

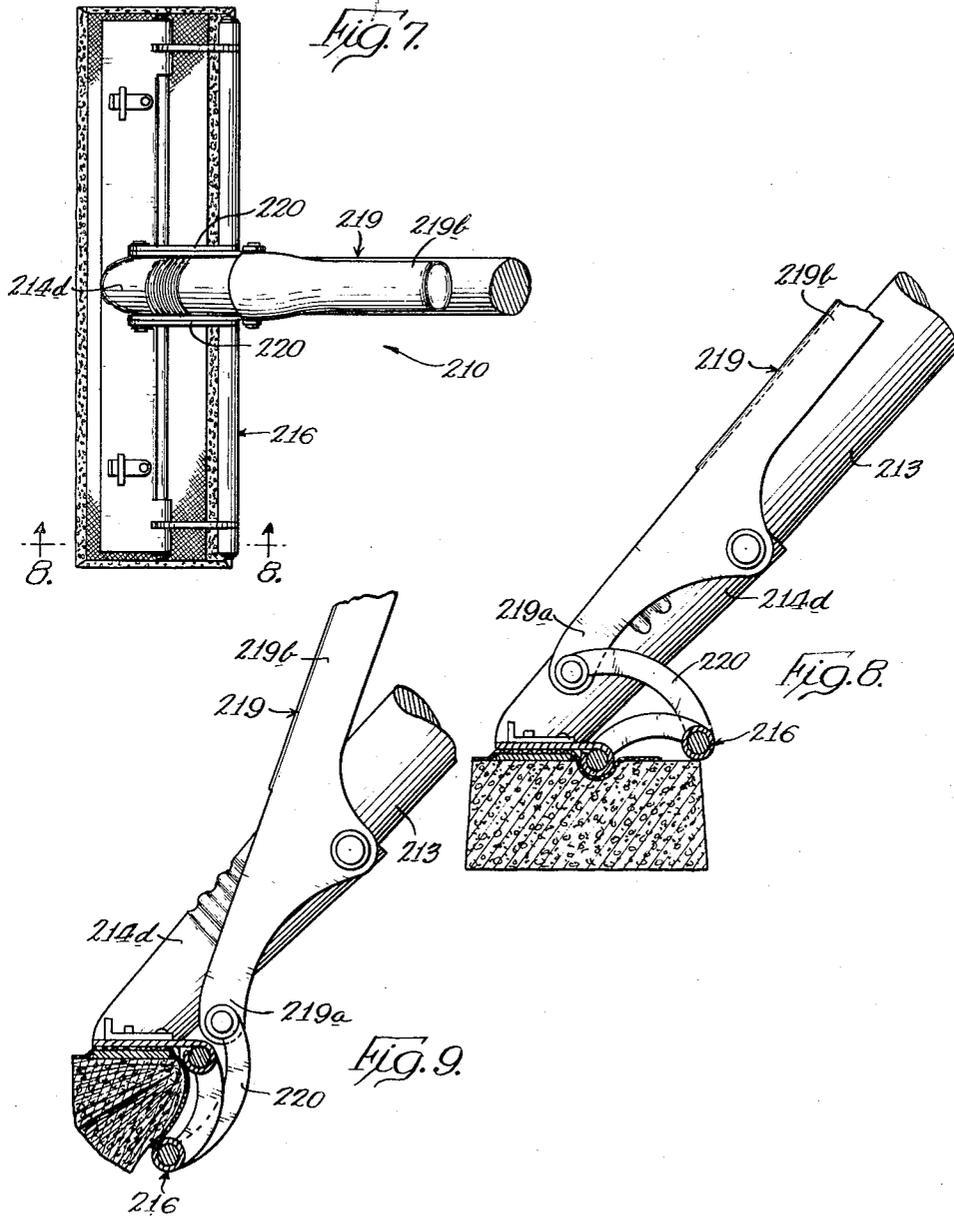
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SELF-WRINGING SPONGE MOP

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SELF-WRINGING SPONGE MOP

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This invention relates to mop devices generally and particularly to a mop device having integral squeezing or wringing means.

While many forms of mops are known in the art which are arranged to be wrung by means integral therewith, certain disadvantages are found in these mops which limit their appeal and utility to the housewife. The more serious disadvantages include the rapid wear and deterioration of the mop element or sponge caused by pinching and similar excessive pressure application thereon by the wringing or squeezing means. Another disadvantage is that the means for attaching the mop head to the mop handle are relatively complicated and resultingly costly to manufacture.

The principal object of this invention is to provide a new and improved mop device of the type having integral squeezing means.

Another object is to provide such a mop wherein the mop element or sponge is folded on itself into two substantially similar portions by means of a roller, bearing against a limited portion of the sponge.

A further object is to provide such a mop device wherein a freely extending section of the sponge is arranged for coaction with the roller and is reinforced over a portion thereof with a suitable flexible material.

Still another object is to provide such a mop device wherein the roller may roll over the unreinforced portion of the extending section during the wringing compression of the sponge thereby allowing a substantial pressure to be applied over a limited area while effectively precluding undesirable curling or wrapping of the sponge around the roller.

Yet another object is to provide a mop device which is adaptively usable with any one of a plurality of sponges having different dimensions.

Still another object is to provide a new and improved manual operating means for actuating the roller compressing means.

Other features and advantages will be apparent from the following description taken in connection with the accompanying drawings wherein:

Figure 1 is a top plan view of a mop device embodying the invention and carried on an end portion of a mop handle;

Figure 2 is an enlarged side elevational view thereof with the parts shown in the position of normal mop use;

Figure 3 is a side elevational view thereof, similar to Figure 2, but with the parts thereof shown in the position assumed during the wringing of the mop element;

Figure 4 is a fragmentary rear elevational view thereof with the parts arranged in the position of Figure 3;

Figure 5 is a fragmentary perspective view showing the means for securing the mop head to the support;

Figure 6 is a side elevational view similar to Figure 2 but having a modified form of mop head and securing means;

Figure 7 is a top plan view of modified form of the mop device having a modified form of operating lever;

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Figure 8 is an enlarged, side elevational view of the device of Figure 7, with the parts arranged in the normal mop use position; and

Figure 9 is a side elevational view thereof, similar to Figure 8, but with the parts arranged in the position assumed during the wringing operation.

In the exemplary embodiment of the invention disclosed in Figures 1 to 5 of the drawings, a mop device generally designated 10 is shown to comprise a mop head 11 including a mop element or sponge 11a secured to a plate 12. Secured to a handle 13 of the mop is a support 14 to which plate 12 is adapted to be secured readily removably in facial juxtaposition by a locking means generally designated 15. Only the front portion of sponge 11a is secured to plate 12 with the remainder of the sponge extending rearwardly to underlie handle 13. Means for wringing the sponge are provided in the form of a roller device 16 which is connected to support 14 by means of arms 17 which are pivotally secured to the support to allow the roller means to swing in an arc against the rear portion of the sponge and while rolling thereagainst press the rear portion toward the forward portion and plate 12. This action effectively folds the sponge into two substantially equal portions during the wringing operation.

The wringing pressure applied to the sponge is localized by the limited area of contact between roller 16 and the sponge, and stress distributing means are provided in the form of a flexible sheet 18 carried across the top of the sponge front portion and partially across the top of the sponge rear portion. A manual operating lever 19 is pivotally secured to support 14, and is connected to roller 16 by a suitable link 20 to effect the desired arcuate rolling movement of the roller during the wringing operation. To secure lever 19 in an out-of-the-way position under handle 13 when desired, a suitable spring clip 21 may be provided.

The general structure of my mop device having been made clear, the specific detailed construction thereof will now be described. Mop element 11a comprises a general, elongated block of suitable mop material such as conventional sponge (skeletal Porifera) or similar water absorbent material. Sponge 11a is preferably rectangular in cross section and is divided lengthwise, medially into a front portion 11b and a rear portion 11c. On top surface 11b' of front portion 11b is secured plate 12 by any of suitable means well known in the art. Plate 12 preferably comprises an elongated strip of relatively rigid material such as metal or a plastic and extends substantially completely lengthwise of sponge 11a with only a small peripheral portion of sponge 11a extending laterally outwardly from the plate to prevent undesired engagement of the plate with the household furnishings during use of the mop. The top surface of sponge rear portion 11c is divided into two portions, namely inner top surface 11c' and outer top surface 11c''. Across plate 12a, the exposed periphery of front top surface 11b', and inner top surface 11c' is secured, by suitable means such as cementing, a flexible reinforcing material, preferably comprising a fabric material such as canvas, and forming reinforcing sheet 18. Locking means 15 includes at least one lug 12a upstanding from plate 12 to extend through sheet 18 and having a portion 12b disposed parallel to plate 12 and spaced upwardly therefrom. Two such lugs 12a are provided in the preferred embodiment, being formed integrally with plate 12 by being upset therefrom.

Support 14 comprises a flat member generally similar to plate 12 in dimensions and is provided with suitable openings 14a through which lugs 12a are adapted to pass when plate 12 and support 14 are arranged in facial juxtaposition. Extending rearwardly from support 14 are a plurality of hinge blocks 14b each having a slot

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14c extending transversely therethrough to receive one end 17a of arms 17. Upstanding from support 14 intermediate its ends is a tubular socket member 14d adapted to receive the lower end of handle 13. Means may be provided for securing the handle to member 14d in assembled relationship such as an indented portion 14e on socket 14d adapted to have threaded engagement with the lower end of handle 13.

For illustrative purposes, I have shown the hinge blocks as being disposed below the plane of support 14; it should be understood, however, that the hinge blocks could be otherwise disposed and arms 17 suitably arranged to effect the desired swinging of roller device 16. Such adaptability is particularly advantageous in that different size sponges 11a may be used with mop device 10 with suitable wringing being effected through use of the desired pivoting arm structure.

Lock means 15 includes a bar 15a having one end pivotally secured to support 14 adjacent an opening 14a, to allow the other end of the bar to be positioned removably across the opening. The thickness of bar 15a is preferably comparable to or just slightly greater than the spacing of lug portion 12b above the top surface of support 14 when plate 12 and support 14 are brought together. Thus, bar 15a may be wedged tightly between lug portion 12b and support 14 across opening 14a to lock plate 12 to support 14. To provide improved ease of manipulation the free end 15b of bar 15a may be arranged to project upwardly from support 14 and form a grasping flange.

Roller 16 includes a rod 16a which extends longitudinally slightly less than the length of mop head 11. Arms 17 are each provided at their outer end 17b with an opening 17c through which rod 16a is passed to have free rotation about its axis. Rotatably carried on rod 16a are a plurality of tubular sleeves 16b extending longitudinally between arms 17 and to adjacent the extreme ends of the rod. To secure the rod and sleeves in assembled relationship with arms 17, the extreme ends 16a' and 16a'' of the rod may be peened.

The inner end 17a of each of arms 17 is provided with an opening 17d and a rod 17e is arranged to extend through each of hinge blocks 14b and through openings 17d with the inner ends 17a of the arms received in slots 14c. Longitudinal movement of rod 17e, when thus installed, is prevented by means such as peening of the extreme ends 17e' and 17e'' of the rod. Arms 17 are thus carried by rod 17e to swing roller 16 in a circular arc from a position, as seen in Figure 2, laterally of plate 12 to a position, as seen in Figure 3, spaced below the plate, in which latter position sponge 11a is wringingly compressed by the roller. Arms 17 are made arcuate to prevent engagement with sponge 11a.

Operating lever 19 is arranged to provide a mechanical advantage in the wringing of roller 16. To this end, lever 19 is secured at its lower end 19a to socket 14d by a suitable pivotal connection 19b. Link 20 is secured to lever 19 at one end 20a by a suitable pivotal connection 20b and is provided with an opening 20c in its other end 20d through which a midportion of rod 16a is passed to secure the end 20d of the lug pivotally to the rod. The relative positioning of pivotal connections 19b and 20b, rod 16a, and rod 17e is made such that when lever 19 is pivoted away from handle 13 (in a clockwise direction, as seen in Figure 2) link 20 causes roller 16 to move circumferentially about the axis of rod 17e, as described above.

An opening 19c is provided in lever 19 through which spring clip 21 extends when lever 19 is returned to the inoperative position adjacent handle 13. Clip 21 is arranged to engage releasably the portion of lever 19 defining opening 19c to secure releasably the lever in the inoperative position.

The utilization of mop device 10 is extremely simple. Mop head 11 is secured to support 14 by locking means

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15. To this end, sponge 11a is positioned with plate 12 facially juxtaposed to support 14 and lugs 12a extending through openings 14a. Bar 15a is then moved to the locking position. The mop device may then be utilized in the normal mopping operation as desired. When it is desired to wring the mop, lever 19 is grasped and moved away from handle 13 causing roller 16 to pass rotatively against top surface 11c'' and to move to the wringing position wherein sponge 11a is folded on itself and pressed against plate 12. This wringing operation may be repeated as desired. Because the area of engagement of the roller with the sponge is relatively small and the lever provides a desirable mechanical advantage, a high compressive or wringing force may be developed with relative ease by the operator. Because the roller acts against the unreinforced surface 11c'', rear portion 11c may be forced against front portion 11b without curling or wrapping of the rear portion about the roller and, thus the liquid may be effectively wrung from all portions of the sponge. The extension of reinforcing sheet 18 over inner surface 11c' effects a distribution of the stresses produced in the sponge to prevent undesired pinching of the sponge during the folding thereof. Upon completion of the wringing operation lever 19 is returned to the position along side handle 13 with spring clip 21 acting automatically to retain it in this position.

In Figure 6 is shown a modified form of mop device 110 having a non-wringable mop head 111 such as a dusting, waxing or buffing mop element 111a. A plate 112 is provided which extends substantially laterally beyond a support 114 which is similar to support 14 of the first described form. A lug 112a is carried by the plate and is similar to lug 12 except that the portion 112b is spaced substantially further from the plate to allow the disposition of a clamping plate 122 between plate 112 and support 114. The lateral extent of clamping plate 122 is made similar to that of plate 112 and the outer edge 111d of mop element 111a is brought into the space between the peripheries of plate 112 and 122. Edge 111d is tightly clamped therebetween when the plates are secured to support 14 by means of a locking bar 115a which is similar to locking bar 15a. Thus, it may be seen that mop head 111 may be readily installed in or removed from mop device 110 by the simple clamping and unclamping of plates 112 and 122 to support 114.

Another form of the invention is shown in Figures 7 to 9 wherein a mop device generally designated 210 is seen to include a manual operating lever 219 arranged to be pivotally connected to a support socket 214a. The lower end 219a of lever 219 is bifurcated to extend on opposite sides of handle 213 and two links 220 connect end 219a to a roller means 216. Lever 219 is arranged to lie proximate the upper side of handle 213 when not in use. When it is desired to wring the mop, the upper end 219b of lever 219 is pivoted away from handle 213 whereby the lower end 219a is moved downwardly to the opposite side of the handle to move roller means 216 in a manner similar to that of roller 16 in mop device 10. With the exception that the above described means for manually operating roller 216 differ somewhat from that of mop device 10 the structures and functioning of mop devices 210 and 10 are similar. In device 210, the movement of the operating lever relative to the handle is upwardly, whereas in device 10 the movement of the operating lever is downwardly, the structure for connecting the levers to the roller means being such however to effect a similar operation of the roller means in either device.

While I have shown and described certain embodiments of my invention, it is to be understood that it is capable of many modifications. Changes, therefore, in the construction and arrangement may be made without departing from the spirit and scope of the invention as disclosed in the appended claims.

I claim:

1. A mop device comprising: an elongated block of spongy material, divided into two substantially equal parts forming a front portion having a rectangular top surface and a rear portion having a rectangular top surface; a plate attached to said block at said front top surface; a socket attached to said plate and adapted to receive a handle; flexible reinforcing means across at least a portion of the rear top surface; roller means extending lengthwise of said block adjacent said rear top surface; a plurality of arms arranged to pivot about an axis extending lengthwise of said block and between said surfaces, with one end of each of said arms pivotally attached to said plate and the other end attached to said roller means to cause said roller means to bear against said rear top surface at the edge thereof most remote from said front top surface and to move circumferentially about said axis toward said front top surface and fold said block yieldingly on itself to urge said block compressingly against said plate; a link articulated to said roller means; and a lever articulated to said link with one end pivotally attached to said socket, said lever being movable toward and away from said roller means.

2. A mop device comprising: an elongated block of spongy material divided into two substantially equal parts forming a front portion having rectangular top surface and a rear portion having a rectangular top surface; a plate attached to said block at said front top surface; a socket attached to said plate and adapted to receive a handle; flexible reinforcing means across at least a portion of said rear top surface; roller means extending lengthwise of said block adjacent said rear top surface and arranged to bear against said rear top surface; and means for moving said roller means laterally arcuately toward said front top surface to fold said block yieldingly on itself and urge said block compressingly against said plate, including a lever pivotally carried on said socket and having a grasping portion arranged to extend on one side of said handle and a bifurcated portion arranged to straddle said socket and to extend from the other side of said handle when the grasping portion is pivoted away

from the socket during wringing and also including link means to connect said bifurcated portion and said roller means.

3. A mop device comprising: an elongated block of spongy material, divided into two substantially equal parts forming a front portion having a rectangular top surface and a rear portion having a rectangular top surface; a plate attached to said block at said front top surface; a socket attached to said plate and adapted to receive a handle; flexible reinforcing means across at least a portion of the rear top surface; a roller means extending lengthwise on said block adjacent said rear top surface; a plurality of arms arranged to pivot about an axis extending lengthwise of said block and between said surfaces, with one end of each of said arms pivotally attached to said plate and the other end attached to said roller means to cause said roller means to bear against said rear top surface at the edge thereof most remote from said front top surface and to move circumferentially about said axis toward said front top surface and fold said block yieldingly on itself to urge said block compressingly against said plate; a link articulated to said roller means; and a lever articulated to said link pivotally connected to said socket means with a portion thereof movable toward and away from the location occupied by said rear top surface when the sponge block is unfolded.

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