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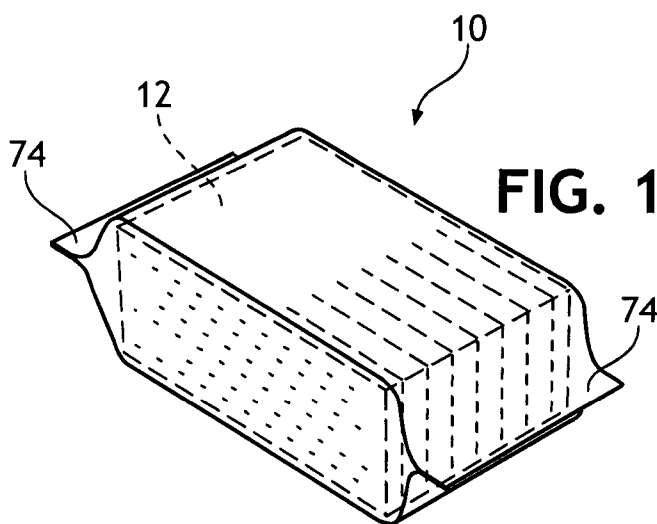
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(54) Title: SINGLE-USE TOILET BRUSH HEAD



(57) Abstract: Disclosed is a disposable
brush head assembly that may be used in
conjunction with a toilet cleaning handle or
wand. The assembly is a brush head pad that
is disposed inside a water soluble wrapper for
ease of handling.

SINGLE-USE TOILET BRUSH HEAD

BACKGROUND OF THE INVENTION

- 5 Toilet brushes are typically used to swirl cleaning chemicals around a toilet bowl and then to scrub the sides of the bowl with those chemicals and water, so as to assist in removing grime along the bowl sides. Such brushes usually have brush bristles that are permanently affixed to the handle of the brush.
- 10 After using such brushes a consumer will typically attempt to rinse off the brush by swirling it in the bowl water. This rinsing process may be repeated through one or more additional rinsing flushes. While this may rinse off most of the cleaning chemicals and grime typically found in the toilet, the brushes still normally retain some contaminants even after extensive rinsing. As a result, such brushes can develop an unpleasant smell or
- 15 appearance during storage.

Regardless, such brushes will be dripping wet immediately after use. The consumer sometimes will therefore shake the brush over the toilet to try to remove most of the excess water, and then quickly move the brush into a storage bucket. This can result in some

20 liquid being splashed or dripped on the floor. In any event, a storage place for the brush is needed between uses where drippings can collect.

To address the drawbacks associated with traditional toilet brushes, permanent brush handles with disposable/replaceable brush heads were developed. These brushes were

25 designed so that the brush heads could be flushed down the toilet after use. Some such

heads were impregnated with a cleaning composition to avoid the need to separately add a cleaning chemical.

5 However, the disposable brush heads that were impregnated with a concentrated cleaning composition were not easy to handle because direct contact with the cleaning composition can cause skin irritation in some individuals. Further, while the heads may be small enough to be considered “flushable,” the brush heads are relatively compact as compared to a wad of toilet paper, and may cause problems in certain waste systems, such as a sensitive septic system. This problem may be exacerbated by any extra structures (such as
10 cardboard bands) used to hold brush head parts together.

In other prior art devices, disposable brush heads are formed from highly water-degradable material. Unfortunately, this may begin to fall apart before the cleaning process is completed, particularly when aggressive scrubbing is attempted. Further, such material
15 may be so flexible that it is difficult to transmit scrubbing force from the handle to the brush head portion.

Thus, a need continues to exist for improved toilet brushes having replaceable brush heads. In light of the foregoing problems and issues discussed above, it is desired to have a
20 disposable brush head that is easy to handle. It is also desired that the brush head be less likely to clog plumbing. It is further desired that the brush head maintain its integrity long enough to adequately clean a toilet.

SUMMARY OF THE INVENTION

In one aspect of the present invention, a disposable brush head assembly suitable to be held by a toilet-bowl cleaning device includes a pad, a cleaning compound, and
5 a water-soluble film configured to contain the pad and the cleaning compound.

In another aspect of the present invention, a disposable brush head assembly suitable to be held by a toilet bowl cleaning device, includes a stack of a plurality of layers of a substrate. A water-soluble film is configured to contain the stack and cleaning compound granules,
10 the film having a plurality of apertures therein. The apertures are small enough to contain the cleaning compound granules.

In yet another aspect of the present invention is a toilet cleaning assembly which includes a handle and a disposable, flushable, pad that may be selectively attached to the handle. The
15 pad is made from a folded strip of material. Further included is a cleaning compound, and a water-soluble film configured to contain the pad and the cleaning compound.

Advantages of the present invention will be apparent from a review of the following disclosure. In the description, reference is made to the accompanying drawings which
20 form a part thereof, and in which there is shown by way of illustration, and not limitation, preferred embodiments of the invention. These embodiments do not represent the full scope of the invention. Rather, reference should therefore be made to the claims herein for interpreting the scope of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

A full an enabling disclosure of the present invention, including the best mode thereof, directed to one of ordinary skill in the art, is set forth more particularly in the remainder of
5 the specification, which makes reference to the appended figures in which:

FIG. 1 is a side perspective view of one embodiment of a brush head assembly of the present invention, with a dissolvable wrapper.

10 FIG. 2 is a plan view of another embodiment of the dissolvable wrapper similar to that shown in FIG 1, with the exception that the wrapper has apertures through a surface thereof.

FIG. 3 is a plan view of yet another embodiment of the dissolvable wrapper similar to that
15 shown in FIG 1, with the exception that the wrapper has indicia on a surface thereof.

FIG. 4 is a front perspective view of a view of yet another embodiment of the dissolvable wrapper similar to that shown in FIG 1, with the exception that the wrapper is constructed from a flat sheet that has been wrapped about the brush head.

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FIG. 5 is a rear elevation of a further embodiment of the dissolvable wrapper similar to that shown in FIG 1, with the exception that at least a portion of the wrapper is constructed from a shrink wrap.

25 FIG. 6 is a rear elevation of one embodiment of the brush head pad as depicted in FIG. 1.

FIG. 7 is a plan view of the brush head pad as seen in FIG. 6.

FIG. 8 is an exploded end-elevation of the brush head pad shown in FIG. 6.

- 5 FIG. 9 is a front perspective view of the brush head assembly shown in FIG. 4, attached to one embodiment of a handle.

FIG. 10 is a front perspective view of an alternative embodiment of a partially constructed brush head pad.

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FIG. 11 is a schematic view of one embodiment of a mesh material covering the brush head assembly shown in FIG. 4, the mesh material having a honeycomb pattern.

FIG. 11A is an enlarged view of the mesh material shown in FIG. 11.

15

FIG. 12 is a cut-away view of another embodiment of a mesh material covering the brush head assembly pad, as shown in FIG. 1.

DETAILED DESCRIPTION OF THE PRESENT INVENTION

20

Reference will now be made in detail to embodiments of the invention, one or more examples of which are illustrated in the drawings. Each example is provided by way of explanation of the invention, and not meant as a limitation of the invention. For example, features illustrated or described as part of one embodiment can be used with another

embodiment to yield still a third embodiment. It is intended that the present invention include these and other modifications and variations.

As used herein the term "meltblown fibers" means fibers of a polymeric material which are
5 generally formed by extruding a molten thermoplastic material through a plurality of fine,
usually circular, die capillaries as molten threads or filaments into converging high
velocity, usually hot, gas (e.g. air) streams which attenuate the filaments of molten
thermoplastic material to reduce their diameter. Thereafter, the meltblown fibers may be
carried by the high velocity gas stream and are deposited on a collecting surface to form a
10 web of randomly dispersed meltblown fibers. Meltblown fibers may be continuous or
discontinuous and are generally tacky when deposited onto a collecting surface. In some
embodiments, however, low or minimal air flow is used to reduce fiber attenuation and, in
some embodiments, to permit neighboring filaments of molten polymer to coalesce (e.g., to
adhere along the respective sides of the strands), becoming joined at least in part along the
15 proximate sides of the neighboring strands to form fibers that are multifilamentary
aggregate fibers (i.e. an aggregate fiber formed of two or more polymer strands further
defined herein).

As used herein, the term "cellulosic" is meant to include any material having cellulose as a
20 significant constituent, and specifically comprising about 20 percent or more by weight of
cellulose or cellulose derivatives, and more specifically about 50 percent or more by weight
of cellulose or cellulose derivatives. Thus, the term includes cotton, typical wood pulps,
nonwoody cellulosic fibers, cellulose acetate, cellulose triacetate, rayon, viscose fibers,
thermomechanical wood pulp, chemical wood pulp, debonded chemical wood pulp, lyocell
25 and other fibers formed from solutions of cellulose in NMMO, milkweed, or bacterial

cellulose, lyocell, and may be viscose, rayon, and the like. Fibers that have not been spun or regenerated from solution may be used exclusively, if desired, or at least about 80% of the web may be free of spun fibers or fibers generated from a cellulose solution.

- 5 As used herein, the term “flushable” generally refers to an articles designed such that its size and manufacture facilitate flushing in conventional sewer and septic systems.

The present invention provides a toilet brush head assembly that is disposable and replaceable. Referring to FIGS. 1-12 is a brush head assembly 10 and its primary
10 components, a brush head pad, referred to as pad 12, and a wrapper 14. Cleaning compounds may be added to the brush head assembly 10, such as within the wrapper 14. Optional abrasives may be further added to the brush head assembly 10. These and other details of the brush head assembly 10 are described herein.

15 In one embodiment of the brush head assembly 10, as seen in FIGS. 6-8, a strip of sheet material may be folded in an accordion-like manner to create the pad 12. Desirably, the folds form edges 52. Edges 52 may lie in the proximity of a common plane so that when the pad is compressed in z-direction 53, the edges 52 together form a surface. The pad then takes on the appearance that it is formed from a rectilinear block of sheets. The pad 12
20 includes cleaning region 60 that is opposite a clamp region 62. The cleaning region 60 is the portion of pad 12 that will be used for cleaning. The clamp region 62 is the portion of pad 12 that is clamped between the jaws 102 of the cleaning tool 100. The clamp region 62 is separated by the cleaning region 60 by an imaginary line in the x-direction 68.

The rectilinear block of sheets defining pad 12 may have other shapes if the sheet material is cut prior to being folded, or the pad 12 is die cut or otherwise altered in shape after being formed. For example, the pad may have rounded corners, in particular, at corners 58 (FIG. 7).

5

In another embodiment of the brush head assembly 10, as seen in FIG. 10, the pad 12 is constructed from a strip of sheet material 50 that is rolled in the direction of its longitudinal axis. This results in a cylindrical-shaped pad 12. As with the previous embodiment of pad 12, there is a cleaning region 60 which is the portion of pad 12 that will be used for
10 cleaning. A clamp region 62 is the portion of pad 12 that is clamped between the jaws 102 of a cleaning tool (not shown).

In yet another embodiment of the brush head assembly 10, pad 12 is constructed from a stack of separate sheets, and constructed to form a pad 12 similar to that seen in FIGS. 6
15 and 7, minus the folds 52. Yet another alternative approach, also not specifically shown, is to take shorter pieces of the water-degradable material to create multiple folded over pieces. The separate folded over pieces could then be stacked in a manner similar to that seen in FIGS. 6 and 7. These alternative approaches may have certain advantages that may merit the likely higher cost of production relative to the switchback or folded construction.
20 The single or shorter folded over sheets will already be split into multiple separate pieces, thereby expediting water-dispersability. Regardless of the precise embodiment, the pad is a stack of layers that may or may not include folded edges.

Regardless of embodiment, the overall pad 12 will unfold or fall apart after being flushed
25 (unless the user purposefully stirs the pad 12 in the toilet water after releasing it from the

holder 100). Thus, it is desirable that the stack remain unbonded or free (e.g. not press bonded, stitched or stapled to create a compressed portion) so that the opening of the stack is not inhibited. This can help prevent potential plumbing clogs prior to after the brush head assembly 10 has been flushed down a toilet. Before use, pad 12 is held together by
5 the wrapper 14. During use, pad 12 is held together by the jaws of handle 100.

To possibly enhance the ability for the pad to conform to the curvatures of a toilet bowl, the sheet or pad may be cut to form slits 54 in area that will define the cleaning region 60 of pad 12. The slits 54 define fingers 56 that are free to move in all directions, allowing the
10 fingers 56 to fan out. In the embodiments seen in FIGS. 7 and 10, slits 54 extend laterally from the cleaning edge 60 to the clamp region 62. Regardless of the embodiment used, the clamp region 62 may be sized such that there are no fingers 56 disposed between jaws 102 when the pad 12 is in use. Desirably, the length (measured in y-direction 66) of fingers 56 may have a width of about 2.54 cm to about 8 cm. Also desirably, the fingers 56 have a
15 width as measured in the x-direction 68 of about 3 mm to about 9 mm. Most desirably, the fingers have a width of about 4 mm to about 7 mm.

In the embodiment as seen in FIGS. 6-8, slits 54 may be aligned so that the section of the sheet 50 between each folded edge 52 is approximately identical. After folding the pad, the
20 fingers 56 may then be approximately aligned. It is further contemplated that the pad could be slitted using a cutting technique capable of going through all the layers of pad 12.

Pad 12 may be made from a variety of sheet materials. Most desirably, the material is considered to be "water degradable," meaning that the material tends, with the degree of
25 mechanical agitation typical in residential plumbing systems, to structurally separate in

water into pieces (preferably numerous pieces less than 2.54 cm in less than about one day or less, or less than about 30 minutes.) Sheet materials appropriate for pad 12 include nonwoven fibrous webs having about 90 to 100 % cellulosic pulp fibers.

- 5 In one embodiment of the present invention, pad 12 is formed from a sheet material that has desirable abrasive properties. For example, the sheet may include an abrasive layer of meltspun web, such as may be formed using a water soluble polymer material or a melamine. In another embodiment, microbeads of metal, glass, carbon, mica, quartz or other minerals, plastic such as acrylic or phenolic may be applied to the sheet material as a
10 spray or ink. In yet another embodiment, the sheet material may have abrasive particles formed within the web, such as the microbeads, meltblown fibers, and the like. It is further contemplated that the abrasiveness of a sheet may be enhanced by a plurality of elevated and depressed regions due to nonuniform basis weight, nonuniform thickness, or due to the three-dimensional topography of an underlying fibrous web such as a textured wetlaid
15 tissue web.

Pad 12 desirably has a thickness of about 1 centimeter to about 3 centimeters. However, for some plumbing systems, it may be more desirable to have a thickness of about 1 centimeter to about 2.25 centimeters. The number of layers of sheet material 50 making up
20 pad depends on the basis weight of the sheet material 50 and the amount of compression applied to the pad 12.

Turning next to FIGS. 1-5 and 9, each single brush head 12 is enclosed in a film that forms a wrapper 14. Wrapper 14 may take the form of a wrap sheet (FIGS. 4 and 9) or a pouch
25 (FIGS. 1-3 and 5). The wrapper 14 allows the consumer to manipulate the brush head into

a handle device 100 without having to touch any cleaning chemicals that may be associated with the pad 12 and/or contained within wrapper 14. The wrapper 14 has a continuous surface, or a non-continuous surface that includes apertures. Further the wrapper 14 may include indicia, as described below.

5

Wrapper 14 is made from a water soluble film material such as polyvinyl alcohol.

Desirably, the film is a polyvinyl alcohol with a degree of hydrolysis from about 80% to about 90%, though other types of polyvinyl alcohol may be used. Desirably, this film has a thickness of about .7 to about 3 mils. In the alternative, the film has a thickness of about

10 .75 to about 2.3 mils. In yet another alternative, the film has a thickness of about .75 to about 1.5 mils. Other water-soluble films from which the wrapper 14 may be made include hard and soft gelatins, hydroxypropylmethylcellulose, polyvinyl pyrrolidone, sugar, sugar derivatives, starch, starch derivatives, and polymerized ethylene and acrylic acid, such as polyethylene, polypropylene, polyethylene oxide and ethylene-co-acrylic, or

15 polycaprolactone. The wrapper film may be opaque or translucent, and may be tinted with color, if desired.

In one exemplary embodiment of the brush head assembly 10, shown in FIG. 1, the pad 12 is surrounded by a wrapper 14 in the form of a pouch. The pouch may be formed from a

20 tube stock, as is known in the art of packaging, either formed separately or formed about the pad 12 from a sheet stock. Once a pad 12 is surrounded by wrapper 14, each end 74 thereof is sealed with a thermal, pressure, or ultrasonic sealing apparatus as is known in the art (see FIG. 2).

In another exemplary embodiment of the brush head assembly 10, shown in FIGS. 3 and 5, the pad 12 is surrounded by a wrapper 14 in the form of a heat-shrink style wrapper.

Specifically, the pouch may be formed from by placing the pad 12 between two sheets of heat shrinkable film, and then heated so that the sheets conform to the pad shape as is

5 known in the art.

In yet another embodiment of the brush head assembly 10, shown in FIG. 4, the pad 12 is surrounded by a wrapper 14 in the form of a sheet. The sheet is wrapped about the pad 12 so that a seam 80 is formed. A pair of flaps 82 and 84 are formed by tucking the sides 86

10 inward toward the pad 12. Flaps 82 and 84 are also folded inward toward the pad so that they overlap. Seam 80 and flaps 82 and 84 are at least partially, if not fully bonded together, so that wrapper 14 remains intact about pad 12, at least until it has been wetted.

A water soluble adhesive such as casein or starch based adhesives may be used to seal seam 80 and flaps 82, 84.

15

In a further embodiment of the brush head assembly 10 (not shown), the pad 12 is only partially surrounded by a wrapper 14 in the form of a pouch or sheet. Rather than completely surround the pad 12 as described in the previous embodiment, the clamp region 62 remains uncovered by wrapper 14. The purpose of this is to prevent any possible

20 sticking of wrapper 14 to the cleaning handle clamp. Further, wetting of pad 12 maybe facilitated. The open end of partial wrapper 14 would be adhesively connected to pad 12.

As described with the previous embodiments, cleaning compound may be disposed between the wrapper 14 and pad 12, or impregnated into pad 12.

Regardless of the wrapper embodiment, desirably, the wrapper 14 surrounds the pad 12 with a friction fit to preserve the structural integrity of the pad 12 prior to being clamped in handle 100. To achieve this, the pad may be compressed just before wrapper 14 is applied, and then allowed to expand so that the friction fit is achieved. However, it is contemplated
5 that the wrapper 14 may have a sliding fit with respect to pad 12, or even a loose fit. These fits may be more appropriate when the layers of the pad adhere together after being impregnated with a cleaning compound.

In one embodiment of the brush head assembly 10, wrapper 14 has several apertures 86 for
10 the purpose of wetting the brush head 12 more quickly, and thereby degrading the wrapper more quickly. For instance, as seen in FIG. 2, an array of apertures 86 may be placed one or more surfaces and regions of wrapper 14. Desirably, the wrapper may have up to about thirty apertures having a generally round shape and ranging from about .5 mm to about 2 mm in diameter or width. In the alternative, the apertures are slitted holes.

15

In a further embodiment of the brush head assembly 10, the wrapper 14 includes indicia 88, visible from an exterior surface. The indicia 88 may be purely aesthetic, or may be used to impart information. The indicia 88 may be printed, adhered, or otherwise disposed on the surface.

20

In some embodiments, messages, statements, or copy may be used to impart information about the brush head assembly 10, or may help facilitate or establish an association in the mind of a user of the component one or more mental states, psychological states, or states of well being. The communication, statements, or copy may include various alphanumeric
25 strings, including, for example: "clean," "fresh," "hygiene," "convenient," or

“disposable,” derivatives or combinations thereof, or other such words or statements indicating that the brush head assembly 10 is a fresh, sanitary way to clean a toilet.

Another piece of information that may be imparted by indicia 88 is the jaw placement. For example, an indicia (not shown) as to where a user is to place the jaws 102 of handle 100 may be disposed on the appropriate portion of wrapper 14 which overlaps clamping portion 62. These indicia, if disposed on the exterior surface 53 of wrapper 14, may be made from an ink containing a material that prevents the jaws 102 from sticking. For instance, a hydrophobic ink such as a TEFLON or silicone-based ink may serve this purpose.

10

In another embodiment, as seen in FIG. 3, an indicia 88 in the form of an aesthetic design is placed on the wrapper 14. For example, a floral design may be used to imply freshness. However, the present invention is not intended to be limited by this random example.

15 Indicia 88 ink may also serve as a fragrance, cleaning compound, and/or a dye to color the water in the toilet bowl. For instance, the dye may be water soluble, and simply dissolve when exposed to water, thereby transferring its color to the toilet water. In another embodiment, the indicia 88 ink may include a fragrance. Further, the indicia 88 ink may include a cleaning compound that cleans by mechanical action (abrasion) or chemical
20 action. For instance, the ink may include abrasive material such as microbeads of metal, glass, carbon, mica, quartz or other minerals, plastic such as acrylic or phenolic, or cleaning materials such as surfactants.

In yet a further embodiment of the brush head assembly 10, the wrapper 14 includes a
25 fragrance. For example, when a user unpacks a brush head assembly 10 from a package,

the film may be used to impart a fresh, clean fragrance to excite the user about the chore of cleaning a toilet, and/or to indicate the freshness that will result from using the brush head assembly 10 to clean the toilet. Any indicia 88 may be coordinated with a fragrance used. For instance, lavender flowers may be depicted in indicia 88, and matched with a lavender
5 fragranced wrapper 14. Fragrance may be applied to the wrapper film as a separate component, or may be incorporated into the wrapper film prior to extrusion.

In addition to the mechanical cleaning ability of pad 12, it is most desirable that a cleaning compound may be used in conjunction with the pad 12. The cleaning compound may be a
10 powder or granular material, or an anhydrous liquid (so as not to prematurely dissolve wrapper 14). Further, the cleaning compound may have anti-fungal and/or anti-bacterial properties. The cleaning compound may be applied to the pad 12 or wrapper 14, disposed within the confines of wrapper 14, or all of the above. In addition, more than one type of cleaning compound may be used to signal different stages of the cleaning process. Each
15 such feature is discussed more fully below.

In one embodiment of the brush head assembly 10, a highly concentrated cleaning compound is injected between a number of sheet material sections located between folds
52 or disposed on the outer surfaces 53 of the pad 12 (see FIG. 7).

20 One example of a cleaning compound for such impregnation or application contains surfactant (e.g. lauramide DEA; sodium lauryl sulfate; sodium dodecylbenzene sulfonate), perfume, and various other ingredients such as dye and preservative. However, it is contemplated that any anhydrous cleaning compound may be used, including compounds
25 that have additional properties such as anti-bacterial, anti-fungal, and/or anti-odor

properties, e.g. chlorine bleach, oxygen bleach, enzymes, and the like. Enzymes that are water soluble proteases like pepsin, tripsin, ficin, bromelin, papain, rennin, and mixtures thereof may be particularly useful.

- 5 In another embodiment of the present invention, brush head assembly 10 has a powdered, anhydrous liquid or granular cleaning compound inside the wrapper 14, along with the pad 12. In storage or shipping, the cleaning compound may work its way into the pad 12, though this is not a necessary characteristic of the cleaning compound. Desirably, the compound is made from an anionic surfactant, such as dodecyl benzene sulfonate, an
10 abrasive, such as calcium or sodium carbonate, dye, fragrance. The compound may also contain perborate or percarbonate to provide oxygen bleaching capability. Further, the compound could contain enzymes for additional soil removal capability.

- In yet another embodiment of the present invention, brush head assembly 10 has the
15 cleaning compound disposed onto the inner surface (opposite surface 53) of the wrapper 14. For instance, the concentrated cleaning compound may be spray-coated onto the inner surface of wrapper 14.

- It is contemplated that more than one type of cleaning compound may be disposed in or on
20 the brush head assembly 10. For example, a foaming cleaning compound may be disposed within wrapper 14, and a colored cleaning compound may be impregnated between the layers making up pad 12. Thus, during use, the brush head assembly 10 will initially demonstrate a foaming action, followed by a coloring action. This way, the user will know that the pad 12 has been activated for two stages of cleaning. In one embodiment, first

stage of cleaning may remove general grime, and the second stage of cleaning may impart a fragrance to the immediate vicinity of the toilet being cleaned.

In one embodiment of the present invention, the foaming cleaning compound may be made
5 from an acid source and a carbon dioxide source. Suitable acid sources herein are capable of providing solid organic, mineral or inorganic acids, and the sources are thereto desirably in the form of acids, salts or derivatives thereof or a mixture thereof.

In particular organic acids may be used. It may be desired that the acids are mono-, bi- or tri-protonic acids. Such acids include mono- or polycarboxylic acids preferably citric acid,
10 adipic acid, glutaric acid, 3-cetoglutaric acid, citramalic acid, tartaric acid, maleic acid, fumaric acid, maleic acid, succinic acid, malonic acid. Such acids may be used in their anhydrous forms. Other acids include sulphonic acids such as toluenesulphonic acid.

A carbon dioxide source includes any material that can provide carbon dioxide when reacting with an acid source upon contact with water. The carbon dioxide source includes
15 carbonate, bicarbonate and percarbonate salts or mixtures thereof.

Yet another alternative embodiment is to facilitate scrubbing by including an abrasive in the cleaning compound, or by using a material having a more abrasive nature, such as a mesh material. For example, in one embodiment of the present invention, a mesh wrap 90
20 could be disposed around the pad 12, or the brush head assembly 10 (see FIGS. 11 and 12). The mesh wrap 90 is made from a water-soluble material, such as polyvinyl alcohol, or any other material that may be used to create wrapper 14. Desirably, the mesh has apertures 92 therein that are arranged into an array. The array may be configured into a honeycomb pattern (as shown), in rows, concentric circles, an aesthetic design, or even random pattern.

25 In the embodiment shown in FIG. 11, the apertures are defined by rib portion 94, and range

in size from about 1 mm to about 4 mm. Each rib portion 94 may range in size from about 1 mm to about 3 mm. The thickness of the mesh is desirably about 1 mil to about 8 mils, as measured at the thinnest section of each rib portion 94. In another embodiment, the thickness of the mesh is desirably about 2 mils to about 6 mils, as measured at the thinnest section of each rib portion 94. In yet another embodiment, the thickness of the mesh is desirably about 3 mils to about 4 mils, as measured at the thinnest section of each rib portion 94.

In another embodiment of the brush head assembly 10, the wrapper 14 is made to be relatively abrasive to assist with scrubbing toilet grime from the bowl. One way to make the wrapper 14 abrasive is to impart a texture on an outer surface, at least in the region of that covers the cleaning region 60 of pad 12. The texture may be a mesh material that is bonded to at least a portion of the exterior surface of the wrapper 14, for example, to the portion overlapping the cleaning region 60. In another embodiment, the texture is created by adhesively bonding a gritty substance such as sodium bicarbonate, salt, silica, or pumice onto the exterior surface of the wrapper 14 (not shown). Any apertures located through the surface 53 of wrapper 14 (described above) may impart a texture to the wrapper 14, and thus, an abrasive quality, at least until the wrapper 14 dissolves.

Abrasive materials that may be added to the cleaning compound include: sodium bicarbonate, silica, pumice, and microbeads of metal, glass, carbon, mica, quartz or other minerals, plastic such as acrylic or phenolic. Desirably, included in cleaning compound is a relatively coarse polymer, such as ABX-30, available from Celanese. It may be desirable that the abrasive materials be water soluble, depending on the type of plumbing system in which the brush head assembly 10 is used.

Moreover, the brush head could be altered in other ways. For example, the wrapper 14 and/or pad 12 could be impregnated with BITRIX or another known bittering agent that will cause a child to immediately spit out the brush head assembly 10 if the child tries to chew on it.

5

In operation, the aforementioned exemplary embodiment of the present invention 10 is attached to a handle, such as the handle 100 shown in FIG. 9. The brush head assembly 10 is completely immersed into the water of a toilet bowl. The user may start to rub the bowl with the brush head assembly, or just wait until the wrapper 10 has degraded to better
10 expose pad 12. The pad 12 may be rubbed against the toilet bowl interior to remove any grime or film. After the toilet bowl is cleaned to the satisfaction, or after the pad 12 had begun to degrade to the point where it is no longer effective for removing grime, the brush head assembly 10 may be released from the handle 100. The pad 12 will either easily fall off into the toilet bowl water, or fall off after the user gently taps the handle 100 against the
15 interior side of the toilet bowl. The pad 12 may be flushed down the toilet where it will further degrade and disperse into smaller pieces. In the alternative, the user may choose the dispose of the pad 12 in a waste can.

Although only a few exemplary embodiments of this invention have been described in
20 detail above, those skilled in the art will readily appreciate that many modifications are possible in the exemplary embodiments without materially departing from the novel teachings and advantages of this invention.

CLAIMS

1. A disposable brush head assembly suitable to be held by a toilet-bowl cleaning device, the brush head assembly comprising:
a pad;
a cleaning compound; and
a water-soluble film configured to contain at least a portion of the pad and the cleaning compound.
2. The brush head assembly of claim 1 wherein the pad comprises a plurality of water-soluble substrate layers positioned to form a stack.
3. The brush head assembly of claim 2 wherein the pad is dispersible in water.
4. The brush head assembly of claim 1 wherein the cleaning compound is non-liquid.
5. The brush head assembly of claim 1 wherein the cleaning compound is an anhydrous liquid.
6. The brush head assembly of claim 5 wherein the film is poly-vinyl alcohol.
7. The brush head assembly of claim 6 wherein the film has a thickness of about 0.7 mils to about 3 mils.

8. The brush head assembly of claim 1 wherein the film further comprises an abrasive particle.
9. The brush head assembly of claim 1 wherein the film further comprises a mesh material.
10. The brush head assembly of claim 1 wherein the film comprises an indicia.
11. The brush head assembly of claim 10 wherein the indicia comprises a water soluble dye.
12. The brush head assembly of claim 10 wherein the indicia comprises a surfactant.
13. The brush head assembly of claim 1 wherein the film comprises a fragrance.
14. The brush head assembly of claim 1 wherein the pad is saturated with the cleaning compound.
15. The brush head assembly of claim 14 further comprising a second cleaning compound that is different than the first cleaning compound.
16. The brush head assembly of claim 1 wherein the pad has a clamp portion adapted to be engaged by a handle, and a cleaning portion comprising finger members.

17. The brush head assembly of claim 1 wherein the pad has a clamp portion comprising a coating to prevent sticking to the handle.
18. The brush head assembly of claim 1 wherein the water soluble film comprises a continuous surface.
19. The brush head assembly of claim 1 wherein the water soluble film completely surrounds the pad.
20. A disposable brush head assembly suitable to be held by a toilet bowl cleaning device, the brush head assembly comprising:
a plurality of layers of a substrate, the plurality of layers positioned to form a stack;
a plurality of cleaning compound granules; and
a water-soluble film configured to contain the stack and the cleaning compound, the film having a plurality of apertures therein; wherein the apertures are small enough that the granules are contained within the film.
21. A toilet cleaning assembly comprising;
a handle;
a disposable, flushable, pad comprising a folded strip of material for selective attachment to the handle;
a cleaning compound; and
a water-soluble film configured to contain the pad and the cleaning compound.

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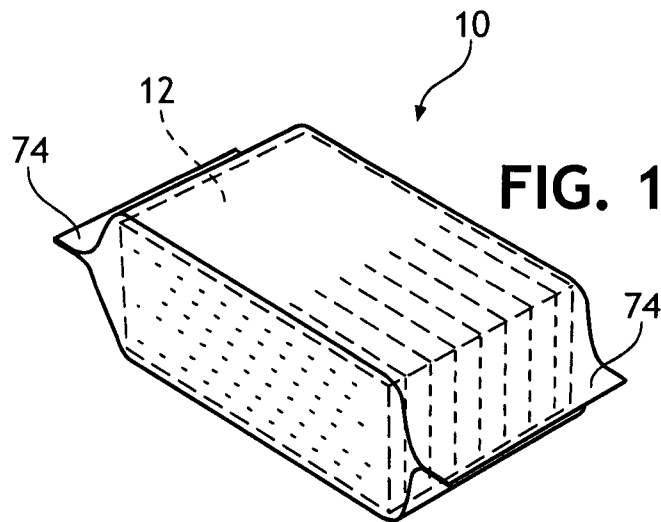


FIG. 1

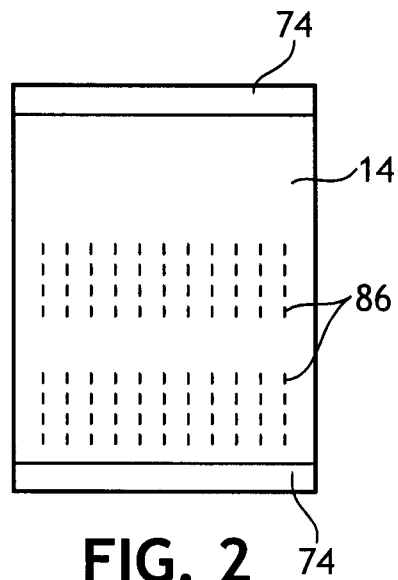


FIG. 2

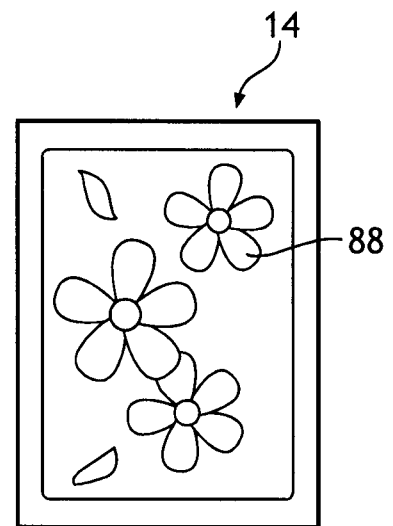


FIG. 3

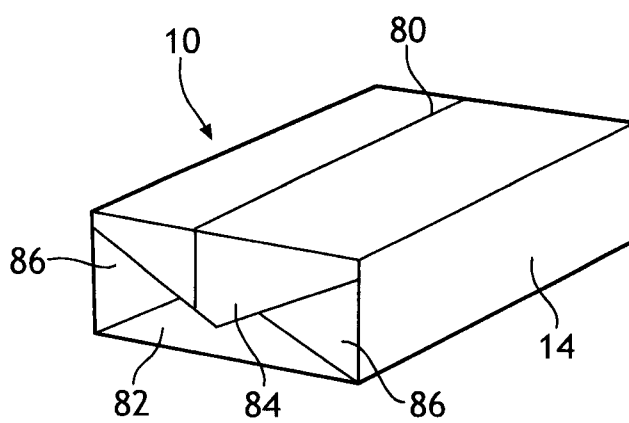


FIG. 4

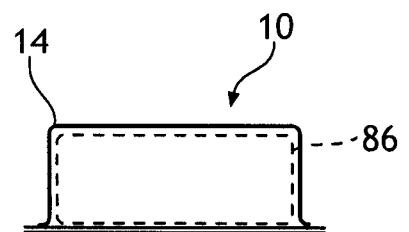
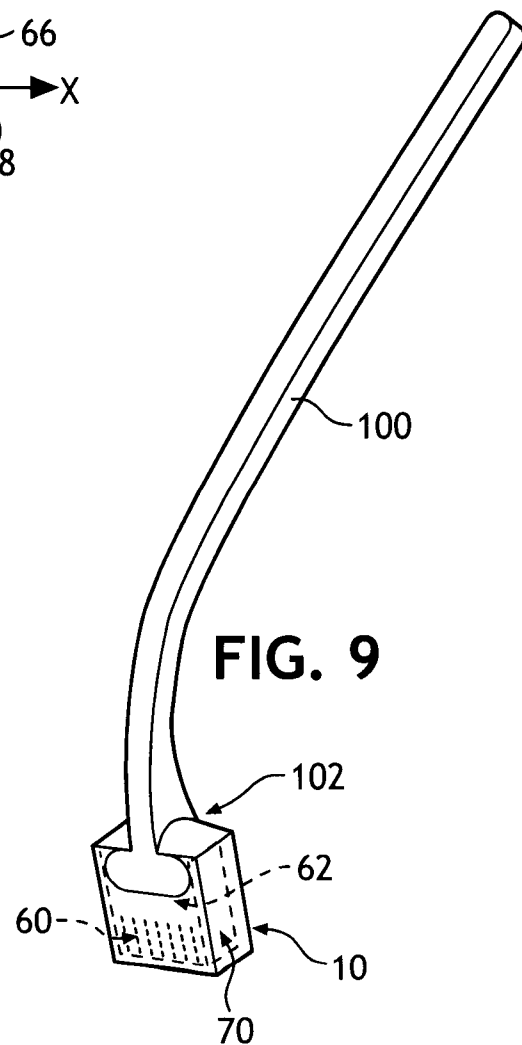
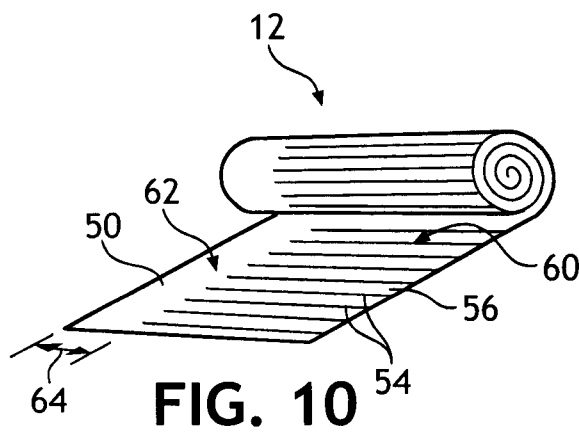
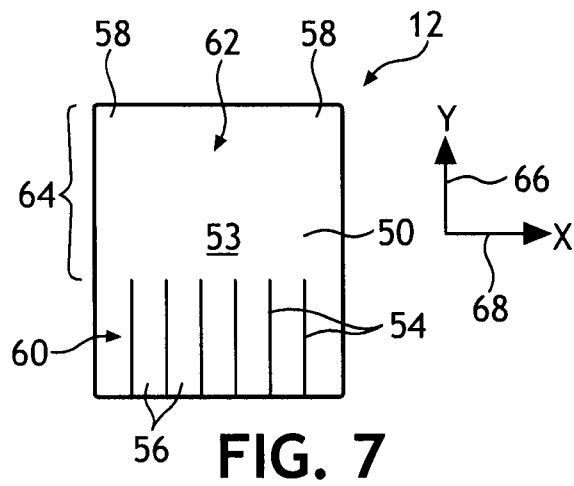
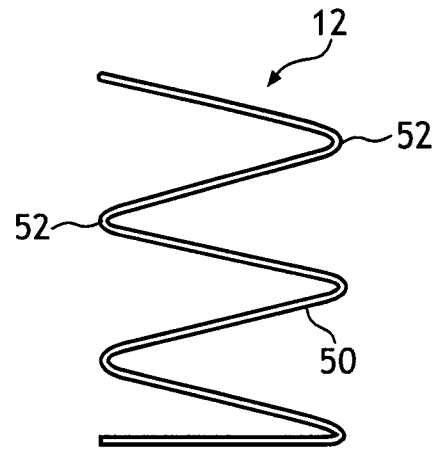
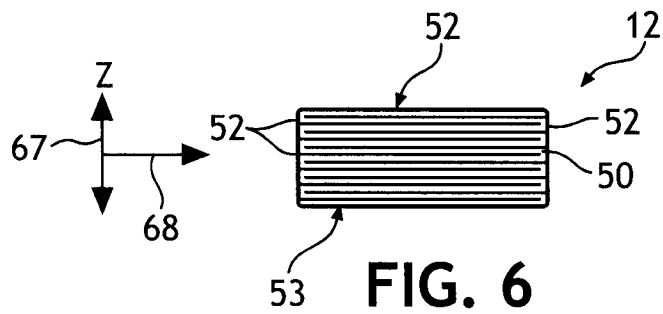


FIG. 5

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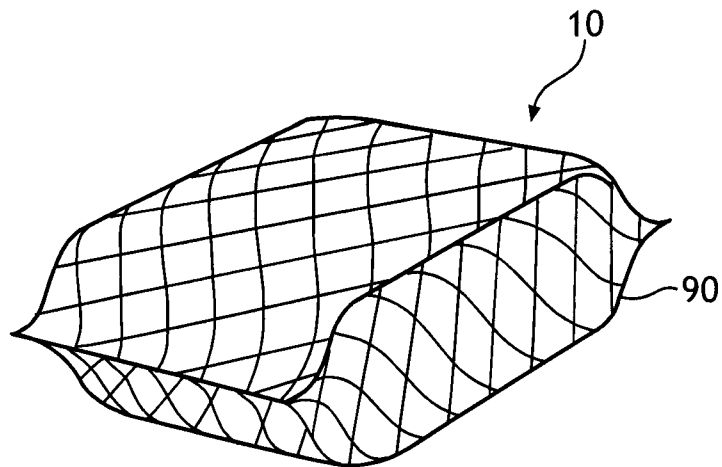


FIG. 11

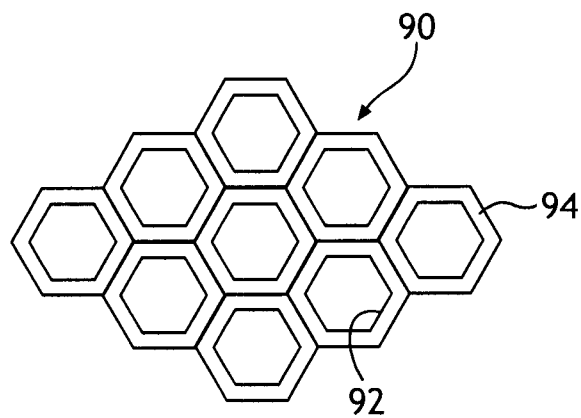


FIG. 11a

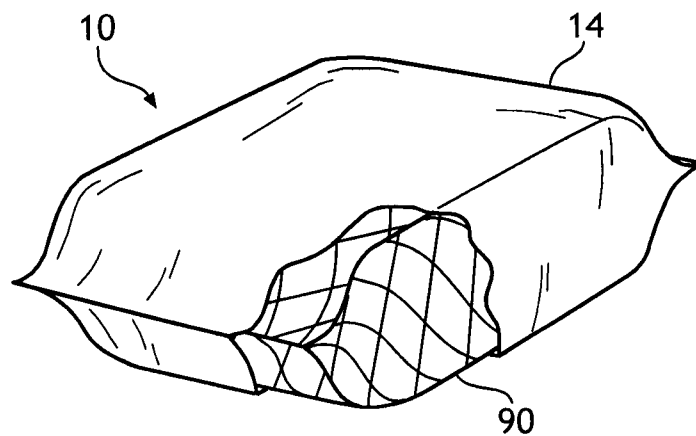


FIG. 12