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(57) **ABSTRACT**

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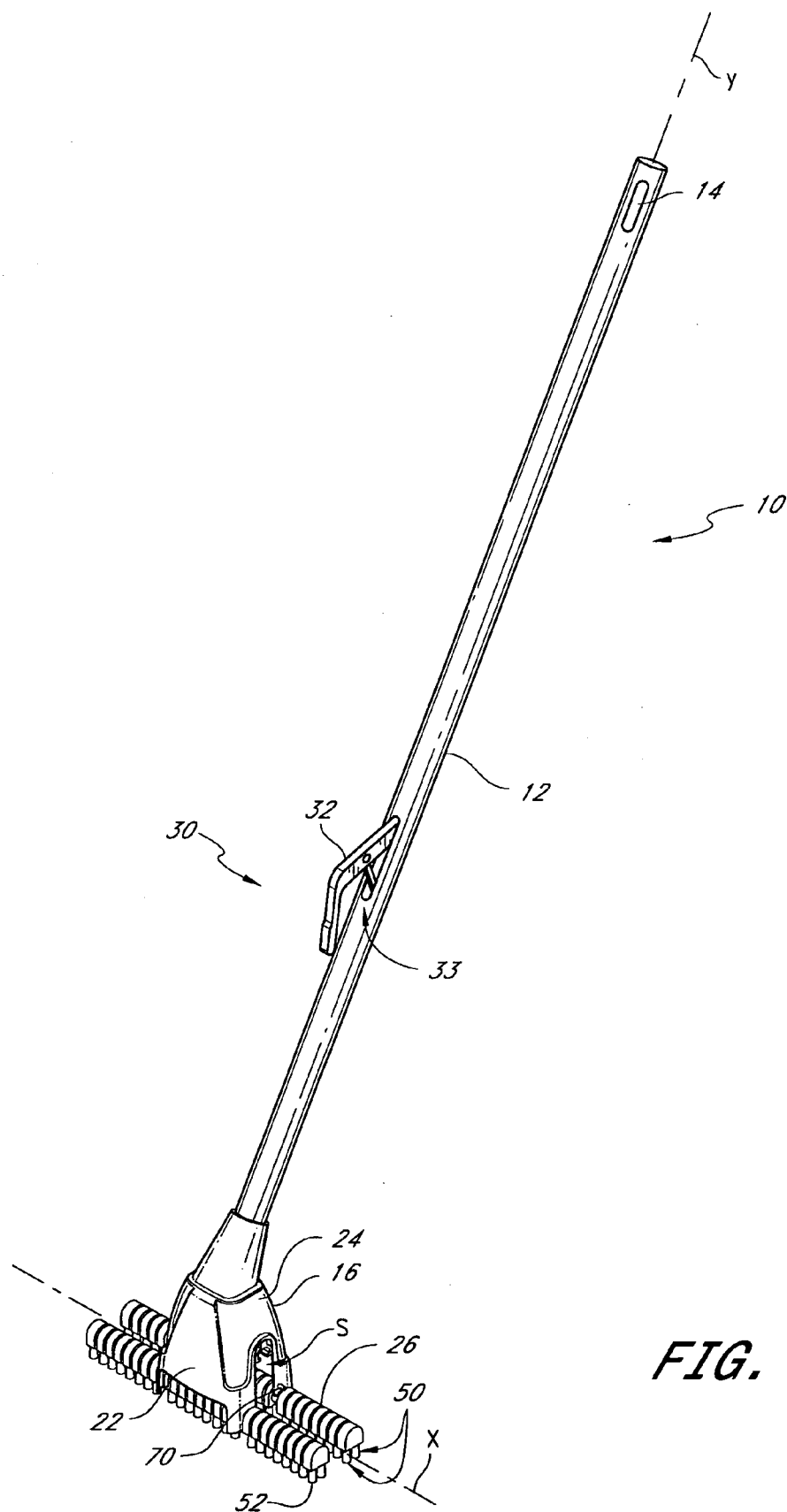
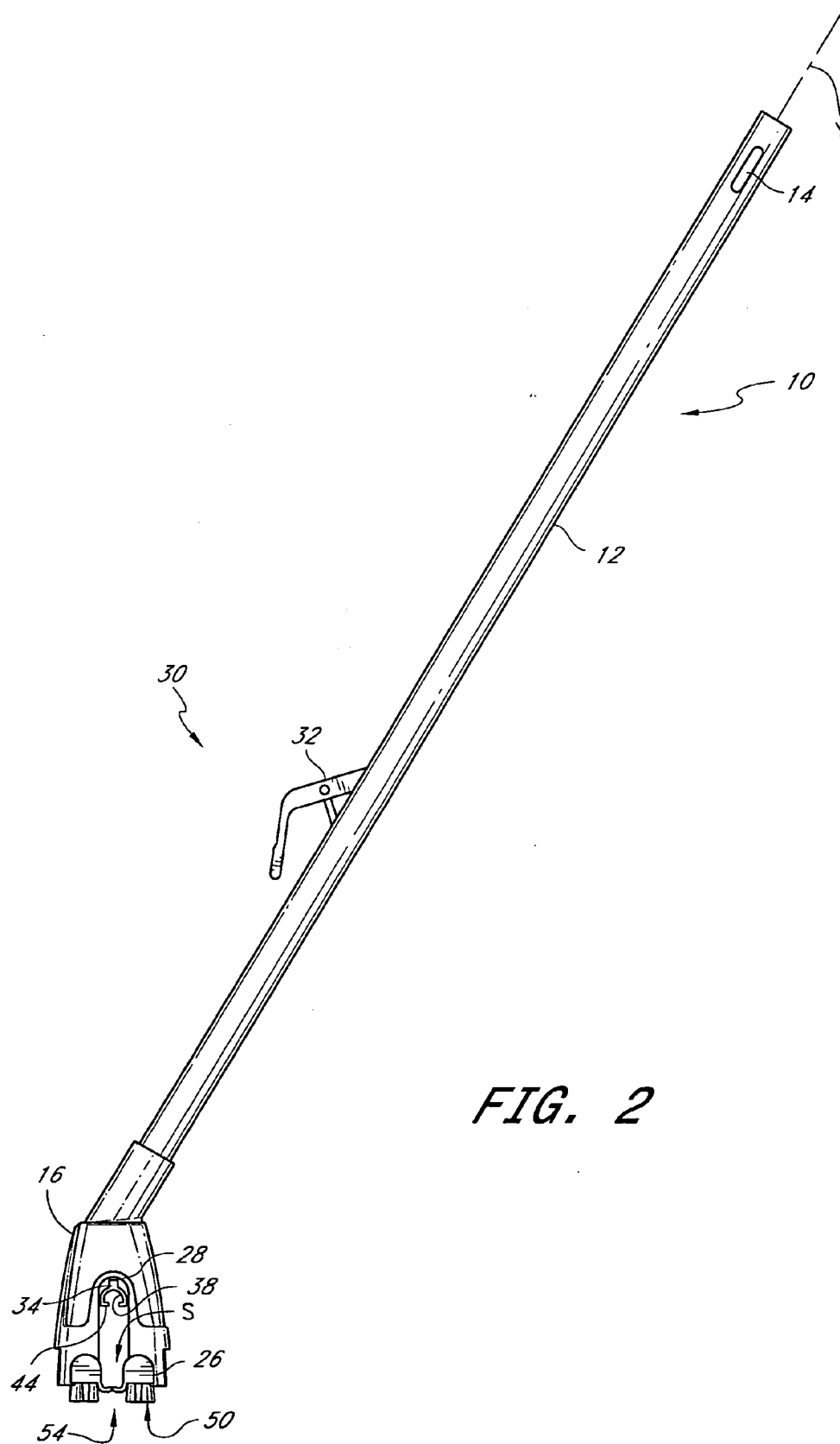


FIG. 1



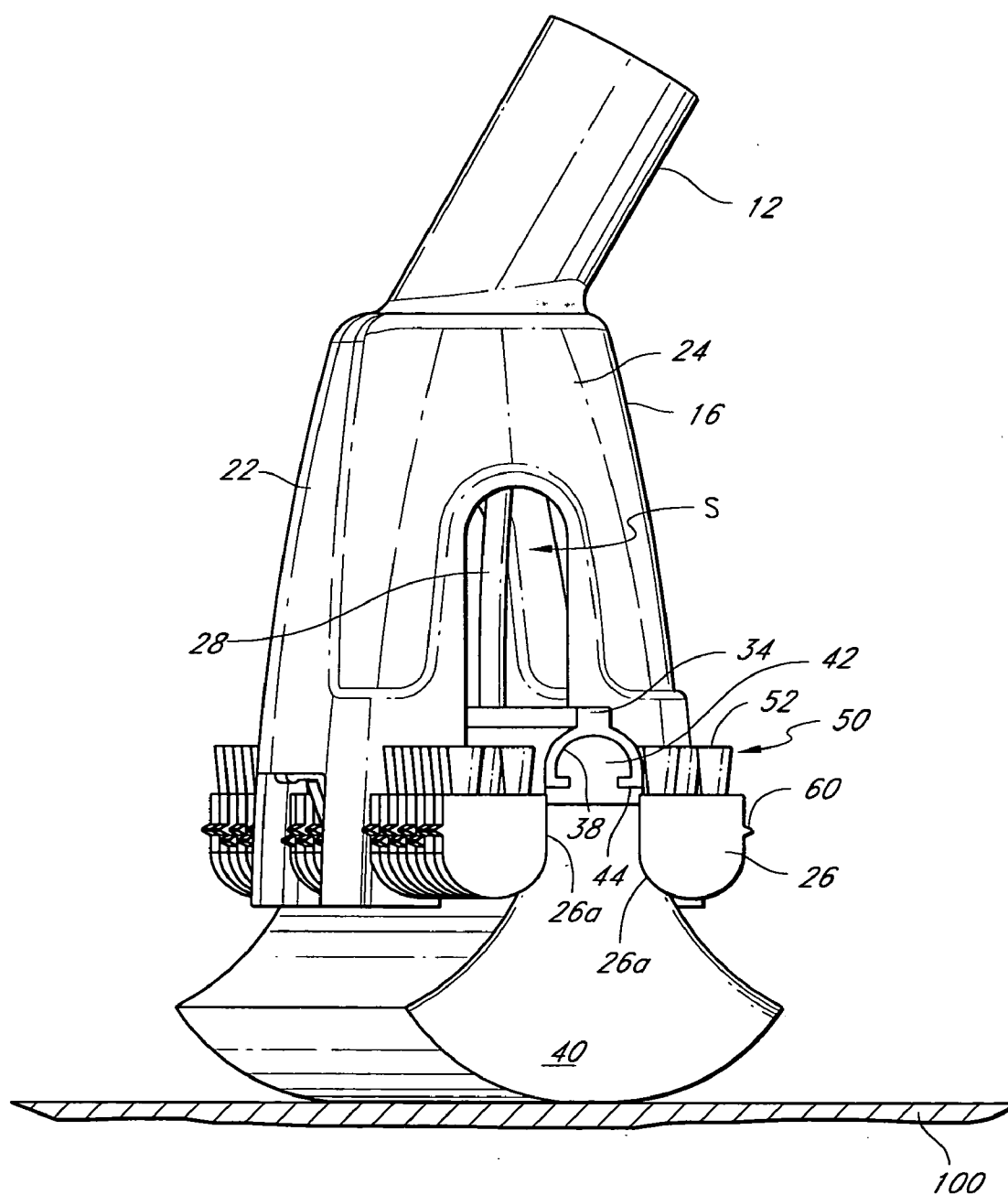


FIG. 3

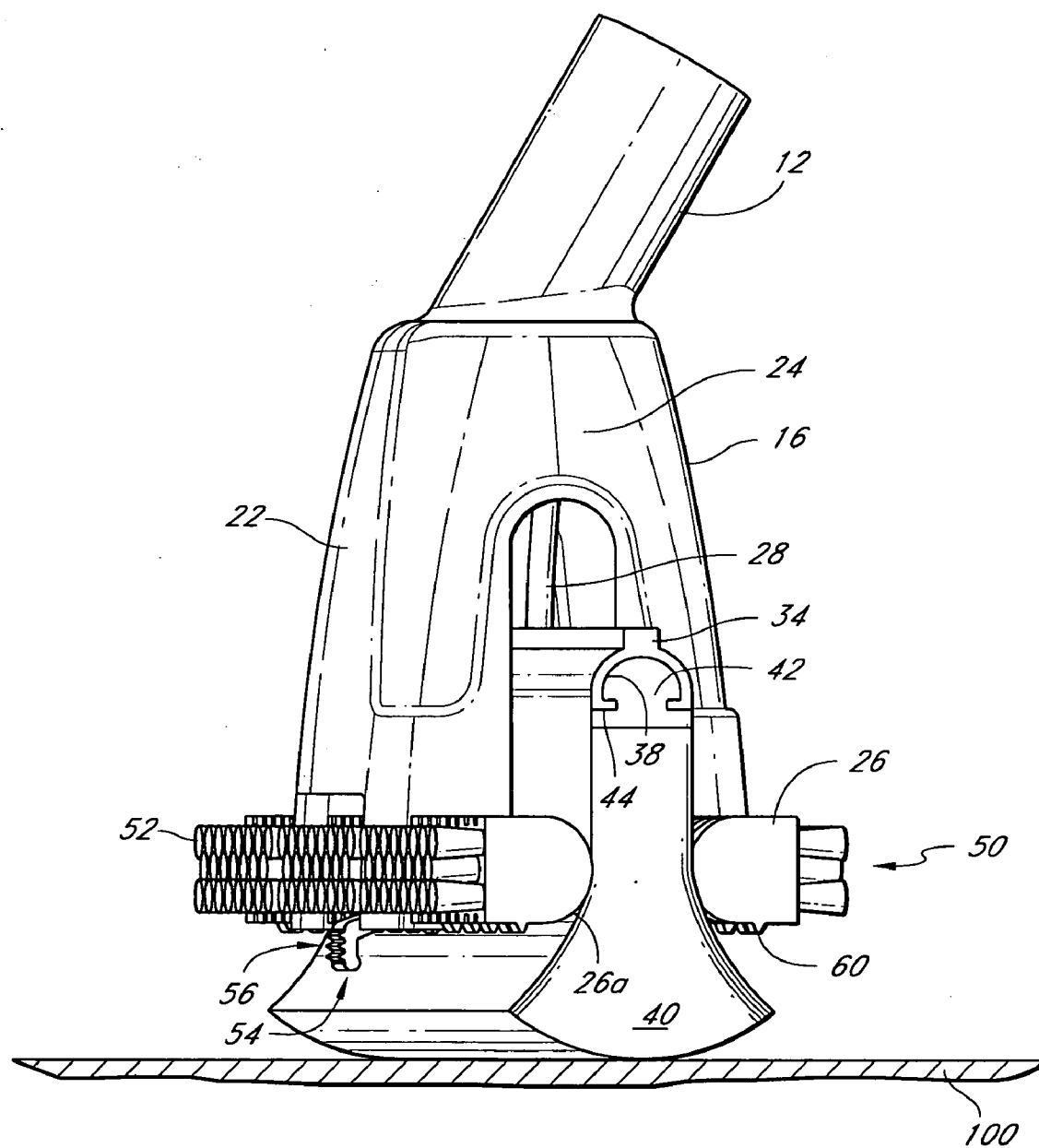


FIG. 4

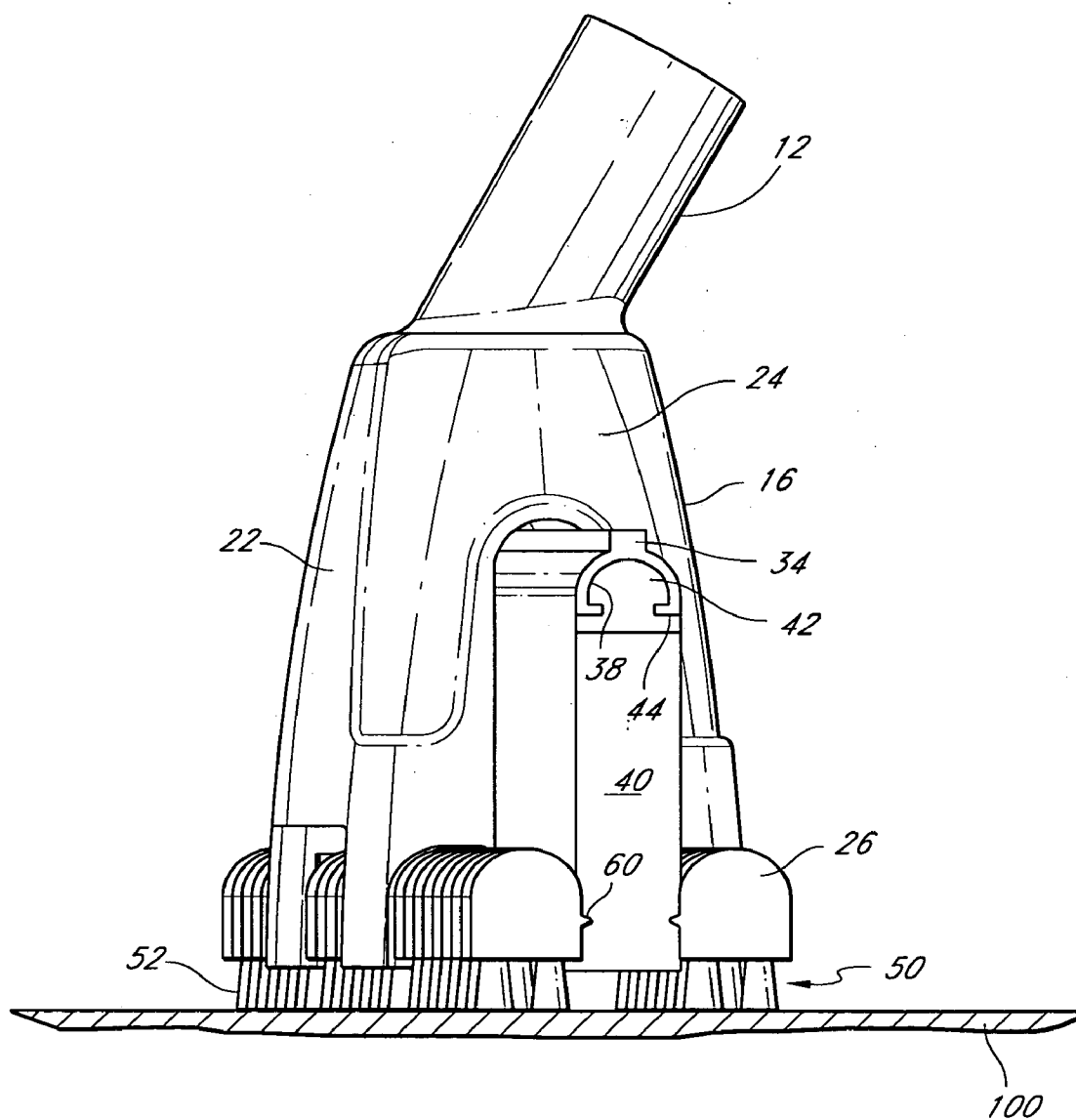


FIG. 5

SPONGE MOP AND SCRUBBER

FIELD OF THE INVENTION

[0001] The present invention relates generally to the field of sponge mops and more particularly to a sponge mop having an integrated scrubber.

BACKGROUND OF THE INVENTION

[0002] Conventional roller mops use a sponge that is wrung dry between a pair of rollers. Such roller mops use a lever that can be pulled or pushed, causing the rollers to roll or press the sponge, wringing the sponge out. Some conventional mops include a brush scrubber that a user can manually attach to the sponge, the mop head, or the mop handle. With such mops, the user must detach the scrubber from the mop when done scrubbing the surface. Additionally, such mops are quite cumbersome and require that the user rotate the entire mop upside down or on its side to use the brush scrubber to scrub a surface.

SUMMARY OF THE INVENTION

[0003] In one aspect of the present invention, a mop is provided with an integral brush scrubber assembly comprising a housing and a pair of rollers. The mop housing rotatably mounts a sponge. Scrubbing elements are attached to a surface of each of the rollers. Water is squeezed from the sponge by the rollers when the sponge is retracted into the housing. In addition, the retracted sponge causes the rollers to rotate as they squeeze the sponge to automatically move the scrubbing elements into a deployed position for scrubbing.

[0004] In another aspect of the present invention, the rollers have locking members configured to engage the sponge when the sponge is retracted between the rollers and the scrubbing elements are in the deployed position. The locking members are configured to maintain the rollers in a generally fixed position relative to the sponge.

[0005] In another aspect of the present invention, a mop is provided comprising an elongated shaft, a body attached to the distal end of the shaft, and a sponge operably coupled to the body. A pair of rollers spaced apart from one another straddle at least a portion of the sponge. Each of the rollers has at least one scrubbing element disposed thereon, wherein each of the rollers is configured to rotate about an axis. The mop also comprises means for moving the sponge and the rollers relative to each other to retract the sponge between the rollers to wring the sponge, and for rotating the scrubbing element into a deployed cleaning position.

[0006] In another aspect of the present invention, a method of cleaning a surface is provided. The method comprises providing a cleaning device having a sponge movably disposed between a pair of rollers, each of the rollers rotatable about an axis and having at least one scrubbing element on a surface thereof, and an actuator. The method further comprises actuating the actuator to move the sponge between the rollers into a retracted wringing position, said movement squeezing the sponge between the rollers to wring the sponge and moving the at least one brushing element into a deployed scrubbing position to scrub the surface.

BRIEF DESCRIPTION OF THE DRAWINGS

[0007] FIG. 1 is a perspective view of one embodiment of the cleaning device.

[0008] FIG. 2 is a side view of the cleaning device shown in FIG. 1.

[0009] FIG. 3 is a partial perspective view of one embodiment of the cleaning device in a first operating position.

[0010] FIG. 4 is a partial perspective view of the cleaning device shown in FIG. 3, in a second operating position.

[0011] FIG. 5 is a partial perspective view of the cleaning device shown in FIG. 3, in a third operating position.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0012] As used herein, a roller refers generally to a member having a movable surface and is not limited to a particular shape or configuration. A roller can thus include a member with a circular, oval, c-shaped, u-shaped or generally curved cross-section. In one embodiment, the movable surface can rotate about an axis. In another embodiment, the movable surface can pivot about an axis.

[0013] With reference to FIGS. 1 and 2, a cleaning device 10 or mop is illustrated therein. The mop 10 includes an elongated handle or shaft 12 extending along an axis Y, a slot 14 at a proximal end of the shaft 12, and a body or housing 16 at a distal end of the shaft 12. In the illustrated embodiment, the housing 16 includes front and rear walls 22 and side walls 24. The side walls 24 are advantageously spaced apart and define a slot S therebetween.

[0014] The rollers 26 are preferably fastened to the distal end of the housing 16. In one preferred embodiment, the rollers 26 are removably fastened to the housing 16 so as to be readily and easily replaceable. For example, a roller shaft (not shown) of the rollers 26 can be removably clamped to a c-shaped clamp (not shown) on the housing 16. However, other suitable fasteners can be used to fasten the rollers 26 to the housing 16, such as bolts and screws.

[0015] In the embodiment illustrated in FIGS. 1 and 2, the rollers 26 have a generally U-shaped cross-section. However, the rollers 26 can have other suitable cross-sections, such as circular, oval, or curved. The rollers 26 preferably comprise a movable surface 26a (see FIG. 3) and include a scrubbing element disposed on the movable surface 26a, as discussed further below. In one embodiment, the rollers 26 rotate about an axis generally perpendicular to the elongated shaft 12. In the illustrated embodiment, said axes extend generally parallel to an axis X that extends through the slot S.

[0016] The elongated shaft 12, housing 16, and rollers 26 are preferably made of a resilient and light-weight material, such as a hard plastic. For example, they can be made of polyethylene. However, the elongated shaft 12, housing 16, and rollers 26 can be made of other suitable materials.

[0017] As shown in FIGS. 1 and 2, the mop 10 also includes an actuator or deployment mechanism 30. The actuator 30 includes an operating member 32 pivotably fastened through a slot 33 to the shaft 12 and to an operating rod 28 (see FIG. 3) that extends longitudinally through at least a portion of the length of the shaft 12. In the illustrated embodiment, the operating member 32 is a lever that is pivoted up or down relative to the shaft 12. However, the operating member 32 can be other suitable mechanisms, such as a knob that is pulled in and out of the shaft 12.

[0018] In the illustrated embodiment, a sponge retainer **34** having opposite side walls **38** is preferably fastened to a distal end of the operating rod **28**. Guide rails **44** extend from a distal end of the side walls **38**. The sponge retainer **34** preferably has a length that extends longitudinally along the axis X generally orthogonal to the axis Y. The sponge retainer **34** is preferably configured to removably hold a sponge **40** therein (see FIG. 3). In one preferred embodiment, the sponge **40** has a brace member **42** that is slidably inserted into the sponge retainer **34**. Such a sponge **40** for use in combination with the embodiments of a sponge mop described herein is further described in U.S. Pat. No. 6,643,885, the contents of which are hereby incorporated in their entirety and should be considered a part of this specification.

[0019] As discussed above, the rollers **26** preferably have a movable surface **26a** and at least one scrubbing element disposed thereon. As illustrated in FIGS. 3-5, in one embodiment, the movable surface **26a** is curvilinear and the at least one scrubbing element is a scrubber brush **50** disposed on a portion of the movable surface **26a**, wherein the brush **50** comprises bristles **52**. In the illustrated embodiments, a plurality of scrubber brushes **50** are disposed along substantially the entire length of the rollers **26**. In another embodiment, the brushes **50** can be disposed along a portion of the length of the rollers **26**, such as on either side of the housing **16**. Additionally, in the illustrated embodiment, one of the at least one scrubbing elements is a scraper **54** (see FIG. 4). The scraper **54** preferably has serrated members **56** configured to scour a cleaning surface **100**, as discussed below. In a preferred embodiment, the serrated members **56** are made of a non-scratching poly resin configured to remove tough marks or stains on the cleaning surface **100** without scratching the cleaning surface **100**. However, the scraper **54** can be made of other materials suitable for scouring the cleaning surface **100** without scratching the surface **100**.

[0020] With continued reference to FIGS. 3-5, each of the rollers **26** preferably comprises at least one locking member **60** disposed on the movable surface **26a**. In the illustrated embodiment, a plurality of locking members **60** are shown. However, in other embodiments, the rollers **26** can have any suitable number of locking members **60**. In the illustrated embodiment, the locking members **60** are spike-shaped tabs. However, the locking members **60** can have other suitable shapes. The locking members **60** advantageously engage at least a portion of the sponge **40** when the sponge is in a retracted position and the scrubbing elements are in a deployed position, as discussed further below and as shown in FIG. 6. For example, the locking members **60** can grip a surface of the sponge **40**. Preferably, the locking members **60** substantially hold the sponge in a generally fixed position relative to the rollers **26** while the locking members **60** are engaged to the sponge **40** and the scrubbing elements are deployed. In the illustrated embodiment, the locking members **60** are staggered relative to each other and disposed at an angle of about 90 degrees relative to the brushes **50**. However, other suitable arrangements can be used for the locking members **60**.

[0021] Advantageously, a user can selectively operate the cleaning device **10** to deploy the sponge **40** or scrubbing elements, as best suited for cleaning the cleaning surface **100**. In the illustrated embodiment, the user can move (e.g., push) the operating member **32** of the actuator **30** to move

the sponge **40** forward relative to the rollers **26** into a deployed cleaning position proximal the cleaning surface **100**, as shown in FIG. 3. The sponge **40** can then be used generally as a mop to soak up liquids. When the sponge **40** is in the deployed cleaning position, the brushes **50** and scraper **54** are in a first or retracted position and oriented away from the cleaning surface **100** (see FIG. 3).

[0022] The user can alternatively move (e.g., pull) the operating member **32** of the actuator **30** to move the sponge **40** backward into a retracted position away from the cleaning surface **100**, as shown in FIG. 5. As the sponge **40** is retracted between the rollers **26**, the sponge **40** frictionally engages the movable surface **26a** of the rollers **26**, causing the movable surface **26a** to rotate in the direction of retraction (see FIG. 4). In the illustrated embodiment, such rotation of the movable surface **26a** automatically results in the rotation of the brushes **50** and scraper **54** about 180 degrees so that they are positioned in a second or deployed position proximal the cleaning surface **100**. Additionally, the rollers **26** advantageously squeeze the sponge **40** as the sponge **40** is retracted into the slot S of the housing **16**, thus wringing the sponge **40** of any liquids. As shown in FIG. 5, when the brushes **50** are in the fully deployed position, the locking members **60** engage the sponge **40** to substantially maintain the rollers **26** in a generally fixed position relative to the sponge **40** and to maintain the scrubber brushes **50** in the deployed position. In one embodiment, at least one stop member **70** (see FIG. 1) is disposed on the housing **16** and engages the rollers **26** to limit the rotation of the rollers **26** (and brushes **50**) between their first or retracted storage position and their second or deployed cleaning position to about 180 degrees. The stop member **70** can be, for example, a post or protrusion that interacts with the brushes **50**. However, the stop member **70** can have other suitable shapes and configurations.

[0023] If the user wants to deploy the sponge **40** once again, the user can move the operating member **32** once again, as discussed above, to move the sponge **40** forward. The sponge **40** frictionally engages the movable surface **26a** of the rollers **26**, causing the movable surface **26a** to automatically rotate in the direction of deployment, which results in the withdrawal of the brushes **50** and scraper **54** into the first or retracted position, as shown in FIG. 3.

[0024] In another embodiment (not shown), the operating rod **28** connects to the rollers **26**. In this embodiment, the actuator **30** is actuated via the operating member **32** to move the rollers **26** over the sponge **40**. The rollers **26** preferably rotate as they move over the sponge **40**, for example due to the frictional engagement between the sponge **40** and the rollers **26**, to move the brushes **50** from the first or retracted storage position to the second or deployed cleaning position. Additionally, as the rollers **26** rotate over the sponge **40**, the rollers **26** advantageously squeeze the sponge **40** so as to wring any liquid out of the sponge **40**. When the rollers **26** are in the retracted storage position, the sponge **40** is preferably in the deployed position. Conversely, when the rollers **26** are in the deployed cleaning position, the sponge **40** is preferably in the retracted position between the rollers **26**.

[0025] The various devices, methods and techniques described above provide a number of ways to carry out the invention. Of course, it is to be understood that not neces-

sarily all objectives or advantages described may be achieved in accordance with any particular embodiment described herein. Also, although the invention has been disclosed in the context of certain embodiments and examples, it will be understood by those skilled in the art that the invention extends beyond the specifically disclosed embodiments to other alternative embodiments and/or uses and obvious modifications and equivalents thereof. Accordingly, the invention is not intended to be limited by the specific disclosures of preferred embodiments herein.

What is claimed is:

1. A combination sponge mop and scrubber wherein said scrubber brush is automatically deployed whenever the sponge is squeezed to discharge liquid therefrom comprising:

a housing;

a pair of rollers mounted on the housing on each side of a sponge, the pair of rollers supporting a scrubber brush, wherein said rollers squeeze the sponge when the sponge is retracted into the housing, and wherein the rollers are automatically rotated by their engagement with the sponge to move the scrubber brush into a deployed position to scrub the cleaning surface, and wherein the pair of rollers includes locking members configured to engage the sponge when the sponge is retracted between the rollers and the scrubber brush is in the deployed position, the locking members configured to maintain the scrubber brush in the deployed position.

2. A combination sponge mop and scrubber brush wherein said scrubber brush is automatically deployed whenever the sponge is squeezed to discharge liquid therefrom comprising:

a housing;

a pair of rollers mounted on the housing on each side of a sponge, the pair of rollers supporting a scrubber brush, wherein said rollers both squeeze the sponge when the sponge is retracted into the housing and automatically rotate to move the scrubber brush into a deployed position.

3. A mop for cleaning a cleaning surface comprising:

a housing; and

a pair of rollers mounted on the housing on each side of a sponge, the pair of rollers having scrubbing elements on a surface of the rollers, wherein the sponge is squeezed by the rollers when the sponge is retracted into the housing; and wherein the rollers rotate as they squeeze the sponge to move the scrubbing elements into a deployed position to scrub the cleaning surface.

4. The mop of claim 3, wherein a surface of the sponge engages a surface of the rollers so that the retraction of the sponge rotates the rollers.

5. The mop of claim 3, wherein the pair of rollers include locking members configured to engage the sponge when the sponge is retracted between the rollers and the scrubbing elements are in the deployed position, the locking members configured to maintain the rollers in a generally fixed position relative to the sponge.

6. A mop for cleaning a cleaning surface, comprising:

an elongated shaft;

a body disposed at a distal end of the elongated shaft;

a sponge operably coupled to the body;

a pair of rollers movably mounted to the body, the rollers spaced apart from one another and straddling at least a portion of the sponge;

an actuator configured to move the sponge into a retracted position between the rollers, wherein the rollers squeeze the sponge to wring liquid from the sponge; and

at least one scrubbing element disposed on at least one of the rollers, the at least one scrubbing element configured to move into a deployed position when the sponge is moved into the retracted position, the at least one scrubbing element configured to move into a retracted position when the sponge is moved into a deployed position.

7. The mop of claim 6, wherein the at least one scrubbing element comprises a brush.

8. The mop of claim 6, wherein the at least one scrubbing element comprises a scraper.

9. The mop of claim 8, wherein the scraper is serrated non-scratching poly-resin configured to scour the surface without scratching the surface.

10. The mop of claim 9, wherein the scraper extends along at least a portion of the length of at least one of the rollers and is configured to cover the sponge.

11. The mop of claim 6, further comprising a locking member disposed on at least one of the rollers, the locking member configured to engage the sponge when the at least one scrubbing element is in the deployed position, the locking member configured to maintain the at least one roller in a generally fixed position relative to the sponge.

12. The mop of claim 11, wherein the locking member is disposed generally about 90 degrees from the at least one scrubbing element.

13. The device of claim 12, further comprising a stop member configured to limit the rotation of the rollers and the movement of the at least one scrubbing element to about 180 degrees.

14. A mop comprising:

an elongated shaft;

a body attached to a distal end of the elongated shaft;

a sponge operably coupled to the body;

a pair of rollers spaced apart from one another and straddling at least a portion of the sponge, each of the pair of rollers having at least one scrubbing element disposed thereon, wherein each of the rollers is configured to rotate about an axis; and

means for moving the sponge and rollers relative to each other to retract the sponge between the rollers to wring the sponge, and for rotating the scrubbing element into a deployed cleaning position.

15. The mop of claim 14, wherein at least one of the rollers has a locking member configured to engage the sponge when the at least one scrubbing element is in the deployed cleaning position, the locking member maintaining the rollers in a generally fixed position relative to the sponge.

16. A method of cleaning a surface, comprising:

providing a cleaning device having a sponge movably disposed between a pair of rollers, each of the rollers rotatable about an axis and having at least one scrubbing element on a surface thereof, and an actuator; and

actuating the actuator to move the sponge between the rollers into a retracted wringing position, said movement squeezing the sponge between the rollers to wring the sponge and moving the at least one brushing

element into a deployed scrubbing position to scrub the surface.

17. The method of claim 16, further comprising the step of actuating the actuator to move the sponge between the rollers into a deployed cleaning position to clean a surface, said movement moving the at least one scrubbing element into a retracted storage position.

18. The method of claim 16, wherein moving the at least one scrubbing element into a deployed cleaning position includes rotating the rollers.

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