

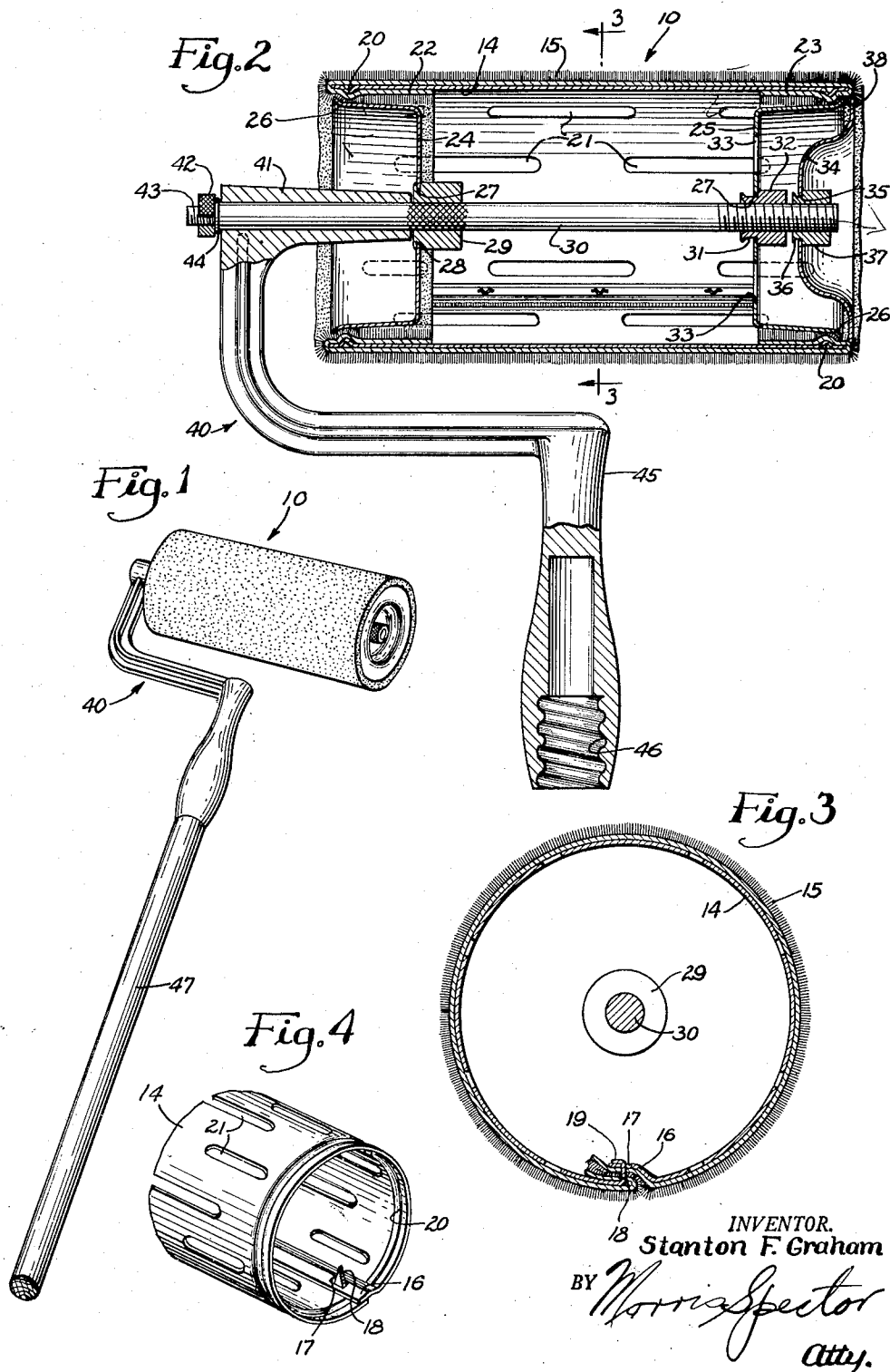
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PAINT ROLLER

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PAINT ROLLER

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The present invention relates to devices for applying paint, and more particularly to the class of paint applicators comprising a cylindrical member having a porous sleeve positioned around its periphery and capable of being rolled over a surface to spread the paint evenly thereover.

It is an object of the present invention to provide a simple, reliable and economical hollow cylinder having a perforated periphery, with a porous sleeve positioned therearound, the cylinder and the sleeve together comprising a porous chamber which may be filled with paint and thereafter rolled over the surface to which it is desired to apply the paint. In connection with the foregoing object of the invention, another object thereof is to provide a rotatable paint applicator which will consistently apply paint evenly on the surface being painted.

Another object of the invention is to provide a rotatable paint applicator which does not leak or drip. In connection with the attainment of this object of the present invention, the ends of the outer porous sleeve are turned into the ends of the perforated metallic cylinder, the ends of the porous sleeve extending beyond inwardly protruding peripheral beads formed in each end of the cylinder, and are compressed against the beads by cups so that the end of the sleeve constitutes a gasket between the cups and the cylinder.

It is another object of the present invention to provide a paint applicator having a relatively short handle suitable for facilitating normal use thereof.

A still further object of the present invention is to provide a disposable or removable cylinder for a rotatable paint applicator, which cylinder is economical to manufacture and which may be assembled with the remainder of the applicator without the use of special tools or requiring any special skill. In this connection the present invention utilizes a rectangular strip of material, preferably metal, which is perforated throughout its area and which is bent into the general shape of a cylinder. The ends of the strip are each provided with lateral grooves. One side of the strip is deformed to form a lip, the lip being apertured, and the other side of the strip is provided with a plurality of projections which are passed through the apertures in the lip and clinched over to thereby hold the sides of the strip in cylindrical form. A porous strip of fabric, preferably pile fabric, is positioned around the cylinder with its sides between the lip and the other side of the metal strip and is

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held in such position by the projections which pass through the apertures in the lip.

The above and numerous other objects and advantages of the invention will become apparent from the following detailed description when read in conjunction with the accompanying drawing wherein:

Figure 1 is a perspective view of a paint applicator of the present invention;

Figure 2 is a longitudinal sectional view of the paint applicator;

Figure 3 is a transverse sectional view taken substantially along the line 3—3 in Figure 2 with portions of the sleeve and one end cap omitted for clarity of illustration; and

Figure 4 is a detail perspective view of the metal cylinder.

Reference may now be had more particularly to the drawing wherein like reference numerals indicate like parts throughout.

The paint applicator is indicated in general by the reference numeral 10 and comprises a cylinder, barrel, or drum 14 around which a porous, pile fabric sleeve 15 is tightly drawn. The cylinder 14 is preferably made from a strip of sheet metal, of rectangular shape, which is permanently flexed into the shape of a cylinder. The porous sleeve 15 is preferably made of cotton and wool cloth or any other suitable material which has the property of readily becoming saturated with paint and assisting in the capillary action of the paint on the material. One side of the strip of sheet metal forming the cylinder 14 is deformed to form a lip 16 which has a plurality of apertures 17 spaced thereon lengthwise of the cylinder. The other side of the strip of sheet metal forming the cylinder 14 has a plurality of pointed projections 18, each of the projections being opposite a corresponding aperture 17. A rectangular sheet of material that is to form the sleeve 15 is wrapped around the strip that is to form the cylinder 14. The longitudinal sides of the porous sheet are drawn tightly into the cylinder 14 to pass between the lip 16 and the other side of the metal strip, thus forming a sleeve, and the pointed projections 18 are forced through the sides of the porous strip and through the corresponding apertures 17 and clinched over, as at 19, to retain the sleeve 15 positioned around the cylinder 14. There are a sufficient number of apertures 17 and projections 18 to insure that the lip 16 is effectively sealed against the other side of the strip forming the cylinder 14 when the sides of the porous strip are compressed therebetween.

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The metal strip which comprises the cylinder 15 is formed with a lateral or transverse groove at each end thereof which assumes the form of an internally protruding peripheral bead or annular bearing surface 26 when the metal strip is bent to form the cylinder. The purpose of this bead will be described hereinafter. The cylinder 14 is provided with a plurality of perforations 21 uniformly spaced throughout its periphery. While the perforations 21 are shown as elongated axially extending apertures or slots, they may be of any other desired shape, it only being necessary and desirable that they be spaced somewhat evenly throughout the periphery of the cylinder 14, in order to permit the paint within the cylinder 14 to flow substantially uniformly to all peripheral portions of the porous sleeve 15.

The ends of the sleeve 15 are turned into the cylinder 14, as indicated at 22 and 23 respectively, and extend beyond the peripheral beads 20. A pair of bell-shaped end members or cups 24 and 25 are each formed with a peripheral lip 26 and with a central aperture 27. The periphery of the aperture 27 in the cup 24 is sealed within a peripheral groove 28 surrounding a hub that consists of a collar nut 29 which itself is rigidly and sealingly connected to a shaft 30. The cup 24 is sealingly connected to the collar nut 29. The periphery of the central aperture 27 in the cup 25 surrounds a reduced portion 31 of a hub that consists of a collar nut 32 which is threaded on the shaft 30. The external diameters of the lips 26 of the cups 24 and 25 are sufficiently large such that the lips 26 compress the turned in ends 22 and 23 of the sleeve 15 between the lips 26 and the beads 20 in order to form a sealing gasket therebetween, when the cups 24 and 25 are drawn together in the cylinder 14. The beads 20 limit the inward movement of the cups 24 and 25 with reference to the cylinder 14. The cups 24 and 25 may be moved relatively inwardly with reference to the cylinder 14 by merely turning the collar nut 32 on the shaft 31 so that it advances to the left, as viewed in Figure 2. It is thus apparent that the cup 24 effectively seals the left end of the paint applicator 10.

The cylinder 14 and the porous sleeve 15 together comprise a porous chamber which may be filled with a quantity of paint. To facilitate filling this porous chamber the cup 25 is provided with a plurality of filling apertures 33. A closure cup or end plate member 34 having a central aperture 35, the periphery of which is sealingly secured to a reduced portion 36 of a hub that consists of a collar nut 37 also threaded on the shaft 30, is provided for sealing the right end of the paint applicator 10 (as viewed in Fig. 2). The cup 34 has a peripheral rim 38 which engages the turned in end 23 of the sleeve 15, and upon advance of the cup 34 inwardly with respect to the cylinder 14 an annular portion of the turned in end 23 of the sleeve 15 is compressed to form a gasket between the rim 38 and the lip 26 on the cup 25. It is therefore apparent, since the collar nut 37 is sealingly connected to the shaft 30, that the right end of the paint applicator 10 (as viewed in Fig. 2) is also effectively sealed against paint leakage.

The applicator is provided with a handle 40 that may comprise a die casting, and includes a sleeve 41 that makes a sliding fit over the end of the shaft 30 until the sleeve engages the collar nut 29. The sleeve is then held in place by a thumb nut 42 on the threaded end 43 of the shaft 30, the threaded end 43 being preferably of

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smaller diameter than the diameter of the shaft 30 so that the thumb nut 42 when threaded on the portion 43 can be threaded until it abuts against a shoulder 44 on the shaft 30, or against a washer which in turn abuts against the shoulder as shown in the drawing, so that while the nut acts as a stop against retraction of the sleeve 41 it does not compress the sleeve 41 toward the collar nut 29. There is a very small amount of longitudinal play of the sleeve 41 on the shaft 30 between the collar nut 29 and the nut 42. The handle 40 includes a hand gripping portion 45 the longitudinal axis of which is at substantially right angles to and intersects the longitudinal axis of the shaft 30 at substantially the center of the cylinder 10. The bottom of the hand gripping portion 43 is provided with means for receiving an extension handle. One simple arrangement to that effect is by making the hand gripping portion 45 hollow at the base and providing the hollow portion with internal threads 46 into which may be threaded an extension handle 47 which may comprise an ordinary wooden mop stick one end of which is externally threaded for receiving a mop, which threaded end of the stick is then threaded into the threads 46. The extension handle 46 facilitates manual rolling of the paint applicator 10 over surfaces that may otherwise be hard to reach, such as, for instance, a ceiling.

When the paint applicator 10 is used, it is first assembled as shown in Figure 2, except that the cup 34 is removed. Paint is poured into the applicator 10 through the apertures 33 in the cup 25 and thereafter the cup 34 is positioned as shown. After a short period of time the paint passes through the perforations 21 and saturates the sleeve 15. The assembly is then ready for use and may be manually rolled over a surface to be painted.

By the present invention there is provided a cheap and efficient rotatable paint applicator. It is contemplated that when the sleeve 15 becomes worn to the extent that it is no longer suitable for use, the sleeve 15 together with the cylinder 14 may be replaced by a new sleeve and cylinder. The sleeve 15, which comprises merely a rectangular strip of porous material, eliminates the necessity of using a cylindrical porous sleeve which is customarily utilized in rotatable paint applicators.

In compliance with the requirements of the patent statutes I have here shown and described a preferred embodiment of my invention. It is, however, to be understood that the invention is not limited to the precise construction here shown, the same being merely illustrative of the principles of the invention. What I consider new and desire to secure by Letters Patent is:

1. In a paint applicator, the combination of a perforated paint-holding cylinder, an internal annular bearing surface at each end of said cylinder, a porous sleeve enclosing said cylinder and covering the perforations thereof, the ends of said sleeve being turned into positions overlying said annular bearing surfaces, a shaft, means for sealing one end of the cylinder comprising an end cup at one end of the cylinder sealingly connected to said shaft and having its periphery engaged with the turned in end of said sleeve, a second end cup at the opposite end of the cylinder, means secured to said shaft for compressing said cups inwardly of said cylinder to seal the edges of said cups with said bearing surfaces by compressing the turned in ends of said sleeve

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therebetween, said cylinder with said sleeve positioned therearound comprising a porous chamber for receiving a quantity of paint, the second end cup being apertured for filling the chamber with the paint, and a third cup sealingly connected to said shaft adjacent the apertured cup and having its edge sealed with respect to said cylinder for thereby sealing the chamber.

2. In a paint applicator, the combination of a perforated paint-holding cylinder, an internal annular bearing surface at one end of said cylinder, another internal annular bearing surface at the opposite end of said cylinder, a porous sleeve enclosing said cylinder and covering the perforations thereof, the ends of said sleeve being turned into positions overlying said annular bearing surfaces, a shaft, means for sealing one end of the cylinder comprising an end cup at one end of the cylinder sealingly connected to said shaft and having its periphery engaged with the turned in end of said sleeve, a second end cup at the opposite end of the cylinder, means secured to said shaft for compressing said cups inwardly of said cylinder to seal the edges of said cups with said bearing surfaces by compressing the turned in ends of said sleeve therebetween, said cylinder with said sleeve positioned therearound comprising a porous chamber for receiving a quantity of paint, the second end cup being apertured for filling the chamber with the paint, a third cup sealingly connected to said shaft adjacent the apertured cup and having its edge sealed with respect to said cylinder for thereby sealing the chamber by having its edge engaged with the corresponding turned in end of said sleeve, and means for compressing a portion of said corresponding turned in end of said sleeve between the edge of said third cup and the edge of said apertured cup for thereby sealing the chamber, the porous chamber being effective upon being rolled over a surface to spread the paint uniformly thereover.

3. In a paint applicator, the combination of a paint-receiving cylinder having apertures spaced about the periphery thereof, internal annular bearing surfaces at each end of said cylinder, a porous sleeve enclosing said cylinder and covering the apertures thereof and having its ends turned into positions overlying said annular bearing surfaces, a shaft centrally located within said cylinder, a pair of cups each having a central aperture for receiving said shaft and each having a peripheral lip for engaging the turned in ends of said sleeve, means for mounting said cups on said shaft, one of said last mentioned means being movable along the shaft for drawing said cups inwardly to compress said turned in sleeve ends between said lips and said bearing surfaces to provide a sealed connection therebetween, one of said cups having an aperture therein for facilitating filling said cylinder with paint, said cylinder with said sleeve positioned therearound comprising a porous chamber, a third cup sealingly connected to said shaft and having a peripheral lip engaged with the turned in end of said sleeve adjacent the apertured cup, and means for compressing said third cup inwardly with reference to said cylinder whereby a portion of said last mentioned turned in end of said sleeve is compressed to form a gasket between the lips of said third cup and said apertured cup in order to seal the chamber.

4. In a paint applicator, the combination of a perforated cylinder having a porous sleeve positioned therearound comprising a perforated rec-

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tangular strip of sheet metal deformed to a cylindrical shape, one side of said metal strip being deformed to form a lip, said lip having a plurality of apertures therein, the other side of said metal strip being formed with a plurality of projections thereon, a strip of porous material positioned with its edges between said lip and the other side of said metal strip, said projections passing through the edges of said porous strip and through said apertures in said lip and being clinched over to hold the sides of said metal strip together with the porous strip positioned therearound; a shaft; a pair of cups sealingly connected to said shaft and to said cylinder with the porous sleeve positioned therearound to thereby form a porous chamber for receiving a quantity of paint; and a handle rotatably secured to said shaft for facilitating the rolling of said chamber over a surface in order to spread the paint uniformly thereover.

5. In a paint applicator, the combination of a perforated cylinder having a porous sleeve positioned therearound comprising a perforated rectangular strip of sheet metal deformed to a cylindrical shape, one side of said metal strip being deformed to form a lip, said lip having a plurality of apertures therein, the other side of said metal strip being formed with a plurality of projections thereon, the ends of said strip each having a transverse groove formed therein, a strip of porous material positioned with its edges between said lip and said other side of said metal strip, said projections passing through the edges of said porous strip and through said apertures in said lip and being clinched over to thereby hold the sides of said metal strip together with the porous strip positioned therearound, said transverse grooves thereby forming an inwardly protruding peripheral bead at each end of the cylinder and the ends of said porous strip being turned into the ends of the cylinder beyond the peripheral beads; a shaft; a pair of cups sealingly connected to said shaft and having their edges engaged with the turned in ends of said porous strip; means secured to said shaft for compressing said cups inwardly with respect to said cylinder to thereby seal the edges of said cups with said peripheral beads by compressing the turned in ends of said porous strip therebetween; said cylinder with said porous strip positioned therearound comprising a porous chamber for receiving a quantity of paint; one of said cups being apertured for facilitating filling the chamber with the paint; and a third cup sealingly connected to said shaft adjacent the apertured cup and having its edge sealed with respect to said cylinder for thereby sealing the chamber; the porous chamber being effective upon being rolled over a surface to spread the paint uniformly thereover.

6. A paint applicator in accordance with claim 5 wherein a handle is rotatably secured to said shaft for facilitating the rolling of the chamber over the surface.

7. In a paint applicator, the combination of a perforated paint holding cylinder, an internal annular bearing surface at each end of the cylinder, a porous sleeve enclosing said cylinder and covering the perforations thereof, the ends of the sleeve being turned into positions overlying said annular bearing surfaces, a shaft, means for sealing one end of the cylinder comprising an end cup at one end of the cylinder sealingly connected to said shaft and having its periphery engaged with the turned in end of the sleeve, a cupped member at

the opposite end of the cylinder, the adjacent turned in end of the sleeve being between the adjacent annular bearing surface and the periphery of the cupped member and being held in turned position by the cupped member, said cupped member having means at the center thereof for supporting the shaft and through which the shaft extends, said cupped member having at least one aperture therethrough for filling the cylinder with paint; and means for sealing said opposite end of the cylinder comprising another end cup overlying the cupped member and through which the shaft extends and a threaded member threaded on the shaft at the end thereof that extends through said last mentioned end cup for forcing the same inwardly of the cylinder to form a seal around the periphery of the last-mentioned end cup where said periphery engages the assembly of the cylinder and the sleeve.

8. In a paint applicator, the combination of a paint receiving cylinder having apertures spaced about the periphery thereof, an internal annular bearing surface at each end of said cylinder, a porous sleeve enclosing said cylinder and covering the apertures thereof and having its ends turned into position overlying said annular bearing surfaces, a shaft centrally located within said cylinder, a pair of cups each having a central aperture for receiving said shaft and each having a peripheral lip for engaging the turned in ends of said sleeve between the lips and the bearing surfaces, one of said cups having an additional aperture therein for facilitating filling said cylinder with paint, said cylinder with said sleeve positioned therearound comprising a porous chamber, a third cup sealingly connected to said shaft and having a peripheral lip and imperforate between the lip and the shaft, said last mentioned lip surrounding at least the apertured portion of the cup with the filling aperture, and means for compressing said third cup inwardly with reference to said cylinder whereby the lip of the third cup forms a seal around the said paint filling aperture.

9. A paint applicator comprising a hollow perforate cylinder, a paint pervious tubular sleeve encasing the cylinder and extending beyond the ends thereof, a shaft extending axially of the cylinder, an end closure cup for one end of the cylinder, said shaft extending centrally through the cup and being secured thereto by means forming a liquid-tight seal around the shaft, said shaft extending beyond the cup to form a handle receiving projection on the side of the cup that faces outwardly of the cylinder, the adjacent end of the sleeve being folded to a position between the end of the cylinder and the periphery of the cup, the periphery of the cup compressing the sleeve to form a paint-tight seal between the cup and the cylinder, means at the end of the cylinder remote from the cup for securing the adjacent end of the shaft to the cylinder and drawing the shaft axially of the cylinder to compress the sleeve between the periphery of the cup and the cylinder, a handle journaled on the handle receiving

projection of the shaft, and means for confining longitudinal motion of the handle on the shaft independently of the compression of the sleeve by the periphery of the cup.

10. In a roller assembly for paint applicators having a cylindrical drum carrying a paint pervious sleeve, a shaft having a threaded end and extending longitudinally in the drum, a removable end plate for the drum having an opening for receiving the threaded end of the shaft, means for securing the said removable end plate to the shaft comprising a nut having an internal threaded portion on the outer side of the end plate which nut is threaded on the shaft and bears against the outside of the end plate, the said nut having a shank extending through the end plate, the inner end of the said shank flaring outwardly to secure the nut to the end plate while allowing relative rotation therebetween, and the said nut applying an inwardly directed axial force against the said end plate to clamp the same to the drum.

11. A paint applicator roller assembly having a drum comprising a cylindrical barrel carrying a paint-pervious sleeve, a shaft having a threaded end and extending longitudinally through the drum, and a removable end plate for the drum having an opening receiving the threaded end of the shaft, means for securing the said removable end plate to the shaft comprising a nut having an internal threaded portion on the outer side of the end plate which is in threaded engagement with the said threaded end of the shaft, the said nut having a shank loosely extending through an opening between the end plate and the shaft, the inner end of the said shank flaring outwardly to secure the nut permanently to the end plate while allowing relative rotation therebetween, and the peripheral edges of the end plate engaging the said drum, and the said nut applying an inwardly directed axial force against the said end plate to clamp the same in position with respect to the drum.

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