

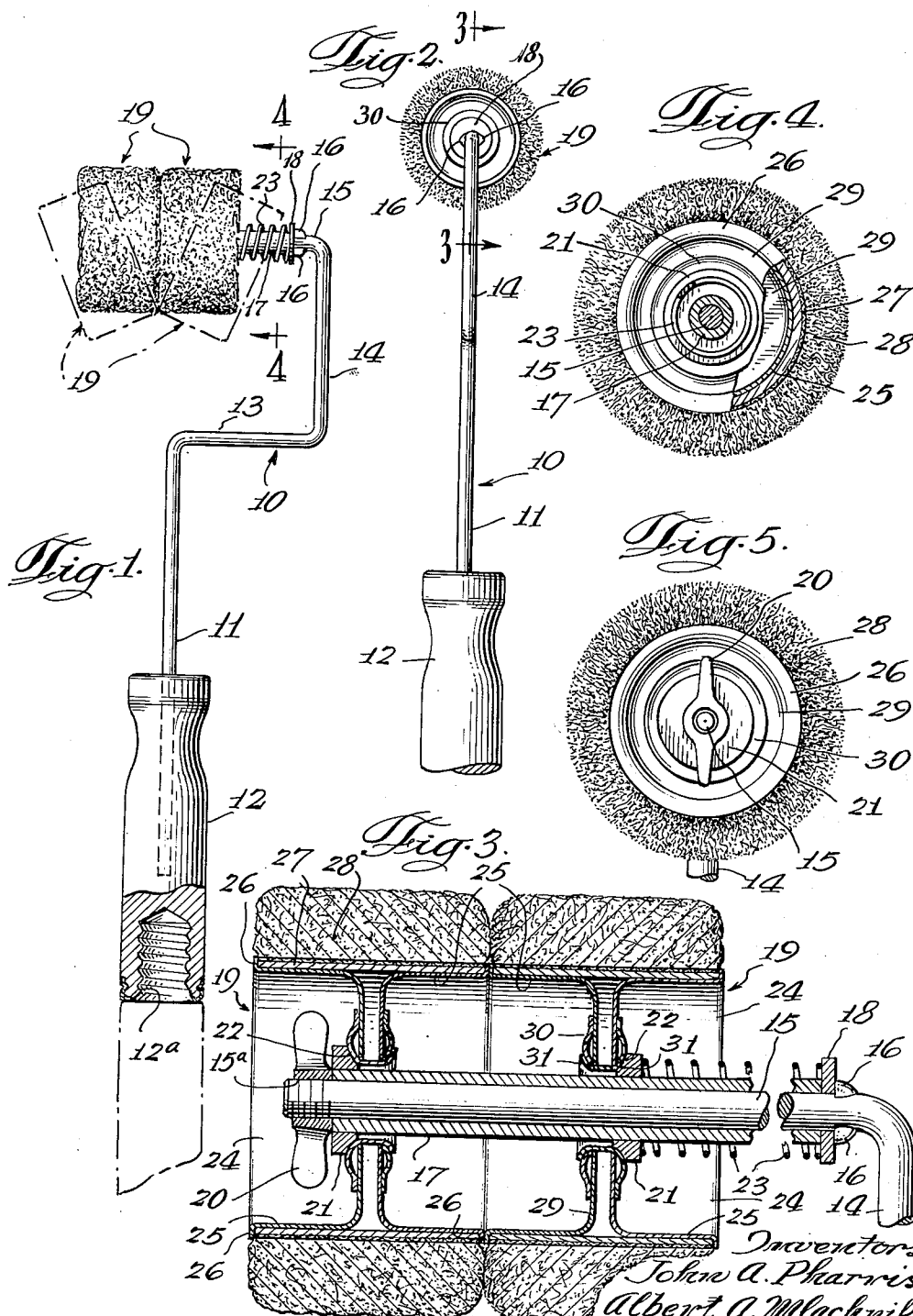
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FLEXIBLE PAINT ROLLER

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FLEXIBLE PAINT ROLLER

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This invention relates to a flexible paint roller, and in particular it relates to a paint roller which is designed to paint extended arcuate surfaces, such as the outsides of pipes.

Insofar as applicants are aware, paint rollers have heretofore been made with rigid, tubular covers so that they were practically useless for painting extended arcuate surfaces, such as the outsides of pipes. Even with a very soft pile cover, a rigid paint roller obviously could contact only a few degrees around the arcuate surface of a pipe which is two or three inches in diameter; so that for all practical purposes such a roller cannot be used to paint a pipe by being rolled lengthwise along it.

The present invention provides a paint roller which is constructed in two segments loosely mounted on a shaft and urged by spring means into a normal parallel position, with their axes of rotation parallel to their cylindrical surfaces. The paint roller segments are axially aligned when paint is applied to them; but if they are placed in contact with an extended arcuate surface so as to roll along this surface, the spring means may be displaced so that the two roller segments cant, or rock and slide, on the shaft and cover a substantially greater area circumferentially of the arcuate surface than is possible if they maintained their normal positions.

The present device is of particular value in painting pipes or rods of relatively small diameter, although by making several passes along the length of the pipe the present device considerably speeds the painting of pipes of relatively large diameter.

For the device to operate satisfactorily, the roller segments must have relatively narrow bearing surfaces which fit loosely on the shaft, so that if pressure is applied to the roller segments at their adjacent margins the two segments may cant, or rock, freely on the shaft.

The invention is illustrated in a preferred embodiment in the accompanying drawings in which:

FIG. 1 is a plan view of a paint roller constructed in accordance with the invention, the roller segments being illustrated in full line in their normal positions and in broken lines in a typical position which they may assume in contact with an arcuate surface;

FIG. 2 is an end elevational view of the device;

FIG. 3 is a fragmentary section on an enlarged scale taken as indicated along the line 3—3 of FIG. 2;

FIG. 4 is a section on an enlarged scale taken as indicated along the line 4—4 of FIG. 1 with a portion of the roller segment broken away to show the construction;

FIG. 5 is a fragmentary end elevational view taken from the end opposite FIG. 2.

Referring to the drawings in greater detail, the present flexible paint roller has a frame, indicated generally at 10, which includes a handle portion 11 on which is a hand grip 12, an offset portion 13, a clearance portion 14, and a straight shaft portion 15 having a pair of flattened protuberances 16 to serve as a stop. Preferably hand grip 12 has a threaded recess 12a in its outer end to receive an extension such as a mop handle.

As best seen in FIG. 3, in the present embodiment of the invention the shaft portion 15 of the frame is provided with a sleeve 17 the inner end of which seats against a spring stop washer 18 adjacent the stop nibs 16; and a pair of roller segments, each of which is indicated

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generally at 19, is held on the sleeve 17 by means of the wing nut 20 screwed on a threaded end portion 15a of shaft 15. Flanking the roller segments 19 are loose bearing rings 21 having frusto-conical inner faces 22 in contact with the roller segments 19; and a light compression spring 23 encircles sleeve 17 between the spring seat washer 18 and the adjacent loose bearing ring 21 to hold the roller segments 19 normally in parallel, coaxial alignment as seen in FIG. 3 and as seen in full line in FIG. 1.

Each of the cover segments 19 consists of a pair of annular, cup-like body members 24 which have oppositely directed longitudinally extending cylindrical supporting portions 25 terminating in radially extending outer flanges 26 between which is a tubular shell 27 provided with a conventional pile fabric cover 28. The body members 24 have radial spacing walls 29 which are parallel to one another and are joined at their inner margins by a grommet 30 which holds the body members 24 and shell 27 together and forms a short axial hollow bearing having rounded margins 31 the outer one of which on each roller segment is in contact with the frusto-conical face 22 of the adjacent loose bearing ring 21.

It is clear from the foregoing description that the loose mounting of the bearing provided by the grommet 30, in combination with the rounded margins 31 of the grommet and their short axial length, permits the roller segments to cant, or rock, freely on the sleeve 17 if they are placed with their adjacent margins against a non planar surface. At the same time, the bearings may slide along the shaft. The two segments may rock and slide to positions such as those shown in broken lines in FIG. 1, and when this occurs the compression spring 23 is compressed between the adjacent bearing ring 21 and the spring seat washer 18. Actually the two segments pivot about their abutting edges where they contact the non-planar surface, and this causes the bearings to move further apart; so that the free sliding movement is just as important as the rocking movement. Upon removal of the roller from contact with the non planar surface, spring 23 returns the roller segments 19 to their normal, parallel positions with the shells 27 in alignment as seen in FIG. 3.

The foregoing detailed description is given for clearness of understanding only and no unnecessary limitations are to be understood therefrom, as some modifications will be obvious to those skilled in the art.

We claim:

1. In a flexible paint roller: a frame; a straight shaft on said frame; a pair of cylindrical cover segments each of which has a short, axial, hollow bearing of relatively small diameter loosely surrounding said shaft and a relatively long outer shell of substantially larger diameter than said bearing, each said bearing having a bearing surface which is longitudinally arcuate, whereby each segment is freely rockable and slidable on the shaft on said short bearing; a pile cover on each of said shells; confining abutments at the ends of said shaft to retain the segments thereon, there being a substantial space between the bearing of one of said segments and the adjacent abutment; and compression spring means lightly compressed between the bearing of said one of said segments and said adjacent abutment, said spring means being only slightly larger in diameter than the shaft to resiliently retain the segments perpendicular to the shaft and with the outer shells in contact with one another throughout their periphery, said spring means being compressible when the cover segments are pressed against an arcuate surface to permit said segments to slide on the shaft and the small diameter of the spring permitting the segments to rock freely to non-parallel positions on the shaft, whereby said pile-covered segments may make continuous contact with contiguous areas of said arcuate surface.

2. In a flexible paint roller: a frame; a straight shaft

on said frame; a pair of cylindrical cover segments each of which has a short, axial, hollow bearing of relatively small diameter loosely surrounding said shaft and a relatively long outer shell of substantially larger diameter than said bearing, each said bearing having a bearing surface which is longitudinally arcuate and having arcuate end faces, whereby each segment is freely rockable and slidable on the shaft on said short bearing; a pile cover on each of said shells; a pair of washers loosely mounted on the shaft flanking the cover segments, said washers having arcuate faces generally complementary to those on the bearings to facilitate rocking of the cover segments on the shaft; confining abutments at the ends of said shaft to retain the segments thereon, there being a substantial space between the bearing of one of said segments and the adjacent abutment; and compression spring means lightly compressed between the bearing of said one of said segments and said adjacent abutment, said spring means being only slightly larger in diameter than the shaft to resiliently retain the segments perpendicular to the shaft and with the outer shells in contact with one another throughout their periphery, said spring means being compressible when the cover segments are pressed against an arcuate surface to permit said segments to slide on the shaft and rock to non-parallel positions on the shaft, whereby said pile-covered segments may make continuous contact with contiguous areas of said arcuate surface.

3. In a flexible paint roller: a frame; a plurality of rigid cylindrical cover segments each of which has a short, axial hollow bearing of relatively small diameter, and having a longitudinally arcuate bearing surface, generally radial wall means having an axial length substantially the same as said bearing, said wall means extending outwardly from the bearing and terminating in a relatively long and large diameter thin outer shell extending both ways from said wall means, and a pile cover snugly surrounding said outer shell and firmly retained against movement thereon; and mounting means loosely supporting and confining said segments normally in coaxial positions on said frame with their shells lightly abutting one another throughout their periphery, said mounting means including a spring member which is displaceable when the cover segments are pressed against an arcuate surface to permit said segments to slide on the mounting means and rock freely on said short bearings to non-parallel positions on the mounting means, said segments fulcruming at their abutting edges, the sliding and rocking movement causing adjacent pile-covered segments to make continuous paint-applying contact with contiguous portions of the arcuate surface.

4. A paint roller cover segment comprising: a pair of like coaxial annular body members with generally longitudinally extending supporting portions having cylindrical outer surfaces terminating at their ends in radially extending outer flanges, said body members having inwardly extending spacing portions at adjacent ends, said spacing portions being closely adjacent to one another and having aligned openings, a short grommet extending through said openings and having radially outwardly extending portions bearing against outer faces of said spacing portions, said grommet being arcuate in longitudinal cross section to provide a short, axial, hollow bearing with an arcuate bearing surface, and a tubular pile-covered shell secured between said flanges.

5. A flexible paint roller comprising, in combination: a frame; a plurality of rigid, cylindrical cover segments each of which has a pair of like annular coaxial annular body members with generally longitudinally extending supporting portions having cylindrical outer surfaces terminating at their ends in radially extending outer flanges, said body members having inwardly extending spacing portions being closely adjacent to one another and at adjacent ends, said spacing portions having aligned openings, a short grommet extending through said openings and having radially outwardly extending portions bearing against outer faces of said spacing portions, said grommet

being arcuate in longitudinal cross section to provide a short, axial, hollow bearing with an arcuate bearing surface, and a tubular pile-covered shell secured between said flanges; and mounting means loosely supporting and confining said segments normally in coaxial positions on said frame with their shells lightly abutting one another throughout their periphery, said mounting means including a spring member which is displaceable when the cover segments are pressed against an arcuate surface to permit said segments to slide on the mounting means and rock freely on said short bearings to non-parallel positions on the mounting means, said segments fulcruming at their abutting edges, the sliding and rocking movement causing adjacent pile-covered segments to make continuous paint-applying contact with contiguous portions of the arcuate surface.

6. A paint roller cover segment comprising: a pair of like, annular, cup-like, coaxial body members, said members having oppositely extending cylindrical outer supporting portions, and having generally radial spacing portions immediately adjacent one another which are provided with aligned openings; a short grommet extending through said openings and having radially outwardly extending portions bearing against opposite outer faces of said spacing portions, said grommet being arcuate in longitudinal cross section to provide short, axial, hollow bearing with an arcuate bearing surface; a tubular pile-covered shell snugly surrounding said body members; and means securing said shell against longitudinal movement on the body members.

7. A flexible paint roller comprising, in combination: a frame; a plurality of rigid, cylindrical cover segments each of which has a pair of like, annular, cup-like, coaxial body members having oppositely extending cylindrical outer supporting portions, and having generally radial spacing portions immediately adjacent one another which are provided with aligned openings, a short grommet extending through said openings and having radially outwardly extending portions bearing against opposite outer faces of said spacing portions, said grommet being arcuate in longitudinal cross section to provide a short, axial hollow bearing with an arcuate bearing surface; a tubular pile-covered shell snugly surrounding said body members, and means securing said shell against longitudinal movement on the body members; and mounting means loosely supporting and confining said segments normally in coaxial positions on said frame with their shells lightly abutting one another throughout their periphery, said mounting means including a spring member which is displaceable when the cover segments are pressed against an arcuate surface to permit said segments to slide on the mounting means and rock freely on said short bearings to non-parallel positions on the mounting means, said segments fulcruming at their abutting edges, the sliding and rocking movement causing adjacent pile-covered segments to make continuous paint-applying contact with contiguous portions of the arcuate surface.

8. A paint roller cover segment, comprising: a pair of like, annular, cup-like, coaxial body members with generally longitudinal and oppositely extending cylindrical supporting portions terminating in circumferential flanges, said body members having inwardly extending portions which are immediately adjacent one another and have aligned axial openings, a tubular pile-covered shell snugly surrounding said body members between said flanges, the length of each body member being only slightly less than half the length of the cover segment, and short, axial hollow bearing means in said aligned openings securing said body members together and clamping said shell firmly between said flanges, said bearing means including a bearing surface which is longitudinally arcuate.

9. A flexible paint roller comprising, in combination: a frame; a plurality of rigid, cylindrical cover segments each of which has a pair of like, annular, cup-like, coaxial body members with generally longitudinal and oppositely

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extending cylindrical supporting portions terminating in circumferential flanges, said body members having inwardly extending portions which are immediately adjacent one another and have aligned axial openings, a tubular pile-covered shell snugly surrounding said body members between said flanges, the length of each body member being only slightly less than half the length of the cover segment, and short, axial hollow bearing means in said aligned openings securing said body members together and clamping said shell firmly between said flanges, said bearing means including a bearing surface which is longitudinally arcuate; and mounting means loosely supporting and confining said segments normally in coaxial positions on said frame with their shells lightly abutting one another throughout their periphery, said mounting means including a spring member which is displaceable when the cover segments are pressed against an arcuate surface to permit said segments to slide on the mounting means and rock freely on said short bearings to non-parallel positions on the mounting means, said segments fulcruming at their abutting edges, the sliding and rocking movement causing adjacent pile-covered segments to make continuous paint-applying contact with contiguous portions of the arcuate surface.

10. A paint roller cover segment comprising: a pair of like, annular, cup-like, coaxial body members, said members having oppositely extending cylindrical outer supporting portions, and having generally radial spacing portions immediately adjacent one another which are provided with aligned openings, the length of each body member being only slightly less than half the length of the cover segment, short, axial, hollow bearing means in said aligned openings securing said body members together, said bearing means including a bearing surface which is longitudinally arcuate, a tubular pile-covered shell snugly surrounding said body members, and means securing said shell against longitudinal movement on the body members.

11. A flexible paint roller comprising, in combination: a frame; a plurality of rigid, cylindrical cover segments each of which has a pair of like, annular, cup-like, coaxial body members, said members having oppositely extending cylindrical outer supporting portions, and having generally radial spacing portions immediately adjacent one another which are provided with aligned openings, the length of each body member being only slightly less than half the length of the cover segment, short, axial, hollow bearing means in said aligned openings securing said body members together, said bearing means including a bearing surface which is longitudinally arcuate, a tubular pile-covered shell snugly surrounding said body member, and

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means securing said shell against longitudinal movement on the body member; and mounting means loosely supporting and confining said segments normally in coaxial positions on said frame with their shells lightly abutting one another throughout their periphery, said mounting means including a spring member which is displaceable when the cover segments are pressed against an arcuate surface to permit said segments to slide on the mounting means and rock freely on said short bearings to non-parallel positions on the mounting means, said segments fulcruming at their abutting edges, the sliding and rocking movement causing adjacent pile-covered segments to make continuous paint-applying contact with contiguous portions of the arcuate surface.

12. In a flexible paint roller: a frame; a straight shaft on said frame; a pair of cylindrical cover segments each of which has a short, axial, hollow bearing of relatively small diameter loosely surrounding said shaft, said bearing having a bearing surface which is longitudinally arcuate, generally radial wall means having an axial length substantially the same as said bearing, said wall means extending outwardly from the bearing and terminating in a relatively long and large diameter thin outer shell extending both ways from said wall means, each segment being freely rockable and slidable on the shaft; confining abutments at the ends of said shaft to retain the segments thereon; and compression spring means between one of said abutments and an adjacent segment resiliently retaining the segments perpendicular to the shaft and with the entire periphery of their outer shells in contact with one another, said spring means being only slightly larger in diameter than said bearing and being compressible when the cover segments are pressed against a non-planar surface to permit said segments to rock to non-parallel positions on the shaft.

References Cited in the file of this patent

UNITED STATES PATENTS

530,421	Judd	Dec. 4, 1894
1,908,399	Boland et al.	May 9, 1933
2,735,128	Adams	Feb. 21, 1956
2,805,439	Parker	Sept. 10, 1957
2,881,461	Parker	Apr. 14, 1959

FOREIGN PATENTS

6,438	Sweden	Jan. 21, 1895
81,321	Netherlands	Apr. 16, 1956
81,886	Denmark	Sept. 24, 1956
84,653	Netherlands	Mar. 15, 1957
1,112,091	France	Nov. 9, 1955