said paint brush.

5. In a manually operated appliance for cleaning paint brushes or roller covers by centrifugal spinning and in which the handle of a paint brush is secured for spinning within gripping fingers at the rotatably driven end of said appliance, that improvement wherein said appliance is provided with a coupling member secured to and at the lower end of a rotatably driven shaft, gripping and centering means fixedly secured to said coupling member comprising three pair of web connected resilient parallel fingers extending longitudinally below said coupling member and in coaxial alignment therewith, said fingers being fixedly mounted at their webs to said coupling member, one pair of said fingers being substantially longer than the other two pairs of fingers and arranged outwardly about the latter so as to provide a compressive grip upon the shank of a paint brush handle inserted therebetween and alternatively upon the bore of a cylindrical paint roller cover, said two pairs of fingers being arranged symmetrically adjacent said coupling member to center the tip end of said paint brush handle under compression axially of said appliance, whereby to minimize eccentric spinning of said paint brush.

References Cited in the file of this patent

UNITED STATES PATENTS

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2,794,265	Krueger	June 4, 1957