Jan. 7, 1969 V. GRUNERT 3,419,930

DUAL ACTION CLEANING MOP

Filed April 6, 1967 Sheet 1 of 2

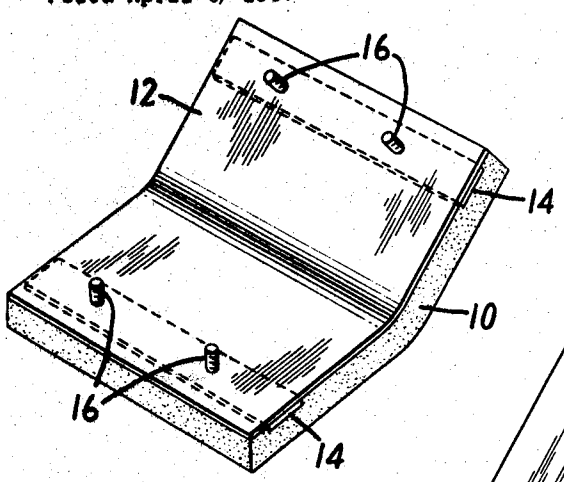

FIG. 2

FIG. 1

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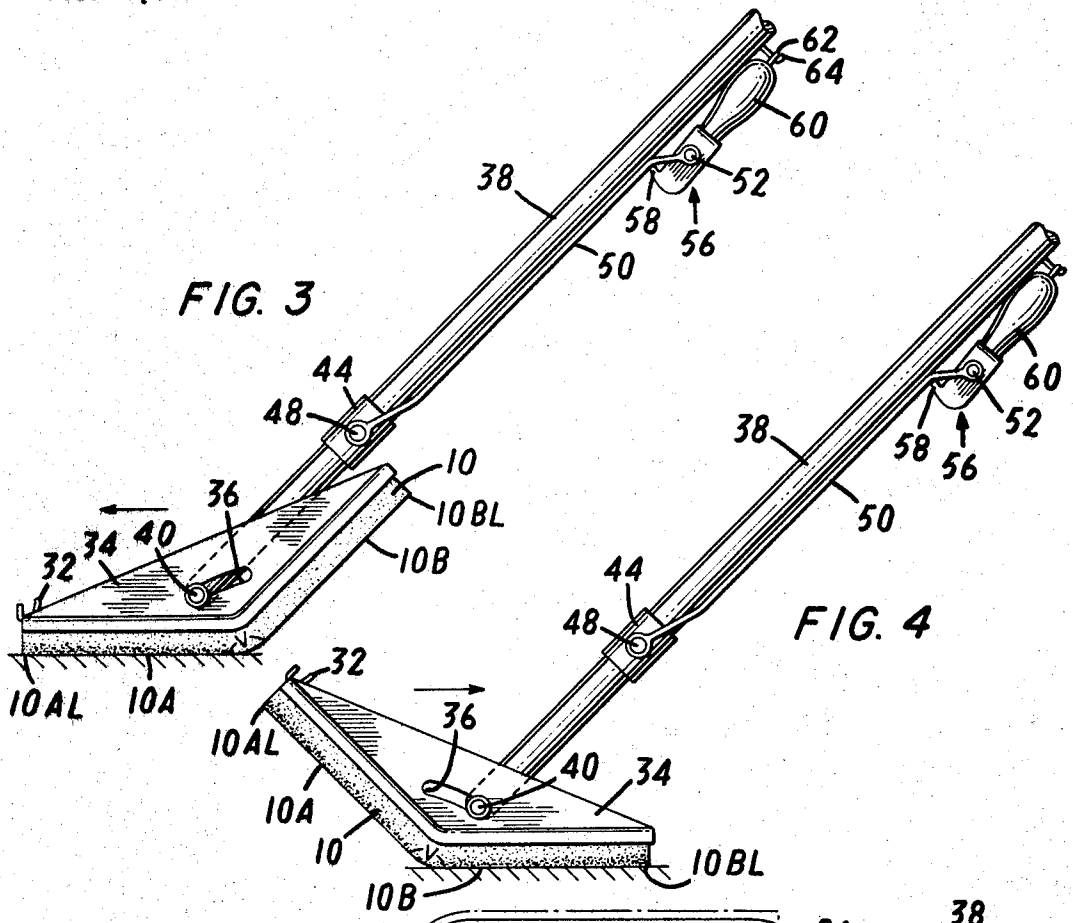

FIG. 3

FIG. 4

FIG. 5

FIG. 6

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DUAL ACTION CLEANING MOP

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Int. Cl. A47e *13/14*; A47e *13/46*

ABSTRACT OF THE DISCLOSURE

A mop is provided with a cleaning pad having two substantially flat surfaces disposed at an obtuse angle. The cleaning pad is connected to the mop handle by a transverse rod which is positioned within slots extending across the vertex of the obtuse angle, which vertex is oriented downwardly for contact with a floor. When the mop handle is pushed forward, the transverse rod rides forward in the slots to the forward ends thereof to pivot the cleaning pad about the vertex of the obtuse angle, thereby bringing one of the flat surfaces into forward wiping engagement with the floor. When the mop handle is pulled backward, the transverse rod rides backward in the slots to pivot the cleaning pad in an opposite direction, thereby bringing the other of the flat surfaces into rearward wiping engagement with the floor. A squeeze sheet is also provided for compressing the cleaning pad to expel fluids absorbed therein during use of the mop.

This invention relates to a cleaning mop and more particularly to a mop having an absorbent, compressible cleaning pad such as a resilient sponge.

Conventional sponge mops are well known household items and usually consist of a rectangular sponge attached to an elongated handle so that the sponge may be wiped over the floor to absorb dirt and water by manipulation of the handle from a standing position. One of the drawbacks of such mops is the fact that the residues and dirt which accumulate on the cleaning surface of the sponge are continuously rubbed on and across the floor as the mop is pushed back and forth. Therefore, the dirt has just as much opportunity to rub off the sponge (especially from the trailing edge thereof) back on to the floor as it has to be picked up, and unless the sponge is rinsed and cleaned at the end of each individual stroke of the handle, this problem cannot be avoided.

The present invention provides a mop which overcomes the above-mentioned problem in a simple and practical manner. More specifically, the mop of the invention is provided with a cleaning pad, of resilient sponge material or any other desired material, having two substantially flat surfaces disposed at an obtuse angle. This pad is attached to a support plate of complementary obtusely-angled configuration and the plate-pad assembly is connected to a handle so that the vertex of the obtusely-angled pad is oriented downwardly for contact with a floor.

The connection consists of a transverse rod at the bottom of the handle cooperatively associated with slots in upstanding cross-braces on the support plate, with the slots extending across the vertex of the obtuse angle of the pad. The rod is free to ride forward and backward in the slots, and since the slots terminate on opposite sides of the vertex of the obtuse angle, force exerted on the handle by the user is translated into a torque which pivots one or the other of the two flat surfaces of the pad into engagement with the floor. This in turn provides a reciprocating dual action when the mop is pushed forward and backward in the usual manner, whereby first one and then the other of the two flat surfaces are automatically and alternately brought into wiping engagement with the floor.

In this way, the leading edge of the cleaning pad, after completion of either a forward or backward mop stroke, is always lifted off the floor before the pad changes its direction of motion. Since maximum dirt accumulation occurs in the immediate vicinity of such leading edges, the invention prevents this accumulated dirt from rubbing across, and potentially back on to, the floor. Instead, the dirt is always swept back under the cleaning pad towards its vertex no matter in which direction the mop is being manipulated. Thus, the dirt is effectively always picked up and not deposited back upon the floor, and this action continues until the interior of the pad adjacent the vertex gradually also accumulates dirt.

At this time, the cleaning pad may be rinsed, cleaned and then compressed to expel water or other cleaning fluids by means of a flexible sheet arranged to be wrapped across and around the working surface of the cleaning pad and then tightened. The sheet may be made of any strong material including plastic, textile fabrics and thin metallic sheets.

Further details of the invention will be readily understood by reference to the accompanying drawings of which:

FIG. 1 is a perspective view of a mop constructed in accordance with the principles of the invention.

FIG. 2 is a perspective view of a cleaning pad used in the mop of FIG. 1.

FIG. 3 is a side view showing the mop being pushed forward.

FIG. 4 is a side view showing the mop being pulled backward.

FIGS. 5 and 6 are side views showing the cleaning pad being compressed to expel fluids therefrom.

Referring now to FIG. 2, a cleaning pad **10** of resilient sponge material is provided with a backing **12** which may be of flexible fabric material and which is preferably attached to the pad with an adhesive. Sandwiched between the pad **10** and backing **12** are two strips **14** of strong, substantially rigid material, each of which strips supports two, screw-threaded studs **16** extending up through the backing.

Referring to FIG. 1, the studs **16** are inserted into holes **18** in a support plate **20** and are locked in the holes by wing nuts **22** screwed down upon the opposite side of the plate. The support plate **20** is provided with four peripheral flanges, three of which **24**, **26** and **28** are turned down over three sides of the pad **10** in nesting relationship, with the fourth flange **30** standing up away from the pad. Two small portions of the support plate **20** are knocked out and bent up to provide upstanding tabs **32** adjacent and spaced from the upstanding peripheral flange **30**.

When attached to the support plate **20**, the pad **10** provides two substantially flat cleaning surfaces **10A** and **10B** disposed at an obtuse angle the vertex of which is designated V. The support plate **20** has two integral cross-braces **34** of triangular configuration, including an obtuse angle substantially equal to the obtuse angle of the plate and the cleaning pad **10**. Each cross-brace **34** is provided with a slot **36** which extends over and across the vertex V so that opposite ends of the slot are located on opposite sides of the vertex V.

An elongated handle **38** is provided at its lower end with a transverse rod **40**, the opposite ends of which are disposed within the slots **36** and secured in that position by retaining collars **42**. The rod **40** is free to travel back and forth along the length of the slots **36**, and by this motion the rod and the attached lower end of the handle **38** may shift position from one side to the other side of vertex V.

An annular collar **44** is secured to the handle **38** by set screw **46** at a distance from the rod **40** such that the bend of the peripheral flange **26** contacts the collar when the support plate **20** is pivoted about rod **40** in the extreme forward position of the latter within the slots **36** (see FIGS. 5 and 6). Two rods **48** pass through lower integral peripheral loops of a flexible sheet **50** and are screwed into opposite sides of the collar **44** to secure the lower periphery of the sheet at the distance at which the collar is spaced from the rod **40**. The upper periphery of sheet **50** also has an integral loop through which a rod **52** extends. The rod **52** also passes through holes in spaced arms **54** of a bracket member **56**, which is thereby secured to the rod **52** with the arms **54** being free to pivot about the rod. The free ends of the arms **54** are provided with hooks **58**, and two opposite right angle bends in each of the arms bring the other ends of the arms together within the body of a handle **60** which may be friction fitted over such ends. The upper end of the handle **60** is provided with an eyelet **62** which is retained by a hook **64** in order to secure the sheet **50** in a stored position. The size of the sheet **50** is slightly greater than the total surface area of the cleaning surfaces **10A** and **10B** of pad **10**.

The operaion and use of the mop described above will be readily understood by reference to FIGS. 3 and 4. When a person pushes the mop handle **38** forward in the direction indicated by the arrow (FIG. 3), the transverse rod **40** rides forward in the slots **36**. Therefore, if the cleaning surface **10A** is not already in contact with the floor, the first thing that will happen is that the pad **10** will be pivoted about the vertex V, when the rod **40** reaches its limit of travel at the forward end of the slots **36**, to bring the surface **10A** down into contact with the floor. Continued pushing on the handle **38** will thereafter move the surface **10A** forward in wiping engagement with the floor, and the leading edge **10AL** of this surface will pick up the highest concentration of dirt during this forward movement.

When the person has completed the above forward stroke and then pulls on the handle to perform a backward stroke in opposite direction (FIG. 4), the transverse rod **40** will first ride backward in the slots **36**, reach the rear ends of the slots and then pivot the pad **10** about vertex V to bring the surface **10B** into contact with the floor. Simulaneously, the surface **10A** is lifted up off the floor. Continued pulling on the handle **38** will thereafter move surface **10B** backward in wiping engagement with the floor, and now the leading edge **10BL** of this surface will pick up the most dirt. However, the leading edge **10AL** with its high dirt concentration has had no opportunity to rub back across the floor because it was lifted clear and did not remain in trailing contact with the floor as is true of conventional mops. The same uplifting of edge **10BL** is achieved when the cycle starts to repeat with another forward mop stroke.

The above-described reciprocating dual action provides the principal advantage of the invention. With the leading edges **10AL** and **10BL** always being raised from the floor before the direction of mop movement changes, these edges are never permitted to become trailing edges and the high dirt concentration accumulated beneath these edges is not rubbed across the floor in a trailing motion. Instead, the clean interior portions of the pad **10**, in the vicinity of vertex V, always trail the leading edges **10AL** and **10BL** during operation of the mop, whereby the mop has maximum tendency to pick up dirt and virtually no tendency to redeposit the picked-up dirt. Of course, the initially clean interior portion of the pad **10** gradually becomes dirty also as more and more dirt is rubbed back into the interior portion from the leading edges **10AL** and **10BL**. However, not until a far greater floor area has been cleaned, as compared to conventional mops, does the interior vertex area of the mop of the present invention accumulate so much dirt as to require rinsing, cleaning and drying of the pad **10**.

This may be conveniently done by operation of the flexible sheet **50** as illustrated in FIGS. 5 and 6. The eyelet **62** is lifted off hook **64** and the sheet **50** is wrapped over the entire area of the surfaces **10A** and **10B** of pad **10** by hooking the hooked ends **58** of the spaced arms **54** over the edge of the upstanding peripheral flange **30**. As illustrated in FIG. 5, the dimensions of the sheet **50** are so chosen that this initial hooking-over maneuver causes some minor compression of the pad **10**. Next, the handle **60** is pivoted in the direction of the arrow in FIG. 6 to cause the sheet **50** to bear down with greater pressure upon the pad **10**, and the tabs **32** serve as stops and guides to provent the pivot axis constituted by the interior bends in hooked ends **58** from sliding over the edge of flange **30**, since such sliding would prevent an increase in pressure. With the structure shown in FIG. 6, a very substantial and uniform pressure is distributed over the entire pad **10** and, as a result, the pad is very substantially compressed to eliminate a large proportion of rinsing and cleaning fluids that have been absorbed therein. Thereafter, the eyelet **62** may be slipped back over the hook **64** to return the sheet **50** to its storage position and the mop is ready for reuse in the manner described above.

The invention has now been described in terms of its operating principles and one of its specific embodiments. Various changes in the specific embodiment will be obvious to those skilled in the art. For example, the sheet **50** can be provided with perforations to facilitate release of water or other cleaning fluids during compression of the pad **10**. Also, other means for mechanical connection between the handle **38** and pad **10** can be used so long as the lower end of the handle is allowed to shift reciprocably from one side to the other side of the vertex of the pad with each forward and backward stroke of the handle. The obtuse angle of the pad can be varied from the 135° angle illustrated in the drawings. For best results, it is preferred that the angle be within the range from about 130° to about 160°, although other obtuse angles may be used. The slots **36** can have shapes other than shown, including straight slots. While the two cleaning surfaces **10A** and **10B** are shown to have equal areas, the areas or composition of these surfaces can be unequal or different.

What is claimed is:

1. A cleaning mop which comprises a cleaning pad having two substantially flat cleaning surfaces disposed at an obtuse angle, an elongated handle, pivotal means for connecting said pad to one end of said handle with the vertex of said obtuse angle disposed for contact with a floor, said connecting means permitting said connected end of said handle to cross from one side to an opposite side of a line bisecting said obtuse angle, whereby when said handle is alternately pushed and pulled with the cleaning pad on said floor, first one and then the other of said cleaning surfaces is correspondingly alternately pivoted about said vertex down into wiping engagement with said floor.

2. A mop as in claim **1** wherein said cleaning pad is compressible and absorbent, said mop further including a flexible wringing sheet, means for releasably holding said sheet attached to said handle in a storage position, and means for wrapping said sheet over the cleaning surfaces of said pad and then tightening said sheet to compress said pad and expel fluids which have been absorbed therein.

3. A mop as in claim **2** wherein one edge of said sheet is fixedly attached to said handle in a position adjacent one edge of said pad, and the opposite edge of said sheet may be released from said handle to wrap said sheet over the cleaning surfaces of said pad by positioning said releasable sheet edge adjacent an opposite edge of said pad, means for pivoting said releasable sheet edge in a direction which will cause said sheet to apply greater pressure

upon said pad than when said sheet is first wrapped over said pad.

4. A mop as in claim 1 wherein said pad is made of resilient sponge material.

5. A mop as in claim 1 wherein said obtuse angle is within the range from about 130° to about 160°.

6. A mop as in claim 1 wherein said pad is attached to a support plate, said plate having an obtuse angle substantially equal to the obtuse angle of said pad, and said plate also having four peripheral flanges, three of said flanges extending down over three sides of said pad and the fourth said flange extending away from the fourth side of said pad.

7. A mop as in claim 6 wherein said support plate is provided with a pair of cross-braces on the upper surface thereof, each of said cross-braces having a slot which crosses over the vertex of said obtuse angle in said pad, a transverse rod at the connected end of said handle, said transverse rod extending into said slots and being free to ride from one end to an opposite end thereof, whereby said transverse rod is shifted from one side to an opposite side of said vertex when said handle is alternately pushed and pulled.

8. A mop as in claim 6 wherein said pad is provided with a backing on the surface thereof immediately adjacent

said support plate, two strips of rigid material sandwiched between said backing and said pad, each said strip having a pair of threaded studs projecting through said backing, said studs extending up through holes in said support plate and being secured with nuts screwed on to said studs at the opposite side of said plate to lock said pad and plate together.

9. A mop as in claim 6 wherein said two cleaning surfaces have substantially equal areas.

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