Aug. 15, 1967 J. J. McGINLEY 3,335,446

CONSTRUCTION FOR PAINT ROLLER

Filed Feb. 18, 1965

FIG. 1

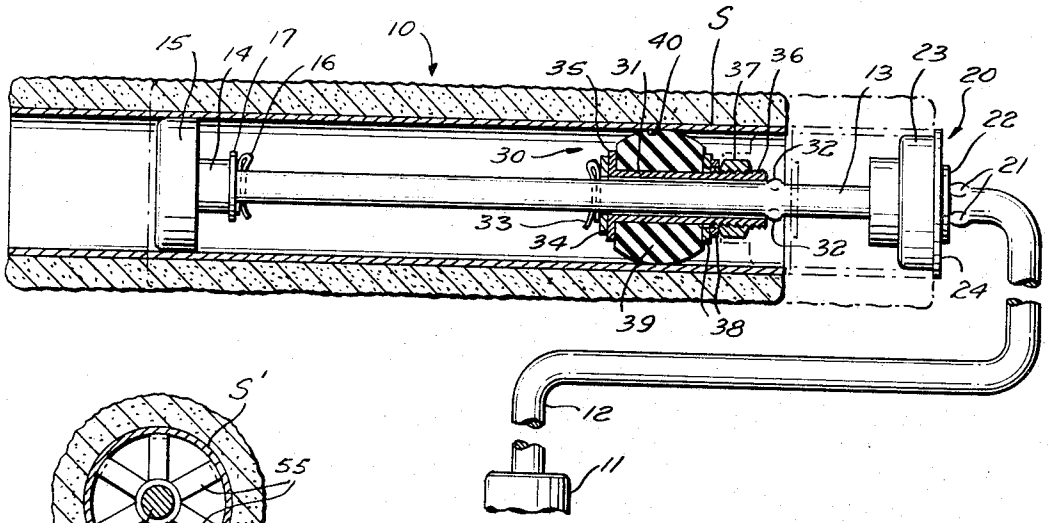


FIG. 3

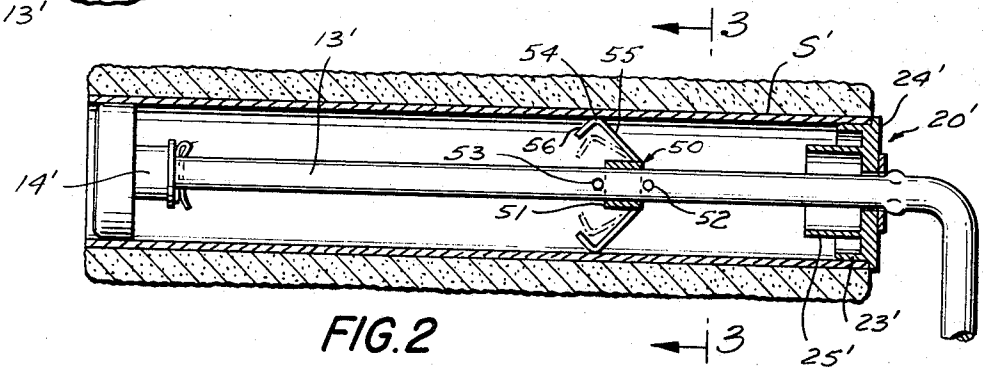


FIG. 2

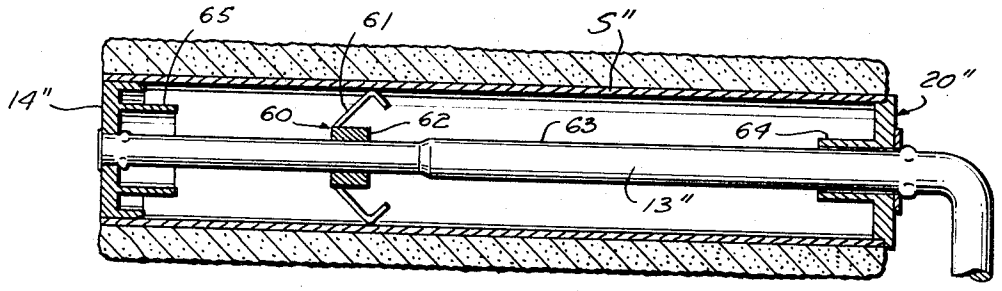


FIG. 4

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CONSTRUCTION FOR PAINT ROLLER

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This invention relates to a paint roller construction, and more particularly to an improved paint roller construction adapted particularly to accommodate paint rollers of inner diameters which vary within a predetermined range of tolerances.

The invention further relates to a paint roller frame of simple and inexpensive construction, having the advantage that the roller may be removed after use without the necessity for handling the same.

It is know that paint roller sleeves, although purportedly of a given size, often vary within wide ranges of tolerances. This is particularly apparent from a comparison of roller sleeves made by different manufacturers. It is an object of the present invention to provide a roller frame capable of supporting roller sleeves having a relatively wide variation in inside diameter.

It is a further object of the present invention to provide an improved paint roller frame whereby the roller sleeve may be removed from the frame without the necessity of manually gripping the roller to pull it off.

It is a further object of the present invention to provide a roller of the type described and from which the roller sleeve may be demounted without manually gripping the sleeve, the roller frame being of an uncomplicated, readily manufactured construction, which construction will perform its intended function notwithstanding the inadvertent admission of paint into the interior of the roller frame.

To attain these objects and such further objects as may appear herein or be hereinafter pointed out, reference is made to the accompanying drawings, forming a part hereof, in which:

FIGURE 1 is a side elevational view of a paint roller assembly in accordance with the invention, portions thereof being shown in section;

FIGURE 2 is a view similar to FIGURE 1 of another embodiment of the invention;

FIGURE 3 is a section taken on the line 3—3 of FIGURE 2;

FIGURE 4 is a view similar to FIGURE 2 of a further embodiment of the invention.

Referring now to the embodiment of FIGURE 1, there is shown a paint roller frame **10** comprising a gripper handle **11** and a bent extension rod **12** leading to axle **13**. On the axle **13**, adjacent the free end thereof, there is mounted an outer end cap 14 which is, in the usual manner, free to rotate about the axle. The outer end cap **14** includes an outwardly directed, annular support shoulder **15** of a size slightly smaller than the inner diameter of paint roller sleeves calculated to be used with the roller frame. The outer end cap **14** is prevented from moving longitudinally of the axle **13** by a cotter pin **16** extending transversely through the axle, washer **17** being interposed between the pin and the outer end cap. It will be evident that other means for preventing longitudinal movement of the end cap **15** may be substituted for the cotter pin and washer.

An inner end cap **20** is rotatably mounted on the axle in spaced relation to the outer end cap **14**. Movement of the end cap **20** away from outer end cap **14** is prevented, as by lugs **21**, struck up from the material of the axle, a spacer washer **22** preferably being interposed between the outer end of the end cap and the lugs **21**.

The end cap **20** includes a peripheral support shoulder **23** for engaging the inner surface of a paint roller sleeve, an annular abutment shoulder **24** forming a stop for the inner end of the roller sleeve being formed adjacent the inner end of the support shoulder **23**. The inner end cap **20** is free to move toward and away from the outer end cap **14**.

Interposed between the end caps there is formed a gripper assembly **30**, of variable diameter calculated frictionally to engage portions of the inner surface of roller sleeves S supported on the roller frame. The gripper assembly **30** includes a ferrule or collar **31** of tubular construction, rotatably supported on the axle **13**. The ferrule **31** is fixed against movement longitudinally of the axle on one end by lugs **32** struck up from the axle, and at the opposite end by a cotter pin **33** and spacer washer **34**. The ferrule **31**, adjacent spacer washer **34**, is provided with a radially extending stop collar **35**. The opposite end of the ferrule **31** is formed with an external thread as at **36**, a complementally threaded compression nut **37** being mounted over the said threaded portion. The outer end of the compression nut **37** bears against a pair of axially shiftable washers **38**.

Interposed between a washer **38** and the collar **35**, there is disposed a resilient, compressible gripper mass **39**, having a high coefficient of friction, preferred examples of materials for such mass being synthetic and natural rubbers. The gripper mass is annular in configuration, the inner diameter of the gripper mass being seated on the main cylindrical body portion of the ferrule **31** and the outer surface **40** of the gripper mass being formed to have a greater diameter at the medial portions thereof than at the inner and outer end portions.

In use, a roller sleeve is slid, in the normal manner, first over the outer end cap **14**, then over the gripper mass **39**, and finally into seated engagement over the support shoulder **23** of inner end cap **20**, the stop shoulder **24**, together with the limiting action of the lugs **21**, serving to form an inward limit for the roller sleeve.

The effective diameter of the gripper mass **39**, particularly at its central point, may be varied by varying the position of the compression end **37** on the threaded portion **36** of ferrule **31**. As the gripper nut is tightened toward collar **35**, it will be evident that the mass **39** will be subjected to additional compression and, hence, foreshortened lengthwise and consequently increased in diameter. Thus, if a particular paint roller sleeve is found to be too loose, it is possible to accommodate the frame within reasonable limits of tolerance to the diameter of the diameter of the paint roller sleeve S by tightening or loosening the compression nut **37**.

To remove a paint roller sleeve S after use (the mounted roller sleeve being shown in dot and dash lines in FIGURE 1), it is merely necessary to press the inner end cap **20** axially outward toward the outer end cap **14**. It will be evident that the initial movements will carry the paint roller sleeve to the partially demounted position shown in solid lines in FIGURE 1. The initial movements aforesaid result in the outer end of the roller sleeve overhanging or outwardly lapping the outer end cap **14**. At this position, it is possible for the user to place his fingers within the partially demounted sleeve, in a position which is free, or at least relatively free, of paint, and thus to draw the roller clear of the frame.

In the embodiment of FIGURE 2, there is shown a different form of the invention in which the demounting of the roller sleeve is further facilitated. In this embodiment, the outer end cap **14'** is mounted on axle **13'** in the same manner as described in connection with the embodiment of FIGURE 1. In the embodiment of FIGURE 2, the inner end cap **20'**, in addition to the roller support shoulder **23'** and the roller stop portion **24'**, in-

cludes an outwardly projecting, annular skirt portion **25'**. Between the inner and outer end caps **14'** and **20'** respectively, there is disposed a roller gripper portion **50** comprising a central hub **51**, rotatably mounted on the axle **13'** and maintained in position against substantial longitudinal movement along the axle, as by transversely extending pins **52, 53**, or any other suitable mechanism.

Extending radially from the hub **51**, there is formed a series of spring arms **54**, the major body portion **55** of the arms being inclined outwardly from the axle and forwardly toward the outer end cap. The leading edge **56** of the arms, as viewed in the direction of a roller sleeve, is inclined forwardly toward the outer end cap and inwardly toward the axle.

In the use of the embodiment shown in FIGURES 2 and 3, the roller sleeve S' is inserted inwardly over the outer end cap **14'** in the direction of the inner end cap **20'**. As the leading end of the roller S passes over the gripper assembly **50**, the inclined portions **56** of the arms **54** will be engaged by the leading edge of the roller sleeve, resulting in an inward radial compression of the arms **54**. The roller may be pressed to its fully inserted position in which the inner end of the roller bears against stop flange **24'** and the inner diameter of the sleeve is supported on the annular shoulder **23'** of the inner end cap **20'**.

When it is desired to demount the roller sleeve in accordance with the embodiment of FIGURE 2, it is merely necessary to slide the inner cap **20'** toward the outer end cap **14'**. At an interim position, the leading edge of the annular flange **25'** will bear against the rearwardly disposed faces **55** of the arms **54**, further outward movement of the end cap **20'** causing the arms **54** to be cammed radially inwardly from the solid line position of FIGURE 2, to the dot and dash position.

It will thus be seen that the paint roller sleeve which had initially been maintained on the roller frame primarily, or substantially exclusively, by the frictional retaining contact with the outer ends of the radially extending arms, is completely released from contact with the arms. Thus, the embodiment of FIGURE 2 has the decided advantage of permitting removal of the roller sleeve without the necessity for gripping the sleeve.

In some instances, as where paint may have seeped into the interior of the frame structure, a slight shaking of the roller frame will be all that is necessary to dislodge the roller sleeve, enabling it to drop free under the influence of its own weight.

The embodiment of FIGURE 2 is most effectively employed where the outer diameter of the end cap and the inner diameter of the roller sleeve provide a very loose sliding fit.

The location of the central skirt **25'** is not critical, and it will be readily recognized that, if desired, the annular roller sleeve support shoulder **23'** may be extended forwardly. In such construction, the outer surface of the support shoulder may perform its usual function, whereas the inner surface of the said support shoulder may be utilized as the means for radially depressing the gripper arms from contact with the inner diameter of the roller sleeve. The claims are accordingly to be broadly construed to cover such construction.

In the embodiment of FIGURE 4, wherein like parts have been given like reference numerals, there is provided an axially shiftable gripper assembly **60**, along with the axially shiftable inner end cap **20''**. In this embodiment, the gripper includes inwardly and radially inclined arms **61**, normally biased to a spread condition. The

gripper includes a hub **62** rotatably mounted on the axle **13''**, movement of the hub **62** toward the end cap **20''** being limited as by an enlargement **63**, or some equivalent means, on the axle.

The end cap **20''** preferably includes a hub portion **64** which, when the end cap is moved toward the outer end cap **14''**, engages against hub **62** of the gripper means and carries the latter member toward the outer end cap. The outer end cap **14''** includes an inwardly directed skirt portion **65**, positioned to engage against the outer edge portions of the arms **61** when said arms are pressed against the skirt **65** under the influence of the outward pressure applied through the end cap **20''**.

In this embodiment, the roller sleeve S'' is removed by shifting the inner end cap **20''** outwardly along the axle. In a partially moved position, the hub **64** of the inner end cap engages and carries with it hub **62** of the gripper assembly. Continued axial movement of the end cap **20''** brings arms **61** into engagement with the skirt **65** of the fixed outer end cap, camming said arms inwardly and thus releasing the frictional connection between the gripper means and the interior of the cylinder.

From the foregoing description, it will be evident that variations and embodiments employing the novel concepts herein disclosed may be made without departing from the spirit of the present invention and accordingly the invention is to be broadly construed within the scope of the appended claims.

Having thus described the invention and illustrated its use, what is claimed as new and is desired to be secured by Letters Patent is:

1. A paint roller frame comprising a handle leading to an axle having a free end, an outer end cap rotatably mounted on said axle adjacent said end, an inner end cap rotatably mounted on said axle in spaced relation to said outer cap and movable along said axle toward and away from said outer cap, an adjustable roller gripper mounted on said axle between said end caps and including a sleeve member rotatably mounted on said axle, a stop shoulder on said sleeve member, a threaded portion on said sleeve member, a compression nut threaded over said threaded portion of said sleeve and shiftable toward and away from said stop shoulder, and a tubular, resilient, deformable annular gripper mass of high frictional material compressed between said stop shoulder and nut, the effective diameter of said apex of said mass being variable, frictionally to engage rollers having a variety of inner diameters by varying the adjusted position of said nut along said sleeve.

2. A device in accordance with claim **1** including a tubular roller mounted on said frame and said inner and outer end caps include support portions disposed within said tubular roller, the inner diameter of said roller being sufficiently oversize as respects said support portions to permit free, longitudinal relative movement of said roller with respect to said support portions, said roller being maintained on said frame substantially exclusively by the contact of said inner diameter with said apex of said gripper means.

References Cited

UNITED STATES PATENTS

2,485,332	10/1949	Sutton et al.	
2,675,605	4/1954	Thomas	29—116
2,987,746	6/1961	Davis et al.	15—230.11
3,097,022	7/1963	Sernetz.	

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