Jan. 4, 1966 N. ANTONUCCI, JR 3,226,752

MOP WITH WRINGER

Filed Sept. 29, 1964 3 Sheets-Sheet 1

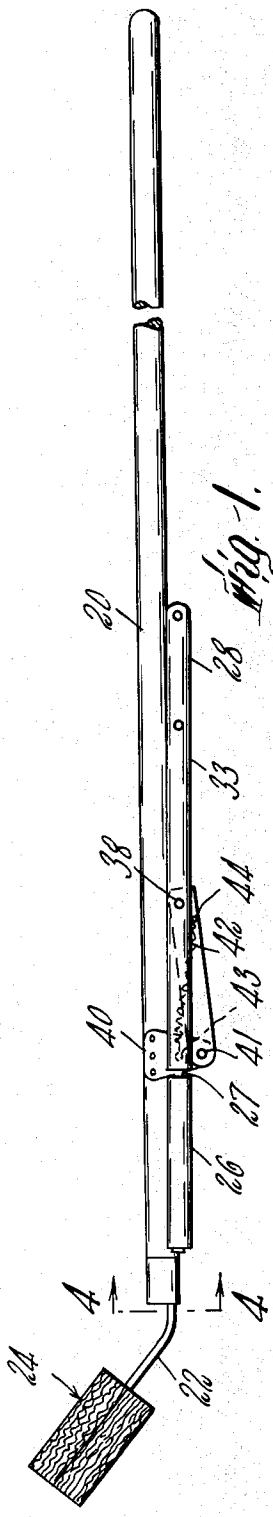


Fig. 1.

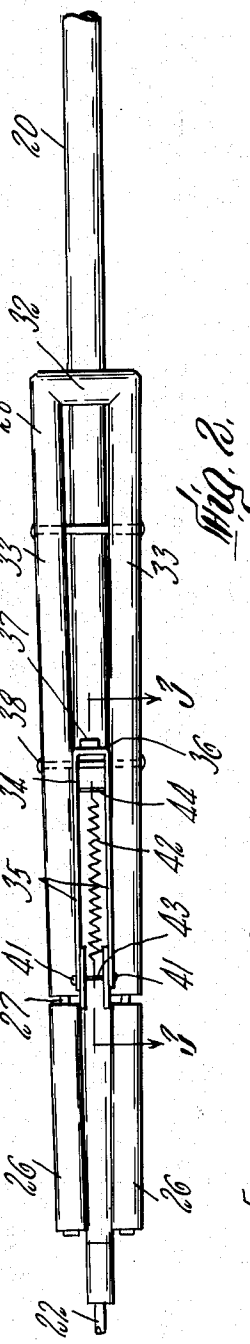


Fig. 2.

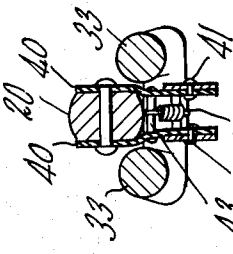


Fig. 5.

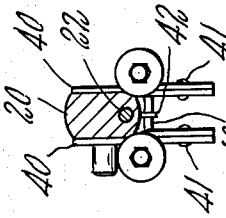


Fig. 4.

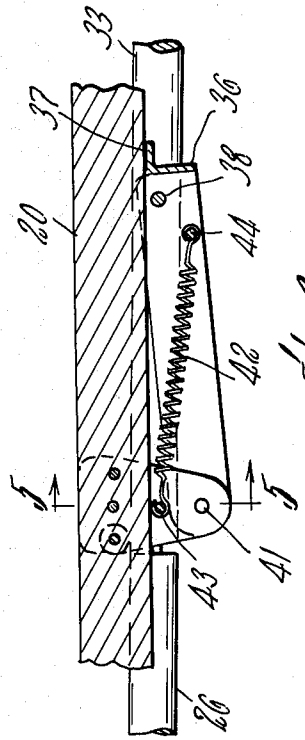


Fig. 3.

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MOP WITH WRINGER

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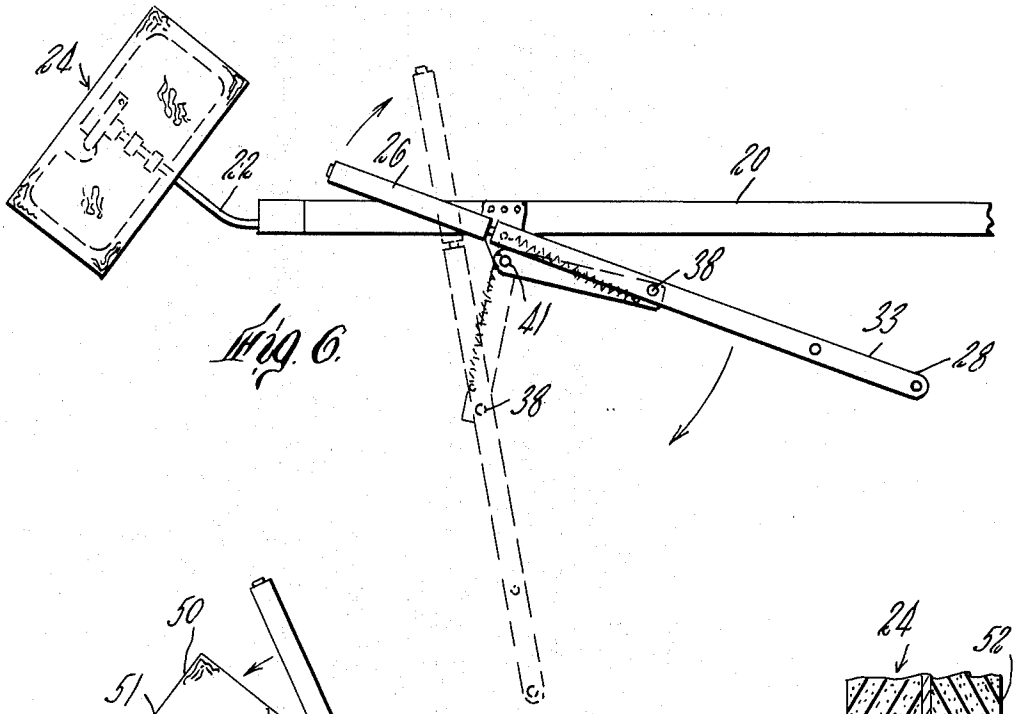


Fig. 6.

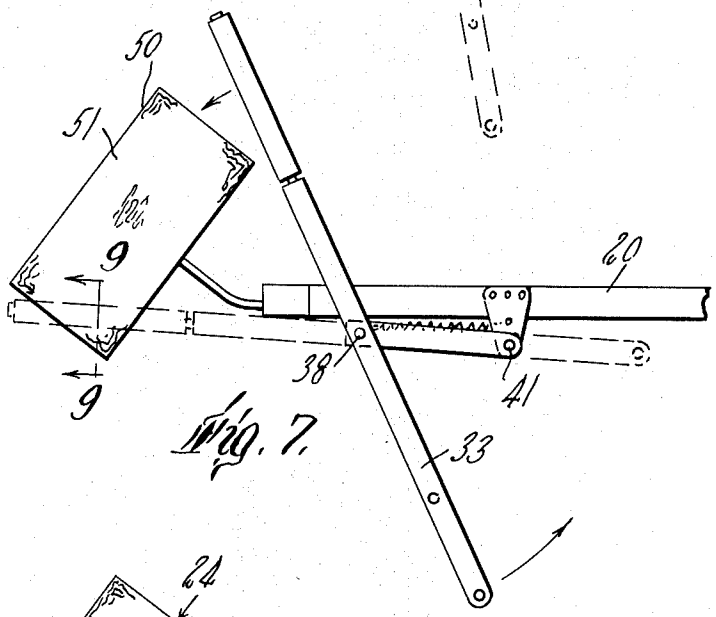


Fig. 7.

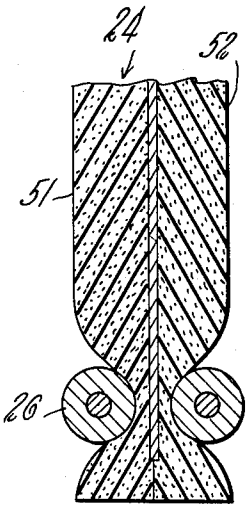


Fig. 9.

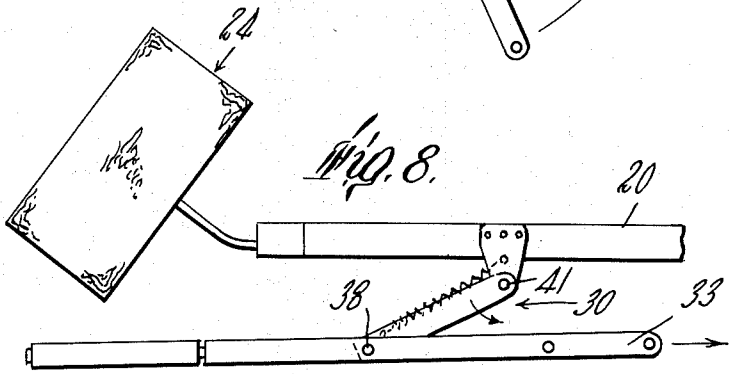


Fig. 8.

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MOP WITH WRINGER

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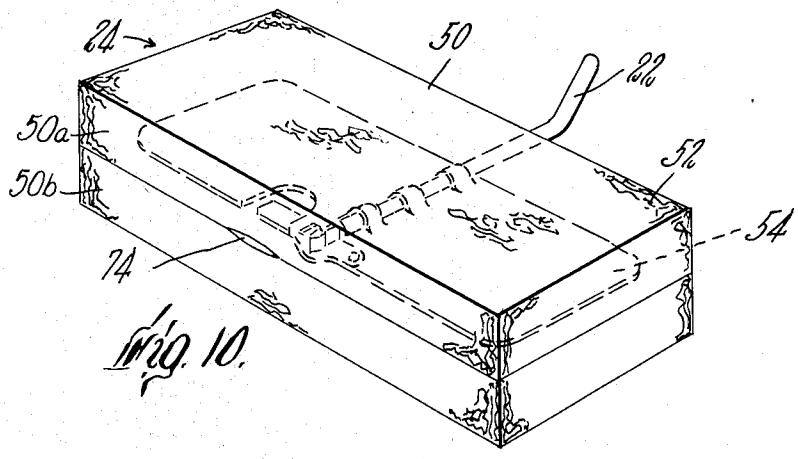


Fig. 10.

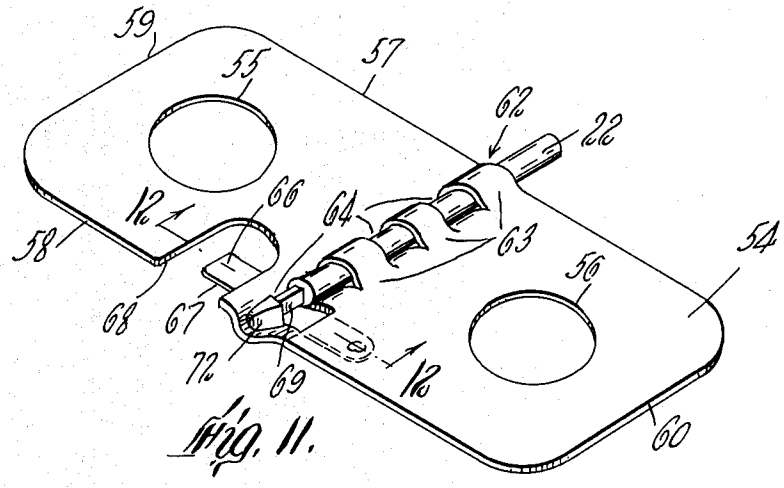


Fig. 11.

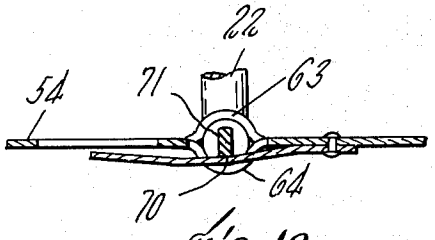


Fig. 12.

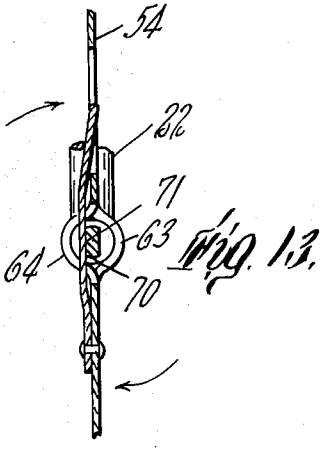


Fig. 13.

United States Patent Office 3,226,752 Patented Jan. 4, 1966

3,226,752

MOP WITH WRINGER

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4 Claims. (Cl. 15—119)

This invention relates to wet mops that carry integral means for periodically wringing out a saturated mop head, and more particularly to those mops having integral wringing rollers that swing past the mop head with the head being squeezed between the rollers.

A particular object of the invention is to provide a linkage between the wringing rollers and the mop handle that enables the person using the mop to easily move the rollers through their wringing cycle, while all parts of his body remain a substantial distance away from the wet head and on the handle side of the head, thus simplifying the wringing operations and lessening the danger of getting wet, while at the same time providing a thorough wringing with minimum wear and tear on the various parts of the mop.

Another object is to provide a set of rollers attached to the main body of the mop through a movable pivot, with the pivot able to be moved away from the mop head while mopping, withdrawing the rollers from the area of the head to a retracted position out of the way, and alternately moved toward the mop head in order to carry the rollers to an extended position above the saturated head, where they can then be pivoted through a vertical path with the mop head passing therebetween. It is also an object to provide biasing means for alternately biasing the movable pivot in the mentioned retracted and extended positions assumed by the rollers.

Yet another object, particularly applicable to mops with wide heads that must be turned endwise relative to the rollers in order that the rollers may pass over the head, is to provide a means for rotatably mounting the head so that it will stay in its endwise position when it is so turned, and will also stay in its mopping position when so turned, yet can easily be moved from one position to another when a torque is applied to the head (e.g. by pressing an end of the head against the floor); it is also an object to provide for easy removal of the mop head from the handle, facilitating replacement of heads. It is further an object to provide resilient means in the above mentioned mounting for resiliently biasing the head in its endwise and mopping positions.

Other objects and features will be apparent from the detailed description and drawings of a preferred embodiment of the invention. In the drawings:

FIG. 1 is a side elevation of the preferred embodiment, showing the wringing rollers withdrawn from the mop head in the above mentioned retracted position;

FIG. 2 is a slightly enlarged top view of a portion of the mop, with the rollers in the same position as in FIG. 1;

FIG. 3 is an enlarged vertical section of a portion of the mop, taken along the line 3—3 in FIG. 2;

FIG. 4 is an end section taken along the line 4—4 in FIG. 1;

FIG. 5 is a section taken along the line 5—5 in FIG. 3;

FIG. 6 is a side elevation similar to FIG. 1, but with the mop head rotated into its endwise or wringing position, and the rollers and linkage moved partially out of their retracted position toward their extended position, in the direction of the arrow, a subsequent position to be assumed by the rollers and linkage being shown in dotted lines;

FIG. 7 is a side elevation similar to FIG. 6, but with the linkage and rollers fully moved to their extended position, with a subsequent position of the rollers as they pass over the mop head in the direction of the arrow shown in dotted lines;

FIG. 8 is a side elevation similar to FIG. 7 showing the partially retracted position of the linkage and rollers after the rollers have fully passed over the mop head;

FIG. 9 is a section taken along line 9—9 of FIG. 7, showing the rollers squeezing the mop head;

FIG. 10 is a perspective view of the mop head from above, with dotted lines showing the manner in which the head is mounted;

FIG. 11 is an enlarged view from the same position as FIG. 10, but with the sponge part of the head removed, exposing the mounting;

FIG. 12 is a section taken along line 12—12 of FIG. 11, showing the mop head mounting in its mopping position; and

FIG. 13 is a section similar to FIG. 12, but with the mop head mounting rotated to its wringing position.

Referring to the drawings in detail, the mop consists broadly of a handle 20, a bent metal shaft 22 of round cross section attached rigidly at one end to handle 20, with a sponge mop head indicated generally at 24 rotatably and removably attached to the other end of shaft 22, spaced and generally parallel wringing rollers 26 rotatably mounted on shafts 27, which shafts in turn protrude rigidly from wringer handle 28, and linkage generally indicated at 30 (FIG. 8) connecting wringer handle 28 and mop handle 20.

Wringer handle 28 includes an end grip 32, to be grasped by the hand when the rollers are being moved, with two elongated arms 33, generally parallel to each other and mop handle 20, but in fact tapering toward each other as they extend away from grip 32. As the shafts 27 extend out from the ends of arms 33, they too, along with rollers 26 mounted for rotation upon said shafts, taper toward one another, so that the ends of the rollers closest to the mop head are spaced by a distance less than the diameter of handle 20. The other ends of the rollers, as well as arms 28, are spaced a distance greater than the diameter of handle 20.

Linkage 30 includes a U-shaped metal lever 34 having substantially parallel arms 35 joined by end piece 36. Stop 37 extends from the upper edge of end piece 36, providing a flat surface to rest against handle 20 when the lever is in its retracted position. Lever 34 fits between arms 28 and is pivotally attached to said arms by means of pin 38 passing through arms 35 of the lever near end piece 36. In this manner the lever is mounted at one end in pivotal relation to the spaced shafts and rollers.

The other ends of lever arms 35 are in turn mounted in pivotal relation to handle 20 through a pair of metal plates 40. In particular, plates 40 are bolted or riveted to opposite sides of handle 20, and extend below said handle, where lever arms 35 flank said plates and are pivotally connected thereto by pins 41. Spring 42 is fixed at one end between plates 40 to pin 43 passing through said plates above pins 41, and at the other end between lever arms 35 to pin 44 passing between said arms. In this manner lever 34 can be pivoted about pin 41 from a retracted position (FIGS. 1–3), in which end piece 36 is away from the mop head and pins 41 are between the mop head and pin 38, to an extended position (FIG. 7) in which end piece 36 is toward the mop head and pin 38 lies between the mop head and pins 41. In each of these positions spring 42 firmly biases the lever with end piece 36 stopped against handle 20. In order to assure the firm biasing of the lever against the handle, pin 43 is above pin 44. As the lever is pivoted between its retracted and extended positions it will pass through an intermediate position of unstable equilibrium at which point the spring will cease to oppose the movement and begin to reinforce it.

The rollers 26, shafts 27 and handle 28 are located so that when the lever is in its retracted position, these elements will lie out of the way beneath the mop handle 20, held there by the biasing force of the spring as transmitted through pin 38. In this position the rollers will straddle the handle 20, with the handle extending a small distance down between the rollers. The ends of the rollers closest to the mop head will be spaced a small distance from the corresponding end of handle 20.

To move the rollers from their retracted to their extended position the procedure is to move wringer handle 28, at grip 32, away from mop handle 20. This can be done while holding the mop in the usual mopping position with one hand and simply pushing down on grip 32 with the other. Due to the above mentioned narrow spacing of the forward ends of the rollers, said rollers will tend to resist upward movement across handle 20, but, due to a degree of resiliency in shafts 27, will cross said handle, as wringer handle 28 and lever 34 pivot about pins 41 (FIG. 6). Handle 28 is manually pivoted downwardly away from the mop handle until the above mentioned position of unstable equilibrium is reached, at which point the spring 42 will reverse its biasing force and move the wringer assembly and linkage to the extended position of FIG. 7. By virtue of this movement the rollers are brought wholly above handle 20, and pivot pin 38 is moved forwardly in the direction of the mop head, thereby bringing the rollers to a location above the mop head, from whence they can be pivoted in a vertical path downwardly, about pin 38, with the mop head, which has been moved to its wringing position, passing therebetween (dotted lines FIG. 7). The rollers then pass to beneath the mop head, and, by pulling rearwardly on handle 28, the linkage and wringer mechanism will be returned (FIG. 8) to the retracted position. Thus, the entire wringing operation can be carried out with very little effort, and with all parts of the user's body remaining on the handle side of the mop head.

The manner in which the mop head is mounted on shaft 22 will now be described. The mop head indicated generally at 24 includes a sponge 50 of oblong horizontal cross section, and formed of upper and lower sections 50*a* and 50*b*. Main mopping surfaces 51 and 52 lie opposite each other separated by a total sponge thickness that is substantially smaller than the width of the sponge. Embedded in the sponge, between sections 50*a* and 50*b* parallel to surfaces 51 and 52 is a metal plate 54; this plate is of dimensions somewhat smaller than the oblong horizontal cross section of the sponge, so that the sections 50*a* and 50*b* can be joined to each other around the edges of the plate, as well as through holes 55 and 56 in the plate. Midway between and parallel to side edges 59 and 60 of the plate is a journal 62, formed of alternate upward and downward deformations 63 and 64. The journal extends across the plate from rear edge 57 to front edge 58, ending with a downward deformation adjacent forward edge 58. The upward deformation adjacent the last mentioned downward deformation is missing, and instead a strip of resilient metal is riveted at one end to the underside of the plate to form a retaining tongue 66 that fits between the last two downward deformations. At the free end of tongue 66 a finger size opening 68 is cut in the plate, with a corresponding opening 74 in the sponge, so that a finger can be inserted into the sponge to manipulate the tongue 66.

The forward end of shaft 22 contains reduced size portion 69 of oblong cross section including flat locating surfaces 70 and 71. Portion 69 is of length equal to the space between the last two downward deformations of the plate, and is so located on the shaft 22 that when said shaft is fully inserted in the journal 62, portion 69 is between said last two deformations, so that resilient retaining tongue 66 will spring up against its flat surfaces. The forward end of the shaft is of larger, preferably rectangular, cross section than the reduced portion

69, forming a stop 72. In operation, stop 72 will abut the forward edge 67 of tongue 66 to retain the mop head on the shaft 22. By depressing the tongue with a finger inserted in opening 74, shaft 22 can be withdrawn from the journal, with the tongue clearing stop 72, allowing replacement of the head.

In operation, tongue 66 will resiliently contact locating surfaces 70 or 71, restraining rotation of the mop head on the shaft. The wider surface 71 is oriented on the shaft to contact the tongue when the head is in its endwise or wringing position of FIGS. 6–8, with mopping surfaces 51 and 52 vertical and adapted to pass between rollers 26 (FIG. 13). Thus, the head is held firmly in the correct position while being wrung, irrespective of the tilting of the mop as a whole. By applying a torque to the mop head about shaft 22 (e.g. by pressing an edge of the head against the floor) it can easily be rotated to its mopping position, with surfaces 51 and 52 horizontal and narrow surface 70 contacting the tongue (FIG. 12). If slight torque is applied to the head while in the mopping position, it will snap automatically into its wringing position.

While the preferred embodiment has been described in great detail, variations within the scope and spirit of the invention will occur readily to those skilled in the art.

What is claimed is:

1. A mop comprising a mop handle, a mop head mounted on said handle, a pair of spaced wringing elements mounted for joint pivotal and translational movement relative to said handle, a wringer linkage connecting said spaced wringing elements and said handle, said linkage comprising a lever mounted in pivotal relation to said handle for rotation about a first axis and in pivotal relation to said wringing elements for rotation about a second axis spaced from said first axis, said lever thereby adapted to pivot about said first axis between a retracted position in which said first axis lies between said mop head and said second axis, and an extended position in which said second axis lies between said mop head and said first axis, said handle and lever oriented so that said handle acts as a stop to limit the movement of said lever in said extended position, said wringing elements when in said extended position being adapted to be pivoted about said second axis with said mop head passing therebetween.

2. A mop comprising a mop handle, a mop head mounted on said handle, a pair of spaced wringing rollers rotatably mounted on a pair of spaced shafts for joint pivotal and translational movement relative to said handle, and a wringer linkage connecting said spaced shafts and said handle, said linkage comprising a lever mounted in pivotal relation to said handle for rotation about a first axis and in pivotal relation to said spaced shafts for rotation about a second axis spaced from said first axis, and a spring connected at one end to said lever between said axes and at the other end to said handle at a point above said first axis, said lever thereby adapted to pivot about said first axis between a retracted position in which said first axis lies between said mop head and said second axis, and an extended position in which said second axis lies between said mop head and said first axis, said handle and lever oriented so that said handle acts as a stop to limit the movement of said lever in said extended position, said rollers when in said extended position being adapted to be pivoted about said second axis with said mop head passing therebetween, said spring acting alternately to bias said lever in said retracted and extended positions.

3. A mop comprising a mop head having at least one mopping surface, a handle, a pair of spaced wringing elements mounted for joint movement through a vertical path with said mop head passing therebetween, a shaft connected at one end to said handle, said mop head mounted on the other end of said shaft for rotation relative to said handle between a mopping position in which

said mopping surface is horizontal and a wringing position in which said surface is vertical and adapted to pass between said wringing elements, said mop head having a journal for receiving said shaft and a resilient retaining portion adjacent said shaft, said shaft having adjacent locating surfaces adapted to be alternately rotated into cooperating relationship with said resilient portion, said locating surfaces corresponding respectively to said mopping and wringing positions of said mop head, said resilient portion thereby adapted to cooperate alternately with said locating surfaces to restrain said mop head from rotation out of its mopping and wringing positions, but to flex, when torque is applied to said mop head, to allow the head to move between its said positions.

4. A mop comprising a mop head having at least one mopping surface, a handle, a pair of spaced wringing elements mounted for joint movement through a vertical path with said mop head therebetween, a shaft connected at one end to said handle, said mop head mounted on the other end of said shaft for rotation relative to said handle between a mopping position in which said mopping surface is horizontal and a wringing position in which said surface is vertical and adapted to pass between said wringing elements, said mop head having a journal for receiving said shaft and a resilient retaining portion adjacent said shaft, said retaining portion adapted to cooperate with a stop portion of said shaft to retain the mop head on said shaft and to be manually flexed away from said shaft to allow said stop portion to clear said resilient portion as said shaft is withdrawn from said journal, said shaft also having two adjacent locating surfaces adapted to be alternately rotated into cooperative relationship with said resilient portion, said locating surfaces corresponding respectively to said mopping and wringing positions of said mop head, said resilient portion thereby adapted to cooperate alternately with said locating surfaces to restrain said mop head from rotation out of its mopping and wringing positions but to flex, when torque is applied to said mop head, to allow the head to move between its said positions.

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