

[54] **WRINGER MOP HEAD REPLACEMENT AND ACTUATOR MECHANISM**

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[52] U.S. Cl.15/119 A
 [51] Int. Cl.A47I 13/144
 [58] Field of Search15/116 R, 116 A, 15/119 R, 119 A

[56] **References Cited**

UNITED STATES PATENTS

3,345,667 10/1967 Blum15/119 A

FOREIGN PATENTS OR APPLICATIONS

985,124 3/1965 Great Britain15/119 A
 1,125,604 3/1962 Germany15/119 A

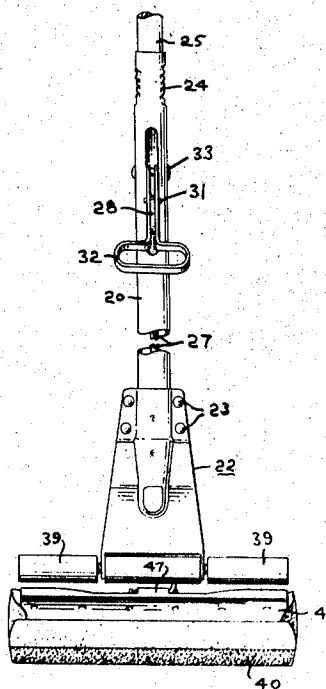
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[57] **ABSTRACT**

A wringer mop head replacement and actuator

mechanism including a pair of spaced parallel wringer rollers carried at the lower end of a housing through which housing extends an operating crank upward through a hollow handle to pivotal securement with a pivoted crank handle, and which operating crank detachably connects at its lower end to the mop head by means of a cooperating snap-latch carried by the mop head. The crank handle is shiftable between up and detented center positions to similarly shift the operating crank and wring out the mop head by passing it between the rollers, and is shiftable to a down position to expel the mop head and lower end of the operating crank from the housing and from between the rollers to completely expose the snap-latch connection for fast mop head replacement. The mop head snap-latch consists of an inverted channel member holding a sponge absorbent element by compression of a marginal edge of the sponge between the channel member walls, the center of the channel base wall having an upstanding tunnel formation into which the operating crank lower end hook arm is slidable with the latter held in position by a shiftable latch plate biased resiliently upward by the sponge material to capture the hook arm.

1 Claim, 12 Drawing Figures



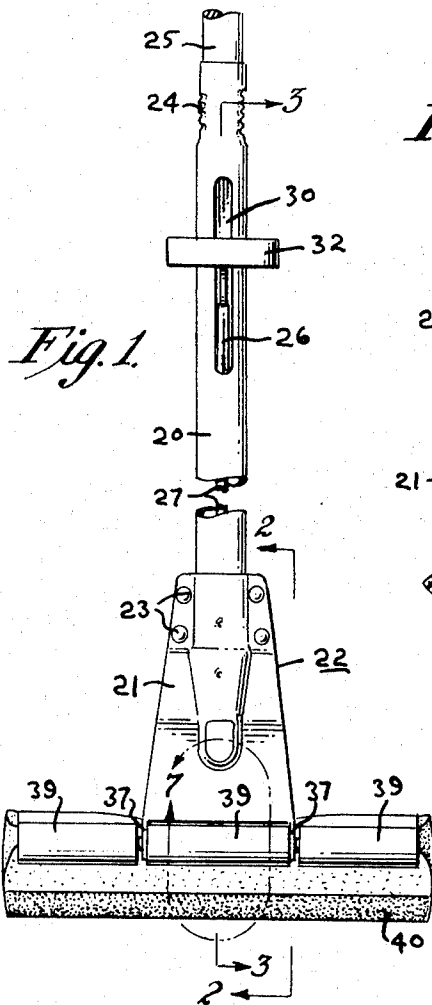


Fig. 1.

Fig. 2.

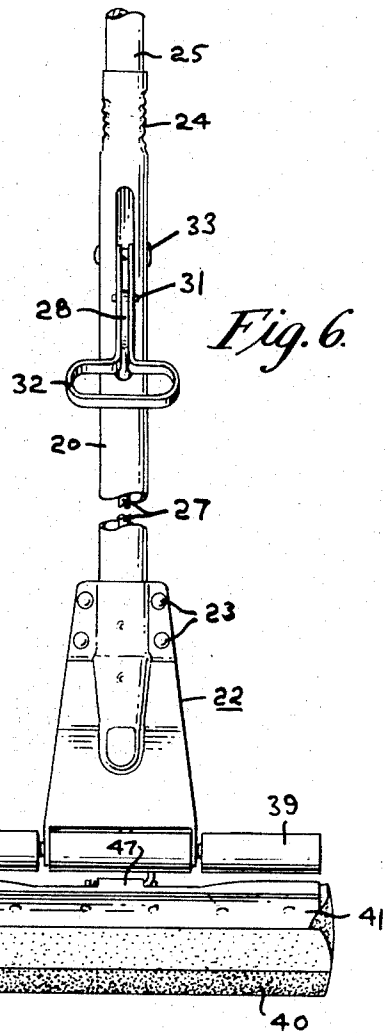
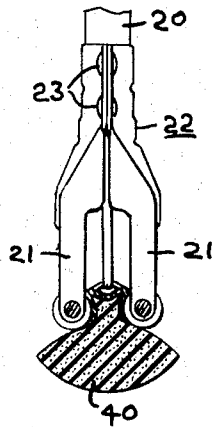


Fig. 6.

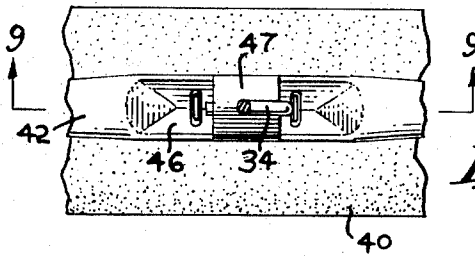


Fig. 8.

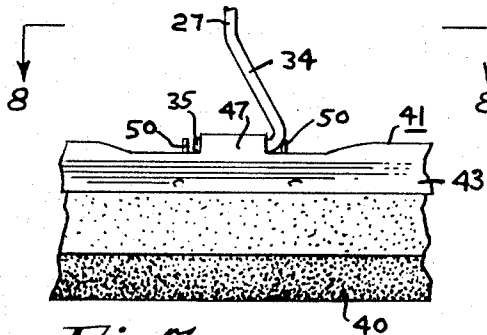


Fig. 7.

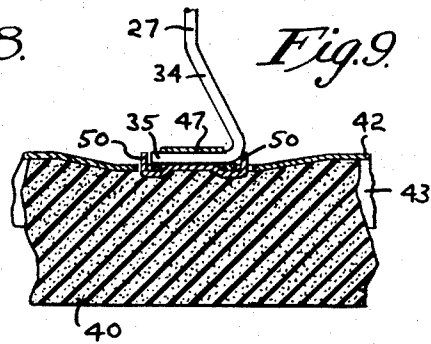


Fig. 9.

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Fig. 3.

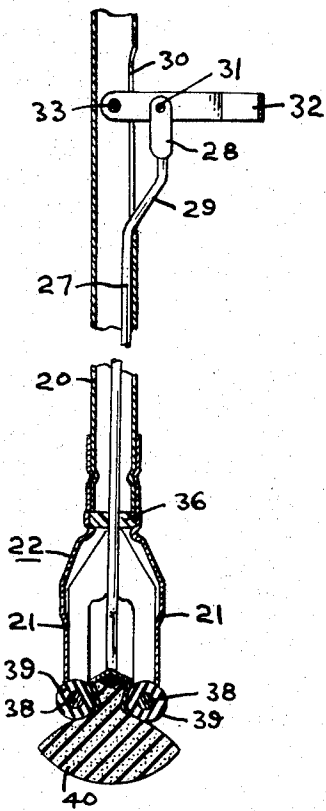


Fig. 4.

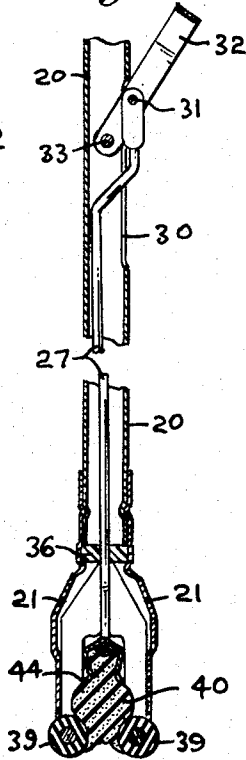


Fig. 5.

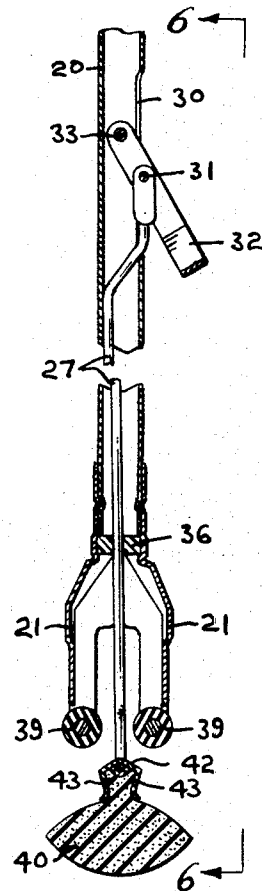


Fig. 10.

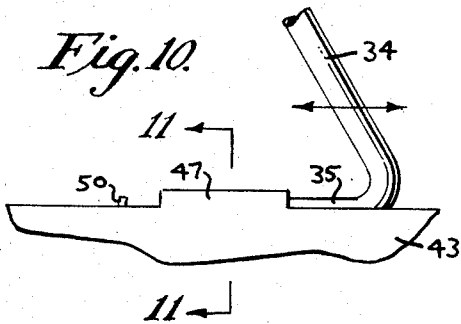


Fig. 12.

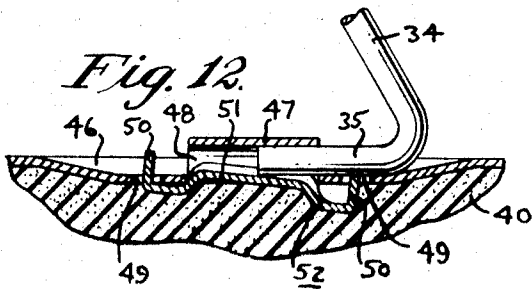
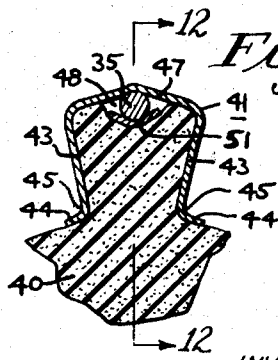


Fig. 11.



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WRINGER MOP HEAD REPLACEMENT AND ACTUATOR MECHANISM

This invention relates generally to wringer mops, and more particularly relates to a novel mop head replacement and actuator mechanism by means of which the mop head may be quickly and easily detached when worn and replaced by a new head within a matter of seconds.

Sponge wringer mops of the type generally contemplated by the invention are not per se new, but have been characterized by mop head replacement mechanisms which required access to restricted spaces in order to attempt to unsecure the mop head from the operating handle mechanism for purposes of replacement. The mechanism according to the invention is not so limited in that it provides a means for projecting the mop head out of the mop holding mechanism in a condition which completely exposes the mop head securement mechanism. Moreover, the securement mechanism itself involves no nuts or screws, but instead consists of a biased snap-latch arrangement by means of which the worn mop head may be snapped-off of the head holder and replaced by a new head. Accordingly, it is a primary object of the invention to provide a novel mop head replacement and actuator mechanism as aforescribed.

Another object of the invention is to provide a novel mop head replacement and actuator mechanism in which the operating crank mechanism by means of which the mop head is caused to be wrung out is also the mechanism by means of which the mop head may be projected out of the mop handle and wringer structure for purposes of head replacement.

The foregoing and other objects of the invention will appear more fully hereinafter from a reading of the following specification in conjunction with an examination of the appended drawings wherein:

FIG. 1 is a front elevational view of the wringer mop incorporating the invention, with the mop shown in normal condition for mopping use;

FIG. 2 is a vertical section through the mop of FIG. 1 as would be seen when viewed along the lines 2—2 of FIG. 1;

FIG. 3 is a central vertical sectional view through the mop shown in FIG. 1 as would be seen when viewed along the lines 3—3 of FIG. 1;

FIG. 4 is a longitudinal central section similar to that of FIG. 3 but illustrating the operating crank and handle mechanism in the "up" position and causing the mop head to be drawn upward between the rollers and wrung out;

FIG. 5 is a longitudinal central sectional view similar to that of FIG. 3 but illustrated with the operating crank and handle mechanism in the "down" position showing the mop head in a downwardly projected expelled position from the mop handle and wringer structure;

FIG. 6 is a front elevational view similar to that of FIG. 1 but illustrating the condition of the mop with the mop head expelled as shown in the sectional view of FIG. 5 and as would be seen when viewed along the lines 6—6 of FIG. 5;

FIG. 7 is an enlarged view taken on the broken lined area designated by numeral 7 on FIG. 1, and with the casework and rollers of the mop removed to reveal the structure of the underlying mop head;

FIG. 8 is a top plan view of the portion of the mop head shown in side elevation in FIG. 7 and as would be seen when viewed along the line 8—8 of FIG. 7;

FIG. 9 is a longitudinal vertical sectional view through the mop head as would be seen when viewed along the line 9—9 of FIG. 8;

FIG. 10 is an enlarged fragmentary side elevational view of the mop head snap-latch mechanism engaged with the lower end hook arm of the operating crank in a position intermediate that of engagement or disengagement of the mop head and crank end;

FIG. 11 is a vertical cross sectional view as would be seen when viewed along the line 11—11 of FIG. 10 and illustrating one aspect of the mechanical inter-relationship between the mop head snap-latch and the engaging hook arm end of the operating crank; and

FIG. 12 is a longitudinal vertical sectional view as would be seen when viewed along the line 12—12 of FIG. 11 and more clearly showing details of the mop head snap-latch in engaging relationship with the operating crank hook arm.

In the several figures, like elements are denoted by like reference characters.

The general structural and operating features of the improved mop according to the invention are illustrated in FIGS. 1 through 6, and attention should first be directed to FIGS. 1, 2 and 3. As shown, the mop structure generally consists of a hollow tube 20 secured at its lower end between the two halves 21 of a hollow bell shaped housing 22, the housing halves being fixedly secured together by rivets 23. The upper end of the hollow tube 20 is formed with threads 24 for threadedly receiving a handle extension 25.

Disposed within the hollow tube 20 is an operating crank 26 formed from a steel rod or other suitable material, operating crank having a long straight central portion 27 and an upper short straight arm 28 laterally offset from the central portion 27 and connected thereto by a diagonal portion 29, which latter extends outward through an elongated slot 30 in a wall portion of the hollow tube 20 proximate to the upper end of the tube 20. The end of the crank upper arm 28 is pivotally secured as by means of a rivet 31 to the stem of a T-shaped crank handle 32, the lower end of the stem of the T-shaped crank handle extending into the hollow tube 20 through the slot 30 and being pivotally secured therein by means of a rivet 33.

The lower end of the operating crank central portion 27 is formed with a portion 34 extending diagonally thereof and terminating in a hook arm 35 extending substantially orthogonally to the crank central portion 27, this lower terminating structure of the operating crank being best seen for example in the showing of FIG. 9. A guide disc 36 is held captive within the upper end of the housing 22 at the lower end of the hollow tube 20, the central part 27 of the operating crank 26 passing slidably therethrough.

Each housing half 21 is provided at its opposite side lower edges with depending ears 37 through which axially rotatably extend roller support shafts 38 and upon each of which are mounted three co-linear cylindrical rollers 39. As will be subsequently seen, the rollers 39 provide a squeezing or wringer action for the purpose of extracting water from the mop head. The water retaining portion of the mop head 40 is made of sponge rubber or some other suitable material and is generally

of sector shape in cross-section resulting from the inward pinching of the upper marginal portion of a piece of foam rubber of generally square or rectangular cross-section by means of a channel member 41 of inverted U-shape in cross section, as best seen in FIG. 11.

As best seen in FIG. 8, the channel member 41 has an upper base wall 42 from which downwardly convergingly extend the channel side walls 43, each side wall terminating in an outwardly turned lower marginal skirt 44 forming a recess 45 between the skirt 44 and the side wall 43. The transverse distance between the recesses 45 is substantially equal to or just slightly less than the distance between the facing rollers 39, as best seen in FIGS. 2 and 3, so that the rollers 39 hold the channel member 41 in fixed position to thereby mechanically stabilize the mop head when the latter is in its use position. It should be noted that the formation of the detenting recesses 45 by the configuration of the channel side walls 43 and marginal skirts 44 together with the spacing between the rollers 39 normally prevents movement of the mop head in either up or down direction between the rollers 39 by virtue of the outward flare of the channel member 41 at the upper edge and the outward flare of the skirts 44 at the lower edge. The channel member base wall 42 is formed in its central region with a depressed area 46 from which is turned upward a central loop 47 which forms a receiving tunnel 48 for the hook arm 35 of the operating crank 26. Also punched out of the base wall central depression 46 on opposite sides of the loop 47 are slots 49 which loosely receive the ears 50 turned upward from opposite ends of the base 51 of a latch plate 52. The base 51 of the latch plate 52 has a raised central portion which projects upward into the receiving tunnel 48 of the turned up loop 47 as an aid to positional stabilization of the latch plate with respect to the channel member upper base wall 42 since the latch plate is held in floating position with respect thereto only by the resilient action of the sponge material 40 pressing upward against the undersurface of the latch plate.

As best seen from FIGS. 7 and 9, the latch plate ears 50 are disposed at opposite ends of the operating crank lower hook arm 35 in capturing relationship thereto and prevent the mop head from normally shifting longitudinally with respect to the hook arm 35 to thereby prevent detachment of the mop head from the operating crank. When it is desired to replace a mop head, this is done as best seen in FIGS. 10 and 12 by slightly rotating the mop head to cause the end of the hook arm 35 to depress the latch plate 52 against the resilient action of the sponge 40 and thereby also depress the latch plate ear 50 which normally retains the hook 35 in the tunnel 48. The mop head and operating crank are then shifted longitudinally relatively to one another in the manner shown in FIG. 10 to completely disengage the hook arm 35 from the mop head.

A new mop head is of course attached by the reverse process, that is, by depressing a latch plate ear 50 with the end of the hook arm 35 and then slipping the hook arm 35 into the tunnel 48 and permitting the depressed latch plate ear to rise by the resilient biasing action of the underlying sponge 40. The attachment and detachment mechanism is thus seen to provide a very simple but effective latch mechanism for quickly and easily replacing mop heads without the use of any tools whatever.

Consider now FIGS. 3, 4 and 5 for an understanding of the operating mechanism of the crank system. FIG. 3, as previously described, illustrates the condition of the mop with the mop head in its normal use position mechanically stabilized by the interaction between the rollers 39 and channel member 41. In this use condition, the crank handle 32 extends substantially straight out from the hollow tube 20 and is in what may be termed its "center" position.

When it is desired to squeeze or wring out the mop head 40, the crank handle 32 is pulled upward causing it to pivot about the rivet 33 and move upward within the slot 30 of the hollow tube 20 to thereby draw the operating crank 26 upward within the tube 20, and consequently pull the mop head 40 upward between the rollers 39 and squeeze out the water within the mop as shown in the illustration of FIG. 4. When the crank handle 32 is first pulled upward the rollers 39 are caused to move laterally outward away from one another in order to override the lower marginal skirts 44 of the channel member 41, and to then move inward and press against the sponge head 40 as the latter is drawn upward within the housing 22. The mop head 40 is of course again squeezed or wrung out as the crank handle 32 is again moved downward to its central position restoring the conditions as illustrated in FIG. 3.

The "center" and "up" positions of the crank handle 32 are the only two positions which are utilized in normal use of the mop. However, when the sponge head 40 of the mop has become worn so that it requires replacement, the operating mechanism is utilizable to effectively expel the mop head from between the rollers 39 for easy replacement of the mop head in the manner previously described in connection with the illustrations of FIGS. 10 and 12. The expulsion of the mop head is accomplished by pressing the crank handle 32 downward within the slot 30 so that the rollers 39 are moved physically apart by the sloping surfaces of the U-shaped channel side walls 43 to permit the operating crank 26 to move downward within the hollow tube 20 until its bottom terminating hook arm 35 is disposed beneath the level of the rollers 39, and therefore of course carrying the mop head with it, all as illustrated in the showings of FIGS. 5 and 6. When the mop head has been replaced in the manner previously described, it is only necessary to again pull upward on the crank handle 32 to withdraw the crank 26 upward within the hollow tube 20 until the rollers 39 ride over the channel 41 upper base wall 42 and again engage in the detenting recesses 45 formed by the channel lower marginal skirts 44 and side walls 43.

Having now described my invention in connection with a particularly illustrated embodiment thereof, it will be apparent that variations and modifications of the invention may now occur from time to time to those persons normally skilled in the art without departing from the essential scope or spirit of the invention, and accordingly it is intended to claim the same broadly as well as specifically as indicated by the appended claims.

What is claimed as new and useful is:

1. A wringer-mop head-replacement and actuator mechanism in a mop of the type having a frame including a hollow housing and a mop handle section extending upward therefrom and from the lower end of which housing depend a pair of parallel spaced apart wringer rollers, comprising in combination,

- a. an operating crank having upper and lower ends with said lower end carrying a first latching part in the form of a hook arm and extending into the housing,
- b. a mop-head partly disposed between and engaged by the wringer rollers and including a pad-carrier and an absorbent pad depending therefrom, said pad-carrier being a channel member having a base wall carrying a second latching part quick detachably interlatchable with said first latching part carried by said operating crank lower end, said second latching part comprising,
 - 1. a hook arm receiving tunnel formation turned upward from a part of said channel member base wall adapted to have said hook arm projected thereinto and withdrawn therefrom,
 - 2. a pair of slots formed in said channel member base wall outwardly beyond the opposite ends of said tunnel formation, and
 - 3. a resiliently biased latch plate adapted to underlie and retain said hook arm in said tunnel formation against relative endwise shifting movement

therewithin, said latch plate including an elongated strip having ears turned upward from the opposite ends thereof, said ears being respectively projected upwardly through said pair of channel member base wall slots with the central portion of said elongated strip therebetween disposed within said tunnel formation and with the opposite ends of said hook arm captively disposed between said ears,

- c. a crank handle secured to said operating crank upper end and also secured to the mop frame, said crank handle being reversely shiftable between first and second positions to pass said absorbent pad between the wringer rollers to effectively wring out said pad, and said crank handle being reversely shiftable into a third position effective to expel said mop head and said first and second latching parts out of the housing and from between the rollers for quick unlatching of said first and second latching parts for detachment of said mop head and replacement thereof by a new mop head.

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