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(54) **CLEANING TOOL ASSEMBLY AND RELATED METHOD OF USE**

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(75) Inventors: **Perry S. Dotterman**, Maplewood, MN (US); **Michael J. Kubes**, Oakdale, MN (US); **Diane R. Wolk**, Woodbury, MN (US); **Arthur V. Lang**, Maplewood, MN (US); **Byron E. Trotter**, St. Paul, MN (US); **Kristine K. Krumhus**, River Falls, WI (US)

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(57) **ABSTRACT**

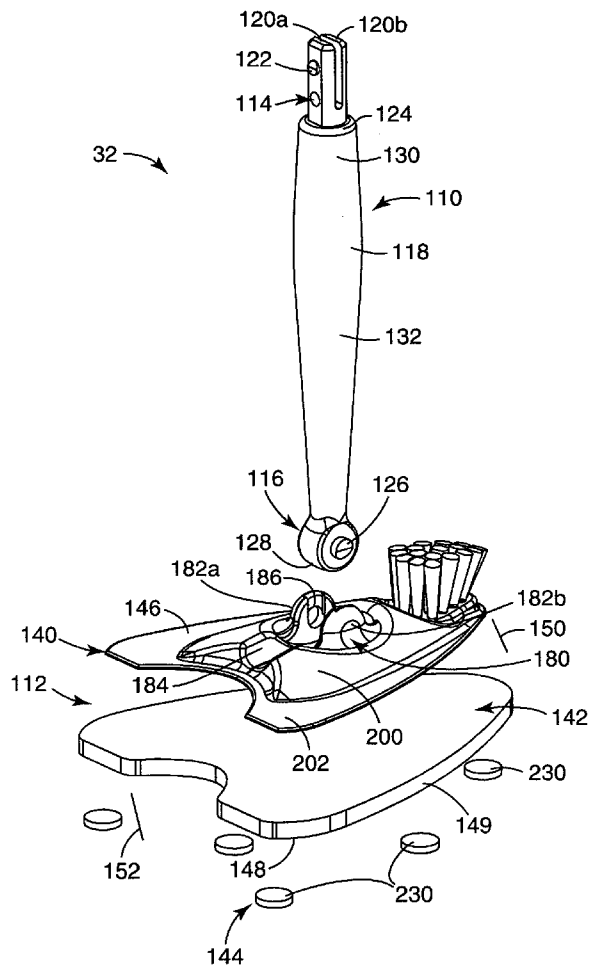
A cleaning tool assembly is disclosed for cleaning hard surfaces, such as bathroom surfaces. The cleaning tool assembly includes a cleaning tool and a cleaning pad. The cleaning tool includes a handle and a head having a plate and a support pad. The plate includes a first side connected to the handle, a second side opposite the first side, and a perimeter. The support pad includes a first side connected to the second side of the plate, a second side, and a perimeter extending beyond the perimeter of the plate. The support pad is a compliant, closed-cell foam.

Correspondence Address:
3M INNOVATIVE PROPERTIES COMPANY
PO BOX 33427
ST. PAUL, MN 55133-3427 (US)

(73) Assignee: **3M Innovative Properties Company**

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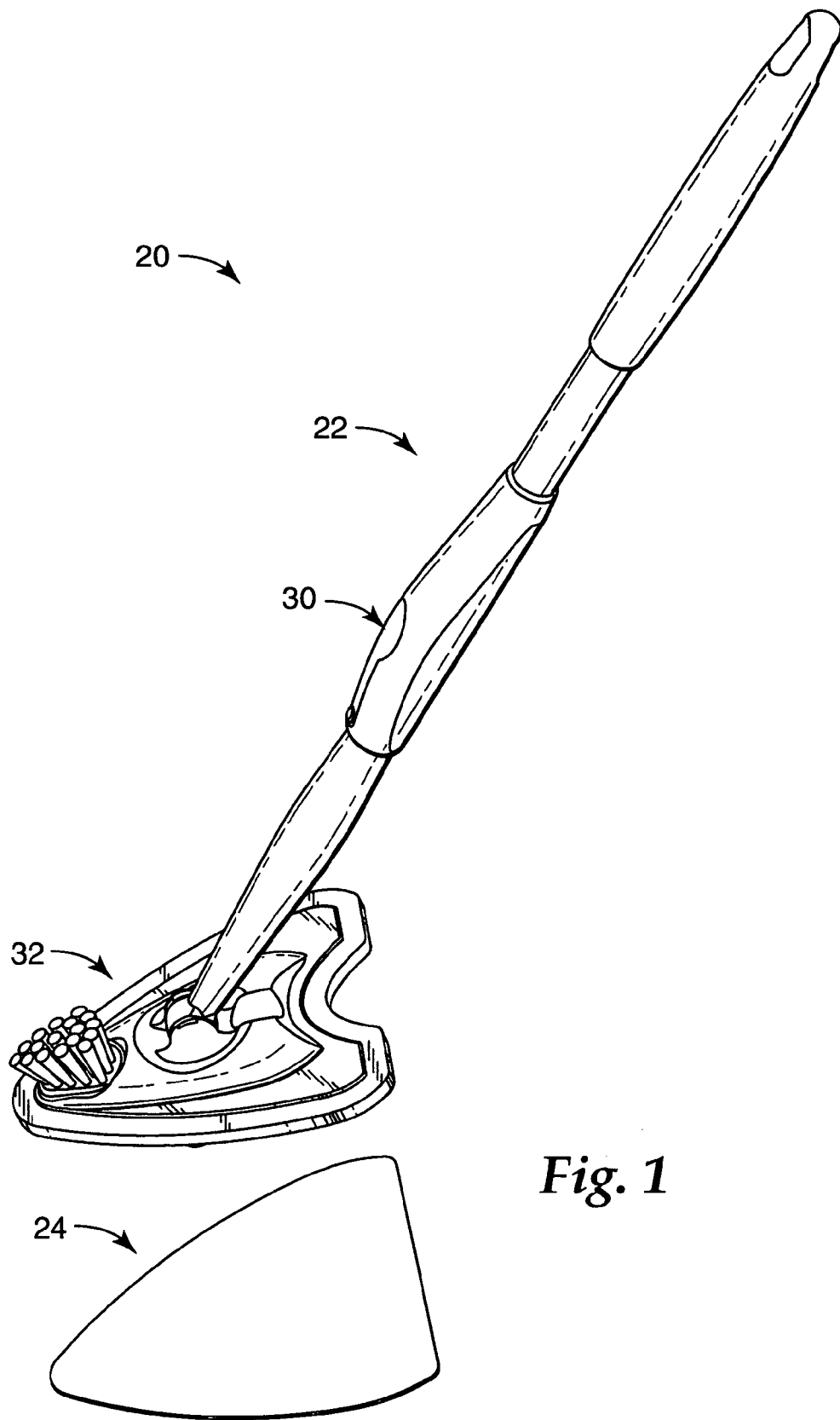


Fig. 1

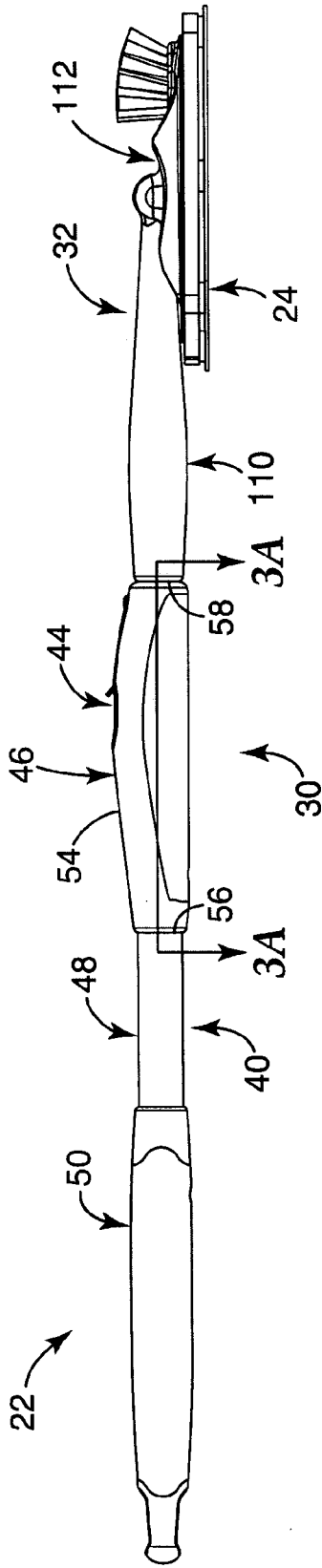


Fig. 2A

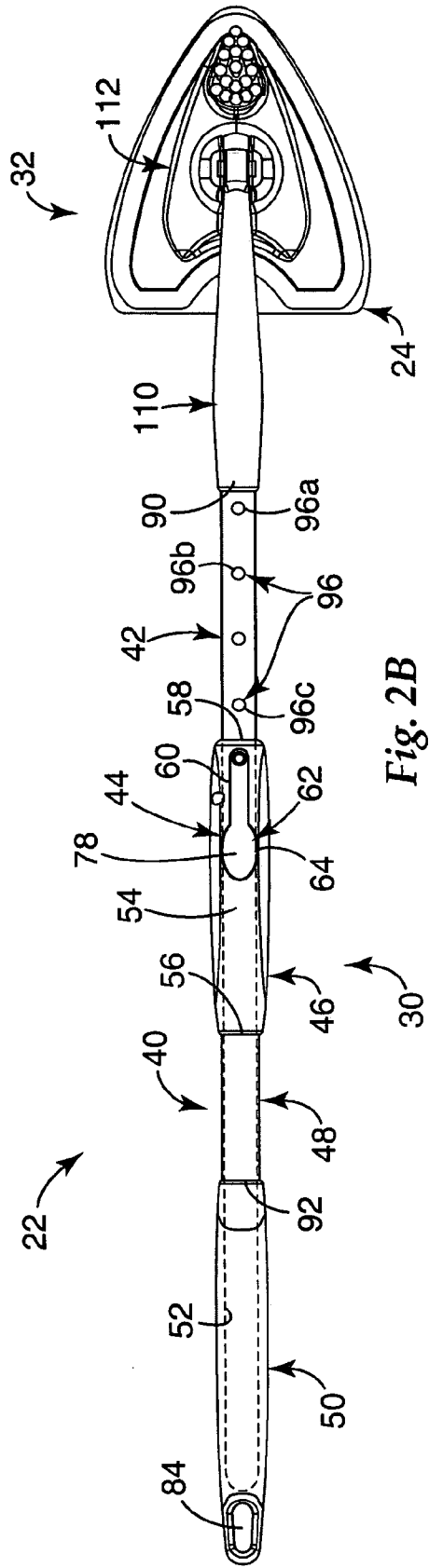


Fig. 2B

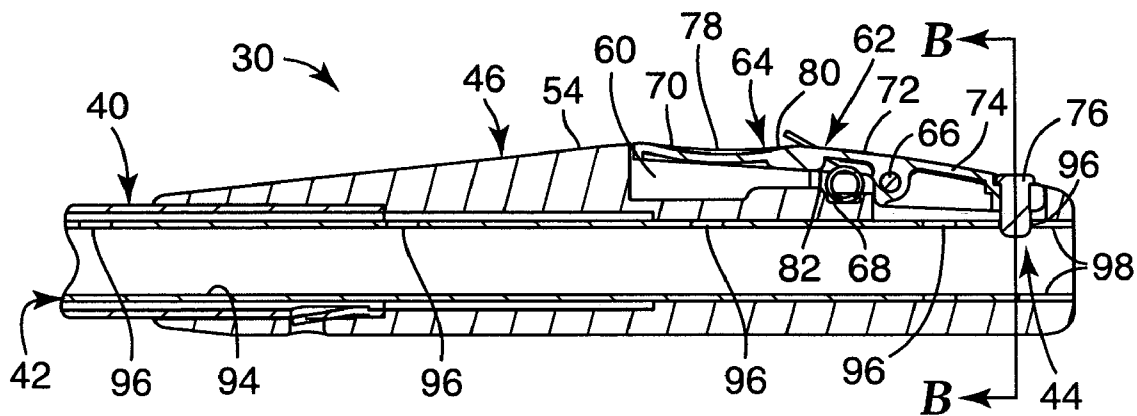


Fig. 3A

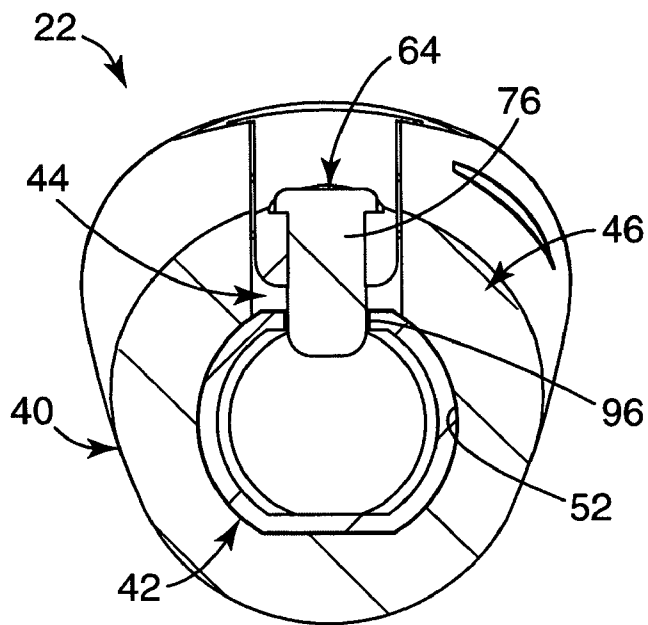


Fig. 3B

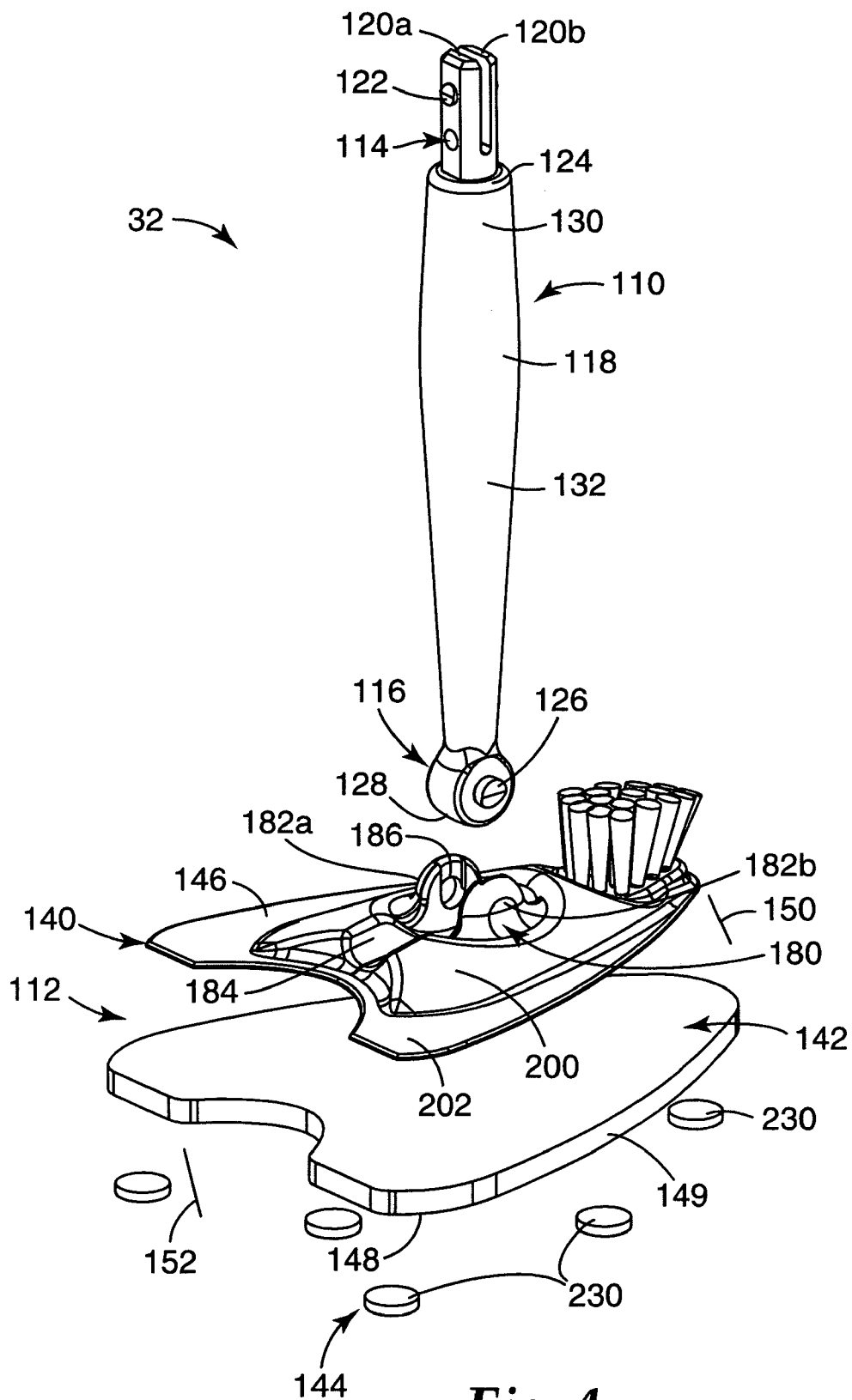


Fig. 4

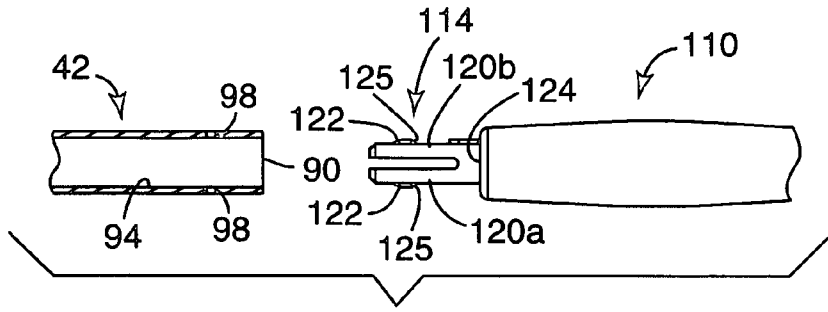


Fig. 5

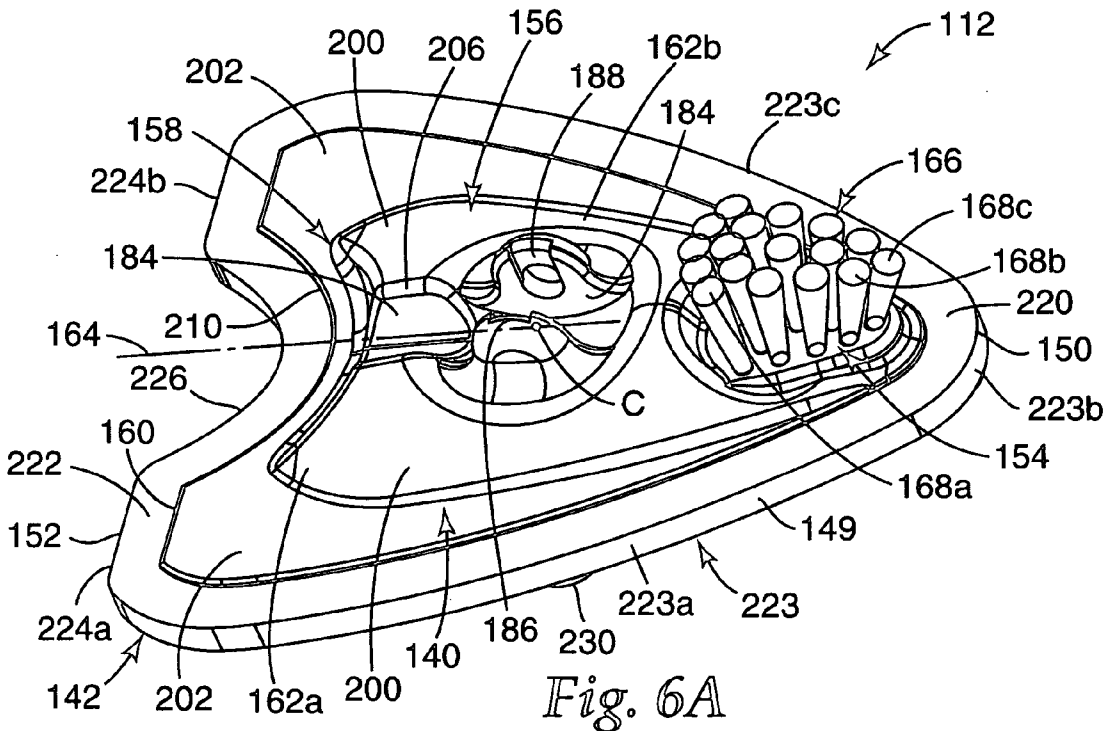


Fig. 6A

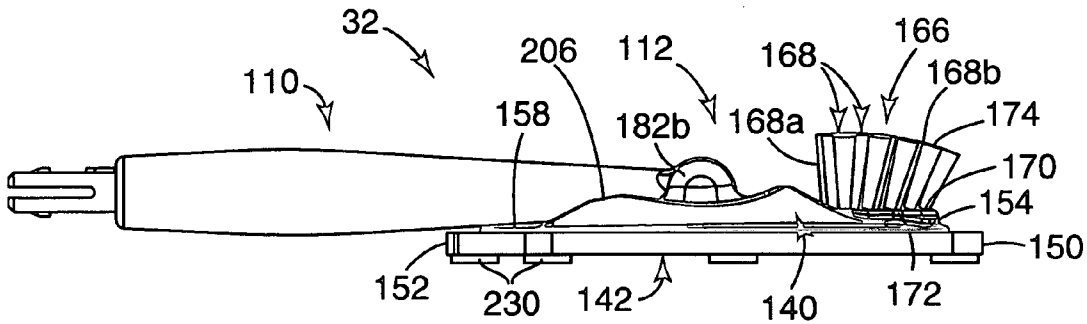


Fig. 6B

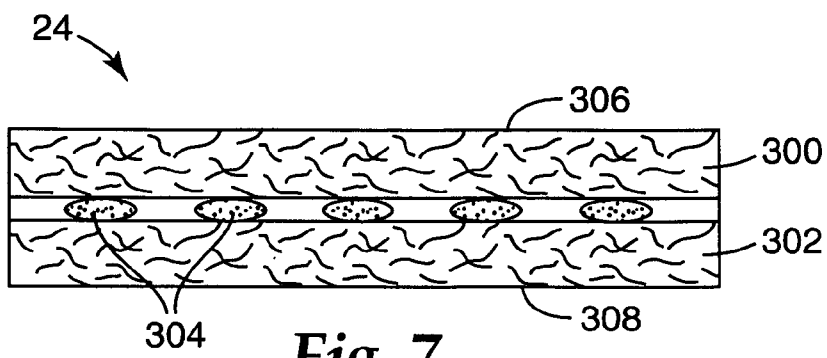


Fig. 7

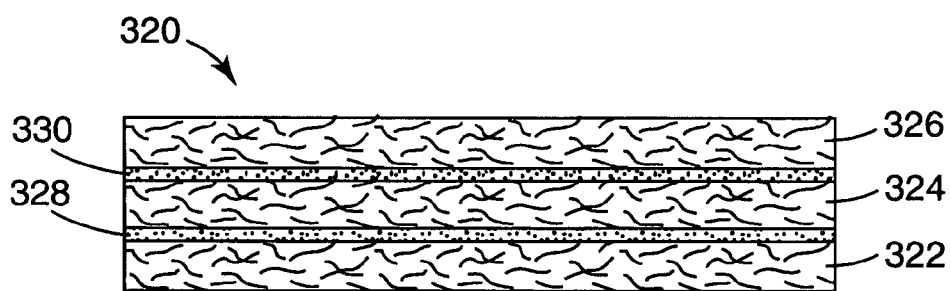


Fig. 8

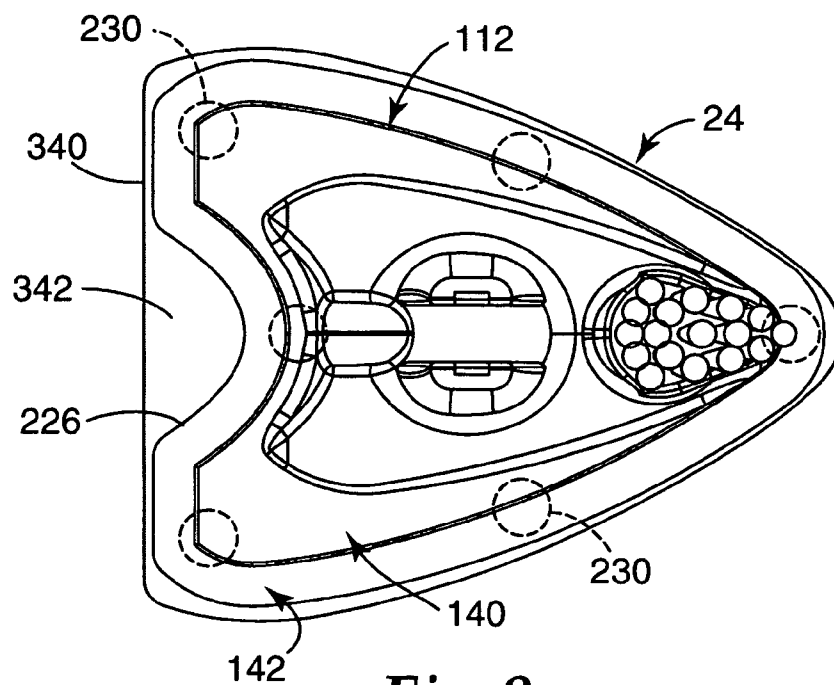


Fig. 9

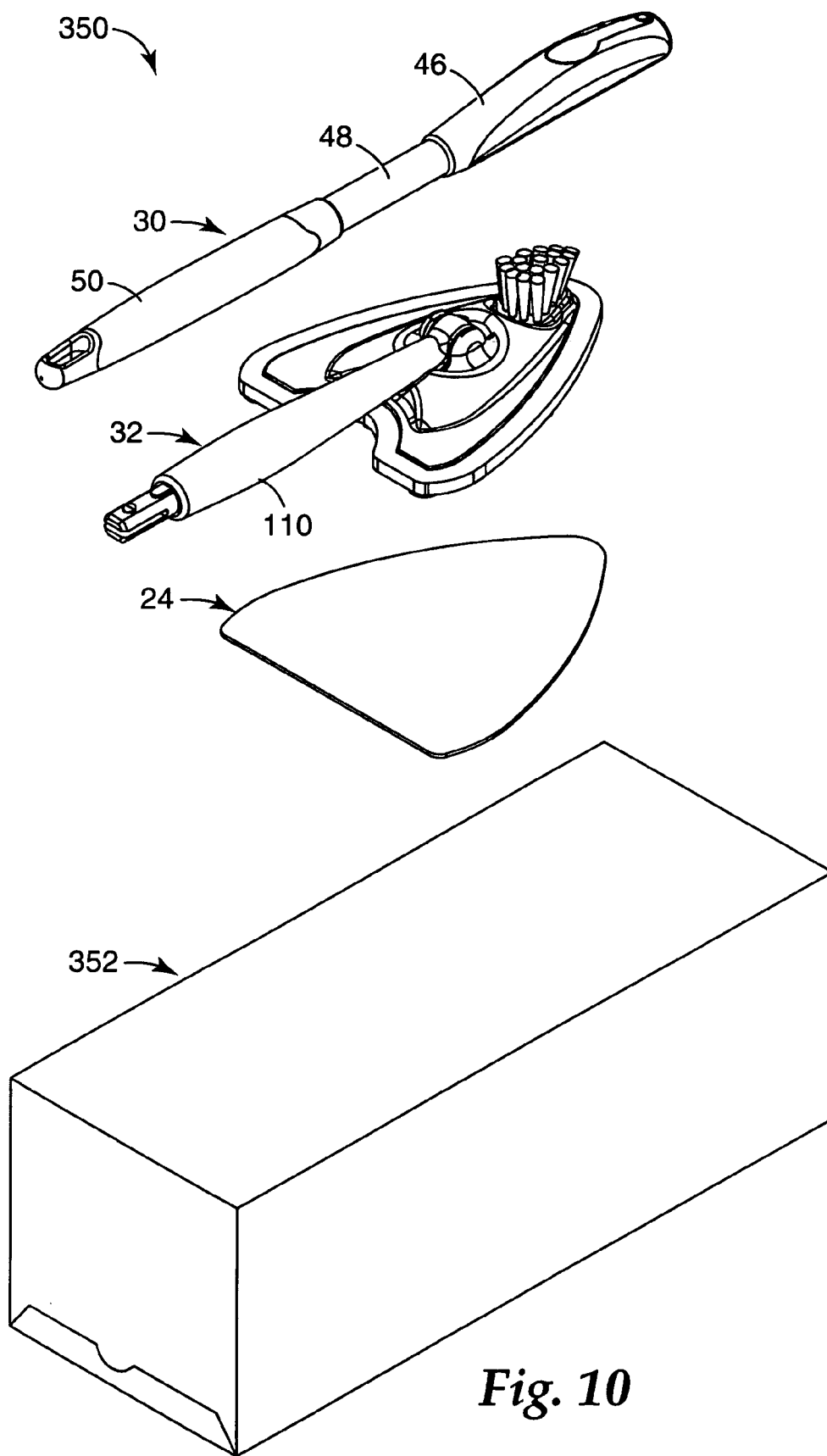


Fig. 10

CLEANING TOOL ASSEMBLY AND RELATED METHOD OF USE

REFERENCE TO CO-PENDING APPLICATIONS

[0001] This application is a continuation of U.S. patent application Ser. No. 11/045,701, filed Jan. 28, 2005.

BACKGROUND

[0002] The present invention relates to a cleaning tool. More particularly, it relates to a manual cleaning tool assembly useful for cleaning various surfaces, such as bathroom surfaces.

[0003] A wide range of products and tools are currently available for assisting consumers with cleaning tasks. Many, such as sponges, mops, brooms, brushes, etc., have been available for countless years. Others, such as hand-held wipes, spray-on cleaning chemicals, liquid-containing/dispensing implements, scouring pads, etc., represent more recent developments. Along these same lines, improvements to these and other products and tools are constantly being developed in an effort to address actual or perceived consumer needs presented by common cleaning tasks. Unfortunately, while advancements have certainly eased the efforts required to perform many cleaning tasks, other common consumer cleaning-related complaints remain unresolved.

[0004] One particularly demanding chore faced by consumers (both in the home and in commercial/industrial settings) is cleaning a bathroom. Most bathrooms include diverse, hard surfaces (e.g., floor, sink, countertop, toilet, tub, shower stall, etc.) that are frequently exposed to debris that are difficult to completely remove, a condition exacerbated over time by the high humidity conditions of most bathrooms. For example, in addition to dirt, bathroom shower stall walls and doors can be contaminated with highly adherent soap scum and hard water stains. Shower stall floors can be similarly dirtied, as can bathtub walls/floors. Also, most bathrooms have tiled floors and/or walls and/or vanities. While water-resistant, the tiles readily accumulate hard-to-remove debris. Even more problematic is the exposed grout that otherwise holds individual tiles together and to a support surface. Grout is aesthetically pleasing, but has a tendency to "lock in" dirt and other debris. Clearly, the toilet and surrounding areas present additional cleaning concerns.

[0005] Beyond the difficulties associated with removing many of the common debris found in bathrooms, consumers have a need to ensure that all surfaces are thoroughly cleaned. The high humidity environment of most bathrooms in combination with the types of contaminants normally found (e.g., bacteria) can result in mold or mildew if not properly removed. In fact, most consumers desire to not only achieve a visually clean appearance, but also to eliminate unwanted materials on a microscopic level. Thus, for example, disinfectant products are oftentimes applied to bathroom surfaces to "kill" bacteria, fungus, etc.

[0006] In light of the above, most consumers are forced to employ multiple different products and tools when performing a bathroom cleaning task. Hand-held sponges are used to wipe surfaces. Brushes and scrubbing pads are used to scour surfaces. Mops are used to clean floors. Some of these tools

are amenable for a user to deploy while standing upright, while others are shorter, and can be more physically taxing on the user depending upon the cleaning task being performed. Conversely, the consumer may not have access to (or there may not exist) an appropriately-sized tool for performing a particular task. For example, a common consumer complaint is having to repeatedly reach and stretch when attempting to clean shower stall walls with a hand-held sponge. Regardless, a number of different tools must be transported to and from the bathroom. In addition, consumers often bring various aggressive cleaning products, such as bleach or other harsh chemicals, to the bathroom (e.g., spray bottle or aerosol can). In many cases, the dispensed chemical(s) must be manually worked or scrubbed into the surface being cleaned, such as with a sponge. Under these circumstances, the user's hand(s) are in direct, or nearly direct, contact with cleaning solutions, posing certain health concerns (e.g., skin rashes). Similarly, many popular liquid or liquid-like cleaning products generate fumes or odors (e.g., bleach) that are repugnant, even hazardous, to users if inhaled; where the user applies such a product by hand, the fumes generated by the product are in close proximity to the user's face thus increasing the likelihood of inhalation, especially in the confined environment of most bathrooms.

[0007] Bathroom cleaning is a necessary, but physically difficult task faced on a regular basis. While various tools and products are available for achieving enhanced cleanliness, multiple cleaning implements are still required and the task itself remains quite time-consuming and potentially hazardous. Therefore, a need exists for a cleaning assembly or device that addresses some, if not all, of the difficulties associated with cleaning a bathroom or similar area.

SUMMARY

[0008] One aspect of the present invention relates to a cleaning tool assembly for cleaning hard surfaces, such as bathroom surfaces. The cleaning tool assembly includes a cleaning tool and a cleaning pad. The cleaning tool includes a handle, a neck, and a head. The neck extends from the handle. The head defines a first side, a second side, and a perimeter having a thickness. The first side of the head is connected to the handle and includes a cleaning implement. Further, at least a portion of the perimeter defines a compliant edge surface. Finally, the cleaning pad is attached to the second side of the head. With this in mind, upon final assembly, at least three distinct, usable cleaning surfaces are provided by the cleaning implement, the compliant edge surface, and the cleaning pad. Thus, the cleaning tool assembly provides a user with the ability to perform at least three different cleaning operations, a feature effectively required by certain cleaning tasks, such as cleaning a bathroom. In one alternative embodiment, the cleaning pad is releasably attached to the head. In another alternative embodiment, the cleaning pad includes a bleach composition.

[0009] Another aspect of the present invention relates to a cleaning assembly kit for cleaning hard surfaces, such as bathroom surfaces. The kit includes a cleaning pad, a head assembly, a handle and a container. The head assembly includes a neck and a head, with the head defining a first side, a second side, and a perimeter. The first side of the head is connected to the neck and includes a cleaning implement. Further, at least a portion of the perimeter defines a com-

pliant edge surface. The handle is provided apart from the head assembly, and can be assembled to the neck. Finally, the cleaning pad, the head assembly, and the handle are contained within the container. During use, the cleaning pad is attachable to the second side of the head. In one embodiment, the handle is extendable to a length of at least 28 inches and the container has a length of not more than 12 inches.

[0010] Yet another aspect of the present invention relates to a cleaning tool for use with a cleaning pad for cleaning hard surfaces, such as bathroom surfaces. The cleaning tool includes a handle, a neck, and a head. The neck extends from the handle. The head defines a first side, a second side, and a thickness. The first side of the head is connected to the neck and is provided with a cleaning implement. Attachment bodies are provided on the second side of the head for releasably maintaining a cleaning pad. At least a portion of the thickness is comprised of a compliant material. Finally, the head has a generally triangular shape. In one embodiment, the neck is pivotally attached to the head.

[0011] Yet another aspect of the present invention relates to a method of cleaning hard surfaces in a room, such as bathroom surfaces. The method includes providing a cleaning tool assembly including a handle, a neck, a head, and a cleaning pad. The neck connects the handle and the head. The head includes a top side having a cleaning implement and a thickness defining a perimeter at least a portion of which forms a compliant edge surface. Finally, the cleaning pad is attached to a bottom side of the head. With this in mind, the method further includes performing a first cleaning operation on a surface in the room with the cleaning pad; performing a second cleaning operation on a surface in the room with the cleaning implement; and performing a third cleaning operation on a surface in the room with the compliant edge surface. To this end, the first, second, and third cleaning operations are performed during a single cleaning session and are characterized by the cleaning pad remaining attached to the head. In one embodiment, the first cleaning operation includes applying bleach to the surface, with the bleach being provided by the cleaning pad. In another embodiment, a fourth cleaning operation is performed by replacing the cleaning pad with a second cleaning pad providing a differing cleaning attribute.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012] FIG. 1 is a perspective, exploded view of a cleaning tool assembly in accordance with the present invention;

[0013] FIG. 2A is a side view of the cleaning tool assembly of FIG. 1 in a retracted state;

[0014] FIG. 2B is a top view of the cleaning tool assembly of FIG. 2A (at a smaller scale) in an extended state;

[0015] FIG. 3A is an enlarged, cross-sectional view of a portion of the cleaning tool taken along the line 3A-3A of FIG. 2A;

[0016] FIG. 3B is an enlarged, cross-sectional view of the cleaning tool of FIG. 3A taken along the line B-B;

[0017] FIG. 4 is an exploded, perspective view of a head assembly portion of the cleaning tool assembly of FIG. 1;

[0018] FIG. 5 is a side view of a portion of the cleaning tool of FIG. 2A, with a portion shown in cross-section;

[0019] FIG. 6A is a top perspective view of a portion of the head assembly of FIG. 4;

[0020] FIG. 6B is a side view of the head assembly of FIG. 4;

[0021] FIG. 7 is an enlarged, cross-sectional view of a cleaning pad in accordance with one embodiment of the present invention;

[0022] FIG. 8 is an enlarged, cross-sectional view of an alternative embodiment cleaning pad in accordance with the present invention;

[0023] FIG. 9 is a top view of a portion of the cleaning tool assembly of FIG. 1 illustrating removal of a cleaning pad from the cleaning tool; and

[0024] FIG. 10 is a simplified, exploded view of a cleaning assembly kit in accordance with the present invention.

DETAILED DESCRIPTION

[0025] One embodiment of a cleaning tool assembly 20 in accordance with the present invention is shown in FIG. 1. The cleaning tool assembly 20 includes a cleaning tool 22 and a cleaning pad 24. The various components are described in greater detail below. In general terms, however, the cleaning pad 24 is attached to the cleaning tool 22, and in one embodiment is releasably attached to the cleaning tool 22. The resultant cleaning tool assembly 20 provides a plurality of cleaning surfaces for performing cleaning tasks, such as cleaning various hard surfaces of a bathroom. To this end, the cleaning tool assembly 20 can incorporate a number of features highlighted below that promote convenient use under a variety of circumstances including, in one embodiment, delivering a cleaning solution (not shown), such as bleach, otherwise carried by the cleaning pad 24.

A. Cleaning Tool

[0026] The cleaning tool 22 includes a handle 30 and a head assembly 32. The head assembly 32 can be attached to the handle 30 in a variety of fashions, and is described in greater detail below. Regardless, and in one embodiment, the handle 30 is configured to be extendable, as best shown in FIGS. 2A and 2B. In particular, the handle 30 is configured to be transitionable between a retracted state or position (FIG. 2A) and one or more extended state(s) or position(s) (FIG. 2B) in which an overall length of the handle 30 is increased as compared to the retracted position.

[0027] The extendable feature of the handle 30 is achieved, in one embodiment, by forming the handle 30 to include a grip portion 40 and an extension shaft 42 (shown best in FIG. 2B). The shaft 42 is slidably received within the grip portion 40 and is connected to the head assembly 32. With this configuration, the shaft 42 can be longitudinally extended and retracted relative to the grip portion 40 to increase and decrease a length, respectively, of the handle 30 and thus a longitudinal position of the head assembly 30 relative to the grip portion 40. As described in greater detail below, in one embodiment, the handle 30 further includes a locking mechanism 44 (referenced generally) adapted to selectively maintain or "lock" the handle 30 at a selected longitudinal length.

[0028] The grip portion 40 is generally tubular in nature, and in one embodiment includes a grip body 46, an inter-

mediate segment 48 and an end segment 50. The grip body 46, the intermediate segment 48 and the end segment 50 can be formed separately and assembled to one another; alternatively, components of the grip portion 40 can be integrally formed. Regardless, the grip body 46, the intermediate segment 48 and the end segment 50 collectively define an internal passage 52 (shown with dashed lines in FIG. 2B) sized to receive the shaft 42.

[0029] The grip body 46 can assume a wide variety of forms, and preferably provides a contoured outer surface 54 configured to facilitate grasping thereof by a user's hand (not shown). The outer contoured outer surface 54 extends between a proximal end 56 and a distal end 58. In addition, the grip body 46 forms a cavity 60 (referenced generally in FIG. 2B) adjacent the distal end 58 and within which a lever assembly 62 is maintained, as described below.

[0030] The intermediate segment 48 of the grip portion 40 is affixed to, and extends rearwardly from, the proximal end 56 of the grip body 46, and thus can assume a variety of shapes and sizes. In one embodiment, the intermediate segment 48 is a tube having an outer diameter less than an outer diameter of the grip body 46. Because, in one embodiment, it is not intended for a user to grasp the intermediate segment 48 during use, the intermediate segment 48 can be thinner than the grip body 46, and thus less expensive. Alternatively, the intermediate segment 48 can be commensurate in thickness with the grip body 46, and, in one embodiment, is integrally formed with the grip body 46. In one embodiment, the intermediate segment 48 is of sufficient length to longitudinally space the grip body 46 and the end segment 50 at ergonomically desired positions for convenient, natural grasping by both hands of a user (i.e., one hand grasps the grip body 46 and the other hand grasps the end segment 50). For example, in one embodiment, the intermediate segment 48 defines a spacing between the grip body 46 and the end segment on the order of 5-15 inches. Alternatively, other dimensions, either lesser or greater, are also acceptable.

[0031] The end segment 50 is connected to the intermediate segment 48 opposite the grip body 46, and can assume a variety of shapes and sizes. In one embodiment, the end segment 50 forms a hole 84 that provides a convenient means for hanging the cleaning assembly 20 from a hook (not shown) or similar body when not in use. Alternatively, the hole 84 can be eliminated. Regardless, the end segment 50 preferably has an increased outer diameter as compared to the intermediate segment 48, sized for convenient grasping by a user (not shown).

[0032] In one embodiment in which the grip body 46, the intermediate segment 48, and the end segment 50 are separately formed and subsequently assembled, differing materials can be employed in the manufacture of each component. For example, in one embodiment, the grip body 46 is formed of a molded plastic, the intermediate segment 48 is a more rigid metal-based material, and the end segment 50 has a rubberized exterior for enhanced handling by a user (not shown). The end segment 50 need not have a rubberized exterior, and can be formed from any acceptable material such as polypropylene, thermoplastic rubber or ABS. The components are preferably rigidly affixed to one another, such as by frictionally mounting opposing ends of the intermediate segment within corresponding passages of the

grip body 46 and the end segment 50. For example, the grip body 46 can define a passage (not shown) adjacent the proximal end 56 thereof sized to frictionally receive and maintain a portion of the intermediate segment 48. Other attachment techniques (e.g., adhesive, mechanical connectors, etc.) are equally acceptable; conversely, the grip body 46, the intermediate segment 48 and the end segment 50 can be integrally formed. Even further, one or more of the grip body 46, the intermediate segment 48 and/or the end segment 50 can be eliminated. Regardless, the grip portion 40 is sized to slidably maintain the shaft 42 as described below.

[0033] As referenced above, the lever assembly 62 is connected to the grip body 46. The lever assembly 62 forms a portion of one embodiment of the locking mechanism 44. In particular, and with additional reference to FIG. 3A, the lever assembly 62 includes a lever arm 64, a pin 66, and a biasing device 68. In general terms, the lever arm 64 is pivotally mounted to the grip body 46 via the pin 66, with the biasing device 68 biasing the lever arm 64 to a locked position.

[0034] The lever arm 64 defines a trailing end 70, an intermediate portion 72 and a leading end 74 terminating in a finger 76. In one embodiment, and as best shown in FIG. 2B, the trailing end 70 has an increased width as compared to a remainder of the lever arm 64, and defines a central depression 78 (referenced generally) sized for receiving a user's thumb and/or finger (not shown). Alternatively, the trailing end 70 can assume a variety of other shapes and/or sizes. Regardless, and returning to FIG. 3A, the lever arm 64 is sized in accordance with the cavity 60 otherwise formed by the grip body 46, and is preferably configured such that an outer surface 80 thereof generally matches the contour of the outer surface 54 of the grip body 46, resulting in a streamlined appearance. The intermediate portion 72 provides a pivot point at the pin 66, and defines an inner surface 82 configured to interface with the biasing device 68. Finally, the leading end 74, and in particular the finger 76, extends downwardly (relative to the orientation of FIG. 3A) from the intermediate portion 72, and is adapted to selectively mate with a corresponding portion of the shaft 42, as described below.

[0035] The pin 66 can assume a variety of forms, and is generally constructed to pivotally connect the lever arm 64 to the grip body 46. Similarly, the biasing device 68 can have a number of different constructions, and is adapted to bias the lever arm 64 toward a locked position (i.e., biases the lever arm 64 clockwise (about the pin 66) relative to the orientation of FIG. 3A). For example, in one embodiment, the biasing device 68 is a torsional spring located within the cavity 60 and bearing against the inner surface 82 of the intermediate portion 72 between the pin 66 and the trailing end 70; this configuration biases the lever arm 64 to rotate or pivot clockwise relative to the orientation of FIG. 3A. Notably, the cavity 60 can be sized to limit overt movement or rotation of the lever arm 64 in response to the force generated by biasing device 68, such as by abutting a top surface of the lever arm 64 in the locked position of FIG. 3A. Alternatively, a number of other configurations for the lever assembly 62 can be employed, and the lever assembly 62 need not be permanently attached to the grip body 46.

[0036] With reference to FIGS. 2B and 3A, the shaft 42 is, in one embodiment, a rigid tubular structure defining first

and second ends 90, 92. With this in mind, the shaft 42 forms a longitudinal passage 94 (FIG. 3A) and a plurality of transverse locking recesses 96 (FIG. 3A). In one embodiment, the longitudinal passage 94 extends between the first and second ends 90, 92. Regardless, the longitudinal passage 94 is sized to receive and maintain a corresponding portion of the head assembly 32 as described in greater detail below. To this end, the shaft 42 includes an opposing pair of grooves 98 that further facilitate attachment of the head assembly 32 to the shaft 42 (it being understood that for purposes of clarification, the head assembly 32 is shown disassembled from the shaft 42 in FIG. 3A). As best shown in FIG. 2B, the recesses 96 are spaced along an exterior of the shaft 42 and are sized to selectively receive the finger 76 (FIG. 3A) provided by the lever assembly 62. The recesses 96 can be identically sized holes or other forms of indentations relative to an outer diameter of the shaft 42. Thus, in one embodiment, the recesses 96 form a complimentary portion of the locking mechanism 44. For example, and with reference to FIGS. 3A and 3B, when properly aligned, the finger 76 is received within a corresponding one of the recesses 96. Because the lever arm 64, and thus the finger 76, is biased to the locked position of FIGS. 3A and 3B via the biasing device 68, in this locked position, the locking mechanism 44 "locks" the grip portion 40 relative to the shaft 42. When desired, the locking mechanism 44 can be "released" by a user (not shown) pressing down (relative to the orientation of FIG. 3A) on the trailing end 70 of the lever arm 64 with sufficient force to overcome the biasing device 68. This action, in turn, pivots or rotates the finger 76 out or away from the recess 96, allowing the shaft 42 to freely slide relative to the grip portion 40.

[0037] Once the locking mechanism 44 is released (e.g., the user (not shown) maintains the lever arm 64 in the lifted position whereby the finger 76 is not within one of the recesses 96), the user can slide the shaft 42 relative to the grip portion 40 to position the handle 30 at a desired length. For example, the plurality of recesses 96 can include first, second and third recesses 96a-96c (as shown in FIG. 2B). In a retracted position, the grip portion 40 is positioned relative to the shaft 42 such that the finger 76 can engage within the first recess 96a. In a first extended position, the grip portion 40 is positioned relative to the shaft 42 such that the finger 76 nests within the second recess 96b upon releasing the lever arm 64 (with the biasing device 68 acting to bias the lever arm 64 toward the locked position in which the finger 76 extends within the second recess 96b once properly aligned). Thus, the handle 30 has an overall length in the first extended position greater than a length in the retracted position. Similarly, a second extended position of the handle 30, with a length greater than the first extended position, is achieved upon aligning the finger 76 with the third recess 96c. The number of extended positions available with the handle 30 is thus a function of the number of recesses 96 (it being understood that more or less of the recesses 96 can be provided as compared to the illustration of FIG. 2B). A spacing between adjacent ones of the recesses 96 can be uniform along a length of the shaft 42, or can vary. Regardless, the shaft 42 is preferably configured such that in the retracted position, the head assembly 32 abuts the distal end 58 of the grip body 46 thereby defining a minimal overall length of the cleaning assembly 20, as shown in FIG. 2A. In

one embodiment, the handle 30 has a length on the order of 17.5 inches when fully retracted, although other dimensions are also acceptable.

[0038] With the above construction, the head assembly 32 longitudinally moves relative to the grip portion 40, and in particular the grip body 46, with longitudinal movement of the shaft 42 relative to the grip portion 40. Thus, regardless of an extended length of the handle 30, a desired spacing between the grip body 46 and the end segment 50 is unchanged. Alternatively, the handle 30 can be constructed such that the grip body 46 is directly connected to the head assembly 32, with extension of the handle 30 being accomplished between the grip body 46 and the end segment 50. Regardless, and with specific reference to FIG. 3B, in one embodiment, the grip portion 40 and the shaft 42 are configured to minimize or eliminate undesired rotation of the shaft 42 relative to the grip portion 40, thus ensuring proper alignment between the finger 76 and a corresponding one of the recesses 96 otherwise provided by the shaft 42. In particular, the shaft 42/grip body 46 interface is non-circular in transverse cross-section such that the shaft 42 does not readily rotate relative to the grip body 46. For example, an outer surface of the shaft 42 (and corresponding shape of the passage 52 provided by the grip body 46) can be obround in transverse cross-section as shown; alternatively, other cross-sectional shapes such as rectangular, square, triangular, etc., are also acceptable.

[0039] Returning to FIGS. 2A and 2B, the head assembly 32 is adapted for connection to the handle 30 and generally includes a neck 110 and a head 112. As described in greater detail below, the neck 110 can be connected or assembled to the handle 30 and maintains the head 112. The head 112, in turn, provides a variety of cleaning surfaces and maintains the cleaning pad 24.

[0040] With reference to FIG. 4, in one embodiment the neck 110 is an elongated body configured to be pivotally attached to the head 112, and defines a handle end 114, a head end 116, and an intermediate region 118 extending between the ends 114, 116. The handle end 114 is adapted for mounting to the handle 30 (FIG. 2A) and in particular the shaft 42 (FIG. 3A). Mounting of the neck 110 to the handle 30 can be accomplished in a variety of fashions, and in one embodiment, the handle end 114 forms a pair of spaced legs 120a, 120b each including an outwardly extending tab 122 (the tab 122 associated with the leg 120a is visible in the view of FIG. 4). In particular, the handle end 114 extends from a shoulder 124 of the intermediate region 118, with the legs 120a, 120b combining to define an outer diameter that is less than an outer diameter of the shoulder 124. The legs 120a, 120b are inwardly deflectable toward one another, but naturally assume the position shown in FIG. 4. With this configuration, then, the handle end 114 is adapted for mounting to the first end 90 of the shaft 42 as best shown in FIG. 5 (that otherwise depicts a portion of the shaft 42 in cross-section and apart from the grip portion 40 (FIG. 2A)). More particularly, the neck 110 is assembled to the shaft 42 by inserting the handle end 114 within the passage 94 of the shaft 42 at the first end 90 thereof. In an unloaded state, the legs 120a, 120b combine to define an outer diameter that is slightly greater than a diameter of the passage 94. However, the deflectable nature of the legs 120a, 120b allows the handle end 114 to be inserted within the passage 94. Once the tabs 122 are aligned with correspond-

ing ones of the grooves 98 of the shaft 42, the legs 120a, 120b naturally deflect outwardly such that the tabs 122 nest within a corresponding groove 98, thus “locking” the neck 110 to the shaft 42. In one embodiment, the handle end 114/shaft 42 are configured such that the locked relationship is not readily reversed by a user (e.g., a user cannot easily remove the handle end 114 from the passage 94 once assembled) due to, for example, abutment between the tabs 122/shaft 42 along a plane (referenced generally at 125 in FIG. 5) that is perpendicular to a longitudinal axis of the shaft 42; alternatively, the handle end 114/shaft 42 can be configured such that the neck 110 is releasable from the shaft 42. Even further, the neck 110 and the shaft 42 can be integrally formed. Conversely, a variety of other interlocking designs can be employed. For example, the legs 120a, 120b can be provided as part of the shaft 42 for insertion within a corresponding passage in the neck 110.

[0041] Returning to FIG. 4, and as previously described, the head end 116 of the neck 110 is, in one embodiment, configured for pivoting or rotating connection to the head 112 and can include a transversely extending shank 126 and a rounded surface 128. Assembly of the head end 116 to the head 112 is a function of a construction of the head 112 itself, and thus is described in greater detail below. In general terms, however, the neck 110 can assume a variety of configurations varying from that shown, each capable of facilitating connection to the head 112.

[0042] The intermediate region 118 preferably has a contoured shape, tapering in outer diameter from a first section 130 adjacent the handle end 114 to a second section 132 adjacent the head end 116. This one preferred configuration renders the first section 130 of appropriate size and shape for convenient grasping by a user’s hand (not shown), such that a user can readily operate the cleaning assembly 20 (FIG. 1) via the neck 110. In other words, the handle 30 (FIG. 1) can be removed and a cleaning operation performed by simply grasping and manipulating the neck 110, and in particular the first section 130. To this end, the second section 132 is preferably sized and shaped for rigidly engaging a corresponding portion of the head 112, as described below. Alternatively, the intermediate region 118 can assume a wide variety of other shapes and sizes.

[0043] With continued reference to FIG. 4, in one embodiment the head 112 is generally triangular in shape and includes a plate 140, a support pad 142 and a mounting device 144 (referenced generally). In general terms, the plate 140 maintains the support pad 142 and is attachable to the neck 110. The support pad 142, in turn, maintains the mounting device 144 that is otherwise adapted to selectively receive the cleaning pad 24 (FIG. 1) as described below. Thus, the head 112 can be described as having a first side 146 (defined by the plate 140), a second side 148 (referenced generally in FIG. 4; defined by the support pad 142 opposite the first side 146), and a perimeter 149 defined by the support pad 142. The generally triangular shape in conjunction with a location and pivoting direction of the neck 110 relative to the head 112 creates an identifiable front 150 and a back 152, corresponding generally with a visual impression created upon a user when the cleaning tool assembly 20 is grasped at the handle 30 (FIG. 1).

[0044] With additional reference to FIGS. 6A and 6B (that better illustrate the above described front 150 and back

152), the plate 140 has a leading section 154, a central section 156 and a trailing section 158. The leading section 154 is defined at an apex of the triangular shape defined by the plate 140 (i.e., the front 150), whereas the trailing section 158 terminates at an edge 160 opposite the leading section 154 (i.e., the back 152). With this convention in mind, in one embodiment, central section 156 forms sides or “wings” 162a, 162b as lateral extensions from a longitudinal centerline 164 (FIG. 6A) that otherwise bisects the apex at the leading section 154.

[0045] In one embodiment, a cleaning implement 166 is attached to the plate 140 at the leading section 154 thereof. The cleaning implement 166 can assume a variety of forms, and in one embodiment is a plurality of bristles 168 (referenced generally) extending outward from a top surface 170 (FIG. 6B) of the plate 140. The bristles 168 can assume a variety of forms known in the art, and preferably including rearward bristles 168a and forward bristles 168b. As best shown in FIG. 6B, the rearward bristles 168a extend substantially perpendicular to a plane of the top surface 170 of the plate 140. In one embodiment, the forward bristles 168b extend at a non-perpendicular angle from the plate 140. In particular, the forward bristles 168b extend at a forward angle from the plate 140 toward the front 150 (i.e., each of the forward bristles 168b includes a base 172 and a free end 174; the forward bristles 168b are oriented such that the base 172 of each of the forward bristles 168b is closer to the trailing section 158 of the plate 140 as compared to the free end 174). This preferred, forwardly extending orientation facilitates placement of the forward bristles 168b in tight areas, such as corners and provides an ergonomically correct position when a user manipulates the cleaning assembly 20 (FIG. 1) via the neck 110 when the neck 110 is otherwise nested against the head 112 as described below. In one embodiment, the bristles 168 terminates in a single bristle 168c (FIG. 6A) adjacent the front 150; by including a single, forward-most bristle 168c, a point-like surface is provided for cleaning highly confined areas. Alternatively, the cleaning implement 166 can assume a variety of other forms, such as a scrubby pad, sponge, cloth, etc.

[0046] In addition to forming the sides 162a, 162b, the central section 156 forms an attachment body 180 (referenced generally in FIG. 4) configured for receiving the neck 110. In particular, the attachment body 180 includes, in one embodiment, a pair of spaced shoulders 182a, 182b extending from opposite sides of a groove 184. Each of the shoulders 182a and 182b forms an aperture 186 (shown for the shoulder 182a in FIG. 4) sized to receive a corresponding portion of the shank 126 associated with the head end 116 of the neck 110. In one embodiment, each of the shoulders 182a, 182b further defines a slot 188 (best shown in FIG. 6A) that guides the shank 126 into the corresponding aperture 186 upon assembly of the neck 110 to the head 112. Regardless, the apertures 186 are configured to facilitate pivoting attachment of the head end 116 to the plate 140, with the groove 184 providing sufficient clearance for the rounded surface 128 of the neck 110 during movement of the neck 110 relative to the head 112. Alternatively, the attachment body 180 can assume a number of other configurations capable of pivotally connecting the neck 110 to the head 112. Even further, the neck 110 can be permanently mounted to the head 112.

[0047] In one embodiment, the attachment body 180 is configured to position the neck attachment point (e.g., the apertures 186) approximately at a center point of the plate 140 (plus or minus 0.5 inch) relative to a longitudinal length thereof. More particularly, and as best shown in FIG. 6A, the apertures 186 are in close proximity to a longitudinal center point C of the plate 140. This one preferred location promotes the application of a pushing force onto the plate 140, and thus the head 112, via the neck 110 (FIG. 4) that is otherwise attached to the handle 30 (FIG. 1) at a location that does not cause the head 112 to “flip” up or down (i.e., the front 150 or back 152 raises away from the surface being cleaned) when the neck 110 is otherwise positioned at an angle relative to the head 112. In other words, during normal use, the handle 30, and thus the neck 110, will extend at an upward angle (e.g., in the range of 30-75 degrees) relative to the head 112. In this orientation, a pushing force applied to the head 112 via the neck 110 would have a tendency to cause the head 112 to translate or “flip” upwardly (pivoting at the front 150 or the back 152) if the neck 110/head 112 connection point were offset from the center point C (e.g., greater than 0.5 inch). By centrally positioning the neck 110 connection point relative the head 112, undesired pivoting of the head 112 relative to the surface being cleaned is avoided.

[0048] The sides 162a, 162b defined by the central section 156 are preferably symmetrical in nature, each having a contoured interior area 200 and a planar exterior area 202. The contoured interior areas 200 combine to define the groove 184, and have an increased thickness as compared to the exterior areas 202. In this regard, the contoured interior areas 200 each define a lateral protrusion 206 over the groove 184, as best shown in FIG. 6A. A distance between the corresponding lateral protrusions 206 is sized to be slightly smaller than an outer diameter or dimension of the second section 132 (FIG. 4) of the neck 110 (FIG. 4). Thus, the neck 110 can be selectively retained within the groove 184 via frictional engagement with the protrusions 206, as shown for example in FIG. 6B.

[0049] In addition, the plate 140, and in particular the sides 162a, 162b, are configured, in one embodiment, to distribute a force applied to the head 112 via the neck 110 to exterior areas of the head 112. By way of explanation, a force applied to the head 112 via the neck 110 will be centralized at the point of attachment (i.e., the attachment body 180). During use, it is desirable for this force to be distributed across a majority of the cleaning pad 24 (FIG. 1) that is otherwise attached to the second side 148 of the head 112. By forming the sides 162a, 162b to each have the thicker interior area 200 (i.e., adjacent the attachment body 180) and the thinner exterior area 202, the force is more even distributed across the cleaning pad 24. In a preferred embodiment, the plate 140 is formed of a relatively rigid material (e.g., aluminum, stainless steel, plastic etc. that further promotes this force distribution. Alternatively, other configurations for the plate 140 can be employed.

[0050] Finally, the trailing section 158, and in particular the trailing edge 160, preferably forms a cutout region 210 (FIG. 6A) that facilitates removal of the cleaning pad 24 (FIG. 1). Features of the cutout region 210 are best described with reference to a corresponding feature of the support pad 142, and thus are provided below. In general

terms, however, the cutout region 210 is defined as an inward extension of the trailing edge 156 toward the leading section 154.

[0051] The support pad 142 preferably has a perimeter shape mimicking a shape of the plate 140, and thus, in one embodiment, is generally triangular. Thus, in one embodiment, and with reference to FIG. 6A, the support pad 142 defines a leading side 220 at an apex (e.g., the front 150) of the triangular shape and a trailing side 222 (e.g., the back 152) opposite the leading side 220. The support pad 142 is preferably formed of a compliant material, such as foam, preferably closed cell and even more preferably polyethylene. In one alternative embodiment, the support pad 142 is capable of retaining liquid such as water, though this may not be desirable for certain applications. Although the support pad 142 has a shape approximating a shape of the plate 140, is larger than the plate 140 as best shown in FIG. 6A. With this construction, then, the perimeter 149 of the head 112 is defined by a thickness of the support pad 142. In particular, the perimeter 149 can be described as having a plurality of connected edge cleaning surfaces 223 (such as surfaces 223a, 223b, and 223c). In addition, the trailing side 222 of the support pad 142 is defined by opposing end segments 224a, 224b and a central, cutout or cutout segment 226. The end segments 224a, 224b are approximately coplanar, with the cutout segment 226 extending inwardly relative to the leading side 220. In one embodiment, the cutout segment 226 approximates a half-circle, although any other shape or combination of shapes is equally acceptable. As described below, the cutout segment 226 provides a convenient location for a user (not shown) to grasp and remove the cleaning pad 24 (FIG. 1) otherwise attached to the head 112.

[0052] Returning to FIG. 4, the mounting device 144 can assume a variety of forms and in one embodiment is a plurality of connection bodies 230. The connection bodies 230 are configured to selectively retain the cleaning pad 24 (FIG. 1) and include, in one embodiment, appropriate material such as a multiplicity of micro-hooks or micro-loops. With this one construction, the connection bodies 230 are mounted to the support pad 142, extending from the support pad 142 opposite the plate 140 as shown in FIG. 6B. To promote relatively uniform attachment of the cleaning pad 24 relative to a perimeter of the head 112, six of the connection bodies 230 are provided, strategically positioned at the locations shown in dashed lines in FIG. 9. In one embodiment, the connection bodies 230 are fastened to the support pad 142 at locations commensurate with a perimeter of the plate 140. As described above, one embodiment of the plate 140 distributes an applied force to the perimeter thereof, thus, by locating the connection bodies 230 “beneath” a perimeter of the plate 140, this distributed force promotes a more complete connection between the cleaning pad 24 and the connection bodies 230. Alternatively, more or less of the connection bodies 230 can be provided and at different locations. Further, the mounting device 144 can assume an entirely different configuration. For example, the mounting device 144 can include or be replaced by one or more components that “wrap” the cleaning pad 24 along sides/top of the head 112.

[0053] Returning to FIG. 4, assembly of the head 112 includes fastening the support pad 142 to the plate 140. For example, the support pad 142 can be affixed to the plate 140

via an appropriate adhesive. Alternatively or in addition, mechanical fasteners can be employed. Similarly, the mounting device **144** (e.g., the connection bodies **230** in accordance with one embodiment of the present invention) can be attached to the support pad **142** (or the plate **140**) in a variety of fashions, such as an adhesive. Finally, the neck **110** can be pivotally assembled to the head **112** via connection of the head end **116** to the attachment body **180**.

B. Cleaning Pad

[0054] Returning to **FIG. 1**, the cleaning pad **24** can assume a wide variety of forms. For example, the cleaning pad **24** can be a wipe, a scrubbing pad, bristles, sponge, etc., or a combination of different materials useful for cleaning; thus, the term “cleaning pad” as used in this specification, including the claims, is inclusive of a wide variety of material constructions and is not limited to a conventional “pad”. In one embodiment, however, the cleaning pad **24** is formulated to provide, or is loaded with a cleaning solution, and in particular a bleaching agent, in dry form. Such a loaded wipe or pad would be able to remove soap scum, hard water stains and mildew with minimal scrubbing, a feature desired by most users, and serve as a disinfectant. In general terms, the bleach is applied in a dry form in the cleaning pad **24** and is activated upon contact with water to perform a cleaning operation. The term “dry” is defined to mean “dry to the touch” such as by having a moisture content of less than 5%, preferably not greater than 2% under normal ambient conditions. A surfactant carried by the cleaning pad **24** imparts a foaming characteristic and assists in uniformly applying bleach to the surface being cleaned, and serves to clean debris such as soap scum. By providing bleach as part of the cleaning pad **24** in accordance with one embodiment, a user is away from fumes that are traditionally associated with chemicals that need to be sprayed on to the surface to be cleaned from a spray bottle or aerosol container. Delivery of a dry bleach composition via the cleaning pad **24** also minimizes streaking and leaves minimal or no residue that might otherwise require application of a specially formulated rinsing agent.

[0055] For example, in one embodiment, the cleaning pad **24** is a two-sided, non-woven wipe comprised of two or more layers of non-woven substrates. More particularly, and with reference to **FIG. 7**, the cleaning pad **24** includes a first layer **300**, a second layer **302** and a bleach composition **304**. The first layer **300** defines a first side **306** of the cleaning pad **24**, whereas the second layer **302** defines a second side **308**. The bleach composition **304** is encapsulated between the first and second layer **300, 302**. For ease of illustration, the bleach composition **304** is shown as being applied in discrete locations; as described in greater detail below, the bleach composition **304** can be randomly scattered between the layers **300, 302**. Further, while the cleaning pad **24** is shown in **FIG. 7** as having two of the non-woven-based layers **300, 302**, in alternative embodiments, additional non-woven layers can be included.

[0056] The first layer **300** and the second layer **302** can assume a wide variety of forms, and may or may not be identical. For example, the layers **300, 302** can include any non-woven substrate, such as 100% PET or polyester, that preferably does not degrade in the presence of bleach. Alternatively, a variety of other non-woven constructions are also acceptable. For example, the fibers comprising the

layers **300, 302** are preferably synthetic or manufactured, but can include natural fibers. As used herein, the term “fiber” includes fibers of indefinite length (e.g., filaments) and fibers of discrete length (e.g., staple fibers). The fibers are used in connection with one or both of the layers **300, 302** and can be multicomponent fibers (i.e., a fiber having at least two distinct longitudinally extensive structure polymer domains in the fiber cross-section). Regardless, useful fibrous materials include, for example, rayon (viscose), polypropylene, nylon, etc. The layers **300, 302** can also be comprised of varying blends of the above-mentioned fibers that may or may not be of varying size or denier. The layers **300, 302** can be formed by any known process such as hydroentangling, thermal bonding, and spun bonding to name but a few.

[0057] In one embodiment, the second layer **302** is more lofty as compared to the first layer **300** (e.g., the second layer **302** is a high loft needle-punched non-woven substrate whereas the first layer **300** is a “tight” needle-punched non-woven substrate); with this configuration, the bleach composition **304** can be released primarily through the second layer **302**. In a further embodiment, the second layer **302** is thicker than the first layer **300**. For example, the second layer **302** can have a thickness in the range of 0.05-0.5 inch, whereas the first layer **300** can have a thickness in the range of 0.02-0.2 inch, although other dimensions are also acceptable.

[0058] In one embodiment, the first layer **300** forms the first side **306** to facilitate attachment to the mounting device **144** (**FIG. 4**), whereas the second layer **302** forms the second side **308** in a manner that promotes a desired cleaning operation. With this in mind, in one embodiment, the first layer **300** includes a non-woven substrate that defines a surface (i.e., the first side **306**), either integrally or by an additional material attached to the non-woven substrate, that releasably engages the connection bodies **230** (**FIG. 4**). For example, where the connection bodies **230** form a plurality of micro-hooks, the first side **306** of the cleaning pad **24** can include or form a plurality of corresponding micro-loops, or vice-versa. Conversely, the second layer **302** includes, in one embodiment, a non-woven substrate that forms a cleaning surface (i.e., the second side **308**), either integrally or by an additional material attached to the non-woven substrate, capable of cleaning or scrubbing a surface. For example, the second layer **302** can be a needle-tacked web that is laminated to or coated with a resin bonded or printed scrubbing layer (e.g., an acrylic abrasive). In other words, the second layer **302** either inherently forms the second side **308** as a scrubby surface, or a scrubby surface can be applied (e.g., laminated, coated, printed, etc.) to the second layer **302**. Alternatively, a wide variety of other configurations are also acceptable. In one embodiment, one or both of the layers **300, 302** are capable of absorbing water and/or collecting dirt/debris.

[0059] The bleach composition **306** includes a bleaching agent and a nonionic or anionic surfactant, and may include other inert ingredients such as a binder, chelating agent, fragrance, etc. With the preferred bleach/surfactant formulation, the bleach composition **306**, and thus the cleaning pad **24**, can be presented to a user in dry form, with the user exposing the cleaning pad **24** to water during use. Alternatively, the cleaning pad **24** can be configured to be presented to a user in wet form. With the one embodiment in which the

cleaning pad **24** is initially dry, the bleach composition **306** includes a mixture of a solid bleach and solid surfactant. For example, in one embodiment, the bleach component or agent is sodium dichloroisocyanurate, dihydrate salt (available, for example, from 3V Inc. of Charlotte, N.C. under the product designation "Oxidan DCN/WSG"). Alternatively, a number of other bleaching agents, such as hypochlorite (e.g., calcium hypochlorite), peroxide or peroxy-based compounds (e.g., urea hydrogen peroxide, calcium peroxide, zinc peroxide, Mg peroxide, etc.), peroxy carboxylic acid or hydrophilic precursors thereof, perboric acid or precursors thereof, percarbonic acid or precursors thereof, hypochloric acid or hypobromic acid or precursors thereof, to name but a few, are also acceptable. Other oxygen-releasing bleaching compounds useful with the present invention include sodium perborate, sodium mono-persulfate (available, for example, from Dupont Company under the trade name Oxone™), etc. Further, the compound Peroxydone™ XL-10 from ISP Technologies Inc., that contains hydrogen peroxide (bleaching agent) and poly-vinyl pyrrolidinone (a film-forming polymer that can enhance the gloss of the surface being cleaned) is another example of an acceptable bleach composition.

[0060] The surfactant can also assume a variety of forms appropriate for use with the selected bleaching agent. For example, in one embodiment, the surfactant is sodium dodecylbenzene sulfonate (available, for example, from Stepan Co. of Northfield, Ill. under the product designation "Nacconol 90G"). Alternatively, a number of other surfactants, such as anionic surfactants (e.g., alkyl ethoxy sulfates), amphoteric surfactants (e.g., amine oxides), non-ionic surfactants (e.g., alcohol ethoxylates, alkyl aryl phenols), zwitterionic surfactants, etc. are also available. The surfactant chosen can also be used with other agents such as chelators, builders, sequestrants, etc., as described below.

[0061] Where desired, the bleach composition **304** can further include an appropriate binder. For example, caprolactam (available, for example, from Dow Chemical Co. of Midland, Mich. under the product designation "Tone Polymer, P767") has been found to be useful in binding or adhering the layers **300**, **302**. Alternative binders include, for example, copolyesters, copolyamides, ethylene-vinyl acetate (EVA) and other hot melt powder adhesives. The binder preferably exhibits melting below 150 degree F. for low temperature adhesion of the two non-woven layers **300**, **302**, greatly assisting in handling of the surfactant and bleaching agent(s) below their flash points. Further, the binder can assist in the controlled release of the cleaning chemical.

[0062] The bleach composition **304** can further include other components, such as bleach activator(s) (e.g., tetracetyl ethylene diamine, NOBS, acyl triethyl citrate, nonylamide of peradipic acid, etc.); bleach catalyst(s) (e.g., complexes of metals such as Co, Mn and Fe, etc.); thickening agent(s) (water-soluble thickening polymer or solvent such as propylene glycol); fragrance(s); etc.

[0063] The bleach composition **304** preferably includes 60%-95% surfactant, 5%-40% bleach (more preferably approximately 5%-10% bleach), and 0%-30% binder. For example, acceptable bleach compositions have been formulated with surfactant/bleach/binder ratios of 67/23/10; 80/10/10; 70/10/20; and 90/10/0. In one embodiment, the

bleach composition **304** is provided in dry form, with a mass of approximately 5-20 grams per cleaning pad, more preferably 5-10 grams per cleaning pad, with a targeted coating amount of 250-400 g/m².

[0064] Regardless, in one embodiment, the bleach composition **304** is formed as a powder blend (e.g., milling the individual powder ingredients) and is coated on to the first or second layer **300** or **302** (and subsequently encapsulated by the other layer **300** or **302**). In one preferred embodiment, the bleach composition is scatter coated on to the first or second layer **300** or **302**. Scatter coating of the dry powder bleach composition **304** avoids exposing the bleaching agent to moisture or water that would otherwise undesirably activate the bleaching agent and enable the pre-mature release of chlorine during manufacture. Alternatively, the bleach composition can be coated via calender roll. Even further, the bleach composition **304** can be formed as a viscous paste (e.g., mixture of surfactant, bleaching agent and a solvent (e.g., 10% propylene glycol)) that is knife coated or extrusion coated on to the first or second layer **300** or **302** to form one or more "stripes" (e.g., akin to the illustration of FIG. 7). Even further, the bleach composition **304** can be deposited directly onto the fibers used to subsequently manufacture one or both of the non-woven layers **300** and/or **302**. The layers **300**, **302** can then be laminated together using, for example, a hot melt adhesive, needle-punching or similar dry-processing techniques. Even further, component(s) of the bleach composition **304** can be provided (e.g., scatter coated) on to different layers of the cleaning pad. For example, FIG. 8 illustrates an alternative embodiment cleaning pad **320** including a first layer **322**, a second layer **324**, a third layer **326**, a first portion bleach composition **328** and a second portion bleach composition **330**. In one embodiment, the first portion bleach composition **328** includes a mixture of surfactant and binder that is coated (e.g., scatter coated) on to the first layer (non-woven) **322**. Following application of the second layer **324** (as described below), the second portion bleach composition **330** in the form of a bleaching agent is coated (e.g., scatter coated) on to the second layer **324** and subsequently encapsulated by the third layer **326**. This one technique assists in the manufacture of a multi-layer construction that lends itself to being more conformable during cleaning tasks. Also, the separation of the surfactant and bleaching agent by different non-woven layers can result in better controlled-release properties.

[0065] Returning to the embodiment of FIG. 7, the layers **300**, **302** can be bonded together in a variety of fashions to ensure encapsulation of the bleach composition **304** that otherwise facilitate a desired, slow release of the cleaning agents during use. For example, where the bleach composition **304** includes a binder/adhesive, the binder/adhesive facilitates adhesion of the two non-woven substrate layers **300**, **302** together. The resultant laminate can be further laminated via ultrasonic bond(s) or seal(s) that improve an overall aesthetic appeal of the cleaning pad **24** as well as capturing of the powder bleach composition **304**. Along these same lines, the layers **300**, **302** can first be bonded (e.g., ultrasonically bonded) along two or more corresponding edges to define a pocket. The bleach composition **304** is then dispensed into this pocket, followed by bonding of the remaining, corresponding edges of the layers **300**, **302** to thus encapsulate the bleach composition. Even further, the layers **300**, **302** (or additional layers) can be bonded along

two or more corresponding edges in a manner that defines two pockets (either simultaneously or consecutively). With this approach, a portion of the bleach composition 304 (e.g., the first portion bleach composition 328 of FIG. 8) is dispensed into the first pocket and a remaining portion of the bleach composition 304 (e.g., the second portion bleach composition 330 of FIG. 8) is dispensed into the second pocket.

[0066] Further bonding of the layers 300, 302 encapsulates the bleach composition 304 portions.

[0067] Alternatively, where the bleaching composition 304 does not include a binder, the bleach composition 304 can be coated (e.g., scatter coated) on to the first layer 300, followed by needle-tacking or needle-punching fibers of the second layer 302 through the first layer 300 to encapsulate and hold the powdered bleach composition 304 between the two layers 300, 302.

[0068] It will be understood that the above descriptions reflect but a few possible configurations of the cleaning pad 24. Once again, while in one embodiment the cleaning pad 24 includes a bleach composition, in other embodiments, the cleaning pad 24 does not include a bleach composition. Further, the cleaning pad 24 can include one or more differing cleaning characteristics (e.g., sponge, scouring surface, bristles, encapsulated cleaning chemicals, etc.). Preferably, the cleaning pad 24 has a size and shape generally akin to that of the second side 148 (FIG. 4) of the head 112 (e.g., the planar size and shape of the support pad 142) and thus is, in one embodiment, generally triangular. With additional reference to FIG. 9 that otherwise shows the cleaning pad 24 assembled to the head 112, however, the cleaning pad 24 does not include a cutout feature (i.e., does not incorporate a feature or shape akin to the cutout segment 226 of the support pad 140). Instead, a trailing edge 340 of the cleaning pad 24 is approximately linear in one embodiment. As described in greater detail below, this relationship effectively defines a grasping region 342 on the cleaning pad 24 that is otherwise "exposed" via the cutout segment 226 and that facilitates removal of the cleaning pad 24. Alternatively, the cleaning pad 24 can have any other shape and/or size.

C. Cleaning Assembly Kit

[0069] Returning to FIG. 1, regardless of an exact configuration of the cleaning pad 24, the cleaning tool assembly 20 is, in one embodiment, made available to consumers in the form of a kit. In particular, and with reference to FIG. 10, one embodiment of a kit 350 in accordance with the present invention includes the handle 30, the head assembly 32, one or more of the cleaning pad(s) 24, and a container 352. In kit form, the handle 30, the head assembly 32 and the cleaning pad 24 are separately packaged within the container 352 for subsequent assembly by a user (not shown). In one embodiment, the extendable nature of the handle 30 enables the resultant cleaning assembly 20 (FIG. 1) to be highly conducive to upright operation by a user (e.g., a user can stand while performing a cleaning task on a floor using the cleaning assembly 20), yet packaged in the container 352 that is otherwise properly sized for retail sales. By way of reference, most retailers desire that products being displayed for sale be as small possible so as to not occupy an inordinate amount of shelf space (or inventor storage space). Normally, products having elongated handles (such as a mop or broom)

must be sold in a non-packaged form, typically hanging from a hook or similar device; retailers view this technique as being inefficient as a relatively large space is required to ship, store and display the items. In accordance with one embodiment of the present invention, these concerns are overcome.

[0070] In particular, in one embodiment, a combination of the handle 30 and the neck 110 (that otherwise combine to define an effective length of the cleaning tool assembly 20) is extendable to length of at least 28 inches, more preferably a length of at least 30 inches, and even more preferably a length of at least 32 inches. Conversely, due to the retractable nature of the handle 30 and, in some embodiments, an ability to quickly disassemble and assemble components of the handle 30 (e.g., the end segment 50, the intermediate segment 48 and/or the grip body 46 can be disassembled from one another within the container 352), the container 352 has a length (or major dimension) of not more than 14 inches, more preferably not more than 13 inches, and even more preferably not more than 12 inches, and even more preferably approximately 11.25 inches. With this in mind, the container 352 can assume a variety of forms, such as a cardboard or paper box, plastic packaging, etc. In an alternative embodiment, the cleaning tool assembly 20 (FIG. 1) is provided to consumers in a fully assembled form.

D. Method of Use

[0071] Regardless of how initially provided to a user, the cleaning tool assembly 20 of the present invention is highly suitable for performing cleaning tasks in a variety of environments, for example cleaning hard surfaces in a bathroom. In many cleaning operations, multiple different cleaning surfaces are normally encountered, presenting unique obstacles, such as composition of the surface to be cleaned (e.g., grout, tile, etc.), physical constraints associated with the surface to be cleaned (e.g., corners, floors, high walls, etc.), debris being removed (e.g., soap scum, hard water stains, etc.), augmented end results (e.g., disinfecting, gloss finishing, etc.) to name but a few. The cleaning assembly 20 can address one or more or all of these concerns as follows.

[0072] A user (not shown) can conveniently clean a floor or wall or other surface beyond a normal reach of the user via the extendable handle 30. For example, and with reference to FIGS. 2A and 2B, the handle 30 can be extended to a desired length that otherwise promotes ready cleaning of the surface in question by releasing the locking mechanism 44 and extending the shaft 42 (and thus the head assembly 32) relative to the grip portion 40 as previously described. Once the handle 30 is at a desired length, the locking mechanism 44 is actuated (e.g., the lever arm 64 is released) to re-engage the grip portion 40 with the shaft 42. The cleaning pad 24 can then be employed to clean the surface in question via simple manipulation of the handle 30 while the user remains standing. For example, the cleaning pad 24 can be used to clean a bathroom floor or wall. To this end, and in accordance with one embodiment in which the cleaning pad 24 includes a dry bleach (e.g., the bleach composition 304 of FIG. 7), the user can expose the cleaning pad 24 to water to promote release of the bleaching agent on to the surface in question. Notably, due to the extended length of the handle 30, the cleaning pad 24 (and thus the contained bleaching agent in accordance with one embodiment) is spaced a relatively large distance from the

user's face (especially as compared to conventional bleach applications in which a wipe or sponge is held in the user's hand and used to apply the bleach along a surface), thus minimizing the possibility of an adverse reaction to the bleaching agent by the user. Further, as previously described, a pushing force placed on the handle 30 is relatively uniformly distributed across the head 112, and thus the cleaning pad 24, to promote substantial interface between the surface being cleaned and a majority of the cleaning pad 24 surface otherwise facing the surface being cleaned.

[0073] In conjunction with, or apart from (either before or after cleaning with the cleaning pad 24), the handle 30 can be manipulated to present one of the cleaning edge surfaces 223 (FIG. 6A) provided by the support pad 142 to another surface to be cleaned. For example, the cleaning edge surface 223 can be used to clean (e.g., scrub) grout on a tile wall. Regardless, the cleaning edge surface 223 presents, in one embodiment, a cleaning characteristic differing from the cleaning pad 24. For example, the preferred foam construction of the support pad 142 that otherwise defines the cleaning edge surface 223 provides a compliant attribute that more readily engages rough surfaces, such as grout, and easily conforms to corners and curved surfaces.

[0074] In conjunction with, or apart from (either before or after cleaning with the cleaning pad 24 and/or the cleaning edge surface 223), the handle 30 can be manipulated to present the cleaning implement 166 to another surface to be cleaned. For example, in one embodiment in which the cleaning implement 166 is a plurality of bristles 168, the bristles 168 can be employed to scrub a surface, such as tile, in an effort to clean hard-to-remove debris such as soap scum or hard water stains. Regardless, to facilitate providing adequate pressure on to the cleaning implement 166 during use, the handle 30 can be maneuvered to a nested position in which the neck 110 is engaged by the head 112. For example, and as previously described, the neck 110 can be tilted or pivoted relative to the head 112 (for example via manipulation of the handle 30) such that the neck 110 is engaged within the groove 184 of the head 112. In this nested position, the head 112 does not move relative to the neck 110/handle 30, thus promoting rigorous cleaning/scrubbing with the cleaning implement 166. Regardless, in one embodiment, the cleaning implement 166 provides a cleaning characteristic that differs from the cleaning pad 24 and the cleaning edge surface 223.

[0075] Each of the above cleaning operations (i.e., cleaning with the cleaning pad 24, the cleaning edge surface 223, and the cleaning implement 166) is accomplished, in one embodiment, with the cleaning assembly 20 remaining intact. That is to say, three distinct cleaning activities can be preformed by the cleaning assembly 20 alone, without altering the cleaning assembly 20 in any way. The cleaning assembly 20 further facilitates additional cleaning operations with only minor alterations. For example, the handle 30 can be removed from the head assembly 32. The user can then perform a cleaning task by simply grasping the neck 110 (such as along the first section 130). To this end, the neck 110 can be locked to the head 112 (such as via the attachment body 180 (FIG. 4) as previously described), such as where it is desired to use the cleaning implement 166 in a confined space. Alternatively, the neck 110 can remain pivotable relative to head 112.

[0076] In addition, the cleaning assembly 20 is, in one embodiment, adapted to promote easy replacement of the cleaning pad 24 with another cleaning pad (not shown) that is either identical to, or different from, the cleaning pad 24. For example, where the cleaning pad 24 carries a bleach composition, once the user detects that the bleach composition has been depleted, the cleaning pad 24 can be replaced by another, bleach composition-carrying cleaning pad. Alternatively, the replacement cleaning pad can have a different cleaning characteristic. For example, the replacement cleaning pad can be a scrubbing pad. Alternatively, the replacement cleaning pad can be a cloth or similar structure suited for drying a surface being cleaned. Even further, the replacement cleaning pad can include or carry a finishing composition, such as a finishing composition available under the trade name ScotchGard™, available from 3M of St. Paul, Minn.

[0077] Regardless of the replacement pad configuration, removal of the cleaning pad 24 from the cleaning tool 22 is, in one embodiment, easily performed by the user (not shown). With specific reference to FIG. 9 that otherwise depicts a top view of the head 112 having the cleaning pad 24 attached thereto, a user grasps the grasping region 342 of the cleaning pad 24 through the cutout segment 226 provided by the head 112. The cutout segment 226 affords access to a sufficient surface area of the cleaning pad 24 to allow for forceful pulling of the cleaning pad 24 from the head 112 (e.g., the user can apply sufficient pulling force to the cleaning pad 24 to disengage the cleaning pad 24 from the connection bodies 230). Once removed, the replacement cleaning pad (not shown) is readily assembled to the head 112 in a similar fashion. Alternatively or in addition, the cleaning pad 24 can include a tab (not shown) or similar structure that can be grasped by a user during a cleaning pad removal operation. Alternative releasable connection designs can also be employed, such as providing the cleaning pad 24 with an elastic perimeter that "captures" the head 112; forming the cleaning pad 24 to include a pocket that nests about the head 112; etc. Regardless, the head 112 remains part of the cleaning tool 22, and only the cleaning pad 24 is removed/replaced, thus minimizing disposal/replacement costs.

[0078] The cleaning tool assembly, cleaning tool, kit, cleaning pad and method of use of the present invention provides a marked improvement over previous designs. Multiple hard surfaces of a room or other area are readily cleaned using a single device that provides diverse cleaning characteristics. The extendable handle allows the user to stand while cleaning high or low surfaces with minimal exertion. The handle can further pivot with respect to the head where desired, and can also be locked with respect to the head where desired. The cleaning pad can dispense bleach where desired, and is easily replaced.

[0079] Although specific embodiments have been illustrated and described herein, it will be appreciated by those of ordinary skill in the art that a variety of alternate and/or equivalent implementations may be substituted for the specific embodiments shown and described without departing from the scope of the present invention. For example, the cleaning tool can be configured to contain a volume of liquid (e.g., water) that is selectively dispensed during use. One such possible configuration includes the handle being hollow and in fluid communication with an exit port(s) on the

head; liquid stored in the handle can thus be dispensed via the exit port(s). Alternatively, the head can be configured to define a scoop-like top surface; with this design, water or other liquid can be temporarily stored in the scoop-like surface and then dispensed as desired by the user, such as when cleaning a wall. Similarly, the head can include a sponge-like material that holds water or other liquid; during use, as pressure is applied by the user to the head (such as via the handle), the contained water or other liquid is then released from the sponge-like material. Alternatively, the head can be configured to form or include a thermoplastic rubber (TPR) or similar material, allowing the head to be used as a squeegee.

What is claimed is:

1. A cleaning tool assembly for cleaning hard surfaces, such as bathroom surfaces, the cleaning assembly comprising:

a cleaning tool including:

a handle;

a head including a plate and a support pad;

wherein the plate includes a first side connected to the handle, a second side opposite the first side, and a perimeter;

wherein the support pad includes a first side connected to the second side of the plate, a second side, and a perimeter extending beyond the perimeter of the plate;

wherein the support pad is a compliant, closed-cell foam;

a cleaning pad attached to the second side of the support pad.

2. The cleaning tool assembly of claim 1, wherein the closed-cell foam is capable of retaining water.

3. The cleaning tool assembly of claim 1, wherein the handle is transitionable between a longitudinally extended position and a longitudinally retracted position.

4. The cleaning tool assembly of claim 1, wherein the first side of the plate includes a contoured interior area and a planar exterior area, wherein the planar exterior area has a thickness less than a thickness of the support pad.

5. The cleaning tool assembly of claim 1, wherein the foam is polyethylene.

6. The cleaning tool assembly of claim 1, wherein the perimeter of the support pad mimics the perimeter of the plate.

7. The cleaning tool assembly of claim 1, wherein the perimeter of the plate and the perimeter of the support pad include a cut out region.

8. The cleaning tool assembly of claim 1, wherein the second surface of the plate is substantially planar and the first surface of the support pad is substantially planar.

9. A cleaning tool assembly for cleaning hard surfaces, such as bathroom surfaces, the cleaning assembly comprising:

a cleaning tool including:

a handle;

a head including a plate and a support pad;

wherein the plate includes a first side connected to the handle, a substantially planar second side opposite the first side, and a perimeter;

wherein the support pad includes a substantially planar first side connected to the second side of the plate, a substantially planar second side including at least one mounting device, and a perimeter extends beyond and mimics the perimeter of the plate;

wherein the support pad is a compliant, closed-cell foam;

a cleaning pad attached to the mounting device on the second side of the support pad.

10. The cleaning tool assembly of claim 9, wherein the closed-cell foam is capable of retaining water.

11. The cleaning tool assembly of claim 9, wherein the handle is transitionable between a longitudinally extended position and a longitudinally retracted position.

12. The cleaning tool assembly of claim 9, wherein the first side of the plate includes a contoured interior area and a planar exterior area, wherein the planar exterior area has a thickness less than a thickness of the support pad.

13. The cleaning tool assembly of claim 9, wherein the foam is polyethylene.

14. The cleaning tool assembly of claim 9, wherein the perimeter of the plate and the perimeter of the support pad include a cut out region.

15. A cleaning tool assembly for cleaning hard surfaces, such as bathroom surfaces, the cleaning assembly comprising:

a cleaning tool including:

a handle;

a head including a plate and a support pad;

wherein the plate includes a first side that pivotally connects to the handle, a substantially planar second side opposite the first side, and a perimeter;

wherein the support pad includes a substantially planar first side connected to the second side of the plate, a substantially planar second side including at least one mounting device, and a perimeter that extends beyond and mimics the perimeter of the plate;

wherein the support pad is a compliant closed-cell polyethylene foam capable of retaining water;

wherein the plate and the support pad have a first end narrower than a second end and a cut out region at the second end;

a cleaning pad attached to the mounting device on the second side of the support pad.

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