April 14, 1964 W. R. HOHMANN 3,128,494

PAINT ROLLER COATING APPARATUS

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FIG. 1

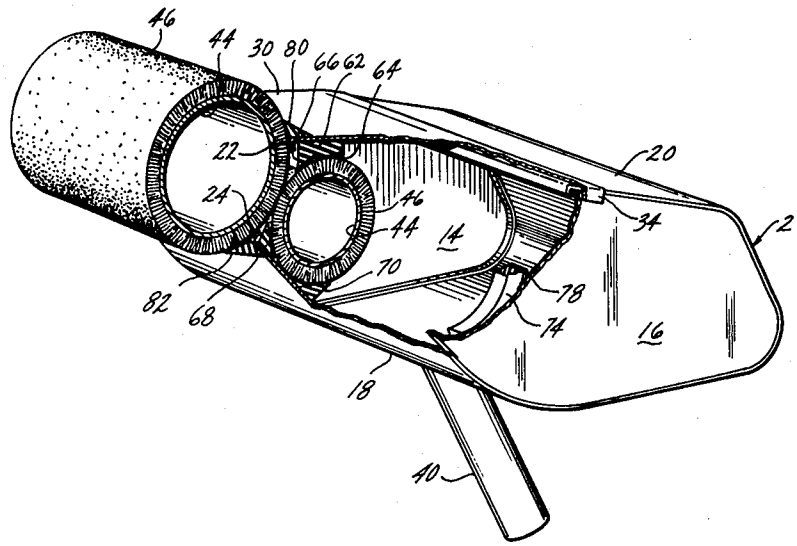
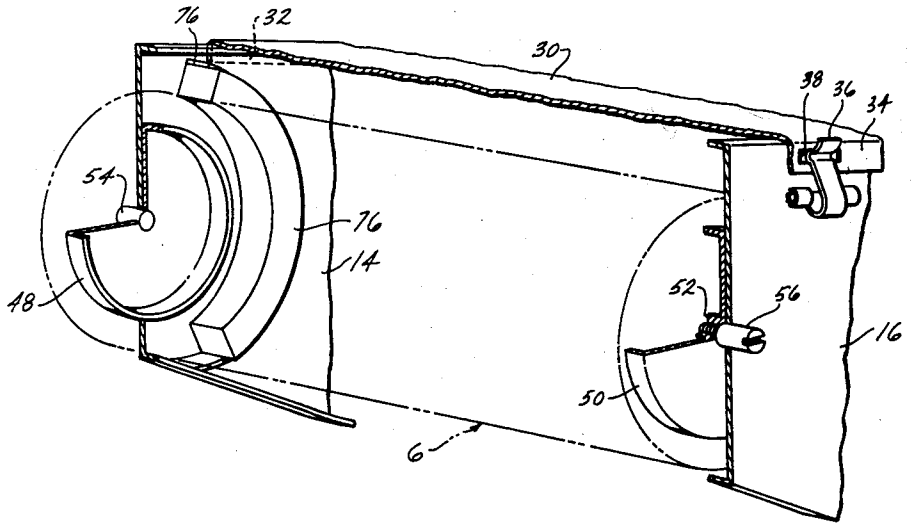


FIG. 2



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FIG. 3

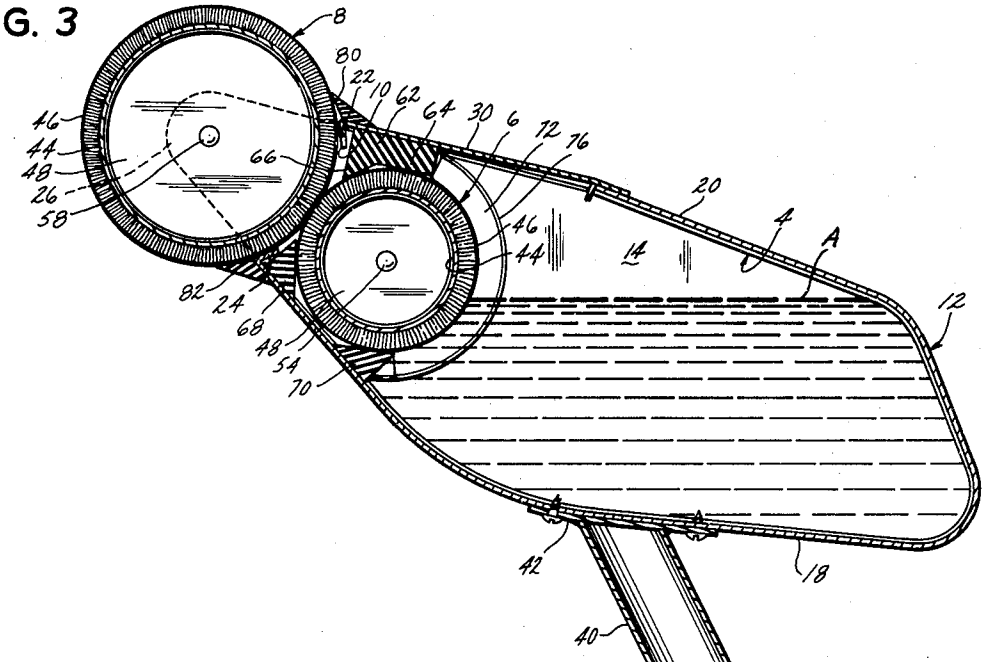
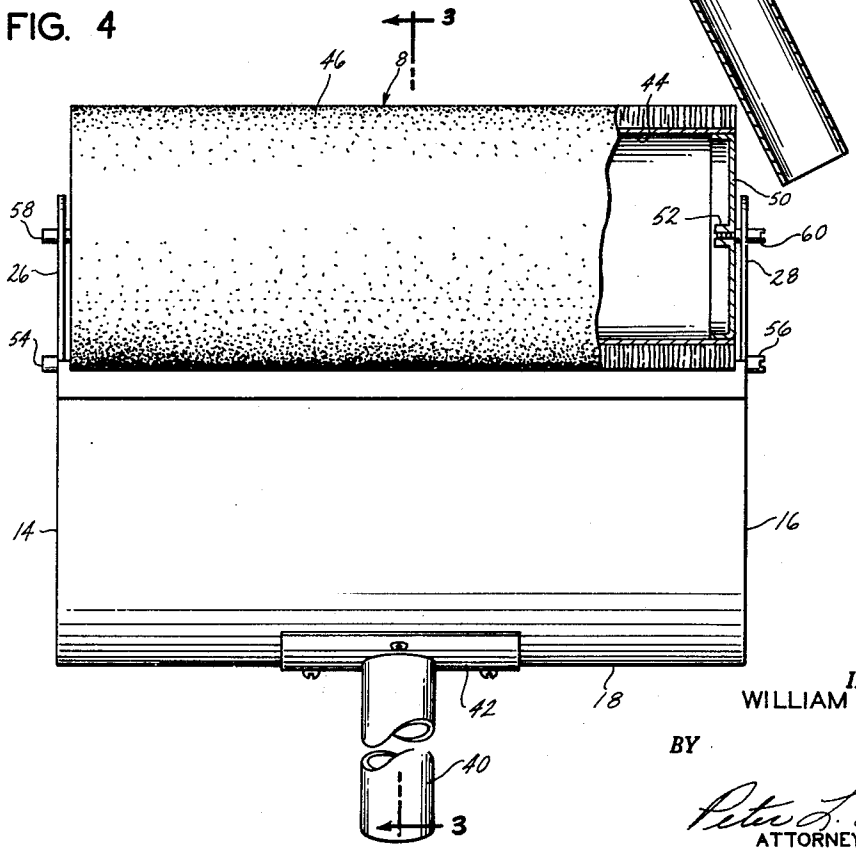


FIG. 4



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PAINT ROLLER COATING APPARATUS

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14 Claims. (Cl. 15—573)

The present invention relates to paint roller coating apparatus, and more particularly to a novel paint roller coating apparatus having a self-contained reservoir for feeding paint to the roller.

Although the most widely utilized paint roller coaters require a supplementary paint container into which the roller must continually be immersed in order to renew the supply of paint on the surface, various types of apparatus have been proposed wherein a paint reservoir supplies paint to the roller by gravity or pressure. Generally, apparatus having a self-contained supply tends to be complex and expensive, and often difficulties may arise in achieving a uniform coating of paint on the entire surface of the roller.

It is an object of the present invention to provide a novel paint roller coating apparatus having a self-contained paint reservoir which is easy to operate and which supplies a uniform coating of paint upon the entire surface of the roller.

Another object is to provide such a paint roller coating apparatus having a self-contained paint reservoir in which the reservoir is sealed to prevent leaking and accidental spilling while permitting use of the apparatus at various angles relative to the surface being coated.

A further object is to provide such a paint roller coating apparatus which can be simply and economically manufactured and which can operate effectively when a relatively small amount of paint remains in the reservoir.

Other objects and advantages will be apparent from the following detailed description and claims and the attached drawings wherein:

FIGURE 1 is a perspective view of a paint roller coating apparatus embodying the present invention with a portion of apparatus broken away to reveal internal construction;

FIGURE 2 is a fragmentary perspective view of the coating apparatus of FIGURE 1 with the outer roller assembly and portions of the housing assembly broken away to reveal internal construction;

FIGURE 3 is a sectional view along the line 3—3 of FIGURE 4; and

FIGURE 4 is a front elevational view of the apparatus shown in FIGURE 1 with a portion of the outer roller broken away to reveal the mounting assembly therefor.

It has now been found that the foregoing and related objects can be readily attained by a paint roller coating apparatus having a housing assembly providing a reservoir portion with a transverse opening at one end. A generally cylindrical inner roller is rotatably mounted in the housing assembly adjacent the transverse opening with its axis extending transversely of the housing and has a relatively rigid core portion and an absorbent outer portion adapted to absorb paint contained in the reservoir portion of the housing when the apparatus is in use. Substantially liquid-tight sealing means are mounted on the housing with portions extending transversely of the housing above and below the axis of the inner roller and in close-fitting relationship with the periphery thereof along its axial length to prevent substantially the passage of paint from the reservoir portion through the opening in the end of the housing assembly except as absorbed and transported by the absorbent outer portion of the inner roller during operation of the apparatus. A generally cylindrical outer roller similarly constructed with a relatively rigid core portion and an absorbent outer portion is rotatably mounted on bearing supports adjacent the opening with its axis outwardly of and parallel to the axis of rotation of the inner roller. The outer roller is mounted so that its absorbent outer portion secantally intersects the absorbent outer portion of the inner roller to effect rotation of the inner roller and transfer of paint from the inner roller to the outer roller during rotation thereof in operation of the apparatus. Most desirably, the housing assembly includes a pair of doctor blades which extend transversely thereof adjacent the opening in close surface contact with the axial length of the outer roller above and below the area of secantal intersection with the inner roller, thus ensuring against excess paint on any portion of the surface of the outer roller.

The housing assembly has side, top, bottom and rear walls to provide a reservoir portion in the rearward area, with the front end of the housing assembly being left open. In the preferred aspect, the bottom wall curves upwardly towards the inner roller and into close proximity thereto, and the top wall includes a closure portion which extends across the width of the forward portion of the top wall. A handle extends downwardly from the bottom wall to provide a means for manipulating the apparatus. In accordance with conventional construction, both rollers have a cylindrical core portion of relatively rigid and inexpensive material such as synthetic plastic or fiberboard, and an outer portion of absorbent material such as fabric or cellular synthetic plastic adapted to absorb paint contained in the reservoir portion during operation of the apparatus. The rollers are removably mounted in the apparatus for cleaning or replacement.

The sealing means includes elongate seals or first sealing means mounted on the inner surface of the top and bottom walls which extend parallel to the axis of the inner roller and in tight contact with the surface of the inner roller along the entire length thereof above and below the axis. End seals or second sealing means are mounted on the side walls adjacent the end portions of the inner roller and extend from the upper elongate seal to the lower thereby cooperating with the ends thereof to complete a sealing structure about the longitudinal periphery of the inner roller and substantially preventing the passage of paint from the reservoir portion through the open front end of the housing assembly except as absorbed and transported by the absorbent outer portion of the inner roller. These end seals have arcuate faces to conform closely to and fit in close surface contact with the periphery of the inner roller and preferably are mounted on the side walls in close-fitting relationship with the rearward surface of the inner roller. These seals are most desirably fabricated from a relatively paint-resistant organic polymer exhibiting some resilience, and the end seals preferably have a high degree of resilient deformability to provide a high degree of surface conformity.

Referring in detail to the attached drawings, there is illustrated an embodiment of the invention generally comprised of a housing assembly 2 providing a reservoir portion 4 therein for storage of a quantity of paint designated by the letter A, an inner roller 6 and an outer roller 8. In this embodiment, the reservoir portion 4 is provided by a sheet metal structure having an opening 10 extending transversely at the front end thereof, a rear wall 12, side walls 14 and 16, a bottom wall 18 which has a front portion sloping upwardly towards the top wall and inner roller 6 and into close proximity to the inner roller and a top wall 20. Bent over lips 22, 24 on the top and bottom walls, 18, 20, respectively, define the top and bottom margins of the transverse opening 10 and the side walls 14, 16 have integral arm portions 26, 28 extending forwardly of the opening 10. A removable clo-

sure portion 30 constitutes the forward portion of the top wall 20 and has depending flanges 32, 34 along its side margins which extend in tight contact along the side walls 14, 16 and are fastened thereto, conveniently by hook-type clasps 36 mounted on the side walls which engage in slots 38 in the flanges 32, 34. The housing assembly 2 is readily manipulated by a tubular handle 40 which is secured to a mounting plate 42 which in turn is fastened to the bottom wall 18.

The inner and outer rollers 6, 8 are generally of cylindrical configuration and have a tubular, relatively rigid core portion 44 and an outer peripheral portion 46 of fabric or other absorbent material adapted to absorb paint for transfer of paint A from the reservoir portion 4, transfer the paint between the inner and outer rollers, and thence apply it uniformly to a planar surface such as a wall or ceiling (not shown). The rollers 6, 8 have cap-shaped mounting elements 48, 50 tightly engaged within the ends of the tubular core portions 44 and the mounting elements 50 have a central boss 52 extending inwardly with a threaded aperture therein. The inner roller 6 is rotatably mounted within the housing assembly 2 inwardly of the opening 10 with its axis extending transversely of the housing by a first pin 54 secured in the mounting element 48 and seated within an aperture in the side wall 14 and a second pin 56 threadably engaged in the boss 52 of the mounting element 50 and seated in an aperture in the side wall 16. As indicated in FIGURE 4, the roller 6 is of sufficient axial length that it extends substantially across the opening 10 and into close proximity with the side walls 14, 16.

The outer roller 8 is similarly rotatably mounted in the arm portions 26, 28 forwardly of the opening 10 by a first pin 58 and a second threaded pin 60 which respectively engage in the mounting elements 48, 50 thereof. The outer roller 8 is mounted with its axis parallel to that of the inner roller 6 and is radially spaced therefrom so that its outer absorbent portion will secantally intersect or compressively engage with that of the inner roller to impart rotation to the inner roller and to effect transfer of paint therefrom during operation of the apparatus. For clarity of illustration, very little overlap has been shown in the drawings; however, an overlap equal to about one-tenth to one-half the radial depth of the absorbent portion generally will be satisfactorily dependent upon the compressibility of the material.

Mounted on the closure portion 30 of the top wall 20 is an elongated seal or sealing means 62 which extends transversely of the housing assembly 2 between the side walls 14, 16. The seal 62 has a lower face with a planar rear portion 64 and a depending, generally V-shaped forward portion 66, both of which are in close-fitting surface contact with the periphery of the roller 6 along the axial length thereof so as to seal the space between the periphery of the roller and the top wall 20. Mounted on the bottom wall 18 are a pair of elongated generally V-shaped seals or sealing means 68, 70 which extend transversely of the housing assembly 2 between the side walls 14, 16 in close-fitting surface contact with the periphery of the roller 6 along the axial length forwardly and rearwardly of the axis thereof so as to seal the space between the periphery of the roller and the bottom wall 18, thus cooperating with the seal 62 to provide transverse or first sealing means.

The sealing assembly is completed by a pair of arcuate resiliently compressible end seals or second sealing means 72, 74 which are mounted inwardly or rearwardly of the inner roller 6 on the arcuate seal supports 76, 78 secured to the side walls 14, 16 by brazing, welding or other suitable means. The arcuate end seals 72, 74 extend in close-fitting surface contact with the rearward or inner periphery of the inner roller 6 between the elongated seals 62, 70 and seal the space between the ends of the roller 6 and the side walls 14, 16. In this manner, the periphery of the inner roller 6 picks up paint from the reservoir portion 4 as it rotates between the elongated seals 62, 70.

Mounted on the outer surface of the bottom and top walls 18, 20 are elongated doctor blades or wiper elements 80, 82 which extend transversely of the housing assembly 2 and have an outer or free end portion projecting forwardly of the opening 10 into close surface contact with the outer roller 8 along the axial length thereof above and below the area of secantal intersection with the inner roller 6. In this manner, any excess paint on a portion of the peripheral surface of the outer roller 8 is wiped therefrom to achieve a more uniform distribution and substantially prevent spattering.

Referring now to the operation of the apparatus as best understood from FIGURE 3, paint is received within the reservoir portion 4 of the housing assembly 2 through the closure portion 30. As is conventional, the apparatus is held with the axis of the outer roller 8 in a position parallel to the surface to be painted and with the surfaces in frictional contact. As the apparatus is moved along the surface, this frictional contact causes the outer roller 8 to rotate about its axis and in turn to cause the inner roller 6 to rotate due to the frictional contact therebeween. As the inner roller 6 rotates, a segment of the periphery of absorbent outer portion 46 passes through and absorbs paint in the reservoir portion 4. Excess paint on the surface of the inner roller 6 is removed as the surface passes the elongate seals 62, 70 in either direction of rotation.

Continued rotation brings the paint absorbed by the inner roller 6 into contact with the absorbent outer portion 46 of the outer roller 8 at their area of intersection where the mutual compression of their absorbent portions 46 effects transfer and absorption of some of the paint therefrom by the outer roller. Any excess paint concentration on the surface of the outer roller 8 is wiped and redistributed as the surface passes the elongated doctor blades 80, 82 mounted on the exterior of the housing assembly, thus providing an even coating of paint on the surface of the outer roller 8 and resulting in a uniform application of paint.

The end seals 72, 74 and the elongated seals 62, 68 and 70 within the housing assembly 2 prevent passage of paint through the open end 10 of the housing except as carried through by the absorbent outer portion 46 of the inner roller 6. Thus, the apparatus is substantially spill-proof regardless of its orientation. As the apparatus is operated over a length of planar surface, tilting about a longitudinal axis of the rollers will inherently occur, and the curvature of the bottom wall 18 will cause the paint in the reservoir portion 4 to flow onto the absorbent outer portion of the inner roller 6 even when the supply of paint is low. The outer roller 8 may be removed for cleaning or replacement by removing the outer threaded pin 60 and springing slightly the arm portions 26, 28. The inner roller 6 may be removed by disengaging the inner threaded pin 56 and withdrawing it through the closure portion 30.

Thus, it can be seen that the paint roller coating apparatus of the present invention provides a self-contained paint reservoir which is effectively sealed to permit use of the apparatus at various angles without danger of spillage or leakage. The apparatus provides a smooth, even coating of paint upon the applicator roller even when a small amount of paint remains in the reservoir. Also, the unit is easily operated and maintained and is relatively simple and economical to manufacture.

Although but one specific embodiment of the invention has been shown and described herein, it will be understood that modifications may be made within the spirit of the invention as set forth in the claims.

Having thus described the invention, I claim:

1. A paint roller coating apparatus comprising a housing assembly providing a reservoir portion with a transverse opening at one end thereof; a generally cylindrical

inner roller rotatably mounted adjacent said transverse opening in said housing assembly with its axis extending transversely of said housing, said roller having a relatively rigid core portion and an absorbent outer portion adapted to absorb paint contained within said reservoir portion during operation of the apparatus; first sealing means for said inner roller mounted on said housing assembly having portions extending transversely thereof above and below the axis of said inner roller and in close-fitting relationship with the surface of said inner roller along the axial length thereof; second sealing means for said inner roller mounted on said housing assembly having portions adjacent the end portions of said inner roller in close-fitting relationship therewith and cooperating with said first sealing means at the ends thereof to prevent substantially the passage of paint from said reservoir portion through said opening at said one end of said housing assembly except as absorbed and transported by said absorbent outer portion of said inner roller during operation of the apparatus; a generally cylindrical outer roller having an absorbent outer portion and a relatively rigid core portion; means rotatably mounting said outer roller with its axis outwardly of said inner roller and adjacent said opening of said housing assembly and parallel to the axis of rotation of said inner roller and with a portion thereof extending radially outwardly of said opening, said means mounting said outer roller with its absorbent outer portion secantally intersecting the absorbent outer portion of said inner roller to rotate said inner roller and effect transfer of paint from said inner roller to said outer roller during rotation thereof in operation of the apparatus.

2. The paint roller coating apparatus of claim 1 wherein said housing assembly includes a pair of doctor blades extending transversely of said housing assembly adjacent said opening in close surface contact with the axial length of said outer roller above and below said area of secantal intersection with the inner roller.

3. The paint roller coating apparatus of claim 1 wherein said housing assembly includes a bottom wall curving upwardly towards said inner roller and into proximity thereto.

4. A paint roller coating apparatus comprising a housing assembly providing a reservoir portion with a transverse opening at the front end and having side, top, bottom and rear walls; a generally cylindrical inner roller rotatably mounted in said housing assembly with its axis extending transversely thereof adjacent said transverse opening in said housing, said roller having a relatively rigid core portion and an absorbent outer portion adapted to absorb paint contained within said reservoir portion during operation of the apparatus; first sealing means mounted on said housing assembly for said inner roller having longitudinal portions extending transversely of said housing assembly above and below the axis of said inner roller in close-fitting relationship with the periphery of said inner roller along the length thereof; second sealing means for said inner roller mounted on said housing assembly having side portions extending between said longitudinal portions of said first sealing means along the inner surface of said side walls in close-fitting relationship with the ends of said inner roller and cooperating with said first sealing means to prevent substantially the passage of paint from said reservoir portion through said opening at said front end of said housing assembly except as absorbed and transported by said absorbent outer portion of said inner roller during operation of the apparatus; a generally cylindrical outer roller having an absorbent outer portion and a relatively rigid core portion; means rotatably mounting said outer roller with its axis outwardly of said opening in said front end of said housing assembly and parallel to the axis of rotation of said inner roller, said means mounting said outer roller with its absorbent outer portion secantally intersecting the absorbent outer portion of said inner roller to rotate said inner roller and effect transfer of paint from said inner roller to said outer roller during rotation thereof in operation of the apparatus.

5. The apparatus of claim 4 wherein said bottom wall of said housing assembly curves upwardly toward said inner roller and into close proximity thereto.

6. The apparatus of claim 4 wherein said top wall of said housing assembly has a removable closure portion for adding and removing paint from said reservoir portion.

7. The paint roller coating apparatus of claim 4 wherein said housing assembly includes a pair of doctor blades extending transversely of said housing assembly adjacent said opening in close surface contact with the axial length of said outer roller above and below said area of secantal intersection with the inner roller.

8. A paint roller coating apparatus comprising a housing assembly providing a reservoir portion with a transverse opening at the front end thereof and having side, bottom, top and rear walls, said top wall having a removable closure portion for adding and removing paint from said reservoir portion and said bottom wall having a handle portion depending therefrom; a generally cylindrical inner roller having a relatively rigid core portion and an absorbent outer portion adapted to absorb paint contained within said reservoir portion during operation of the apparatus; means rotatably mounting said roller in said housing assembly with its axis inwardly of but adjacent said opening in said front end, said roller extending transversely of said housing assembly and having its ends closely adjacent the side walls thereof; elongate seals on the bottom and top walls of said housing extending axially along the length of said inner roll in close-fitting relationship with the surface thereof above and below its axis; end seals having an arcuate face mounted on said side walls inwardly of said inner roll and extending between the elongate seals in close-fitting relationship with the surface of said inner roll adjacent said side walls, said end seals cooperating with said elongate seals to prevent substantially the passage of paint from said reservoir portion through said opening at said front end of said housing assembly except as absorbed and transported by said absorbent portion during operation of the apparatus; a generally cylindrical outer roller having an absorbent outer portion and a relatively rigid core portion; support arms on said housing assembly extending forwardly of said opening; and means rotatably mounting said outer roller in said support arms with its axis parallel to said inner roller, and outwardly of said opening, said means mounting said roller with its absorbent outer portion secantally intersecting the absorbent outer portion or said inner roller to rotate said inner roller and effect transfer of paint from said inner roller to said outer roller during rotation thereof in operation of the apparatus.

9. The paint roller coating apparatus of claim 8 wherein said elongate seals include a pair of seals extending between the bottom wall and inner roller spaced outwardly and inwardly of the axis thereof and a third seal extending between the top wall and inner roller.

10. The paint roller coating apparatus of claim 8 wherein said inner roller is inwardly of said opening and said outer roller extends radially inwardly thereof and said housing assembly includes a pair of elongate doctor blades extending across said opening above and below the area of intersection with said inner roller in close surface contact with the axial length of said outer roller.

11. The paint roller coating assembly of claim 8 wherein said end seals are fabricated of a resiliently deformable organic polymer.

12. A paint roller coating apparatus comprising a housing assembly providing a reservoir portion with an elongate rectangular opening extending across the width of the front end thereof and having side, bottom, top and rear walls, said top wall having a removable closure portion extending across the width of the forward portion thereof adjacent said opening in said front end for adding and removing paint from said reservoir portion

and providing access to the interior of said housing assembly, said bottom wall curving upwardly towards the front end of said housing assembly and having a handle portion depending therefrom, and said side walls having portions extending forwardly of said opening to provide support arms; a generally cylindrical inner roller having a relatively rigid core portion and an absorbent outer portion adapted to absorb paint contained within said reservoir portion during operation of the apparatus; means rotatably mounting said inner roller in said housing assembly inwardly of but adjacent said opening in the front end thereof with its axis of rotation extending transversely of said housing assembly, said roller having its ends closely adjacent the side walls of said housing assembly; an elongated upper seal mounted on the inner surface of said top wall above said inner roller and extending transversely across said housing assembly, said upper seal projecting downwardly to make tight surface contact with the periphery of said inner roller along the length thereof; elongated lower seal means mounted on the inner surface of said bottom wall below said inner roller and extending transversely across said housing assembly, said lower sealing means projecting upwardly to make tight surface contact with the periphery of said inner roller along the length of said inner roller; end seals mounted on the inner surface of the side walls extending between said elongated upper and lower seals inwardly of said inner roller, said end seals having an arcuate face conforming to the periphery of said inner roller, said end seals cooperating with said elongated seals to prevent substantially the passage of paint from said reservoir portion through

said opening at said front end of said housing assembly except as absorbed and transported by said absorbent portion of said inner roller during operation of said apparatus; a generally cylindrical outer roller having a relatively rigid core portion and an absorbent outer portion; means rotatably mounting said outer roller on said support arms with its axis parallel to said inner roller and outwardly of said opening and with its absorbent outer portion secantally intersecting the absorbent outer portion of said inner roller; and a pair of doctor blades mounted on said housing assembly extending across said opening in close surface contact with the axial length of said outer roller above and below the area of intersection with said inner roller.

13. The paint roller coating aparatus of claim 12 wherein said elongated upper seal and said elongated lower sealing means each are configured to provide two lines of surface contact extending along the length of said inner roller.

14. The paint roller coating apparatus of claim 12 wherein said end seals are fabricated from a resiliently compressible organic polymer.

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