Jan. 18, 1966 D. A. GOETZ 3,229,319

EXTENSIBLE PAINT ROLLER

Filed May 1, 1964 2 Sheets-Sheet 1

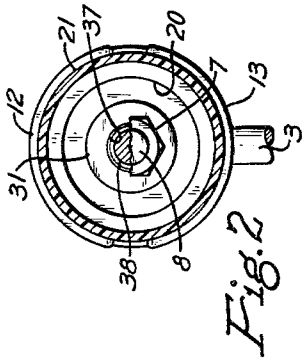


Fig. 2

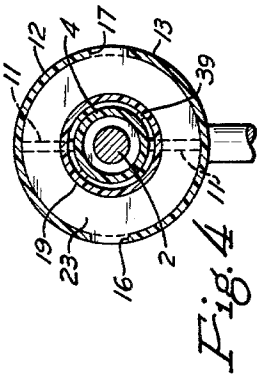


Fig. 4

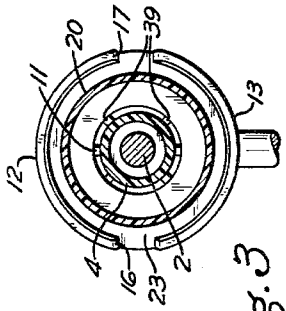


Fig. 3

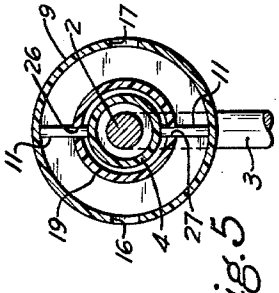


Fig. 5

Fig. 1

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EXTENSIBLE PAINT ROLLER

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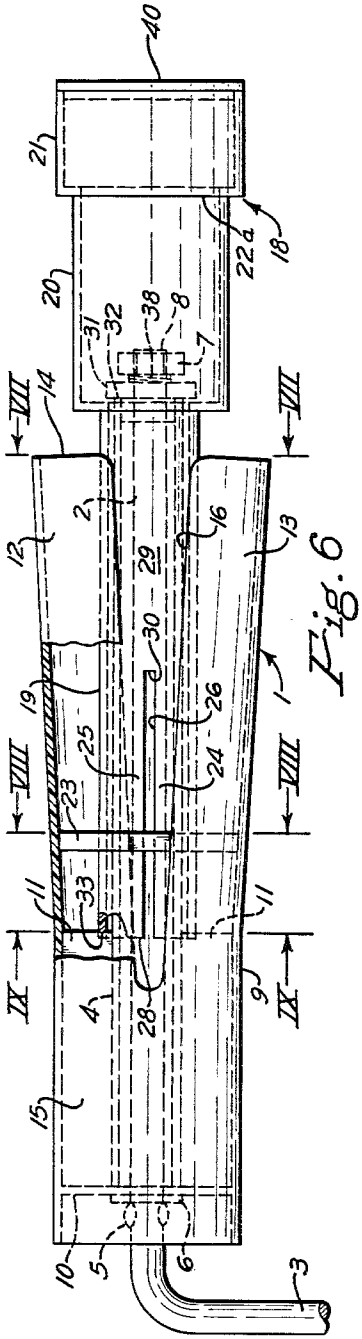


Fig. 6

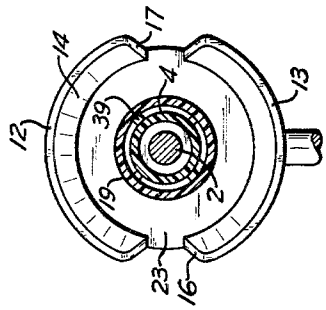


Fig. 7

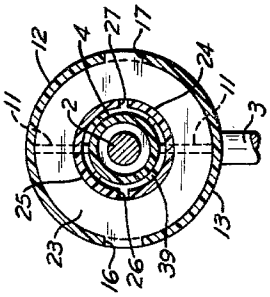


Fig. 8

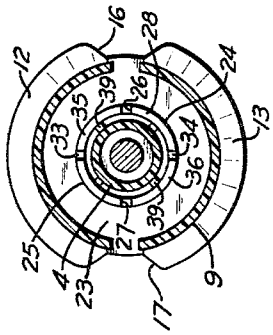


Fig. 9

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United States Patent Office 3,229,319
Patented Jan. 18, 1966

3,229,319

EXTENSIBLE PAINT ROLLER

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Filed May 1, 1964, Ser. No. 364,133
21 Claims. (Cl. 15—230.11)

This invention relates to a paint roller which receives and supports a conventional sleeve or cylinder having nap on its exterior surface for application of paint and the like onto a surface. More particularly, it relates to a paint roller which extensible from a first length, such as 7" to a second length, for example 9", and then, of course, is convertible back to the 7" length. Accordingly, the roller of this invention has versatility, i.e., two rollers in one for painting wide and narrow surface areas, and thereby can replace one roller.

Heretofore, some users of paint rollers purchased two separate rollers, one for painting surface areas relatively narrow in width, and a second roller for covering wider surface areas. Now, however, my invention makes it possible to convert a single roller from a short length length to a long length, or from a long length to a short one. Specifically, my roller receives and rotatably supports a conventional nap-covered sleeve which applies paint onto a surface, and comprises a rod adapted for mounting upon an axle and for rotation about its longitudinal axis on this axle. The rod carries an outer substantially tubular shell member having a portion which extends longitudinally over a portion of the rod. This outer shell member extends in substantially the same direction as the rod and includes at least two spaced apart fingers whose outer ends are free and form an open end of the shell member. The fingers extend inwardly from their outer ends to form two slots therebetween and to connection with that portion of the outer shell member which includes the other end thereof. A first stop member is positioned inwardly from the outer ends of the fingers and extends between the rod and an inner wall of the outer shell member. An inner tubular member with a portion telescoped inside a part of the outer tubular member and circumferentially around the rod extends substantially longitudinally of this rod and in engagement with a part thereof. This inner tubular member is rotatable with the rod and has a slot which is open at one end of the inner tubular member and which runs inwardly from the one end to a slot terminus. The portion of the inner tubular member which includes the slot extends into the open end of the outer tubular member and is slidably disposed upon the rod from a first position whereat the first stop member engages the slot terminus to form a roller of a first length, to a second posititon whereat a portion of the inner tubular member has been moved longitudinally out through the open end of the outer tubular member to bring a part of the inner member into engagement with a second stop member carried by either the axle or the rod, and whereat this inner member has been turned about its longitudinal axis an amount to move the inner member slot out of alignment with the first stop member to form a roller of a second length greater than the first length.

This roller has a means such as a ring slidably disposed upon the inner member along that portion which extends into the open end of the outer member. This ring extends substantially radially from the inner member into engagement with the interior surface of the outer member fingers for urging them radially apart. The inner tubular member also has means such as longitudinally extending ribs which project radially inwardly along a part of the inside surface thereof to provide a friction engagement with the inner tubular member and the rod

to resist movement of the inner tubular member upon the rod.

At one end of the rod or axle is a spring which is disposed to operatively exert a force upon an end of the inner member to resist rotation thereof about the rod when it is in the second position. The inner tubular member has on that end at which its slot is open, at least two spaced apart lips which form a notch for receiving the first stop member when the inner tubular member is in the second position.

In addition to the slot, the inner member may have a means such as a shoulder, rib, lug, projection, etc., thereon for engagement with a first stop member to form the first length of the roller and thereby eliminate the slot of the inner member.

A further embodiment of my roller has the first length formed by engagement of the one end of the inner member with the first stop member which can be an end wall of the outer shell.

In the accompanying drawings, I have shown a preferred embodiment of my invention, in which:

FIGURE 1 is a plan view, partially in section, of my roller arranged for a short length;

FIGURE 2 is a section view along the line II—II of FIGURE 1;

FIGURE 3 is a section view along the line III—III of FIGURE 1;

FIGURE 4 is a section view along the line IV—IV of FIGURE 1;

FIGURE 5 is a section view along the line V—V of FIGURE 1;

FIGURE 6 is a view similar to FIGURE 1, but showing the roller extended from the short length of FIGURE 1 to a long length;

FIGURE 7 is a section view along with the line VII—VII of FIGURE 6;

FIGURE 8 is a section view along the line VIII—VIII of FIGURE 6; and

FIGURE 9 is a section view along the line IX—IX of FIGURE 6.

Referring to the drawings, my roller 1 is rotatably mounted upon a conventional axle 2 which is joined to a conventional handle 3. This roller comprises a rod 4 through which the axle 2 extends and which is rotatably disposed thereupon. The axle has lugs 5 and a washer 6 located adjacent a right-angle bend in the handle 3 to engage one end of the rod, and a threaded nut 7 at the free end 8 of the axle 2 to engage the other end of the rod 4. A combination of the lugs and washer and of the nut position and confine the rod 4 upon the axle 2.

The rod 4 carries an outer tubular shell 9 which is coaxial and rotatable therewith and which extends longitudinally over a part of the length of the rod. This outer shell is joined to the rod by an end wall 10 located at that end of the rod which engages the washer 6 and by a web-like stop 11 which extends on diametrically opposite sides of the rod into engagement with the interior of the shell 9. This web stop 11 runs longitudinally from the rear wall 10 towards the other end of the rod and thereby not only functions as a stop, but also supports the outer shell 9 along a part of its length.

The outer shell 9 has two spaced apart fingers 12 and 13 whose outer ends are free and thereby form an open end 14 of the outer shell. These fingers extend longitudinally of the rod and incline radially outwardly a small amount as shown in FIGURE 6 to assist retention of a conventinal nap-covered sleeve or cylinder on the roller. The two fingers extend inwardly from their outer ends to connection with that portion 15 of the outer shell which includes the end wall 10 and form two slots 16 and 17 therebetween. The two slots are in alignment with one another and disposed substantially at right angles to the

web stop **11**, which extends a short distance beyond the terminus of the slots towards the outer ends of the fingers **12** and **13**.

Disposed upon the rod **4** and slidable thereupon is an inner tubular member **18** which is coaxial and rotatable with this rod. This inner member extends longitudinally of and around the rod and a portion thereof projects in through the open end **14** of the outer shell **9**. A small diameter portion **19** is joined to an intermediate portion **20** which, in turn, is joined to a large diameter portion **21** to form the inner tubular member. As shown in FIGURE 1, the small diameter portion **19** and most of the intermediate portion **20** extend through the open end **14** of the outer shell when the roller is arranged for the short length with the large diameter portion **21** remaining outside the outer shell. For the long length (FIGURE 6), most of the small diameter portion **19** is within the outer shell and the intermediate and large diameter portions are outside the open end. The juncture of the small diameter and intermediate portions forms a shoulder **22** as does the connection of the intermediate and large diameter portions to form a shoulder **22***a*.

The diameter of this large portion **21** is substantially that of the outer shell **9** and is such that it permits the conventional nap-covered cylinder to be slid on and off the roller and yet have such a fit thereupon that the cylinder rotates with the roller and not independently thereof. Generally, the peripheral dimension of the outer shell **9** and large diameter portion **21** is that which accommodates a paint roller whose inside diameter ranges between 1.40" and 1.75". The radially outwardly inclining fingers **12** and **13** of the outer shell, together with a movable ring **23** disposed upon the small diameter portion **19**, cooperate to hold the nap-covered cylinder upon the roller. This ring extends from the small diameter portion **19** to engagement with the inside of the fingers and is slidable along the the small diameter portion **19** to urge and/or maintain the fingers radially apart and thereby maintain the cylinder for rotation with the roller. By moving the ring longitudinally upon the small diameter portion **19**, the fingers **12** and **13** can be adjustably spread radially apart to accommodate different sized nap-covered cylinders.

This small diameter portion **19** has that end **28** opposite the shoulder **22** open and formed by two fingers **24** and **25** spaced apart to define slots **26** and **27** which are open at the end **28**. The two fingers **26** and **27** extend inwardly from the end **28** to a connection with a cylinder part **29** and there form a slot terminus **30**.

The inner member **18** is both slidable upon and rotatable about the rod **4** and also is rotatable with this rod. Convertibility of the roller from a first length to a second length includes sliding the inner member **18** longitudinally upon the rod **4**, followed by rotating the inner member about the rod. For example, to convert the roller from the short length of FIGURE 1 to the long length of FIGURE 6, the inner member **18** is moved to the right, viewing FIGURE 1, longitudinally of the rod **4** until the shoulder **22** engages a stop washer **31** disposed upon the axle **2**, located between the end **32** of the rod **4** and the nut **7** and abutting both the end **32** and the nut **7** and functioning as a second stop to locate the inner member **18** for the long length. Then, the inner member is turned about 90° around the rod **4** to bring the slots **26** and **27** out of alignment with the web stop **11** and to position two diametrically opposed notches **33** and **34** at the open end **28** and formed by two pairs of spaced apart lips **35** and **36** into position opposite the web stop which is received in the two notches. Thus, the small diameter portion of the inner member has a length substantially equal to that between web stop **11** and the stop washer **31**.

Located upon a seat **37** in the bore of the stop washer **31**, and disposed around the axle, is a coil spring **38** which extends into engagement with the nut **7**. This spring is under compression through engagement with the nut **7** and it permits the inner member **1** to be moved to the position of FIGURE 6 where the web stop **11** is received in the two notches **33** and **34**. In the position of FIGURE 6, the spring exerts a force to urge and maintain the inner member into and at the long length position with the web stop **11** in the notches **33** and **34**, and also exerts pressure upon the stop washer and, in turn, upon the inner member **18** to resist rotation of the inner member about the rod **4**.

To convert the roller from its long length (FIGURE 6) to the short one (FIGURE 1), the inner member **18** is pulled to the right, viewing FIGURE 6, against the force of the spring **38** to disengage the pairs of lips **35** and **36** and the notches **33** and **34** from the web stop **11** and then is rotated about the rod **4** to align the slots **26** and **27** with the web stop **11**. Next, the inner member is pushed longitudinally along the rod and in through the open end **14** of the outer shell **9** with the web stop in the slots **26** and **27** until the slot termini **30** engage the web stop **11** to form the short length.

Spaced apart around the interior surface of the small diameter portion of the inner member are longitudinally extending ribs **39** which engage the periphery of the rod **4** and resist both longitudinal movement of the inner member upon the rod and rotational movement thereof about the rod **4**. Thus, these ribs assist to maintain the inner member in the position of FIGURE 1.

An end cap **40** has a snap-fit connection with the outer end of the large diameter portion **21** of the inner member **18** to cover the nut and the stop washer and thereby protect same from paint.

My roller has important advantages which include easy convertibility between a short length and a long length and thereby avoidance of need for a second roller. Additionally, the roller has ability to firmly hold the conventional nap-covered sleeves of both long and short lengths through cooperation of the outwardly inclining fingers **12** and **13** and the ring **23**.

While I have shown and described a preferred embodiment of my invention, it may be otherwise embodied within the scope of the appended claims.

I claim:

1. A roller for receiving and rotatably supporting a sleeve which applies paint and the like onto a surface, said roller comprising a rod adapted for mounting upon an axle and for rotation about its longitudinal axis upon said axle, said rod carrying an outer substantially tubular shell member having a portion which extends longitudinally over a portion of said rod, said outer shell extending in substantially the same direction as said rod and including at least two spaced apart fingers whose outer ends are free and form an open end of said shell member, said fingers extending inwardly from their outer ends to form two slots therebetween and to connection with that portion of said outer shell member which includes the other end thereof, a first stop member positioned inwardly from the outer ends of said fingers and extending between said rod and an inner wall of said outer shell member, an inner substantially tubular member with a portion telescoped inside a part of said outer tubular member and around said rod, a second stop member spaced apart from said first stop member and disposed closer to said open end of said outer shell member than said first stop member, said inner tubular member extending substantially longitudinally of and in engagement with a part of said rod, being rotatable therewith, and having a slot which is open at one end of said inner tubular member and which runs inwardly from said one end to a slot terminus, said portion of said inner tubular member including said slot thereof extending into said open end of said outer tubular member and being slidably disposed upon said rod from a first position whereat said first stop member engages said slot terminus of said

inner tubular member slot to form a roller of a first length, to a second position whereat a portion of said inner member has been moved longitudinally out through said open end of said outer tubular member to bring a part of said inner member into engagement with said second stop member whereat said inner member has been turned about its longitudinal axis an amount to move said inner member slot out of alignment with said first stop member to form a roller of a second length greater than said first length.

2. The roller of claim 1 characterized by means slidably disposed upon said inner member along that portion which extends into said open end of said outer tubular member, said slidable means extending substantially radially from said inner member into engagement with the interior surface of said outer member fingers for urging said outer member fingers radially apart.

3. The roller of claim 1 characterized by said inner tubular member having means which extend into and provide a friction engagement with said rod for resisting movement of said inner tubular member upon said rod.

4. The roller of claim 3 characterized by said friction engagement means being longitudinally extending ribs which project radially inwardly along a part of the inside surface of said inner tubular member.

5. The roller of claim 1 characterized by said first stop member being so located along said rod that same is engaged by said one end of said inner tubular member when at said second position.

6. The roller of claim 1 characterized by spring means disposed to operatively exert a force upon an end of said inner tubular member to resist rotation thereof about said rod when in said second position.

7. The roller of claim 1 characterized by said inner tubular member having on said one end at which said slot is open at least two spaced apart lips which form a notch for receiving said first stop member when said inner tubular member is in said second position, said notch being independent of said slot.

8. The roller of claim 1 characterized by means slidably disposed upon said inner member along that portion which extends into said open end of said outer tubular member, said slidable means extending substantially radially from said inner member into engagement with the interior surface of said outer member fingers for urging said outer member fingers radially apart, and by said inner tubular member having means which extend into and provide a friction engagement with said rod for resisting movement of said inner tubular member upon said rod.

9. The roller of claim 1 characterized by said inner tubular member having means which extend into and provide a friction engagement with said rod for resisting movement of said inner tubular member upon said rod, and by said first stop member being so located along said rod that same is engaged by said one end of said inner tubular member when at said second position.

10. The roller of claim 1 characterized by spring means disposed to operatively exert a force upon an end of said inner tubular member to resist rotation thereof about said rod when in said second position, and by said inner tubular member having on said one end at which said slot is open at least two spaced apart lips which form a notch for receiving said first stop member when said inner tubular member is in said second position, said notch being independent of said slot.

11. The roller of claim 1 characterized by said inner tubular member having means which extend into and provide a friction engagement with said rod for resisting movement of said inner tubular member upon said rod, by said first stop member being so located along said rod that same is engaged by said one end of said inner tubular member when at said second position, by spring means disposed to operatively exert a force upon an end of said inner tubular member to resist rotation thereof

about said rod when in said second position, and by said inner tubular member having on said one end at which said slot is open at least two spaced apart lips which form a notch for receiving said first stop member when said inner tubular member is in said second position, said notch being independent of said slot.

12. The roller of claim 1 characterized by means slidably disposed upon said inner member along that portion which extends into said open end of said outer tubular member, said slidable means extending substantially radially from said inner member into engagement with the interior surface of said outer member fingers for urging said outer member fingers radially apart, by said inner tubular member having means which extend into and provide a friction engagement with said rod for resisting movement of said inner tubular member upon said rod, by said first stop member being so located along said rod that same is engaged by said one end of said inner tubular member when at said second position, by spring means disposed to operatively exert a force upon an end of said inner tubular member to resist rotation thereof about said rod when in said second position, and by said inner tubular member having on said one end at which said slot is open at least two spaced apart lips which form a notch for receiving said first stop member when said inner tubular member is in said second position, said notch being independent of said slot.

13. A roller for receiving and rotatably supporting a sleeve which applies paint and the like onto a surface, said roller comprising a rod adapted for mounting upon an axle and for rotation about its longitudinal axis upon said axle, said rod carrying an outer substantially tubular shell member having a portion which extends longitudinally over a portion of said rod, said outer shell extending in substantially the same direction as said rod and including at least two spaced apart fingers whose outer ends are free and form an open end of said shell member, said fingers extending inwardly from their outer ends to form two slots therebetween and to connection with that portion of said outer shell member which includes the other end thereof, a first stop member positioned inwardly from the outer ends of said fingers and extending between said rod and an inner wall of said outer shell member, an inner substantially tubular member with a portion telescoped inside a part of said outer tubular member and around said rod, said inner tubular member extending substantially longitudinally of and in engagement with a part of said rod, being rotatable therewith, and having means thereon for engagement with said first stop member, a second stop member spaced apart from said first stop member and disposed closer to said open end of said outer shell member than said first stop member, said portion of said inner tubular member including said means extending into said open end of said outer tubular member and being slidably disposed upon said rod from a first position whereat said first stop member engages said means of said inner tubular member to form a roller of a first length, to a second position whereat a portion of said inner member has been moved longitudinally out through said open end of said outer tubular member to bring a part of said inner member into engagement with said second stop member to form a roller of a second length greater than said first length.

14. The roller of claim 13 characterized by said inner tubular member having means which extend into and provide a friction engagement with said rod for resisting movement of said inner tubular member upon said rod.

15. The roller of claim 14 characterized by said friction engagement means being longitudinally extending ribs which project radially inwardly along a part of the inside surface of said inner tubular member.

16. The roller of claim 13 characterized by spring means disposed to operatively exert a force upon an end

of said inner tubular member to resist rotation thereof about said rod when in said second position.

17. The roller of claim **13** characterized by said inner tubular member having means which extend into and provide a friction engagement with said rod for resisting movement of said inner tubular member upon said rod, and by spring means to operatively exert a force upon an end of said inner tubular member to resist rotation thereof about said rod when in said second position.

18. A roller for receiving and rotatably supporting a sleeve which applies paint and the like onto a surface, said roller comprising a rod adapted for mounting upon an axle and for rotation about its longitudinal axis upon said axle, said rod carrying an outer substantially tubular shell member having a portion which extends longitudinally over a portion of said rod, said outer shell extending in substantially the same direction as said rod and including at least two spaced apart fingers whose outer ends are free and form an open end of said shell member, said fingers extending inwardly from their outer ends to form two slots therebetween and to connection with that portion of said outer shell member which includes the other end thereof, a first stop member positioned inwardly from the outer ends of said fingers and extending between said rod and an inner wall of said outer shell member, an inner substantially tubular member with a portion including one end of said inner member telescoped inside a part of said outer tubular member and around said rod, a second stop member spaced apart from said first stop member and disposed closer to said open end of said outer shell member than first said stop member, said inner tubular member extending substantially longitudinally of and in engagement with a part of said rod and being rotatable therewith, said portion of said inner member including said one end thereof extending into said open end of said outer tubular member and being slidably disposed upon said rod from a first position whereat said stop member engages said one end of said inner member to form a roller of a first length, to a second position whereat a portion of said inner member has been moved longitudinally out through said open end of said outer tubular member to bring a part of said inner member into engagement with said second stop member to form a roller of a second length greater than said first length.

19. The roller of claim **18** characterized by said inner tubular member having means which extend into and provide a friction engagement with said rod for resisting movement of said inner tubular member upon said rod.

20. The roller of claim **18** characterized by spring means disposed to operatively exert a force upon an end of said inner tubular member to resist rotation thereof about said rod when in said second position.

21. The roller of claim **18** characterized by said inner tubular member having means which extend into and provide a friction engagement with said rod for resisting movement of said inner tubular member upon said rod, and by spring means disposed to operatively exert a force upon an end of said inner tubular member to resist rotation thereof about said rod when in said second position.

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ROBERT W. MICHELL, *Primary Examiner.*