April 19, 1966 A. M. AMMONS 3,246,357

ROLLER MOP

Filed Dec. 2, 1963 2 Sheets-Sheet 1

FIG. 1

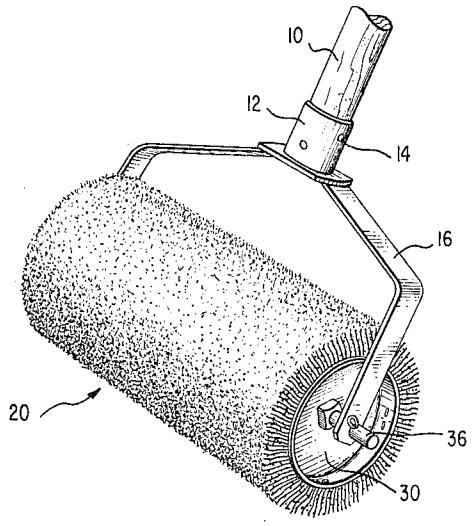
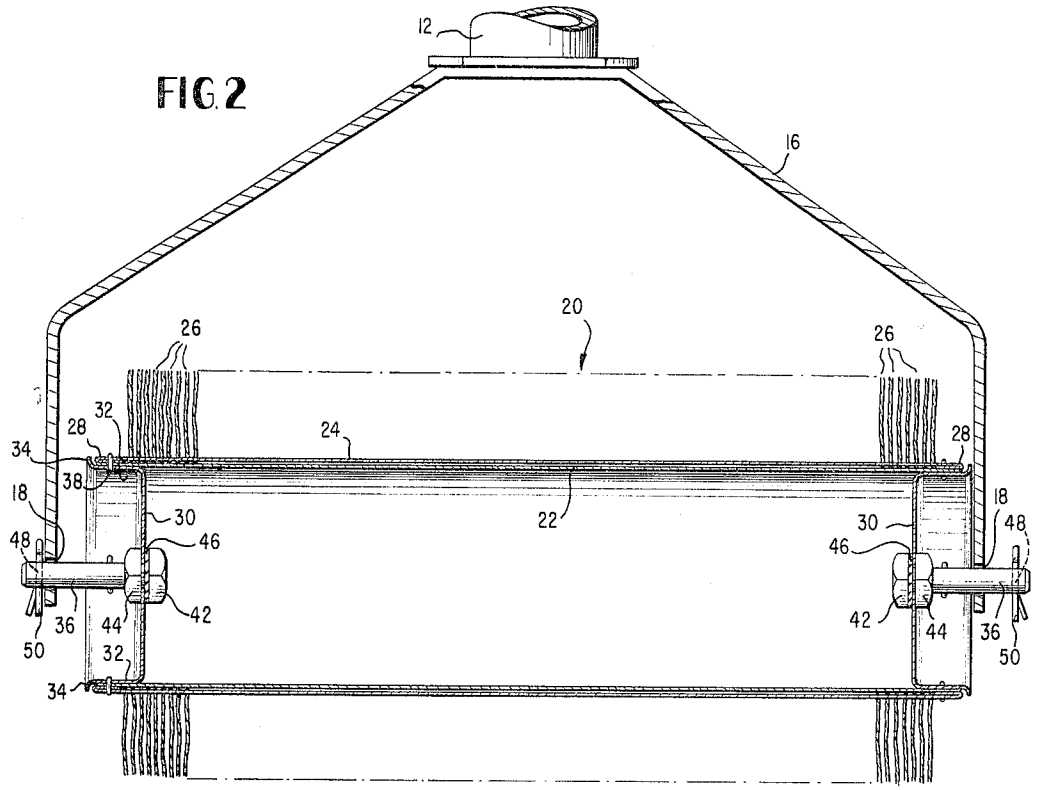


FIG. 2



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April 19, 1966 A. M. AMMONS 3,246,357

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Filed Dec. 2, 1963 2 Sheets-Sheet 2

FIG. 5

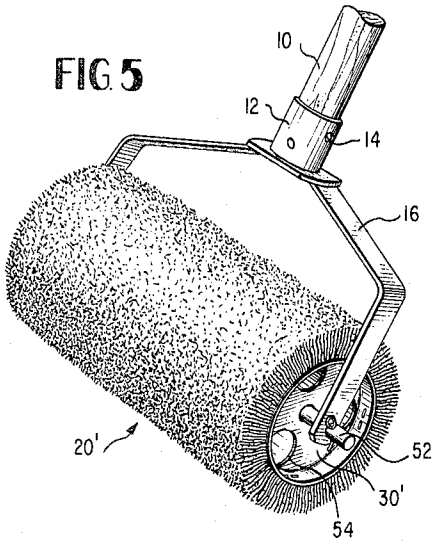


FIG. 3

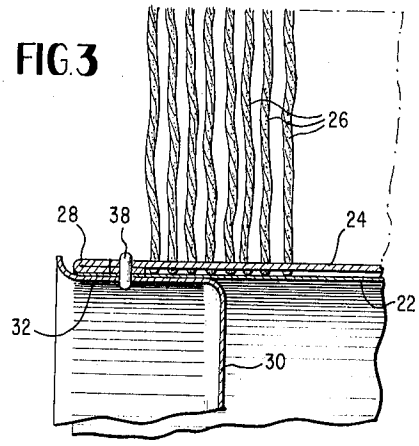


FIG. 6

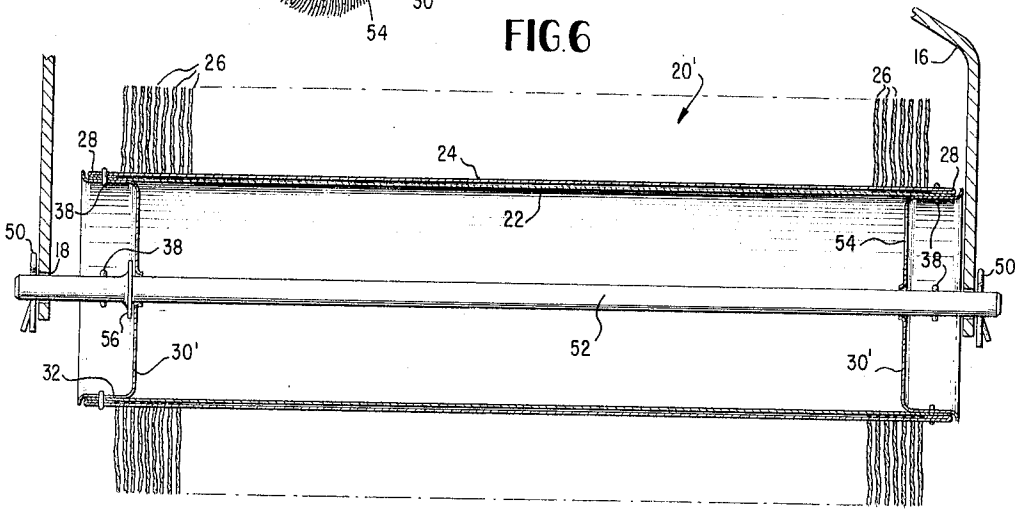
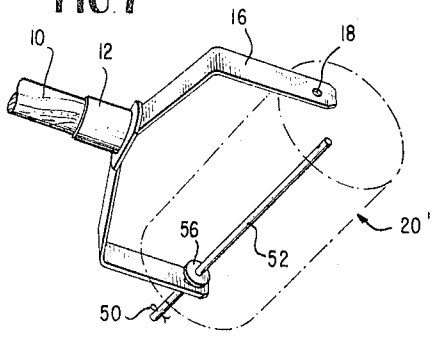


FIG. 7



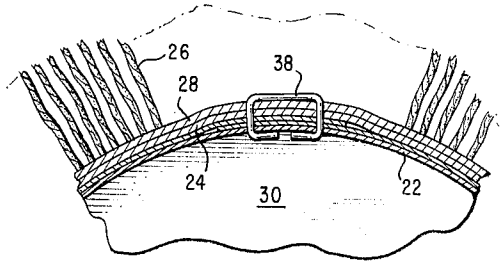


FIG. 4

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ROLLER MOP

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8 Claims. (Cl. 15—230.11)

This invention relates to a roller mop and more particularly to an improved mop having a roller head adapted for quickly and efficiently applying water proofing materials to a surface.

In applying water proofing materials to roof surfaces and vertical walls, attempts have been made to speed the application by use of roller-type paint applicators. These attempts have been generally unsuccessful because the paint applicators commercially available are of flimsy construction unable to withstand the hard usage and heavy, high temperature materials involved in water proofing. Water proofing materials, such as tar applied in liquid form and heated to a temperature of approximately 450° F., are extremely heavy, hot and viscous, and tend to quickly pull out the fibers and their holding rivets of a paint roller. A roller constructed of fiber board, or similar flimsy material, is quickly softened and crushed out of shape, while a metal roller and supporting carrier is quickly corroded. Since labor in the water proofing field is highly paid, it is extremely important to increase the output of the workers by supplying roller-type applicators which are efficient and sturdy enough to withstand rough usage.

Having in mind the above mentioned disadvantages of paint rollers, and the like, for water proofing, it is a primary purpose of the present invention to provide a water proofing, roller mop which will obviate these disadvantages, which is of strong, rugged construction capable of quickly and efficiently applying water proofing materials to roofs, vertical walls and the like, and which will withstand the high temperature and corrosive properties of the material being applied.

A further object of the present invention is to provide an improved roller mop of the above described characteristics in which the mop head is formed as a disposable unit to include the nap or fibers, a sleeve supporting said fibers and a metal cylinder, together with, in certain instances, the axle means of the roller unit, whereby a new unit may be readily substituted to replace a worn unit.

Still another object of the invention is to provide an improved roller of the above described characteristics which is of simple construction and inexpensive to make and use, and which includes a discardable mop head unit which is inexpensive to replace.

The novel features that are considered characteristic of the invention are set forth with particularity in the appended claims. The invention itself, however, both as to its organization and its method of operation, together with additional objects and advantages thereof, will best be understood from the following description of specific embodiments when read in connection with the accompanying drawings, wherein like reference characters indicate like parts throughout the several figures and in which:

FIG. 1 is a perspective view of a preferred embodiment of the invention showing the roller mop head, a supporting carrier frame and the lower portion of a handle attached to said frame;

FIG. 2 is an axial, sectional view through the mop head unit showing a portion of the supporting frame;

FIGURE 3 is a fragmentary view enlarged to show in detail a portion of the roller cylinder, its closing end member and the covering cloth sleeve with nap, or fibers, attached to the cylinder and the end member;

FIG. 4 is an enlarged, fragmentary, sectional detail transverse to the section of FIG. 3;

FIG. 5 is a perspective view similar to FIG. 1 of another embodiment of the invention;

FIG. 6 is a sectional view similar to FIG. 2 of the second embodiment; and

FIG. 7 is a diagrammatic, perspective view of the embodiment of FIG. 5 illustrating the mode of removing the mop head unit from the frame.

Referring now more particularly to FIGS. 1–4, the preferred embodiment of the invention is illustrated as comprising a handle **10**, of any desired length, inserted in a socket **12** and firmly fixed thereto by rivets **14**, nails, bolts or the like. The socket **12** is secured by welding or otherwise to a U-shaped frame **16** at the central portion of the bight thereof. Frame **16** has two oppositely disposed arms in the ends whereof are pierced bearing apertures **18** for removable reception of the axle means **36** of the roller unit **20**.

The roller unit, or head **20**, as best seen in FIG. 2, comprises a relatively thin metal, galvanized sheet **22** rolled into the form of a cylinder and having its overlapping edges, not shown, riveted, or otherwise, suitably fastened together. If desired, the cylinder **22** may be formed of extruded tubing of seamless type.

The cylinder **22** is surrounded by a tightly fitting, sleeve **24** of closely woven cloth, or fabric of any suitable material, through which a large number of individual fibers **26**, forming a nap or chenille, are looped so that their free ends extend radially of the sleeve and cylinder. The fibers or tufts may be of cotton, rayon, wool, nylon or other synthetic materials. At both ends of the sleeve, the fabric **24** is folded and stitched to form a strong selvage **28** binding the edges of the sleeve. The described sleeve construction provides a strong mop having a thick, high uniform pile of fibers **26** which, because they individually extend through, are looped under and extend away from the threads of the cloth, are firmly held in place between the cloth and cylinder even when subjected to the pull of heavy, viscous, hot tar.

Closing each end of the cylinder **22** is a cup-shaped end member **30** of galvanized or plated metal having an annular rim **32** closely fitting the bore of cylinder **22** and terminating at its outer end in an offset flange **34**, which abuts the edge of the cylinder. The end members, or caps **30**, are each provided with a central aperture for reception of the stub axles **36**. At each end of the cylinder a plurality of staples **38** are pressed through the selvage **28** of the cloth **24**, the metal cylinder **22** and the rim **32** of each end cap **30**, and are upset at their inner ends, so as to firmly clamp said parts permanently and strongly together. In FIG. 2, four equally spaced staples are shown at each end, but it will be understood that more staples may be utilized if required to withstand the usage conditions. It is emphasized that the staples **38** are of relatively large diameter, corrosion protected metal wire and provide the only fastening means for holding the cloth, and its fiber tufts to the metal cylinder and the end caps, thus firmly uniting these parts to form a discardable unit. Attempts to use rivets in place of the staples has proved unsatisfactory, the rivets pulling out under hard usage. When the fiber tufts **26** are completely impregnated with hardened tar, or are so worn from use that they are no longer efficient to apply water proofing material, the unit may be easily replaced by a new one as will be described.

A stub axle **36** is preferably fixed to each end cap **30** to form part of the mop head, or roller unit which is to be discarded. Each stub axle desirably comprises a short length of metal rod threaded at its inner end to receive an inner and outer nut, **42** and **44** respectively, one on each

side of the central disc portion of the cap 30. If desired, a lock washer 46 may be inserted between the cap and each nut, a single washer being shown in FIG. 2. The nuts 42, 44 firmly fasten the stub axle 36 to the caps 30 and close the central opening in said caps in a liquid tight manner. A more hermetic seal may obviously be used, as by welding nut 42, or an equivalent part, to the cap 30. At the outer end of each stub axle 36 is a diametrical opening 48 for removable reception of the cotter pin 50.

It will be apparent that the span of the arms of frame 16 being slightly larger than the length of cylinder 22, when the cotter pins are removed one of the stub axles 36, can be inserted through opening 18 in one frame arm and the mop head 20 moved in the same direction to permit entrance of the other shaft 36 in the space between the two arms 16. If desired, or necessary, the arms 16 may be sprung slightly apart to permit sufficient clearance for entry between them of the second shaft 36. When the other stub axle is aligned with the second opening 18, the mop head unit 20 may be moved in the opposite direction to insert the second stub axle through the corresponding, second opening 18. The cotter pins 50 may then be inserted to secure the mop head unit 20 to the frame 16. The bearing apertures 18 permit the mop head unit to rotate freely with respect to the frame arms.

When thus assembled, the mop is ready for use and may be dipped in a bucket, or other container, of hot tar, lifted therefrom and rolled along the surface to which the tar is to be applied. Continuous use for as long as two working days in thus applying hot tar material has been experienced before the mop head fibers are worn sufficiently to warrant replacing the roller unit. During such use, the tufts or fibers 26 in spite of their impregnation with the hot, viscous liquid are firmly retained in place by the fabric 24, under which the individual fibers are looped, and the fabric is retained firmly on the cylinder by the heavy staples 38. The end caps 30 prevent hot tar from entering into the cylinder and thus the mop head remains relatively light during use, which fact, coupled with the reduced friction attendant to the rolling application of the tar, makes for considerable efficiency and speed of application.

When a mop head has become worn or because of hardened tar on the tufts, is no longer usable, it is preferable to discard the entire roller unit rather than attempt to clean the same. To this end, it is necessary merely to remove the cotter pins 50 and move the mop head unit 20 to the left, or right, as viewed in FIG. 2 and spring apart slightly the arms 16 to free one stub axle from its bearing aperture 18 in frame 16. The mop head unit 20 is then tilted out of alignment with the arms 16 and moved in the opposite direction to free the second stub axle from its bearing aperture. A new roller unit 20 may then be inserted in the manner previously described, and the mop is again ready for use.

FIGS. 5–7 illustrate a second embodiment of the invention which is in all respects exactly similar to the described embodiment of FIGS. 1–4 except that the stub axles 36 are replaced by a single continuous axle, or shaft 52, and the end caps 30 are replaced by identical caps 30′ each provided with a plurality of openings 54.

The axle 52 is provided intermediate its length with a collar, or flange 56, welded, soldered, or otherwise, firmly secured to the axle. The collar 56 may be integrally formed thereon if so desired. The collar 56 is so positioned as to secure frame arm 16 between the collar and the closest cotter pin 50 so that when the axle is moved to the left, as in FIG. 7, the flange will abut the inside of an arm 16 to prevent removal of the axle from the frame until such time as the related cotter pin 50 is also removed.

It will be apparent from the above that axle 52 does not form an integral part of the roller unit 20′ shown in FIGS. 5–7, such unit including only the fibers 26 and cloth 24 stapled to the cylinder 22 and end caps 30′. Thus to place a mop head unit 20′ on the frame 16, one end cap 30′ of the unit is first slid onto the axle 52 held in tilted position, as shown in FIG. 7. The axle 52 is then pushed through the opening of the second end cap 30′. Next the unit 20′ is lifted to align the axle with the aperture 18 in the second arm of frame 16. Then the axle 52 is shoved through this aperture and the second cotter pin applied to the axle to hold the assembly together.

In removing the unit 20′, the reverse motions are followed. First the cotter pin at one end is removed, the axle is slid to the left and tilted as shown in FIG. 7, and the unit 20′ is slid off the axle 52 leaving the axle secured to the other arm of frame 16 ready to receive a new mop head unit 20′.

Since the mop head unit 20′ must roll freely on the continuous axle 52, the apertures in the end caps 30′ are of slightly larger diameter than the axle. Accordingly, during the use of the mop and also during insertion of the mop into a container of tar to be applied, the tar will tend to enter the interior of the cylinder 22 through the central openings of caps 30′. A plurality of openings 54 in each end cap 30′ are provided, so that during rolling use of the mop, tar within the cylinder may flow out. Also each time the mop is dipped into the tar container for impregnating the fibers with tar, upon lifting from the container the mop may be tilted slightly to permit the tar within the cylinder to emerge through the openings 54. This reduces to a minimum the weight of the mop coated with tar, as the tar within the cylinder is removed by draining through openings 54.

While the invention has been described above in embodiments primarily adapted to the application of hot tar to roofing, it will be readily apparent that the strong, sturdy constructions are equally suitable for mopping requirements, and the application of other materials than tar such as in whitewashing, calcimining, painting and the like.

Although certain specific embodiments of the invention have been shown and described, it is obvious that many modifications thereof are possible. The invention, therefore, is not to be restricted except insofar as is necessitated by the prior art and by the spirit of the appended claims.

What is claimed is:

1. A roller mop head comprising a cylinder, cup-like end members each having an annular flange closely fitting the wall of said cylinder and positioned to close the ends thereof, an aperture centrally of each end member for receiving axle means to rotatably mount the cylinder, a sleeve covering said cylinder and having radially extending pile fibers looped therethrough, and staples inserted through said sleeve, cylinder and end members clamping them securely together to form a discardable unit.

2. A roller mop head comprising a cylinder, cup-like end members each having an annular flange closely fitting the wall of said cylinder and positioned to close the ends thereof, a stub axle mounted centrally of each end member and protruding beyond the end of the cylinder, a cloth sleeve covering said cylinder and having radially extending pile fibers looped therethrough, and staples inserted through said sleeve, cylinder and end members clamping them securely together to form a discardable unit.

3. A roller mop head according to claim 2 wherein each of said stub axles comprises a rod threaded at its inner end and having a diametrical aperture for reception of a cotter pin at its outer end, said rod being inserted through a central aperture in the end member and securely fastened thereto in liquid tight manner by inner and outer nuts threaded on the rod.

4. The combination with a roller mop head according to claim 1 of a handle, a head holding frame secured to the handle and axle means for mounting said head, said frame being a U-shaped member having a central socket secured to one end of the handle, the ends of the arms of said U-shaped member each having a bearing aperture for mounting said axle means.

5. The combination according to claim 4 wherein said axle means comprises a shaft having a length exceeding that of said cylinder, a diametrical opening near each end of the shaft for removable reception of a cotter pin, and a radial flange spaced inwardly of one end between an end member of the cylinder and one arm of said frame to hold the shaft and frame together during removal of the said discardable unit from the other end of the shaft.

6. The combination according to claim 4 wherein each of said end members is provided with a plurality of openings therethrough to permit egress of liquid from the interior of said cylinder.

7. A roller mop head comprising a cylinder, end closure members closely fitting the wall of said cylinder and positioned across the ends thereof, an aperture centrally of each end member for receiving axle means to rotatably mount the cylinder, a sleeve covering said cylinder and having radially extending pile fibers, and permanent fastening means passing through said sleeve, cylinder and end members to secure them together to form a discardable unit.

8. A roller mop head comprising a cylinder, end closure members closely fitting the wall of said cylinder and

positioned across the ends thereof, a stub axle mounted centrally of each end member and protruding beyond the end of the cylinder, said end closure members and stub axles being secured together in liquid-tight manner so as to prevent entrance of liquid to the interior of said cylinder, a sleeve covering said cylinder and having radially extending pile fibers, and permanent fastening means passing through said sleeve, cylinder and end members to secure them together to form a discardable unit.

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