Jan. 17, 1956 S. P. VAUGHN 2,730,744

WRINGER TYPE MOP DEVICE, CAM OPERATED

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FIG. 1.

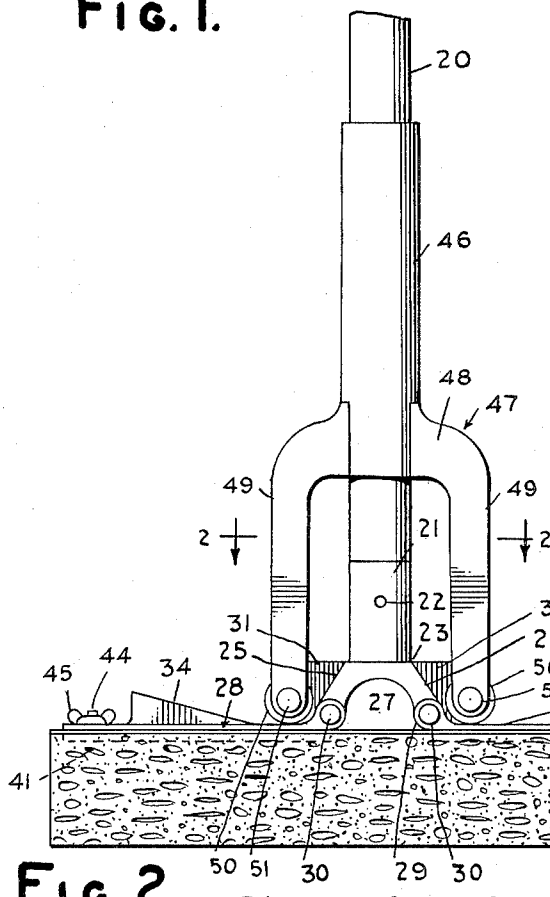
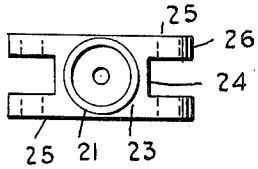


FIG. 6.



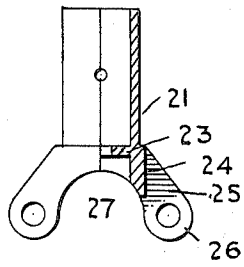


FIG. 7.

FIG. 5.

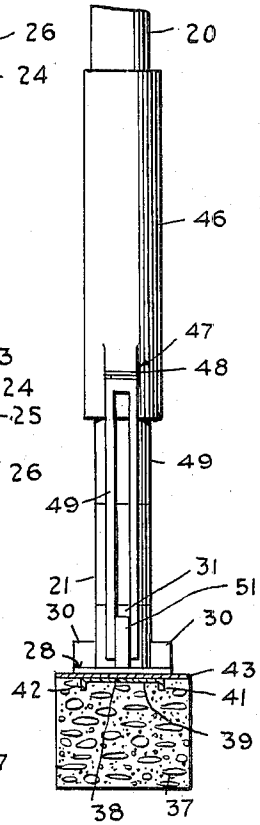
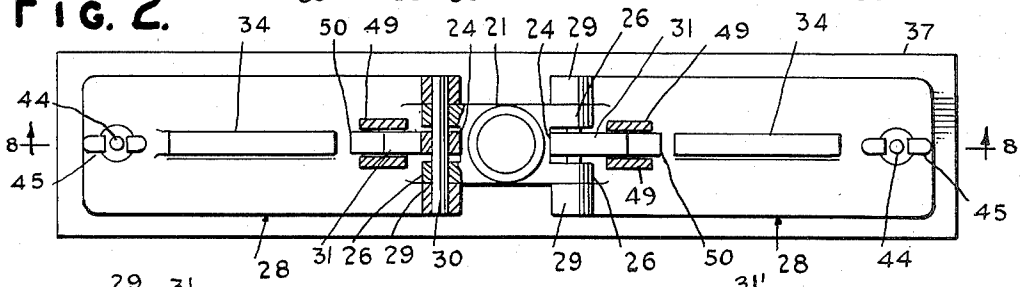


FIG. 2.



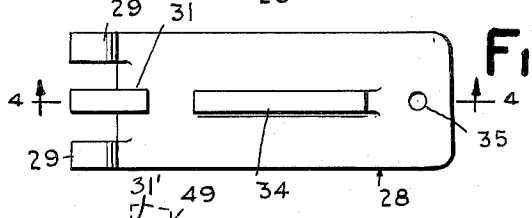


FIG. 3.

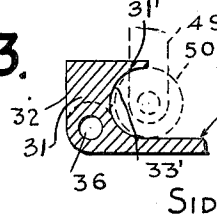


FIG. 4a.

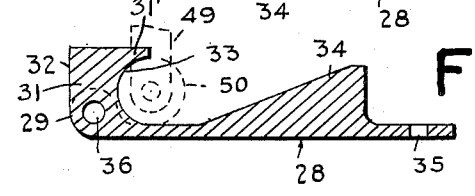


FIG. 4.

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FIG. 8.

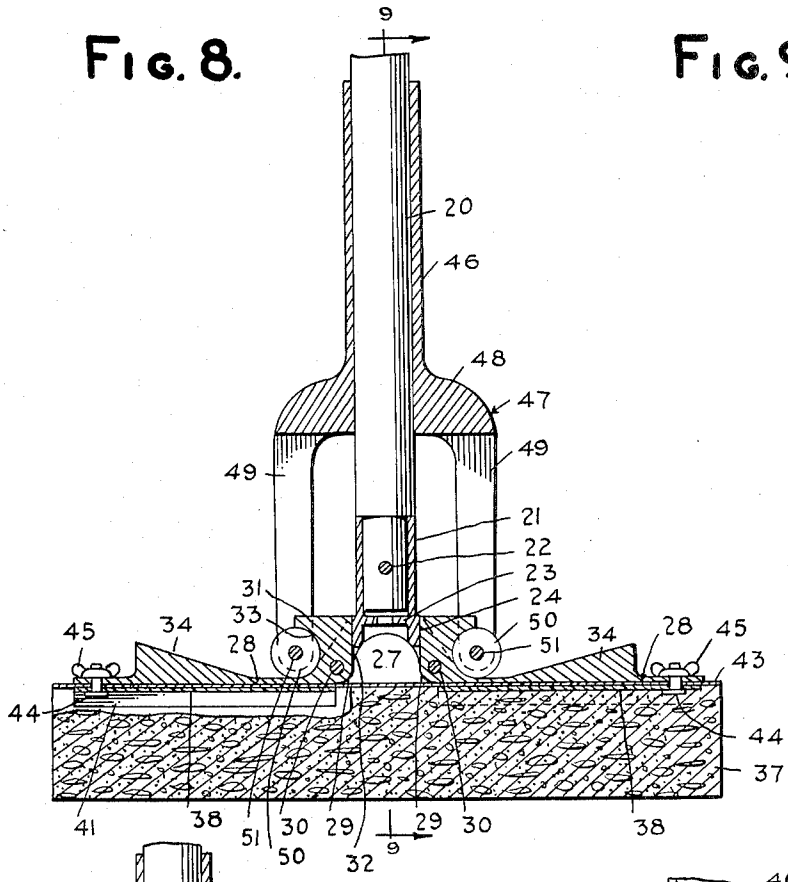


FIG. 9.

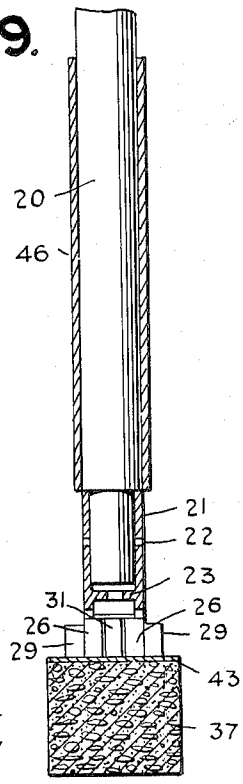


FIG. 10.

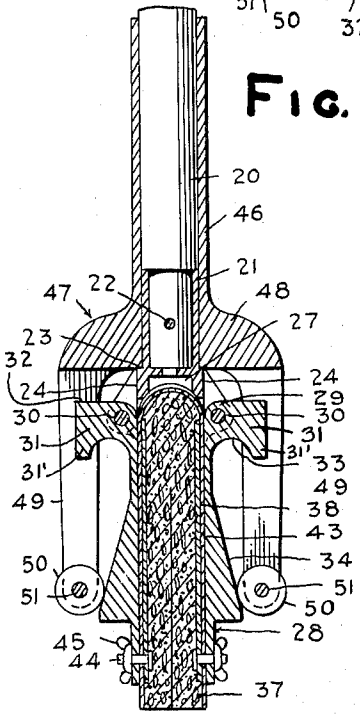
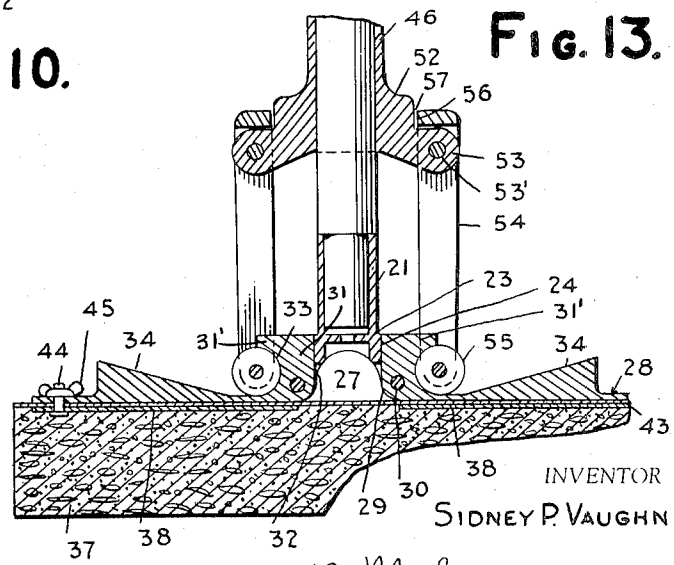


FIG. 13.



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FIG. 11.

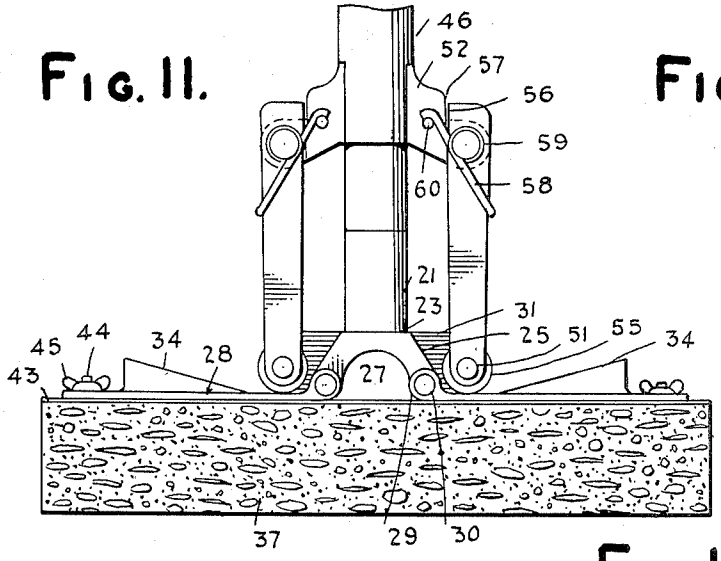


FIG. 12.

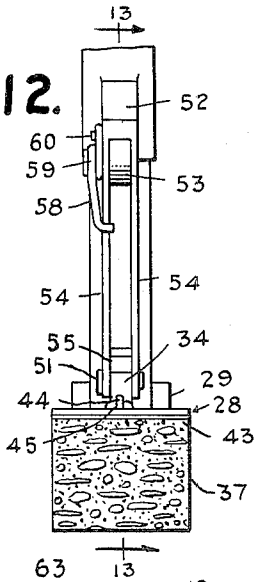


FIG. 16.

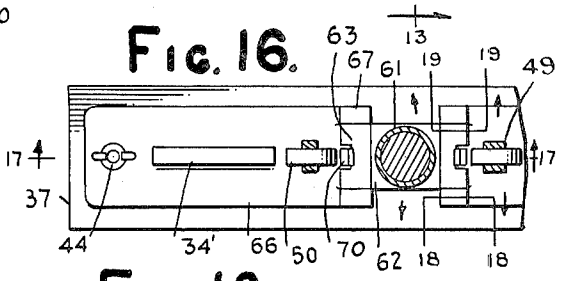


FIG. 14.

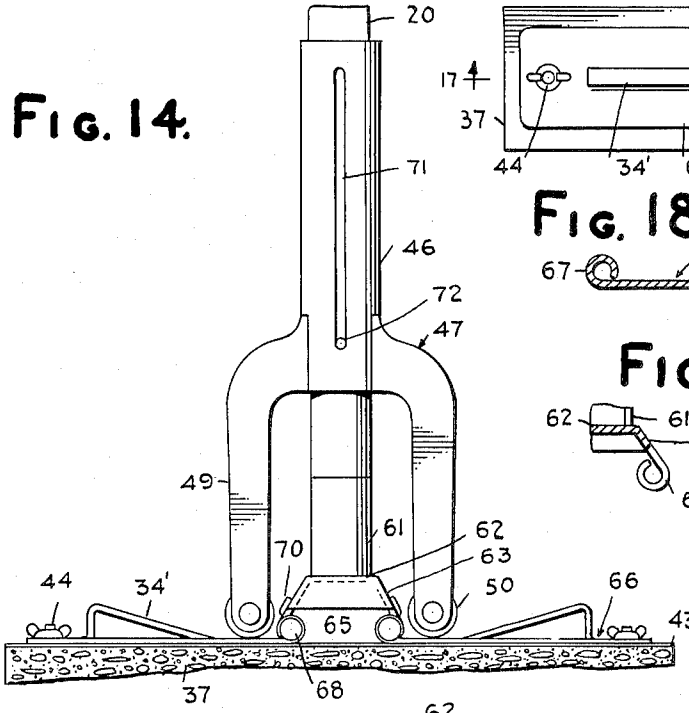


FIG. 18.

FIG. 15.

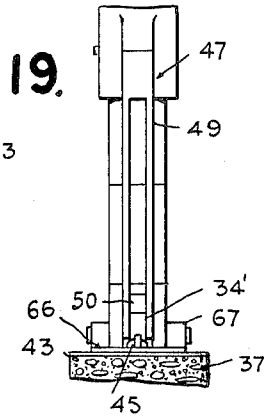
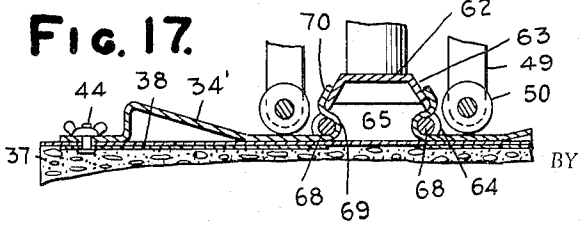


FIG. 19.

FIG. 17.



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United States Patent Office

2,730,744

Patented Jan. 17, 1956

2,730,744

WRINGER TYPE MOP DEVICE, CAM OPERATED

Sidney P. Vaughn, San Diego, Calif.

Application October 12, 1951, Serial No. 250,995

11 Claims. (Cl. 15—119)

My invention relates to a mop device.

Important objects of the invention are, to provide a thick resilient sponge mop element which serves to shift the pressure plates to the open position, with means to limit the opening movement of the pressure plates so that they may be held at substantially a right angle to the longitudinal axis of the handle by the resilient action of the thick resilient sponge mop element; to provide a mop device having a recess for receiving the intermediate portion of the sponge mop element when the sponge mop element is folded upon itself and compressed to permit of such proper folding action; to provide means for folding the sponge mop element transversely upon itself; to provide transverse arms for the pressure plates having recesses to receive the rollers which operate the pressure plates and having extensions which engage over the rollers when the pressure plates are in the opened position, said extensions then projecting between the pairs of spaced legs carried by the slide handle and then preventing the slide handle from turning upon the handle; to provide a mop device in which the pressure plates carry cams which are engaged by parts of a reciprocatory yoke; to provide a mop device in which the sponge mop element may be readily changed; to provide a mop device of simple construction having means whereby water may be readily and repeatedly squeezed from the sponge mop element; to provide a mop device wherein the sponge mop element may be longer than the conventional sponge mop element and which may be used in connection with the usual household pail by partly transversely folding the sponge mop element prior to its insertion within the pail; to provide a mop device having a sponge mop element which will readily enter corners or unaccessible places; to provide a sponge mop element which may serve as a dry sponge mop element or a moist sponge mop element; to provide a mop device wherein a limited pivotal connection is afforded between the legs and cross head, so that the cam actuated rollers will not bind within the recesses of the overhanging stops of the pressure plates.

Other objects and advantages of the invention will be apparent during the course of the following description.

In the accompanying drawings, forming a part of this application, and in which like numerals are employed to designate like parts throughout same,

Figure 1 is a side elevation of a mop device embodying my invention, showing the pressure plates and sponge mop element in the open position,

Figure 2 is a horizontal section taken on line 2—2 of Figure 1 and illustrating portions of a hinge in section,

Figure 3 is a plan view of one of the pressure plates,

Figure 4 is a vertical section taken on line 4—4 of Figure 3,

Figure 4a is a side elevation of a pressure plate having a slight modified form of overhanging stop,

Figure 5 is an edge elevation of the mop device,

Figure 6 is a plan view of the attaching element or head,

Figure 7 is a side elevation of the attaching element or head, parts in central vertical section,

Figure 8 is a vertical section taken on line 8—8 of Figure 2,

Figure 9 is a vertical transverse section taken on line 9—9 of Figure 8,

Figure 10 is a view similar to Figure 8 with the pressure plates shifted to the inner squeeing position,

Figure 11 is a side elevation of a mop device embodying a modication of the invention, the pressure plates being in the open position,

Figure 12 is an edge elevation of the same,

Figure 13 is a vertical section taken on line 13—13 of Figure 12,

Figure 14 is a side elevation of a third modified form of mop device,

Figure 15 is an edge elevation of the same,

Figure 16 is a plan view of one pressure plate and associated elements,

Figure 17 is a vertical section taken on line 17—17 of Figure 16,

Figure 18 is a vertical section taken on line 18—18 of Figure 16,

Figure 19 is a vertical section taken on line 19—19 of Figure 16.

In the drawings, where for the purpose of illustration are shown preferred embodiments of my invention, attention being called first to Figures 1 to 10 inclusive, the numeral 20 designates a handle having a reduced lower end inserted within a sleeve 21 held upon the same by a transverse pin 22. This sleeve is preferably formed integral with an attaching element or head 23, having end flats 24. Formed integral with the head 23 are downwardly diverging pairs of arms 25, having apertured knuckles 26. The attaching head 23 is provided with a recess 27, arranged between the pairs of arms 25 and the knuckles 26. This recess receives the folded portion of the resilient sponge mop element, as will be explained.

The numeral 28 designates rigid pressure plates, provided at their inner ends with apertured knuckles 29, receiving pins or pivot elements 30, also extending through the apertured knuckles 26, as shown. The pressure plates 28 terminate outwardly of the recess 27 when the pressure plates are in the open or folded positions.

Integrally secured to each pressure plate 28 at its inner end is a vertical arm or stop 31, arranged between the apertured knuckles 29 and spaced therefrom. The arm 31 is disposed at a right angle to the pressure plate, and is vertical when the pressure plate is in the open or horizontal position. This arm 31 projects above the pressure plate 28 and is provided upon its inner end with a straight vertical face 32 to contact with the flat 24 and upon its outer end with a circularly curved face 33, concentric with and receiving a roller to be described. The face or recess 33 forms an overhanging extension 31', which is spaced from the pressure plate. The arm also has an opening 36 for the passage of the pivot element 30. Each pressure plate 28 is provided with a longitudinal inclined wedge or cam 34, preferably integrally secured thereto and the cam 34 is in alignment with the arm 31. Each pressure plate also has an opening 35 formed therein. When the arm 31 is in the vertical position, the extension 31' is horizontal and extends between the legs 49, Figures 1, 2 and 8, and when the arm is horizontal, Figure 10, the arm 31 and extension 31' are arranged between the spaced legs 49. This arrangement prevents the tubular handle 46 and yoke 47 from turning upon the handle, and the rollers 50 are retained in alignment with the cams 34.

The numeral 37 designates a compressible resilient sponge mop element which is preferably rectangular in

transverse and longitudinal sections. The sponge mop element 37 is vertically thick, Figure 1, and may have the thickness of about 1½" to 1¾". The numeral 38 designates rigid plates arranged within recesses 39 formed in the top of the sponge mop element 37. These plates have longitudinal flanges 41, inserted within grooves 42 formed in the sponge mop element 37. The plates 39 and flanges 41 are secured to the sponge mop element 37 by an adhesive. A flexible backing sheet 43 formed of cloth or the like extends over the top of the sponge mop element 37 and plates 39 and is secured thereto by an adhesive. Attention is called to the fact that the plates 39 and flanges 41 have their inner ends terminating at the central longitudinal axes of the pivot elements 30 while the intermediate flexible portion of the cover sheet 43 and sponge mop element 37 extend across the recess 27. The pressure plates 28, Figure 8, are clamped to the ends of the rigid plates 39 by bolts 44, carrying winged nuts 45. It is thus seen that the sponge mop element 37 is detachably connected with the pressure plates. It is to be distinctly understood that any suitable means may be employed for connecting the sponge mop element 37 with the pressure plates 28.

Slidably mounted upon the handle 20 is a tubular slide handle 46, having a stiff or rigid yoke 47 preferably formed integral therewith. This yoke includes a cross head 48 carrying pairs of spaced depending legs 49, integral with the cross head. Arranged between the lower end of each pair of legs 49 is a roller 50, rotatably connected therewith by a pin 51. The circularly curved face 33, Figures 4 and 8, is concentric with the roller 50 and is adapted to contact with substantially half of the circumference of the roller. The face 33 is semi-cylindrical. When the pressure plates 28 are horizontal and the handle 20 is vertical, Figures 1 and 8, the end faces 32 contact with the flats 24, and the upward movement of the pressure plates is therefore limited. These pressure plates are moved upwardly or outwardly and maintained in the outer position by the resilient action of the vertically thick sponge mop element 37. When the end faces 32 contact with the flats 24, as explained, the rollers 50 contact with the circularly curved faces 33, which are concentric with these rollers. The overhanging extensions 31' by engaging between the legs 49 hold the rollers 50 in proper alignment with the inclined cams 34 and also prevent the yoke 47 and slide handle from turning upon the handle 20 and also limit the upward movement of the slide handle 20.

When the parts are arranged as shown in Figures 1 and 8, and it is desired to fold and compress the sponge mop element 37, the slide handle 46 is moved downwardly with relation to the handle 20 until it assumes the lowered position, Figure 10. The rollers 50 will travel longitudinally of the pressure plates 28 and engage with the inclined cams 34 and these rollers swing the pressure plates 28 upon their pivots 30 until the pressure plates assume the closed position, Figure 10, at which time they are substantially parallel. The sponge mop element 37 is folded upon itself and the folded portion passes into the recess 27, Figure 10. It is obvious that the folding and squeezing action that the pressure plates exert upon the sponge mop element 37, may be repeated any number of times, while the sponge mop element is submerged in water or held beneath a spigot having water discharging therefrom. The sponge mop element 37, due to its vertical thickness, has sufficient resiliency or strength to hold the pressure plates 28 in the outer position at a right angle to the handle 20, when the pressure plates again assume the outer position. It has been found in actual tests that the rollers 50 do not bind within the recesses formed by the circularly curved faces 33, as there is sufficient resiliency in the rigid or stiff pairs of legs 49 of the yoke. The sponge block 37 may not have sufficient strength to completely open the pressure plates 28, which might occur due to the wear upon the sponge block, and in this event, as the rollers 50 move upwardly from the position shown in Figure 10, such rollers would contact with the arms 31, and shift these arms to complete the opening movement of the pressure plates the extensions 31' will then engage over the rollers 50, Figure 8, and will limit the upward movement of the yoke 47, the faces 32 then engaging the flats 24.

In Figure 4a, the overhanging stop 31 has a curved face 33', corresponding to the curved face 33, but the face 33' is slightly spaced from the periphery of the roller when the pressure plate 28 is in the raised or horizontal position. The extreme tip of the overhanging stop 31 contacts with the roller when the pressure plate is in the uppermost position. This arrangement will provide a slight clearance between the roller and the major portion of the curved face 33', further eliminating any tendency for the roller to bind against the overhanging stop.

Attention is now called to Figures 11, 12 and 13 showing a second modification of the invention. In these figures, the tubular slide handle 46 has a cross head 52 formed integral therewith. This cross head has apertured knuckles 53, arranged between pairs of connected legs 54, pivoted thereto at 53', and carrying rollers 55 at their lower ends. There is a slight clearance or space between the faces 56 and 57, whereby the legs 54 can hav a limited outward swinging movement such as about 1/16 of an inch at their lower ends. The legs 54 have their lower ends urged inwardly by springs 58, having coils 59 carried by the pins 53'. The lower ends of the springs 58 engage the legs 54 while their upper ends engage pins 60. The function of providing the limited outward swinging action of the lower end of the legs 54 is to prevent any binding action between the overhanging stops 31 and the rollers 55. All other parts of the mop device remain identical with those shown and described in the first form of the invention, Figures 1 to 10 inclusive. The operation is substantially the same.

Attention is now called to Figures 14 to 19 inclusive. In these figures, the handle 20 has a sleeve 61 secured to its lower end and this sleeve has an attaching element or head 62 rigidly secured thereto. Depending from the attaching head 62 are pairs of spaced arms 63, diverging downwardly and bent at their lower ends to form knuckles 64. These pairs of knuckles are spaced for providing a main space or passage 65 within the attaching head for receiving the folded intermediate portion of the sponge mop element 37. In this form of the invention, the numeral 66 designates pressure plates, which may be stamped. Each pressure plate, Figure 16, is provided at its inner end with a pair of knuckles 67, to receive pins or pivots 68 also passing through the knuckles 64. The pressure plate is provided at its transverse center and at its inner end with a stop strip or element 69, the inner portion of which forms a knuckle to receive the pivot element 68 while the outer free end 70 is arranged to contact with the exterior of the attaching head 62, to limit the upward movement of the pressure plate to the horizontal position when the handle 20 is in the vertical position. In this form of the invention, inclined cams 34', corresponding to the cams 34, Figure 4, are stamped or formed from the pressure plates 66. The same sponge mop element 37 and connecting means including plates 39 and bolts 44 are employed to attach the sponge mop element 37 to the pressure plates 66.

The same tubular slide handle 46 is used and this slide handle is provided with an elongated slot 71 receiving a pin 72 rigidly secured to the handle 20. This pin limits the upward movement of the slide handle and prevents the slide handle 46 from turning upon the handle 20. The same yoke 47 is carried by the slide handle 46 and the pairs of legs 49 carry the rollers 50, which engage the pressure plates 66 and the inclined cams 34'. All other parts of the device remain identical with those shown and described in connection with the first form of the invention.

As more clearly shown in Figure 14, the slide handle **46** is in the uppermost position and the pressure plates **66** are horizontal while the handle **20** is vertical. The sponge mop element **37** is now in the open, straight position. When it is desired to fold and compress the sponge mop element **37**, the slide handle **46** is moved downwardly with respect to the handle **20** and the rollers **50** act upon the pressure plates **66** and inclined cams 34', whereby these pressure plates swing inwardly until they assume a lower substantially parallel position similar to that shown by the pressure plates in Figure 10. The sponge mop element **37** is folded upon its intermediate portion and this intermediate portion passes into the recess **65**.

It is to be understood that the forms of my invention herewith shown and described are to be taken as preferred examples of the same, and that various changes in the shape, size and arrangement of parts may be resorted to, without departing from the spirit of the invention or the scope of the subjoined claims.

Having thus described my invention, I claim:

1. A mop device comprising an attaching element, a handle carrying the attaching element, pressure plates, means to pivotally mount the pressure plates upon the attaching element so that the pressure plates may be swung to opened and closed positions, arms secured to the pressure plates near the pivot means and extending above the pressure plates when the pressure plates are in the opened position, each arm having a face arranged to contact with the attaching element when the pressure plate is in the opened position and a second face having a recess formed therein and an extension which overhangs the recess when the pressure plate is in the opened position, a slide handle mounted upon the first-named handle, spaced leg elements carried by the slide handle, each leg element having an elongated recess to receive the adjacent overhanging extension, and rollers mounted upon the leg elements for movement therewith and to be shifted into the recesses, said overhanging extensions then being arranged above and overhanging the rollers, said rollers being arranged above the pressure plates when the pressure plates are in the opened position and moving over the pressure plates to shift the pressure plates to the closed position.

2. A mop device comprising an attaching element, a handle carrying the attaching element, pressure plates, means to pivotally mount the pressure plates upon the attaching element so that the pressure plates may be swung to opened and closed positions, said pressure plates serving to carry a sponge mop element, arms secured to the pressure plates and projecting above the same when the pressure plates are in the opened position and disposed at approximately right angles to the pressure plates, each arm having a face to contact with the attaching element when the attaching element is shifted to the opened position, said arms having free end portions, a slide handle mounted upon the first-named handle, supporting means mounted upon the slide handle and having elongated recesses, the free end portions of said arms projecting into the elongated recesses, rollers mounted upon the supporting means, and cams secured to the pressure plates and arranged to be engaged by said rollers.

3. A mop device comprising an attaching element, a handle carrying the attaching element, pressure plates, means to pivotally mount the pressure plates upon the attaching element so that the pressure plates may be swung to opened and closed positions, transverse arms secured to the pressure plates near the pivot means and projecting above the pressure plates when the pressure plates are in the opened position, each arm having an inner face to contact with the attaching element and an outer face having a recess, a slide handle mounted upon the first-named handle, legs mounted upon the slide handle, rollers mounted upon the legs and arranged above the pressure plates when the pressure plates are in the opened position, said rollers then entering said recesses, said recesses forming extensions upon said arms which are arranged above the rollers when the pressure plates

are in the opened position, and cams secured to the pressure plates to engage with the rollers.

4. A mop device comprising an attaching element, a handle carrying the attaching element, pressure plates, means to pivotally mount the pressure plates upon the attaching element so that the pressure plates may be swung to opened and closed positions, arms secured to the pressure plates and projecting above the same when the pressure plates are in the opened position, a slide handle mounted upon the first-named handle, supporting means mounted upon the slide handle and having elongated recesses, said arms projecting into the elongated recesses, rollers mounted upon the supporting means to be moved thereby and to be shifted to a position near said arms when the pressure plates are in the opened position, said arms including extensions projecting over said rollers when the pressure plates are in the opened position, and cams secured to the pressure plates and arranged to be engaged by said rollers.

5. A mop device comprising an attaching element, a handle carrying the attaching element, pressure plates, means to pivotally mount the pressure plates upon the attaching element so that the pressure plates may be swung to opened and closed positions, tranverse arms secured to the pressure plates near the pivot means and projecting above the pressure plates when the pressure plates are in the opened position, each arm having an inner face to contact with the attaching element and an outer face having a circularly curved recess, a slide handle mounted upon the first-named handle, legs pivotally mounted upon the slide handle for limited movement, rollers mounted upon the legs and arranged above the pressure plates when the pressure plates are in the opened position, said rollers then entering said recesses, said recesses forming extensions upon said arms which are arranged above the rollers when the pressure plates are in the opened position, springs to move the legs inwardly, and cams secured to the pressure plates to engage with the rollers.

6. A mop device comprising an attaching element having a recess which opens downwardly, a handle carrying the attaching element, pressure plates, means to pivotally mount the pressure plates upon the attaching element so that the pressure plates may be swung to opened and closed positions, arms secured to the pressure plates near the pivot means and extending above the pressure plates when the pressure plates are in the opened position, said arms having inner faces arranged to contact with the attaching element when the pressure plates are in the opened position and outer faces forming recesses, a wide sponge mop element secured to the pressure plates and when released serving to move the pressure plates toward the opened position and the inner faces of the arms into contact with the attaching element, a yoke slidably mounted upon the handle, rollers carried by the yoke to enter the recesses of the arms when the pressure plates are in the opened position, said recesses forming extensions arranged in the path of travel of the rollers, and cams secured to the pressure plates for coaction with the rollers.

7. A mop device comprising an attaching element, a handle carrying the attaching element, pressure plates, means to pivotally mount the pressure plates upon the attaching element so that the pressure plates may be swung to opened and closed positions, the pressures plates carrying a sponge mop element, arms secured to the pressure plates to swing therewith and projecting above the pressure plates when the pressure plates are in the opened position, said arms having inner faces contacting with the attaching element when the pressure plates are swung to the opened position, said arms having outer faces, elongated cams secured to the pressure plates and longitudinally tapered and increasing in thickness outwardly, a unit mounted upon the handle to move longitudinally thereof and including legs, rollers mounted upon the legs and arranged to travel upon said cams and to

also engage the outer faces of said arms so that the movement of the legs may aid in swinging the pressure plates to the opened position.

8. A mop device comprising an attaching element, a handle carrying the attaching element, pressure plates, means to pivotally mount the pressure plates upon the attaching element so that the pressure plates may be swung to opened and closed positions, arms secured to the pressure plates near the pivot means and extending above the pressure plates when the pressure plates are moved to the opened position and swinging with the pressure plates, said arms having inner faces to contact with the attaching element when the pressure plates are in the opened position, said arms being generally horizontal when the pressure plates are in the closed position and having outer faces, and a device mounted upon the handle to move longitudinally thereof, said device including elements to bear against the pressure plates outwardly of the pivot means and to travel over the pressure plates, said elements serving to swing the pressure plates toward the closed position when said device is moved downwardly upon the handle, said elements engaging the outer faces of said arms and aiding in swinging the pressure plates toward the opened position when said device is moved upwardly upon said handle.

9. A mop device comprising an attaching element, a handle carrying the attaching element, pressure plates, means to pivotally mount the pressure plates upon the attaching element so that the pressure plates may be swung to opened and closed positions, said pressure plates serving to carry a sponge mop element, arms secured to the pressure plates to move therewith and extending above the pressure plates when the pressure plates are in the opened position, said arms being generally horizontal when the pressure plates are in the closed position, and a device mounted upon the handle to move longitudinally thereof, said device including parts to bear against the pressure plates outwardly of the pivot means to swing them to the closed position, said parts being adapted to engage with said arms when said device is moved upwardly upon said handle and to swing said pressure plates toward the opened position.

10. A mop device comprising an attaching element, a handle carrying the attaching element, pressure plates for carrying a sponge mop element, means to pivotally mount the pressure plates upon the attaching element to swing to opened and closed positions, arms secured to the pressure plates near the pivot means to swing therewith and extending above the pressure plates when the pressure plates are in the opened position, longitudinally inclined elongated cams mounted upon the pressure plates and arranged outwardly of said arms, and a device mounted upon the handle to move longitudinally of the handle, said device including parts to engage and travel longitudinally of said cams, said parts being arranged beneath said arms when the pressure plates are in the closed position and said parts engaging beneath said arms when said device is moved upwardly upon said handle, said parts then serving to swing the pressure plates toward the opened position.

11. A mop device comprising a handle, an attaching element secured to the handle, pressure plates, a pivot element passing through the inner end of each pressure plate and the attaching element for directly connecting the pressure plate and attaching element, each pressure plate being adapted to be swung to opened and closed positions, a sponge mop element arranged beneath the pressure plates when the pressure plates are in the opened position and secured to the pressure plates, a device mounted upon the handle to move longitudinally thereof and spaced from the attaching element, said device including leg elements to bear against the pressure plates to swing the pressure plates toward the closed position, said leg elements having elongated recesses, and arms secured to the pressure plates and projecting into the recesses and holding the device against turning movement upon said handle.

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