United States Patent [19]

Hanssen

[11] **3,825,970**

[45] **July 30, 1974**

[54] **PAINT ROLLER FRAME WITH SPRAY SHIELD AND CLEAN-UP MEANS**

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[22] Filed: **Oct. 10, 1972**

[21] Appl. No.: **296,235**

[52] **U.S. Cl.**..... **15/230.11,** 15/248 A, 401/15

[51] **Int. Cl.**..... **B44d 3/28**

[58] **Field of Search**..... 15/230.11, 248 A, 248 R, 15/27, 179; 29/110.5; 401/15

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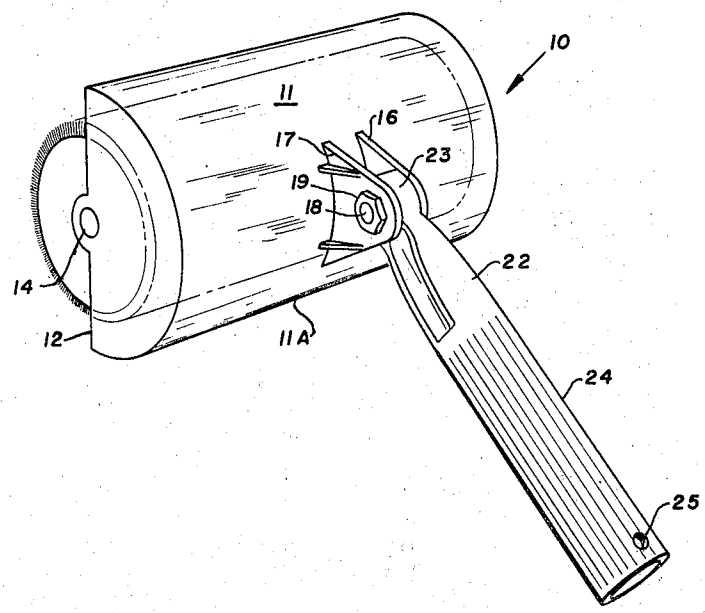
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Primary Examiner—Leon G. Machlin

[57] **ABSTRACT**

A paint roller retaining frame having an integral spray shield which is also arranged to accommodate clean-up of the used paint roller, with the frame being arranged to releasably retain or suspend cylindrical paint-applying rollers therein. The device comprises structural features providing, in combination; frame means for achieving releasable roller retention, a generally semi-cylindrical casing shell or enclosure having a pair of end plates and forming a substantial portion of the frame means and including means for retaining a roller receiving end cup therewithin for releasable roller retention. The integral frame and shield structure is preferably generally transparent so as to assist the user in viewing the action of the roller on the surface being painted and is also provided with a support edge surface which assists in guiding a flow of water to clean the roller after use. The end cups retain the paint-applying roller with its end or edge closely adjacent the end plate, so as to maximize the area capable of being covered with the roller. A centrally mounted pivotally adjustable handle is provided, the handle being centrally located on the outer circumference of the shield portion so as to provide a central pressure point to equalize pressure on both ends of the roller during use.

8 Claims, 6 Drawing Figures



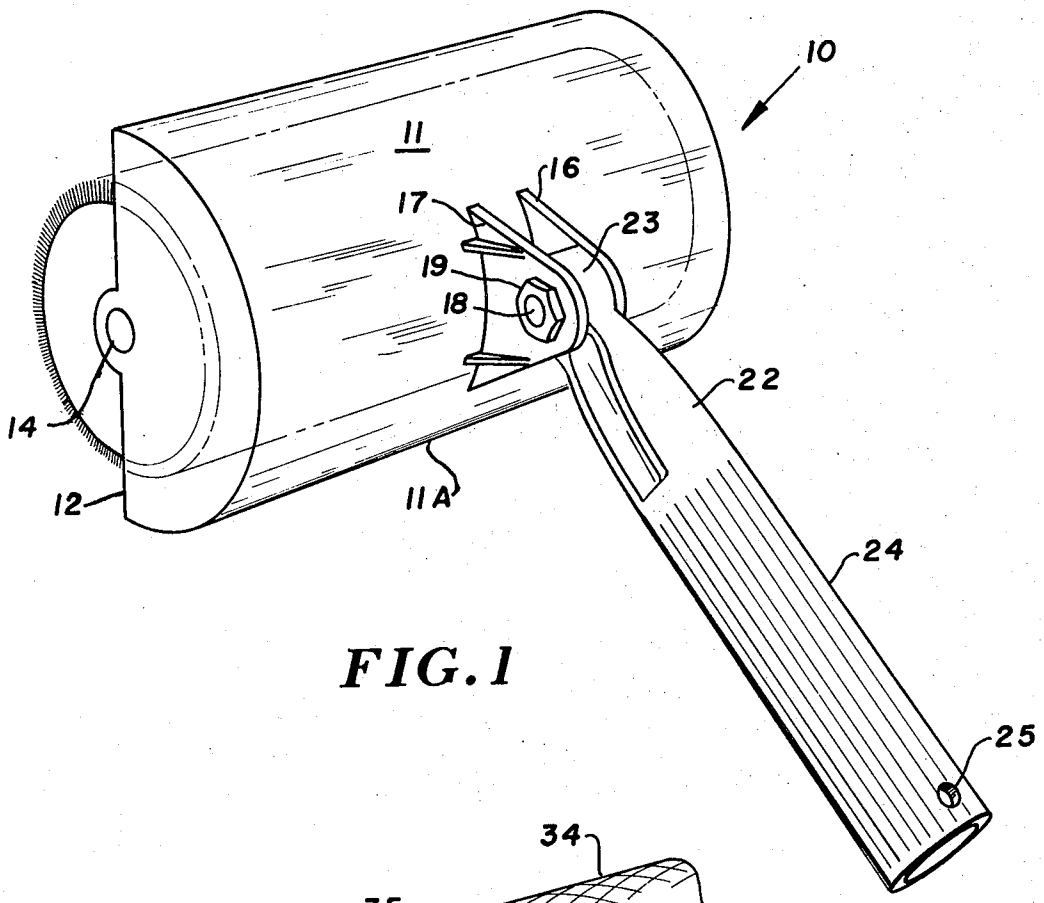


FIG. 1

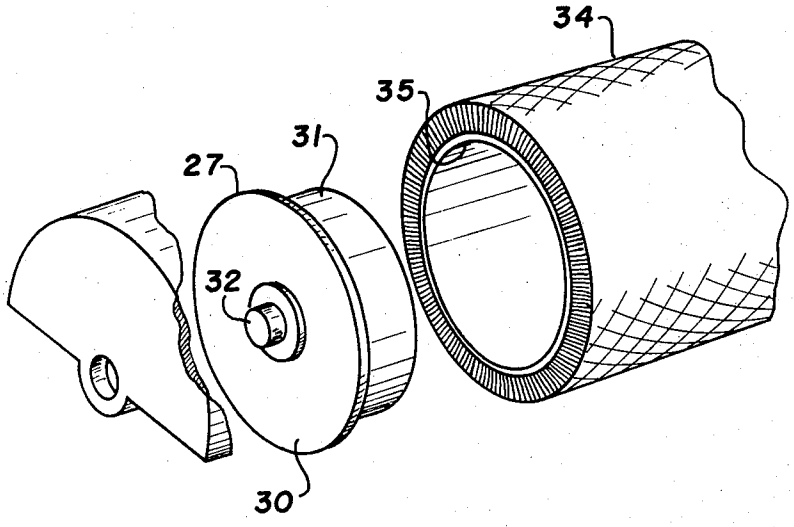
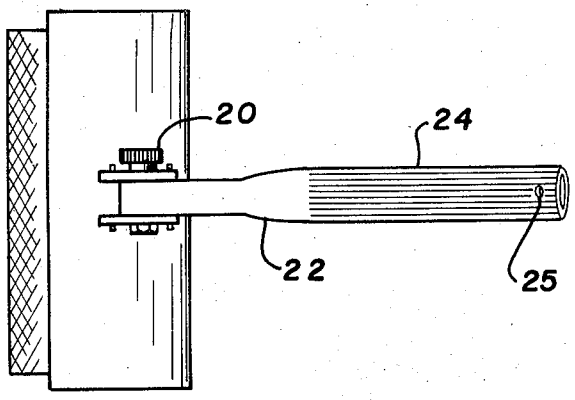


FIG. 2

FIG. 3



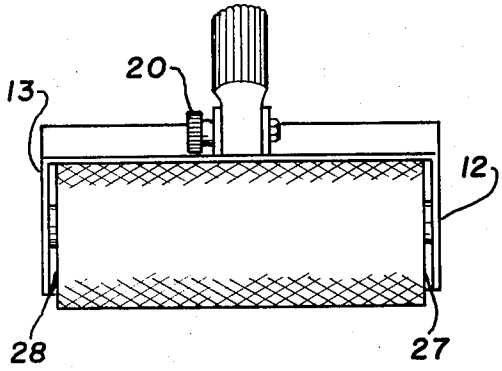


FIG. 4

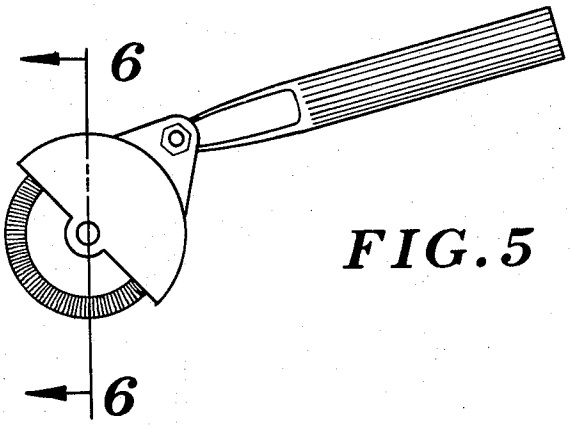


FIG. 5

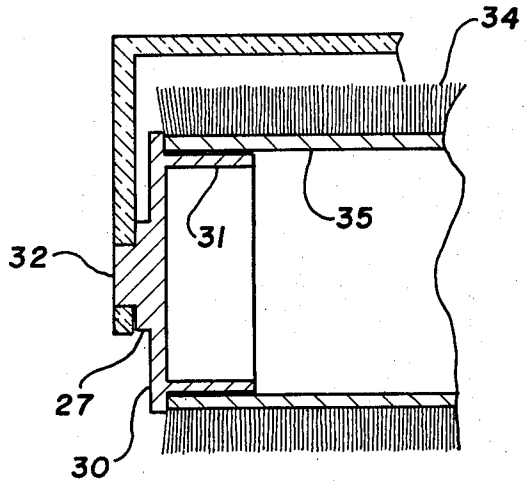


FIG. 6

PAINT ROLLER FRAME WITH SPRAY SHIELD AND CLEAN-UP MEANS

BACKGROUND OF THE INVENTION

The present invention relates generally to an improved paint roller retaining frame having an integral spray shield forming a portion of the frame structure, and with the frame means being arranged to receive a pivotally adjustable handle at a point centrally of the roller length. The apparatus is arranged to releasably retain paint-applying rollers during application of paint, while being arranged to further assist in clean-up of the roller after use. The frame has a shield portion which is preferably transparent, and the pivotally adjustable handle means is centrally mounted on the outer circumference of the shield. Tiltable adjustment of the handle means permits the user to achieve the best angle of operation during paint application, particularly when an extension pole is being utilized. The edge or lip of the shield portion provide structural features which assist in directing a flow of water onto the roller surface to accommodate clean-up after use.

The frame means is constructed so as to retain the paint roller at a point relatively close to the end of the frame and shield, thus maximizing the area capable of being covered by the user. During use, the shield or enclosure portion of the structure shields the area adjacent the area being painted as well as the user from inadvertent spraying or dripping of paint from the roller during use. The integral frame and shield structure of the present invention permits and facilitates ease of application of paint to ceiling surfaces as well as wall surfaces, with the tiltably adjustable handle means permitting safe and simple operation from a variety of operating angles and positions. The structure also permits ease of removal and changing of rollers before and after use. During clean-up of the paint roller and cover structure after use, the shield structure provides an edge surface assist in directing a flow of water or other cleaning solution to the roller while continuing to shield the user, and also providing an enclosure within which effective washing action may take place.

In the past, it has been traditional to utilize wire to make unshielded roller frames with either plastic or wood handles attached to the wire. The wire is bent of formed in such a manner so as to locate the handle in a central position while entering the roller from one end only. However, in such structures, normal pressure applied to the handle is necessarily transmitted to the roller surface unequally over the roller length. Equal pressure on both ends of the roller may be achieved only by the user applying a slight twisting force or torque at the handle.

While unshielded rollers are suitable for certain purposes, they suffer from the disadvantage of permitting a spray of paint from the rapidly revolving roller surface. Dripping of paint is also possible in an unshielded roller. Roller spray shields, if used, are normally provided as attachments to a conventional wire frame and are opaque, clumsy and often ineffective for the purpose intended. Existing unshielded rollers are frequently cleaned by hand by massaging the roller under a faucet of running water, with the clean-up procedure being messy and objectionable to most users. Roller cleaning appliances are normally available only as attachments to water faucets, with the usual construction

normally utilizing jets of water that spin the roller and wash out the paint, however, recently clean-up devices have been made available which include an open-top enclosure within which effective washing action may take place.

The present invention offers a significant improvement over existing unshielded paint rollers with or without spray shields as the present structure combines a more effective roller frame, a spray shield, and a roller clean-up device all in one integral unit.

The present invention embodies a more effective frame in that the centrally located and balanced handle provides application of equal pressure to both ends of the roller and its cover therefor. No twisting force is necessary to achieve effective equalized pressure on the roller and its associated cover. The present invention has a pivotally adjustable handle that can be tilted and locked in various pre-selected positions to achieve the best angle of operation on either floors, walls or ceilings.

The spray shield is an integral part of the frame. The shield actually supports and cradles the paint roller during use, while protecting the user and the surrounding area from spray and dripping paint. In the present invention the shield is preferably a clear plastic material that allows visual observation and inspection of the roller while it is being loaded with paint, and also while the paint is being applied to the working surface. This see-through property of the shield can become diminished as the shield fulfills its function of protecting from roller spray, but actual tests prove that the see-through effect is not completely lost even after hours of use during which time the user has had practice and becomes accustomed to the work situation.

Recently, the dominent use of water clean-up latex paints has made practical a transparent molded plastic roller frame, enclosure, and shield. The wide-spread use of paints which clean up in water facilitate and permit clean-up without requiring the use of solvents which would destroy, etch or othewise impair the transparent plastic nature of the structure. The present invention is also adaptable of the recently available water jet roller clean-up devices that may employ the shield construction as all or part of the cleaning enclosure in which the washing action takes place.

The design features and characteristics of the integral frame and shield structure of the present invention permit conventional use of the device, including the conventional loading of paint onto the roller, as well as conventional motion of the device over the working surface.

The apparatus of the present invention also provides and facilitates ease of cleaning. For example, a cleaning device may be available which includes a simple wash tub faucet adaptor, rubber hose, and nozzle secured to the hose which, together, provide for the application of a jet of water directed against the paint roller at a tangential angle to the roller, thus causing the roller to rotate within the frame means. The water jet spins the paint roller and simultaneously washes out the residual paint and thus cleans the roller. The edge surface of the spray shield provides a guide and support for the nozzle, thus assisting in the cleaning operation. By maneuvering the nozzle and water jet axially along the length of the paint roller while resting on either of the major edges, the entire roller surface can be flushed clean of paint and made ready for drying and re-use. The spray

shield further assists in this technique since it protects the user from paint and water spray that may spin from the roller during the cleaning process.

Another type of clean-up device, recently available, consists of a "spray box." The roller and frame rest on the open top of this box, while multiple jets of water spray from a water source in the box, the source being in the form of a perforated tube. These jets of water are angularly directed to apply their force tangentially to the cylindrical surface of the paint roller. The high pressure jets of water cause the paint roller to revolve at high speed while simultaneously washing the roller free of paint. The "clean-up box" can be operated without necessarily being hand held. The clean-up procedure is accomplished by simply positioning the roller and frame on the top of the box, while allowing the high pressure jets to run for sufficient time to wash the roller free of paint. The spray shield construction of the roller frame, when coupled with the wash box, makes a wash unit that completely encloses or surrounds the paint roller which is being caused to spin at high velocity under the influence of water jets. There is no objectionable spray or splash which can escape from the completely enclosed, clear plastic, see-through wash unit.

SUMMARY OF THE INVENTION

Generally, the integral paint roller frame, spray shield, and roller clean-up means of the present invention comprises a generally semi-cylindrical enclosure or shell having a pair of roller engaging end plates at either end thereof. The shell is preferably molded from transparent materials and is preferably integral with the end plates. The end plates having aligned bores formed therein so as to releasably receive a pair of paint roller retaining end caps therewithin, with the end cups and paint roller cylinder positioned in the shield and arranged for pivotal rotation therewithin. The outer surface of the semi-cylindrical shell portion of the frame is provided with a centrally located handle coupled bracket which has means for receiving a locking pin therewithin, the locking pin extending along an axis which is disposed generally parallel to the elongated axis of the shell. An operating handle (preferably arranged to receive an extension pole) is arranged to be received within the coupling bracket or means and is, of course, arranged for tiltable adjustment therewith.

Therefore, it is a primary object of the present invention to provide an improved integral paint roller frame and shield means for releasably receiving cylindrical paint-applying rollers therewithin during use and clean-up, the frame and shield means being preferably transparent so as to permit visual observation and inspection of the various working areas including the paint tray, and wall, ceiling, or floor surfaces being painted.

It is yet a further object of the present invention to provide an improved integral frame and shield means for cylindrical paint-applying rollers which includes a shield casing or enclosure means comprising a generally semi-cylindrical shell which is formed of a visually clear transparent material so as to provide a spray and drip shield for the paint-applying roller mounted therewithin.

It is yet a further object of the present invention to provide an improved integral frame and shield means for releasably retaining cylindrical paint-applying rollers which includes a casing having a configuration which provides improved paint application and subsequent clean-up of the paint roller after use.

It is yet a further object of the present invention to provide an improved integral frame and shield means for releasably retaining paint-applying rollers which includes a casing having a generally semi-cylindrical shell or enclosure with a centrally disposed coupling means secured to the shell so as to receive an operating or gripping handle in tiltably adjustable disposition thereon.

Other and further objects of the present invention will become apparent to those skilled in the art upon a study of the following specification, appended claims, and accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a perspective view showing the improved integral frame and shield means of the present invention with a cylindrical paint-applying roller being shown as retained therwithin, and illustrating the tiltably adjustable handle in one angular disposition relative to the shield casing;

FIG. **2** is a partial detail perspective view, in exploded disposition, illustrating the end plate of the integral frame and shield structure, a roller receiving end cup, and a portion only of a cylindrical paint-applying roller, the end plate of the frame being arranged to receive the end cup;

FIG. **3** is a top plan vew of the structure illustrated in FIG. **1**;

FIG. **4** is a bottom plan view of the structure illustrated in FIG. **1**;

FIG. **5** is a side elevational view of the structure illustrated in FIG. **1**; and

FIG. **6** is a detail sectional view taken along the line and in the direction of the arrows **6—6** of FIG. **5**.

DESCRIPTION OF THE PREFERRED EMBODIMENT

In accordance with the preferred modification of the present invention, the integral frame and shield means for releasable working retention of cylindrical paint-applying rollers is generally designated **10** and includes a casing means **11** comprising a generally semi-circular shell portion **11A** having a pair of generally semi-circular end plates **12** and **13** at each end thereof. The end plates **12** and **13** have axially aligned bores formed therein, such as at **14—14** for releasable roller retention as more fully described hereinafter. It will also be noted that the axis of the bores **14—14** is preferably coincidental with the axis of the main casing means **11.**

The outer peripheral portion or back of shell **11A** has a pair of centrally disposed ears **16, 17** secured thereto, with these ears having aligned bores formed therein to receive the shank of bolt **18.** Bolt **18** is provided with a nut element **19,** along with a knurled cap portion **20** (FIGS. **3–4**) to accommodate adjustable locking of tiltable handle **22** therewithin. Handle **22** is provided with a head end **23,** along with a body end **24,** body end **24** preferably being internally threaded so as to receive an extension pole if desired. Bore **25** is provided in order to receive a locking screw for rigidly attaching an extension pole to the handle portion **24.**

As is apparent in the illustration of FIGS. **1** and **5,** as well as others, handle **22** may be tiltably adjusted relative to ears **16** and **17** in order to achieve a proper oper-

ating angle between the user and the surface to which paint is being applied.

A pair of end caps **27** and **28** are provided, with these end caps having a generally disc-shape face or plate **30** along with a generally flanged roller engaging means **31** extending outwardly from one surface of disc or plate **30.** An axial projecting stub shaft **32** extends axially outwardly from the opposed surface. In times of actual use or operation, the flanged roller engaging surface **31** is received within the inner confines of cylindrical paint-applying roller **34** as along the surface **35,** and as shown in detail in FIG. **2.** For purposes of enabling and facilitating ease of operation, the axial length of stub shaft or projection **32** is preferably no greater than the thickness of end plate **12** so as to prevent the end of stub shaft **32** from protruding beyond the surface of the end plate. This facilitates ease of application of paint close to the edges of a working surface, particularly when the working surface, such as a wall, floor or ceiling, meets another surface which is disposed at right angles to the working surface.

As has been indicated, the shield element or portion of the frame and shield structure is rigid, durable and preferably transparent in order to provide a rugged structure which permits conventional use while permitting the user to view the working surface. Suitable materials of construction for the transparent element are clear vinyls, high impact polystyrene, acrylics, or the like. It will be appreciated that the materials of construction are not critical to the system, it being noted, however, that a durable material which is resistant to etching or damage from solvents or ordinary oil-base paints should normally receive favorable consideration.

It will be further noted that handle **22** is mounted generally along the center of the back of the frame and shield assembly. This mounting disposition permits the user to apply equal pressure or force across the length of the roller during normal use. The tiltable feature, as previously indicated, permits and facilitates control of the angle at which the frame and shield meets the surface being painted. Also, as has been indicated, while handle **22** may function as a gripping handle per se, the internal surface or portion **24** of handle **22** is preferably threaded in order to receive the tip end of a threaded extension pole or shaft.

As previously indicated, the frame and shield structure of the present invention, in addition to accommodating normal use, facilitates ease of cleaning of the paint-applying roller after use. For example, the edge of the semi-cylindrical shield may be employed as a guide in order to position a water discharge hose or conduit adjacent the roller surface for permitting cleaning of the roller after use. The angle at which the water strikes the surface of the roller may be accurately controlled so as to cause rotation of the roller while it is being retained within the shield. Also, the shield aids in protecting the user from contact with spray which is dispatched from the roller during rotation thereof during washing.

While the structure has been illustrated utilizing a pair of end caps to receive the paint-applying roller, it will be appreciated that the term "end caps" is used in a broad context, since various cylindrical structures could be utilized, including a permanent elongated axle, a wire cage forming a frame or the like, with the end caps or substituted component being the structural components which physically hold or mount the cylindrical paint-applying roller in the structure.

The radius of curvature of the shield portion **11** of the integral frame and shield structure is preferably large so as to accommodate a wide variety of diameters of paint-applying rollers or cylinders, with the coaxial arrangement being preferred in order to extend the range of diameters which may be received within the shield element.

At the present time, paint-applying rollers or cylinders such as the element **34** are available commercially in a wide variety of diameters, these diameters being, for the most part, standard in the industry. Therefore, inter-changeable end caps may be provided with each having a flanged element or segment **31** of standard or known diameters so as to readily accommodate a standard roller thereon. An interference or friction fit is, normally, preferred.

The availability of materials of construction is presently sufficiently wide so as to accommodate both latex-base paint and oil-base paint. The solvent system used will therefore be compatible with any of a variety of materials of construction that may be used for the apparatus of the present invention.

To accommodate assembly, the individual end caps **31-31** are inserted within the ends of the pre-selected roller element. Thereafter, one of the stub shafts is engaged or inserted in the end plate bore, with the roller axis being generally canted relative to the frame axis. At this point, a modest depressing force is applied to the free end plate, preferably near the center, so as to flex the end plate and end cap to permit engagement of the free stub shafts **32** in the other bore. The same technique may be utilized to remove the paint roller from the frame, that is, by depressing the end plate to cause flexure of the end cap until disengagement may be achieved. The acrylic materials which have been found useful in connection with this device have sufficient flexibility so as to permit ease of mounting of the end caps for roller retention thereon.

It will be appreciated that various departures may be made from the detailed description presented herein without departing from the nature of the invention, including a substitution of materials, component configurations or the like.

I claim:

1. Apparatus for releasably receiving a paint-applying roller, and comprising an integral paint roller frame, spray shield and roller cleaning means, said apparatus including, in combination:

a. casing means comprising a generally semi-cylindrical shell having an elongated axis and having generally semi-circular end plates on the ends thereof and forming a frame portion and shield enclosure;

b. coupling means comprising a pair of generally upstanding ears attached to the outer cylindrical surface of said shell and having pin means extending along an axis generally parallel to said elongated axis and forming a pivotal handle coupling shaft;

c. operating handle means having a transverse bore formed therein for receiving said pivotal coupling shaft, and means for releasably locking a portion of said operating handle means between said pair of generally upstanding ears;

d. flexible cylindrical paint roller mounting and coupling means including said semi-circular end plates

and a generally cup-shaped member with a base plate and generally cylindrical flanged roller engaging means extending outwardly from one surface of said base plate, and an axially projecting stub shaft extending from the opposed surface of said base plate, said flexible cylindrical paint roller and coupling means being arranged for relative axial motion with said semi-cylindrical shell in response to flexural forces being applied to said flexible cylindrical paint roller and coupling means for accommodating removable insertion of an assembly consisting of a pair of said cup-shaped roller mounting means disposed on opposite ends of a paint-applying roller; and

e. said end plates having generally axially aligned bores formed therein for receiving said stub shafts within said shell casing when in engagement with a paint-applying roller and for accommodating free rotation of said roller mounting means within said shell.

2. The apparatus as defined in claim **1** being particularly characterized in that said stub shafts have an axial length which is no greater than the thickness of said end plates.

3. The apparatus as claimed in claim **1** being particularly characterized in that said casing means is fabricated from an optically transparent material.

4. The apparatus as defined in claim **1** being particularly characterized in that said upstanding ears are disposed along and on either side of the mid-point of the elongated axis of said semi-cylindrical shell.

5. The apparatus as defined in claim **1** being particularly characterized in that said handle means is tiltably adjustable relative to said semi-cylindrical shell.

6. Apparatus for releasably receiving a paint-applying roller, and comprising an integral paint roller frame, spray shield and roller cleaning means, said apparatus including, in combination:

a. casing means comprising a generally semi-cylindrical shell having an elongated axis and having generally semi-circular end plates on the ends thereof and forming a frame portion and shield enclosure;

b. coupling means comprising a pair of generally upstanding ears attached to the outer cylindrical surface of said shell and having pin means extending along an axis generally parallel to said elongated axis and forming a pivotal handle coupling shaft;

c. operating handle means having a transverse bore formed therein for receiving said pivotal coupling shaft, and means for releasably locking a portion of said operating handle means between said pair of generally upstanding ears;

d. cylindrical paint roller mounting means comprising a generally cup-shaped member with a base plate and generally cylindrical flanged roller engaging means extending outwardly from one surface of said base plate, and an axial projecting stub shaft extending from the opposed surface of said base plate, with said base plate portions of said flanged roller engaging means being flexible; and

e. said end plates having generally axially aligned bores formed therein for receiving said stub shafts within said shell casing when in engagement with a paint-applying roller and for accommodating free rotation of said roller mounting means within said shell.

7. Apparatus for releasably receiving a paint-applying roller, and comprising an integral paint roller frame, spray shield and roller cleaning means, said apparatus including, in combination:

a. casing means comprising a generally semi-cylindrical shell having an elongated axis and having generally semi-circular end plates on the ends thereof and forming a frame portion and shield enclosure;

b. coupling means comprising a pair of generally upstanding ears attached to the outer cylindrical surface of said shell and having pin means extending along an axis generally parallel to said elongated axis and forming a pivotal handle coupling shaft;

c. operating handle means having a transverse bore formed therein for receiving said pivotal coupling shaft, and means for releasably locking a portion of said operating handle means between said pair of generally upstanding ears;

d. cylindrical paint roller mounting means comprising a generally cup-shaped member with a base plate and generally cylindrical flanged roller engaging means extending outwardly from one surface of said base plate, and an axially projecting stub shaft extending from the opposed surface of said base plate; and

e. said end plates having generally axially aligned bores formed therein for receiving said stub shafts within said shell casing when in engagement with a paint-applying roller and for accommodating free rotation of said roller mounting means within said shell, said end plates being generally flexible and arranged for flexure about said semi-cylindrical shell casing for accommodating removable insertion of an assembly consisting of a pair of said cup-shaped roller mounting means disposed on opposite ends of a paint-applying roller.

8. Apparatus for releasably receiving a paint-applying roller, and comprising an integral paint roller frame, spray shield and roller cleaning means, said apparatus including, in combination:

a. casing means comprising a generally semi-cylindrical shell having an elongated axis and having generally semi-circular end plates on the ends thereof and forming a frame portion and shield enclosure;

b. coupling means comprising a pair of generally upstanding ears attached to the outer cylindrical surface of said shell and having pin means extending along an axis generally parallel to said elongated axis and forming a pivotal handle coupling shaft;

c. operating handle means having a transverse bore forming therein for receiving said pivotal coupling shaft, and means for releasably locking a portion of said operating handle means between said pair of generally upstanding ears;

d. cylindrical paint roller mounting means comprising a generally cup-shaped member with a base plate and generally cylindrical flanged roller engaging means entending outwardly from one surface of said base plate, and an axially projecting stub shaft extending from the opposed surface of said base plate, said base plate portions of said flanged roller engaging means being flexible and arranged for axial flexure inwardly of a paint-applying roller for accommodating removable insertion of an assembly consisting of a pair of said flanged roller engag-

ing means disposed on opposite ends of a paint-applying roller; and

e. said end plates having generally axially aligned bores formed therein for receiving said stub shafts within said shell casing when in engagement with a paint-applying roller and for accommodating free rotation of said roller mounting means within said shell.

* * * * *

UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,825,970 Dated July 30, 1974

Inventor(s) Robert I. Janssen

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

In the caption heading; item [76], "Robert I. Hanssen, 116 Sibley Memorial Hwy., St. Paul, Minn. 55118" should read -- Robert I. Janssen, 1160 Sibley Memorial Highway, St. Paul, Minn. 55118 --. Column 1, line 46, "of" should read -- or --. Column 3, line 40, "coupled" should read -- coupling --. Column 6, line 21, "system" should read -- systems --. Column 8, line 53, "forming" should read -- formed --.

This certificate supersedes Certificate of Correction issued Oct. 8, 1974.

Signed and sealed this 15th day of October 1974.

(SEAL)
Attest:

McCOY M. GIBSON JR.
Attesting Officer

C. MARSHALL DANN
Commissioner of Patents

FORM PO-1050 (10-69)

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U.S. GOVERNMENT PRINTING OFFICE: 869-930

UNITED STATES PATENT OFFICE

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In the caption heading; item [76], the inventor's name should read -- Robert I. Janssen --.

Column 1, line 46, "of" should read -- or --.

Column 3, line 40, "coupled" should read -- coupling --.

Column 6, line 21, "system" should read -- systems --.

Column 8, line 53, "forming" should read -- formed --.

Signed and sealed this 8th day of October 1974.

(SEAL)
Attest:

McCOY M. GIBSON JR.
Attesting Officer

C. MARSHALL DANN
Commissioner of Patents

FORM PO-1050 (10-69)

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