

Aug. 4, 1953

E. E. THOMAS

2,647,299

PAINTING APPLIANCE OF THE DETACHABLE ROLLING SLEEVE TYPE

Filed Aug. 14, 1950

2 Sheets-Sheet 1

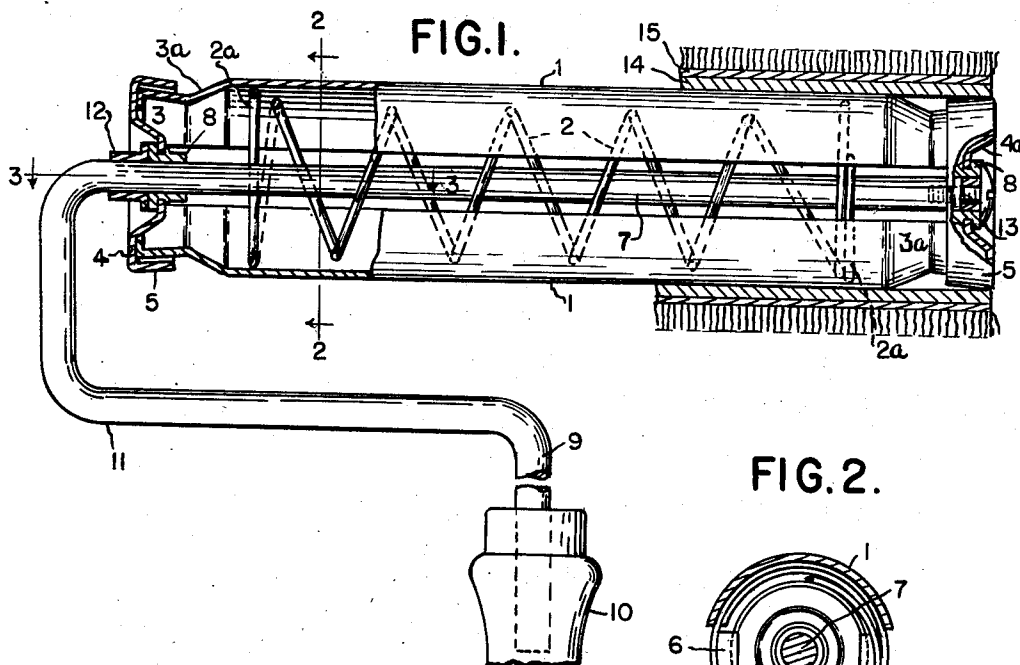


FIG. 3.

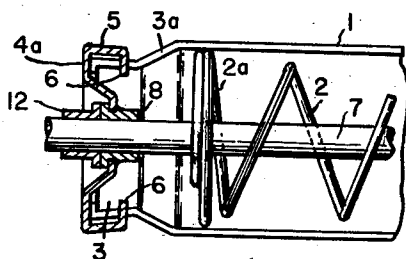


FIG. 2.

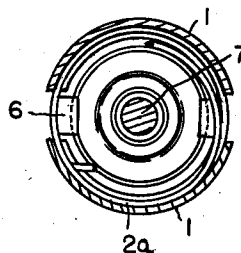
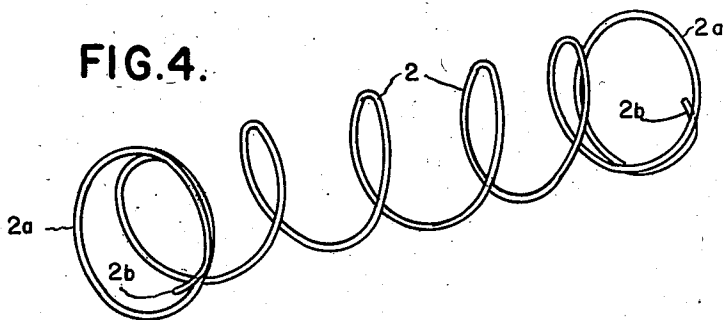


FIG. 4.



INVENTOR.
EARL E. THOMAS

BY

J. D. Murray
ATTORNEY

Aug. 4, 1953

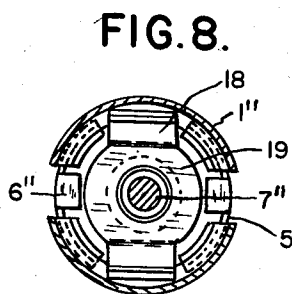
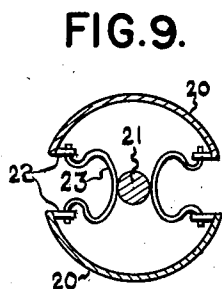
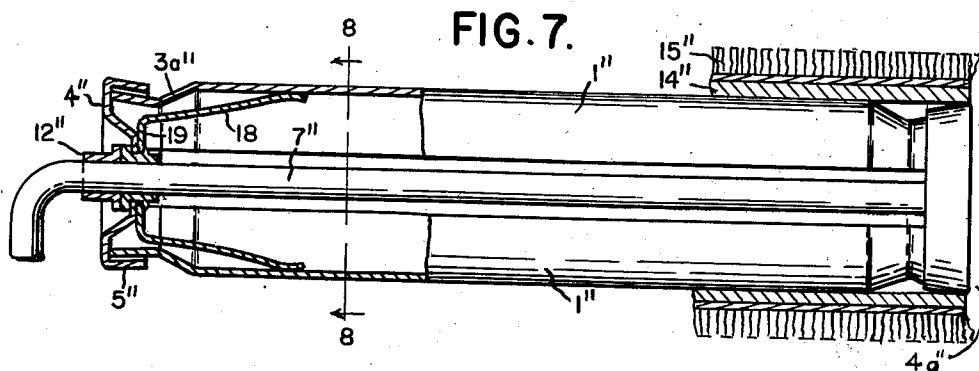
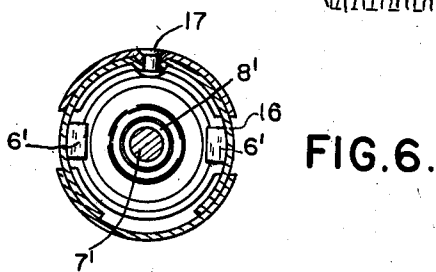
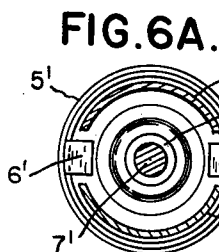
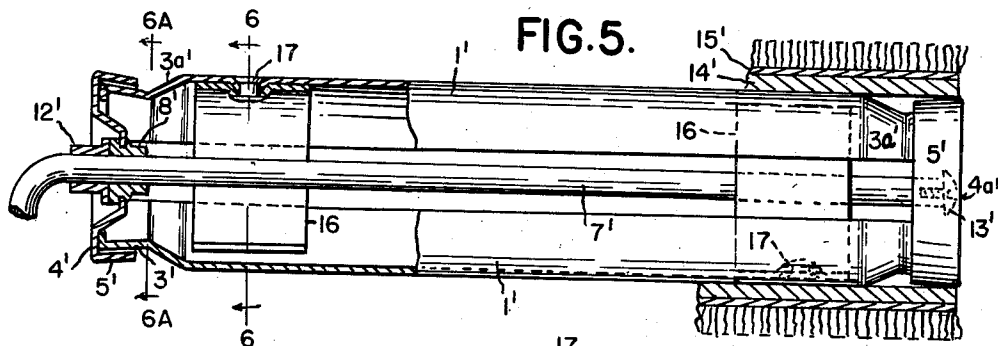
E. E. THOMAS

2,647,299

PAINTING APPLIANCE OF THE DETACHABLE ROLLING SLEEVE TYPE

Filed Aug. 14, 1950

2 Sheets-Sheet 2



INVENTOR.
EARL E. THOMAS

BY

J. D. Murray
ATTORNEY

UNITED STATES PATENT OFFICE

2,647,299

PAINTING APPLIANCE OF THE DETACHABLE
ROLLING SLEEVE TYPE

Earl E. Thomas, Detroit, Mich.

Application August 14, 1950, Serial No. 179,148

15 Claims. (Cl. 29—116)

1

This invention relates to painting rollers of the detachable sleeve type, and particularly to rollers which are endwise engageable and slightly compressible by a paint-applying sleeve and which retain the sleeve in place by resiliently opposing such compression. The invention may be considered as an improvement on the subject matter of my United States Patent No. 2,520,863, issued August 29, 1950.

An object of the invention is to provide a roller suited to frictionally retain a removable sleeve and comprising two opposed segments of a hollow cylinder, spring means between the segments urging them apart, and heads engaging the ends of said segments and limiting their response to the spring means.

Another object is to form each of said heads with a pair of lugs so engaged between the two segments as to maintain their intended opposed relation.

Another object is to form the segments with frusto-conical shoulders adjacent to said heads, reducing the diameter of the head-engaging ends of the roller as compared to its remaining extent, so that a sleeve may be slipped freely over one of the heads and effect a compression of the roller by applying thrust to said shoulders.

Another object is to dispose coiled springs in the end portions of the described roller, between the segments thereof, such springs yieldably urging the segments apart so far as permitted by the heads.

Another object is to interconnect said springs in a manner to maintain their intended spaced relation.

Another object is to provide a sleeve-receiving roller formed by a pair of opposed segments of a cylinder, and to attach to each segment an arcuate spring engaging the companion segment to yieldably expand the roller.

Another object is to engage the end portions of a segmental roller by a pair of heads limiting expansion of such roller, and to equip the heads with springs expansively acting on the segments. These and various other objects are attained by the construction hereinafter described and illustrated in the accompanying drawings, wherein:

Fig. 1 is a front elevational view, in partial section, of a painting appliance including my improved roller.

Fig. 2 is a cross sectional view of said appliance, taken on the line 2—2 of Fig. 1.

Fig. 3 is a fragmentary axial section of an end portion of the roller, taken on the line 3—3 of Fig. 1.

2

Fig. 4 is a perspective view of a spring adapted to be housed within the roller for applying an expansive force to the roller segments.

Fig. 5 is a view similar to Fig. 1 but showing a modified spring provision for expanding the roller.

Fig. 6 is a cross sectional view of said modification, taken on the line 6—6 of Fig. 5. Fig. 6A is a cross section on 6A—6A of Fig. 5.

Fig. 7 is a view similar to Fig. 1 but showing a further modification of the spring means for expanding the roller.

Fig. 8 is a cross sectional view of the last-mentioned modification, taken on the line 8—8 of Fig. 7.

Fig. 9 shows in cross section another spring provision for expanding the roller.

In the construction shown in Figs. 1—4, the reference character 1 designates a pair of opposed complementary sheet metal cylinder segments spaced apart by a coiled spring 2 and jointly forming a hollow roller. The end convolutions 2a of the spring occupy the end portions of the roller and apply a desired expansive effort to the segments, the intervening convolutions being of sufficiently reduced diameter to clear the segments. The spring ends 2b are bent slightly toward the roller axis to avoid such contact with the segments as might resist compression of the end convolutions. The end portions 3 of the described roller have a reduced diameter resulting from annular shoulders 3a, and are inserted in heads formed by sheet metal caps 4 and 4a having peripheral annular flanges 5 to embrace such end portions. Said caps limit the expansive response of the segments to the expander 2, and each flange 5 is formed with a pair of opposed intumed lugs 6 engaged between the segments and maintaining their opposed relation. Said lugs, however, are loosely inserted between the segments, affording a slight predetermined reduction of the roller diameter.

The described roller is journaled on a shaft 7, bushings 8 being rigidly set into the caps to receive the shaft. It is preferred to form the shaft as one end portion of a rod whereof the other end portion 9 carries a handle 10 transverse to and spaced from the roller, the rod having a goose-neck portion 11 interconnecting its parts 7 and 9. The caps are maintained in engagement with the segments 1 by suitable abutments on the shaft. Thus a collar 12 press-fitted on the shaft exteriorly engages the cap 4 adjoining the goose-neck, and a headed screw 13 inserted in the free end of the shaft engages the cap 4a.

3

Frictionally retained on the described roller is a detachable sleeve comprising a quite stiff inner member 14 formed preferably of fibrous material, and an outer covering 15 having a suitable paint-retaining nap or pile. Lamb's wool and felt exemplify materials suited to form the outer covering. The members 14 and 15 are adhesively or otherwise permanently interconnected as a unit. The described sleeve is adapted to be slipped freely over the cap 4a and telescoped endwise over the segments 1, slightly reducing the spacing of the segments, whereby the latter frictionally hold the sleeve in place due to an expansive reaction of the spring convolutions 2a. It will be noted that the shoulders 3a have a frusto-conical taper adapting them to react like cams to end thrust applied by the sleeve 14, 15, such end thrust effecting a compression of the roller. Provision of the reduced end portions 3 on the roller is necessary to allow the caps 4 and 4a to embrace said portions, without requiring caps so large as to interfere with sliding the sleeve 14, 15 on and off the roller. When the sleeve is removed, the main length of the roller must of course have a diameter slightly exceeding the interior diameter of said sleeve, since the latter is required to induce a slight roller compression. It is an important principle of the construction that the caps 4 and 4a apply an initial compression to the spring 2, minimizing the requisite further compression to be imposed by the sleeve 14, 15 for a frictional retention of such sleeve. Attention is particularly directed to the several functions exercised in the described structure by the caps 4 and 4a. Thus such caps, by reason of their lugs 6, maintain the proper opposed relation of the segments. Additionally, the caps serve, in conjunction with the segments, to apply a desired initial compression to the spring 2, 2a. Furthermore, they act as journal bearings to rotatively mount the roller on its shaft. Also, they serve as closures for the roller ends preventing access of paint or the like to the roller interior.

Referring now to the modification shown by Figs. 5 and 6, this duplicates the structure already described as regards the segmental roller 1' with reduced ends 3', annular shoulders 3a', and caps 4 and 4a' with flanges 5', lug 6' on such caps, the shaft 7', bushings 8', collar 12', screw 13' and two-part sleeve 14', 15'. In this modification, however, the coiled spring 2 is replaced by a pair of arcuate springs 16, respectively carried by the respective segments, at reverse ends thereof. Each spring 16 has a yoke portion riveted at 17 to its supporting segment, and a pair of spaced end portions stressed against the opposite segment.

In the modification shown in Figs. 7 and 8, the parts again duplicate those first described, except the springs. In place of springs 2, this modification mounts a pair of spreader springs 18 on each cap 4'' and 4a''. Each such spring has a yoke portion 19 welded or otherwise centrally fixed on the corresponding cap, and comprises a pair of divergent legs projecting from the cap into the roller and applying a spreading effort to the two segments 1'', tending to thrust the segments against the flanges 5''.

It will be noted that the invention, in each of its several described forms, employs a roller formed by a pair of opposed duplicate sheet-metal stampings, lending themselves to quite inexpensive production. It is not necessary that these stampings be resilient, and it has been

4

found that the desired resilient expansive effort of the roller may be more readily, accurately, and economically derived by employing separate spreader springs, than by forming the roller, itself, of spring material. Moreover, the present arrangement lends itself to a stronger construction, since the roller body is not required to flex, and hence will less easily lose its proper shape.

It will be noted that the lugs 6, in addition to assuring a proper opposed relation of the segments 1, also assure a rotation of the segments in unison with the caps 4 and 4a.

Fig. 9 illustrates a construction in which two complementary roller segments 20, spaced apart at opposite sides of a shaft 21, are marginally formed with inturned lugs 22 and are yieldably urged apart by one or more pairs of looped springs 23, each such spring having a yoke portion engaging or adjoining the shaft and a pair of legs inserted in opposed lugs 22 of the two segments. In other respects this modification conforms to the constructions heretofore described.

What I claim is:

1. An appliance for painting and like operations, comprising a shaft, a plurality of elongated segments, spaced apart and outwardly spaced from the shaft and jointly forming a hollow roller and movable to and from each other to contract and expand the roller, a resilient expander for the roller disposed between the segments, a pair of heads freely rotative on the shaft at the roller ends and shaped and proportioned to effect a predetermined contraction of the roller, means on the shaft resisting disengagement of the heads from the roller, and a work-engaging sleeve fitted over and proportioned to effect a further contraction of the roller and having an exterior paint-retaining pile.

2. In an appliance for painting and like operations, as set forth in claim 1, means on said heads restraining the segments from material relative rotation.

3. In an appliance for painting and like operations, as set forth in claim 1, a pair of lugs carried at the periphery of each head and projecting substantially toward said shaft and engaging said segments to restrain such segments from material relative rotation.

4. An appliance for painting and like operations, as set forth in claim 1, said heads being formed with substantially annular flanges embracing the roller ends to limit expansion of the roller, one of said flanges having a pair of lugs struck inwardly therefrom and engaging the segments to restrain the segments from material relative rotation.

5. An appliance for painting and like operations, as set forth in claim 1, at least one of said heads having a lesser diameter than the limiting expanded exterior diameter of the central portion of the roller between said heads, and the end portions of the roller being reduced relative to its central portion to engage said head, whereby said sleeve may slip freely endwise over said head to contractively engage the roller.

6. An appliance for painting and like operations, comprising a shaft, a plurality of elongated segments, spaced apart and outwardly spaced from the shaft and jointly forming a hollow roller, and movable to and from each other to contract and expand the roller, a pair of spring elements respectively occupying the respective ends of the roller and coiled about the roller axis and confined between said segments to form an

5

expander for the roller, a pair of heads freely rotative on the shaft at the roller ends and shaped and proportioned to effect a predetermined contraction of the roller, means on the shaft resisting disengagement of the heads from the roller, and a work-engaging sleeve fitted over and proportioned to effect a further contraction of the roller and exteriorly having a paint-retaining pile.

7. An appliance for painting and like operations, as set forth in claim 6, said spring elements comprising end convolutions of a coiled spring, having convolutions of reduced diameter between its end convolutions.

8. An appliance for painting and like operations, comprising a shaft, a plurality of elongated segments, spaced apart and outwardly spaced from the shaft and jointly forming a hollow roller, and movable to and from each other to contract and expand the roller, a pair of spring elements respectively occupying the respective ends of the roller and coiled about the roller axis and confined between said segments to form an expander for the roller, a pair of heads journaled on the shaft at the roller ends and shaped and proportioned to effect a predetermined contraction of the roller, means on the shaft resisting disengagement of the heads from the roller, and a work-engaging sleeve fitted over and proportioned to effect a further contraction of the roller and exteriorly having a paint-retaining pile, said heads having a lesser diameter than the limiting expanded exterior diameter of the central portion of the roller defined between said heads, whereby said sleeve may slip freely endwise over one of the heads to contractively engage the roller, shoulders being formed on the roller at the juncture of its central and end portions and said spring elements being confined between such shoulders.

9. An appliance for painting and like operations as set forth in claim 1, said segments forming a pair disposed at opposite sides of the shaft, and said resilient expander comprising a pair of springs occupying the roller ends and curved about the roller axis, each such spring having a mid portion secured to one of the roller segments and a pair of end portions bearing on the opposing segment.

10. In an appliance for painting and like operations as set forth in claim 1, said segments

6

forming a pair disposed at opposite sides of the shaft, and said resilient expander comprising a pair of springs occupying the roller ends, means securing said springs respectively to the respective heads.

11. An appliance for painting and like operations as set forth in claim 10, each of said springs comprising a mid portion centrally secured to the corresponding head and a pair of spaced end portions respectively interiorly engaging the respective segments.

12. An appliance for painting and like operations as set forth in claim 1, said segments forming a pair disposed at opposite sides of the shaft, and said resilient expander comprising a pair of springs occupying the roller ends and curved about the roller axis.

13. In an appliance for painting and like operations as set forth in claim 12, means restraining said springs from travel along the axis of the roller.

14. In an appliance for painting and like operations as set forth in claim 1, said segments forming a pair disposed at opposite sides of the shaft, and said resilient expander comprising a pair of expansively acting looped springs disposed at opposite sides of the shaft and each having ends respectively anchored to the respective segments.

15. An appliance for painting and like operations as set forth in claim 14, the longitudinal margins of each segment being formed with opposed lugs projecting toward each other, and said looped springs being anchored to said lugs.

EARL E. THOMAS.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
1,036,671	McDevitt	Aug. 27, 1912
1,441,781	Carlson	Jan. 9, 1923
2,381,301	Markle	Aug. 7, 1945
2,427,581	Touchett	Sept. 16, 1947
2,520,863	Thomas et al.	Aug. 29, 1950
2,543,193	Palotsee	Feb. 27, 1951

FOREIGN PATENTS

Number	Country	Date
530,480	Great Britain	Dec. 12, 1940
726,447	Germany	Oct. 14, 1942