US 20080267689A1

(19) United States

(12) Patent Application Publication

(10) Pub. No.: US 2008/0267689 A1

(43) Pub. Date: Oct. 30, 2008

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(54) LIQUID APPLICATOR

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(21) Appl. No.: **11/741,006**

(22) Filed: **Apr. 27, 2007**

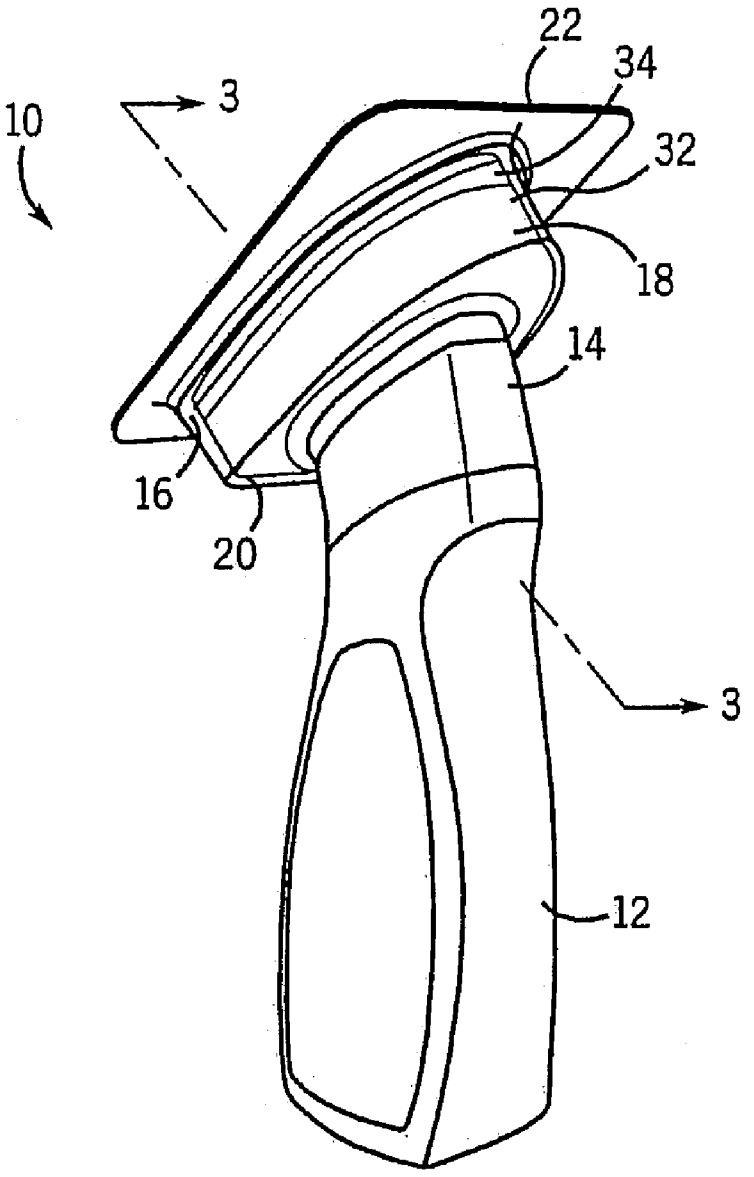
Publication Classification

(51) **Int. Cl.**
A47L 13/26 (2006.01)

(52) **U.S. Cl.** **401/264**

(57) **ABSTRACT**

Disclosed are liquid applicators for dispensing liquid to a surface such as a bathroom wall, and working the liquid against the surface. The applicators may have a compressible reservoir for the cleaning liquid. Upon compressing the reservoir the liquid is driven to a scrubbing pad in a controlled fashion. A check valve prevents back flow to the reservoir from the pad. A blister pack can house the scrubbing pad even when the pad is attached to the reservoir. In another form the applicator can be tipped and rested on its side between uses.



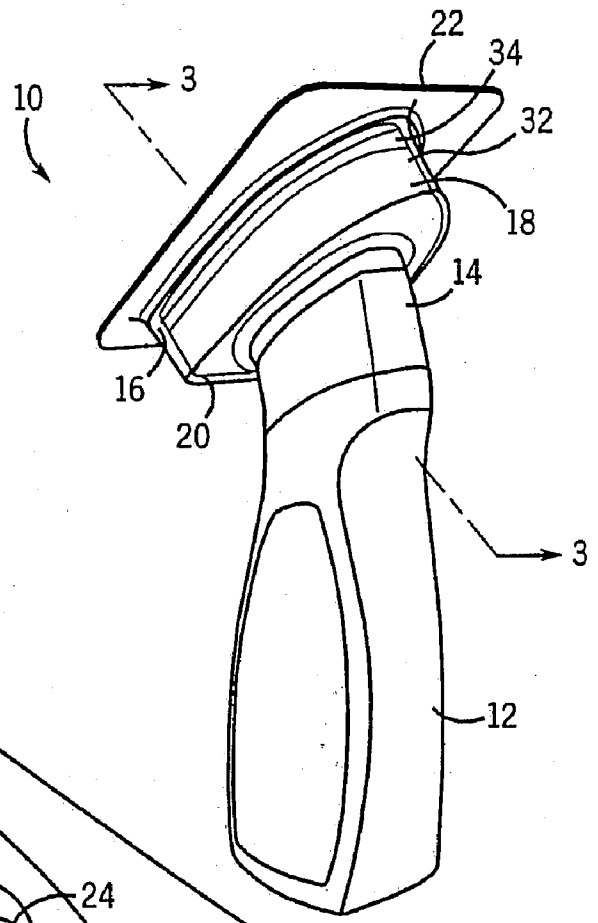


FIG. 1

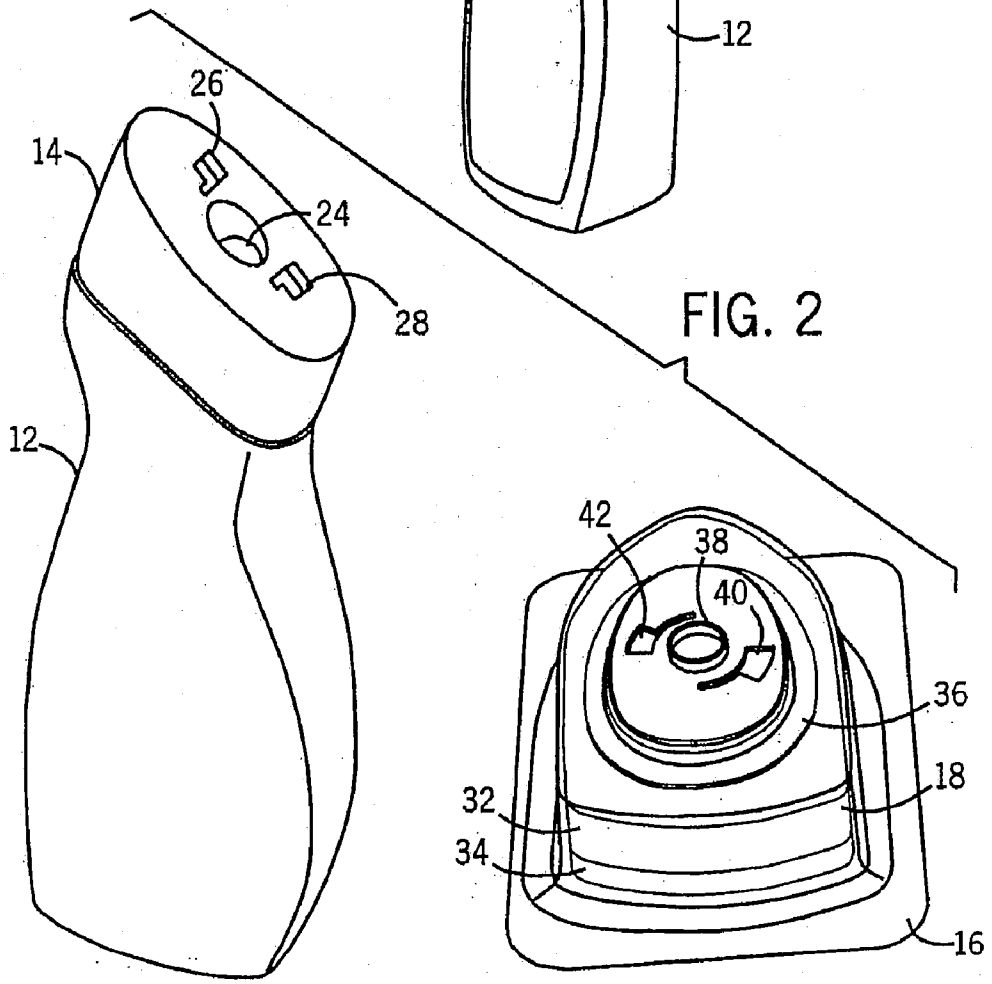


FIG. 2

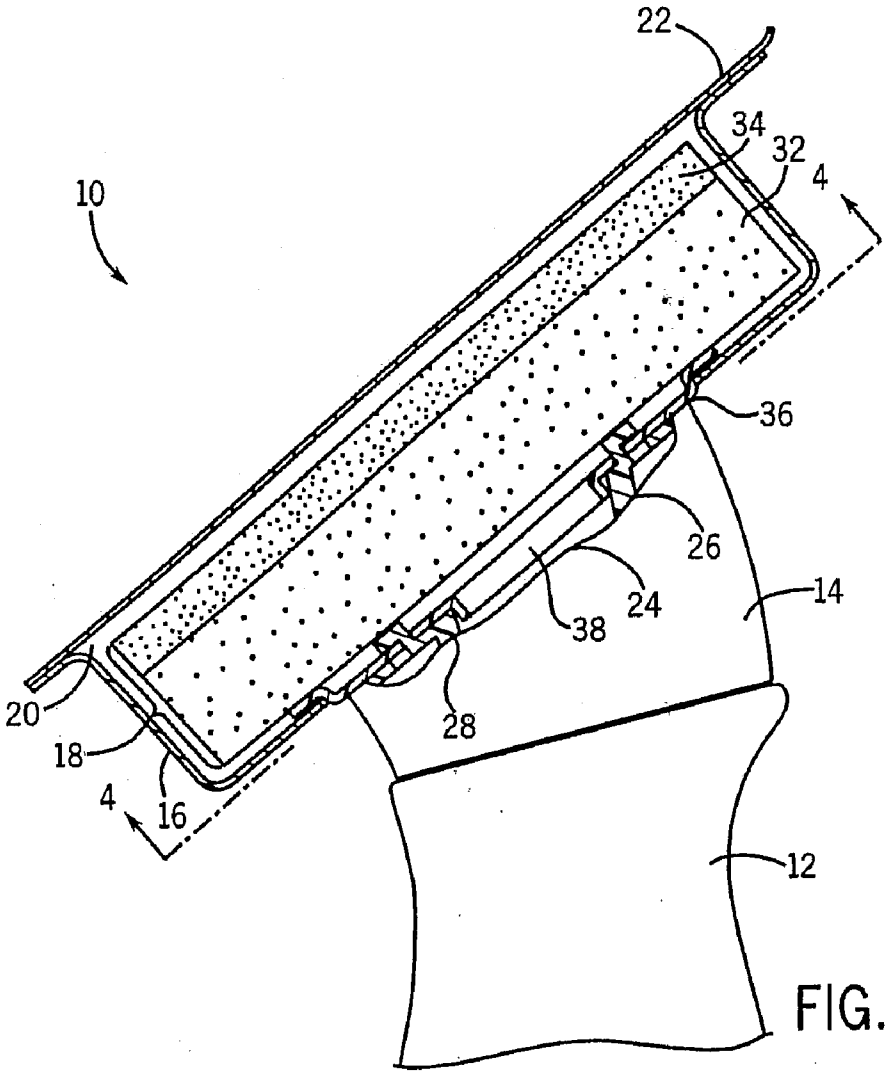


FIG. 3

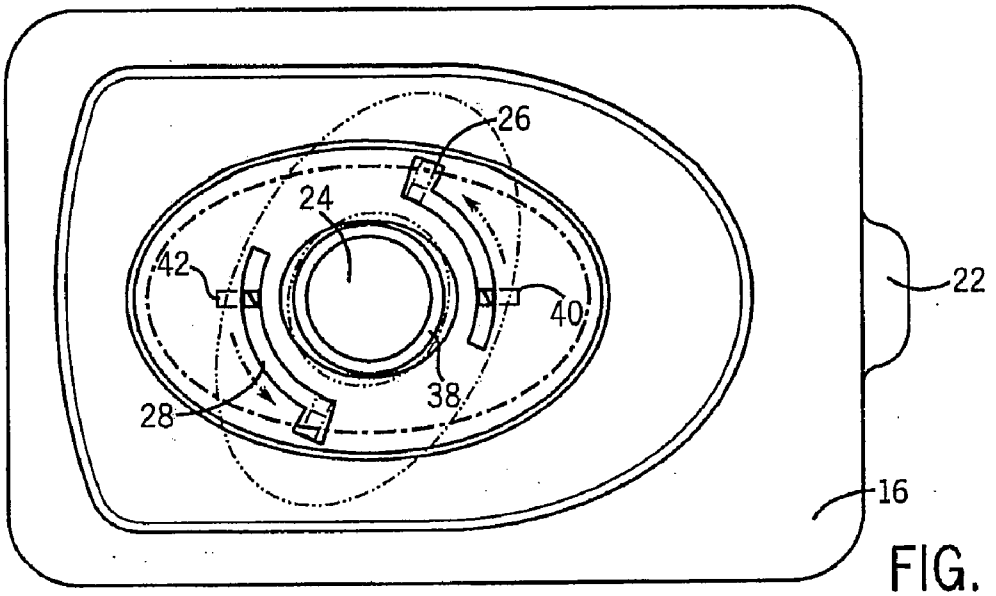


FIG. 4

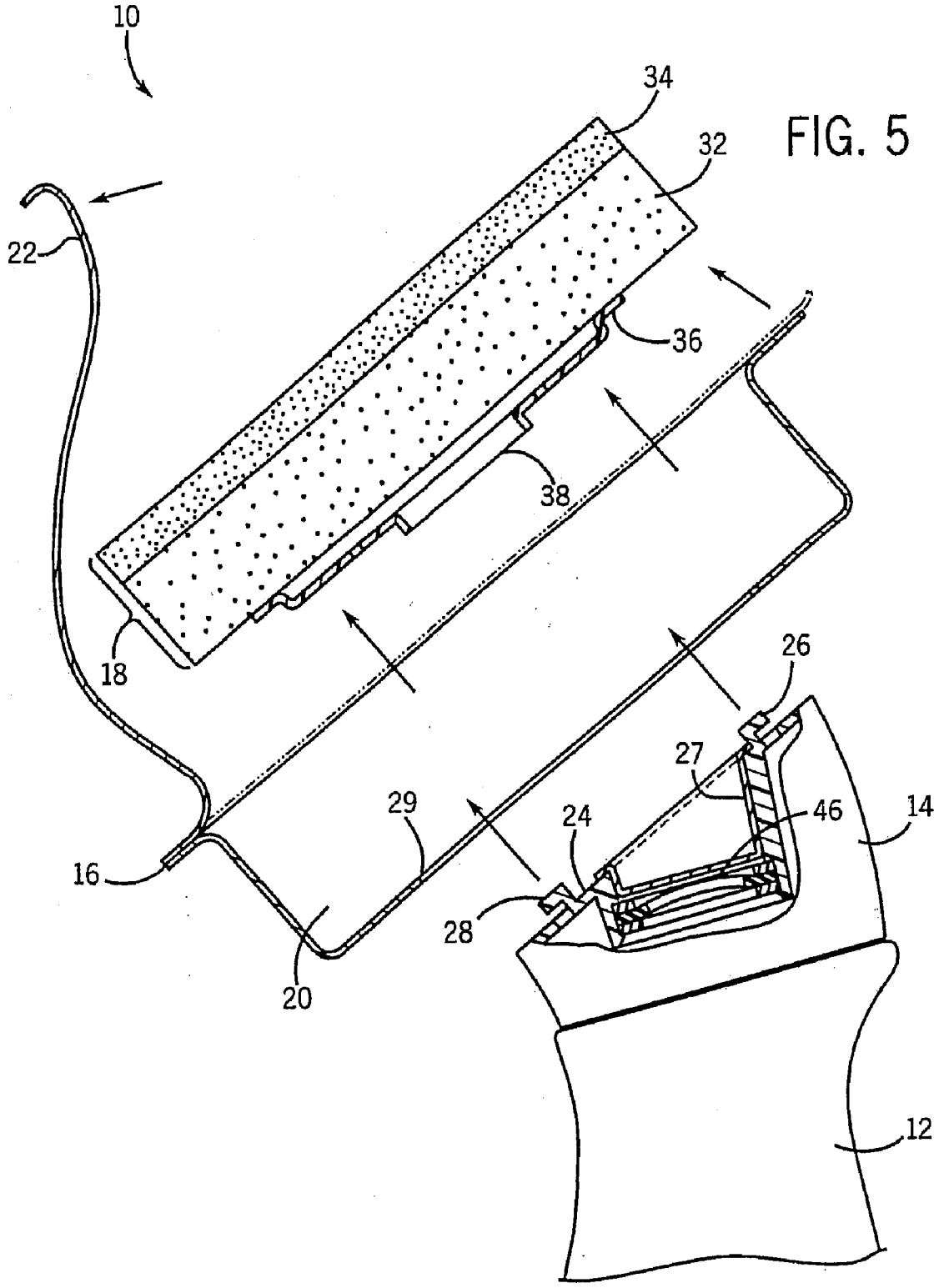


FIG. 5

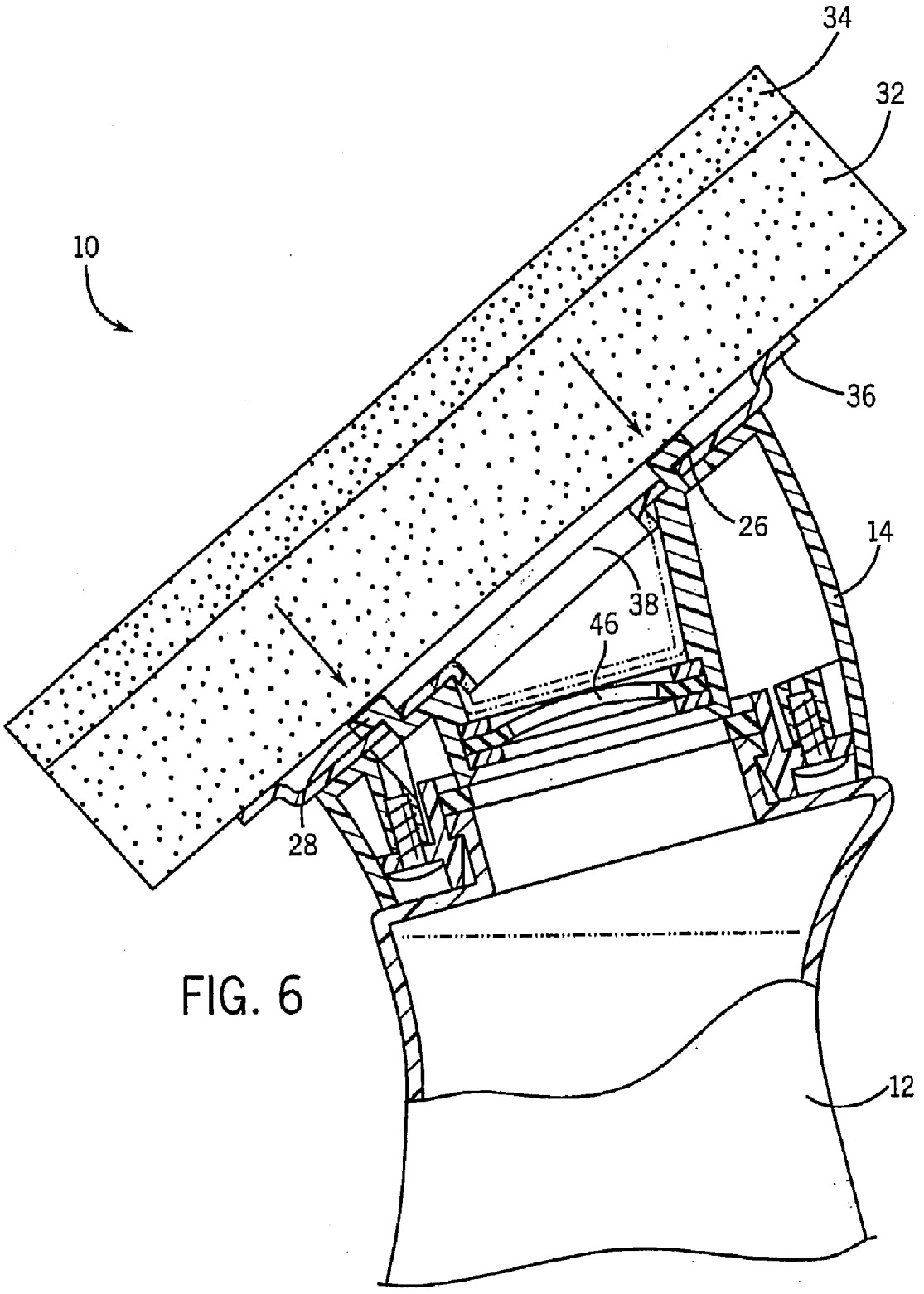


FIG. 6

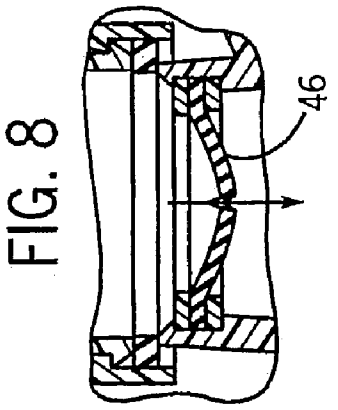


FIG. 8

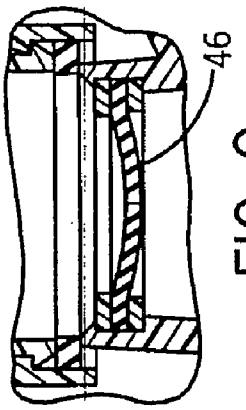


FIG. 9

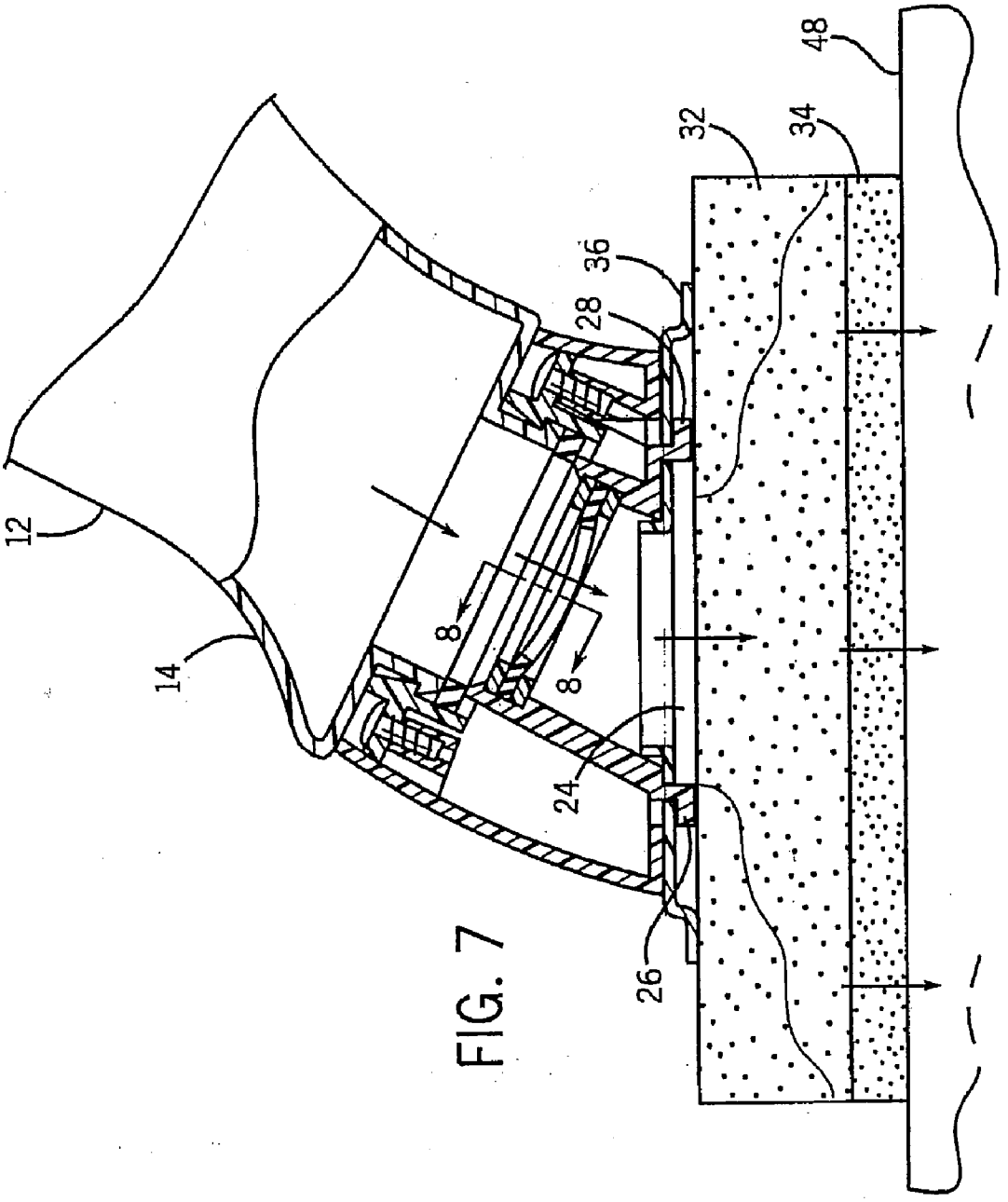
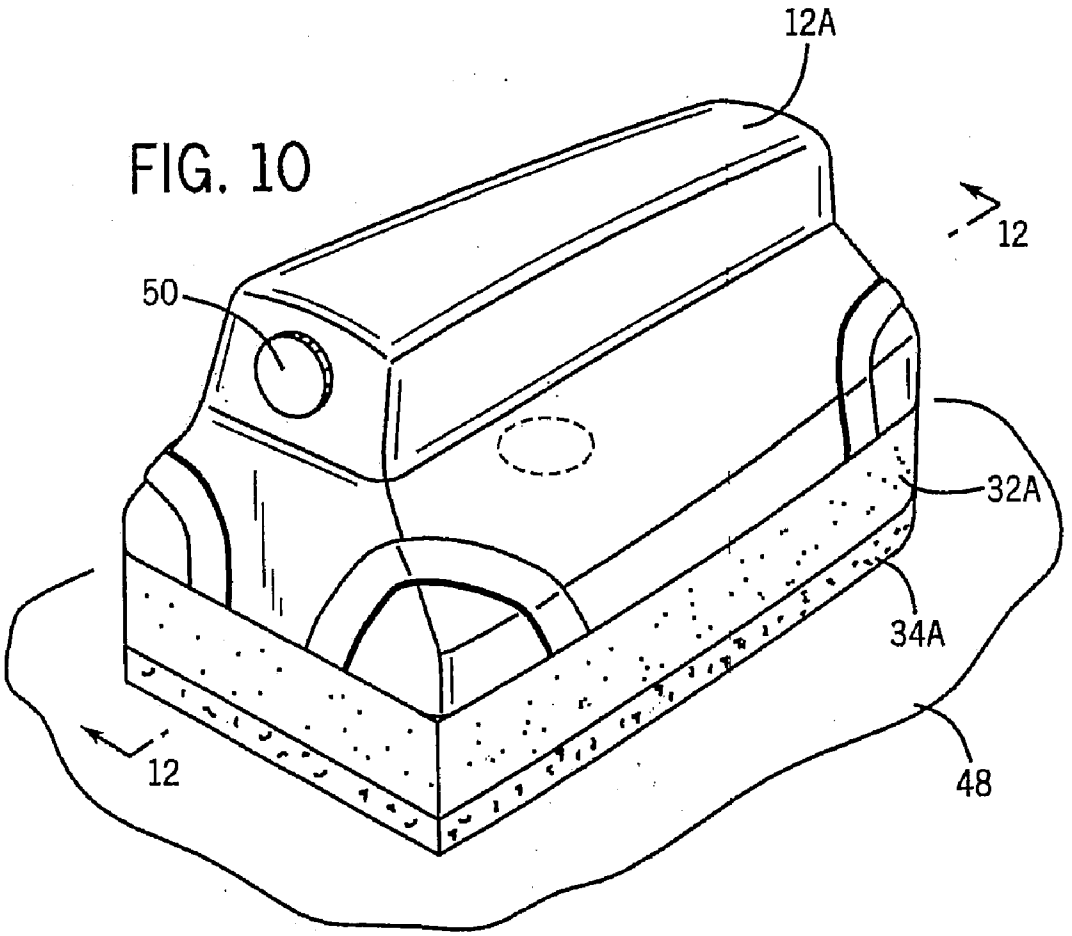


FIG. 7

FIG. 10



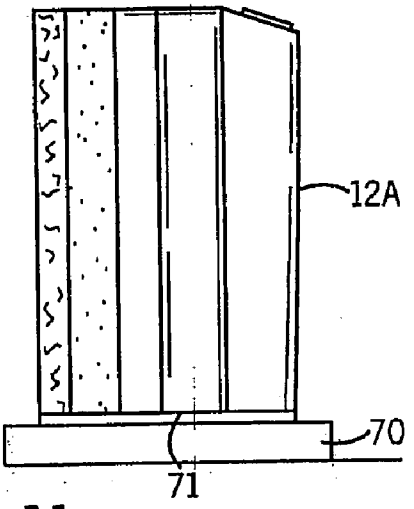


FIG. 11

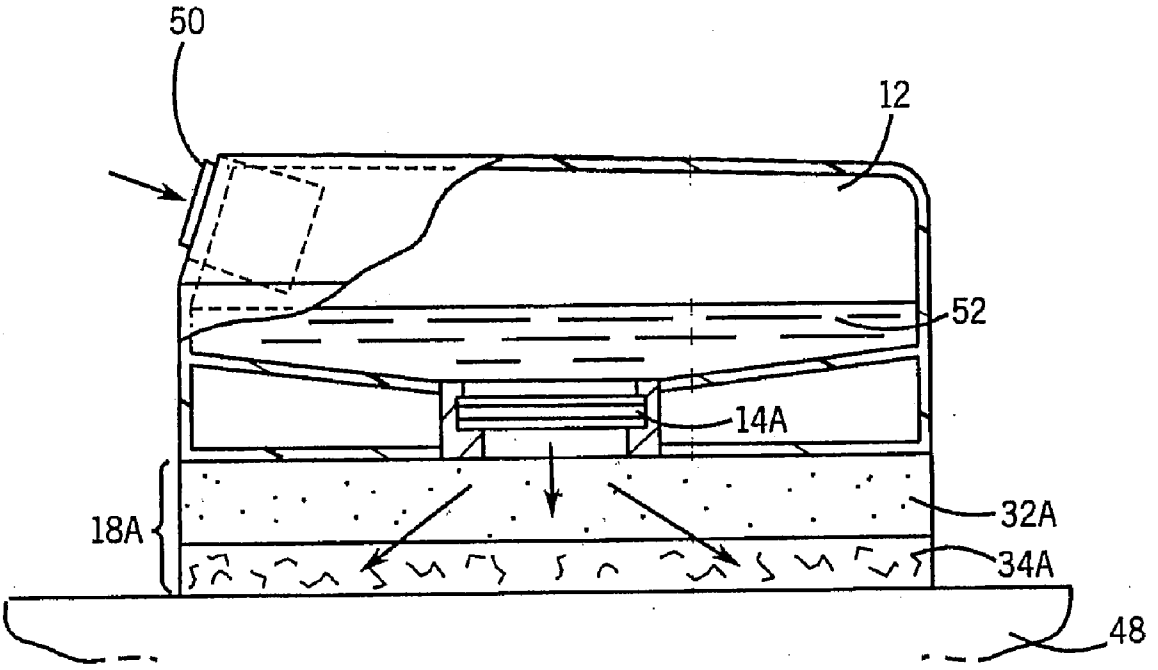


FIG. 12

LIQUID APPLICATOR

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] Not applicable.

STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH/DEVELOPMENT

[0002] Not applicable.

BACKGROUND OF THE INVENTION

[0003] The present invention relates to compact hand-held devices that both provide liquid and the capability of working the liquid against a surface to which the liquid is being applied. It also relates to display/storage packaging useful therewith.

[0004] A variety of liquid applicators have been developed that have a reservoir to store a fluid to be applied and an applicator head/pad. See e.g. U.S. Pat. Nos. 2,820,234, 2,932,840, 3,135,990, 3,148,401, 3,565,294, 3,653,779, 4,183,684, 4,201,491, 4,553,871, 4,652,163, 4,961,661, 4,983,061, 5,114,255, 5,397,194, 5,454,659, 5,908,256, 6,036,391, 6,210,064, 6,425,701, 6,817,801, and 6,945,722. The disclosure of these patents, and of all other patents referred to herein, are incorporated by reference as if fully set forth herein.

[0005] Some of these prior devices use a trigger or other pumping system to dispense the liquid. Others rely on squeezing of the sides of the reservoir to squirt the liquid. Some deliver the liquid to the pad and others deliver the liquid separately.

[0006] A disadvantage of many such devices is that they sometimes deliver too much liquid (e.g. creating a drool or waste problem), or deliver too little liquid (e.g. especially if the pad is susceptible to being clogged). Further, some of these devices are complex to construct and thus unduly costly. Some are also susceptible to vandalism when being displayed in a store. Some are sold unassembled, requiring the consumer to come in direct contact with treated surfaces during assembly of the device.

[0007] Thus, a need exists for improved liquid applicators that can deliver a liquid to a surface being treated (e.g. cleaned) in a reliable manner, particularly where the applicator is suitable for use in desirable display packaging.

BRIEF SUMMARY OF THE INVENTION

[0008] In one aspect the invention provides a liquid applicator. It has a reservoir configured to hold a liquid to be applied to a surface, the reservoir having an adapter at one end. The adapter has an opening extending axially there through in communication with the reservoir, and a connection structure adjacent an outward end of the adapter. There is also a pad (preferably a scrubbing pad) removably engaged to the adapter.

[0009] The pad has a layer attached to a mounting plate, and the mounting plate has a connection structure suitable to engage the connection structure of the adapter. Preferably the connection structures engage each other by a bayonet form connection, such as where one or more legs on the adapter rotationally connect to one or more grooves on the mounting plate. The grooves can each have a widened portion and a narrowed portion to facilitate this.

[0010] There is a one-way check valve in the adapter opening for permitting transfer of liquid from the reservoir past the adapter while resisting return flow of liquid past the check valve to the reservoir. There may also be a plug positioned in the opening downstream of the check valve prior to use.

[0011] In another aspect of the invention other liquid applicators may have a reservoir configured to hold a liquid to be applied to a surface, the reservoir having an adapter at one end. The adapter has an opening extending axially there through and in communication with the reservoir, and a connection structure adjacent an outward end of the adapter. There is also a pad removably engaged to the adapter, and a well form pack suitable to receive the pad and house it prior to use.

[0012] The pad has a scrubbing layer attached to a mounting plate, and the mounting plate has a connection structure suitable to engage the connection structure of the adapter. The pad may be engaged to the adapter while still housed in the pack (through a hole in a rearward wall of the pack), or alternatively be engaged to the adapter when not housed in the pack.

[0013] There is a peel-off lid removably attached to the well form pack (to essentially enclose the pad when it and the pack are attached to the reservoir). Also, the pad may be multilayer such as having a rearward sponge layer and a forward abrasive layer. It is most preferred to use this device for cleaning purposes with a cleaning liquid.

[0014] In yet another form the invention provides still other liquid applicators. They have a reservoir configured to hold a liquid to be applied to a surface. The reservoir has an elongated upper handle and a side surface. A scrubbing pad is linked to a lower surface of the reservoir and configured to receive the liquid there from. There are means associated with the reservoir (e.g. squeezable sides or a pump) to drive liquid out from the reservoir towards the scrubbing pad. The applicator is suitable to be tipped so that its side surface is downwardly positioned, followed by the applicator stably resting on the side surface when the side surface is placed on a horizontal support.

[0015] The cost of producing these devices is low, notwithstanding that they can reliably meter desired amounts of liquid to the surface being treated, and then work the liquid against the surface. Further, in some embodiments they permit the nature of the product to be displayed to the consumer at the time of sale, while still protecting the pad from vandalism and minimizing the risk of leakage. In other embodiments the invention provides a convenient way of storing the applicator between uses, even after the pad has become partially dirtied.

[0016] The foregoing and other advantages of the present invention will be apparent from the following description. In the description that follows reference is made to the accompanying drawings which form a part thereof, and in which there is shown by way of illustration, and not limitation, preferred embodiments of the invention. Such embodiments do not necessarily represent the full scope of the invention, and reference should therefore be made to the claims herein for interpreting the scope of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

[0017] FIG. **1** is a rear, perspective view of a liquid applicator of the present invention, shown in a display form;

[0018] FIG. **2** is an exploded view thereof, taken from a different perspective;

[0019] FIG. **3** is a sectional view of FIG. **1** along line **3-3**;
[0020] FIG. **4** is a plan view with dotted lines indicating rotational engagement;
[0021] FIG. **5** is a somewhat enlarged view similar to FIG. **3**, but showing the assembly partially exploded, and with packaging opened;
[0022] FIG. **6** is a view similar to FIG. **3**, but showing the assembly with the packaging removed;
[0023] FIG. **7** is a sectional view showing the FIG. **6** assembly in use;
[0024] FIG. **8** is a sectional view taken along line **8-8** of FIG. **7**, showing cleaning fluid moving through a one-way check valve when the bottle sides are squeezed;
[0025] FIG. **9** is a view similar to FIG. **8**, but showing the one-way check valve in the closed position (e.g. when the bottle is not being squeezed);
[0026] FIG. **10** is a right, frontal, perspective view of a second embodiment of the present invention, where the fluid reservoir is in the form of an ergonomic handle;
[0027] FIG. **11** is a view of the FIG. **10** device when it is tilted up on its side and positioned on a holding pedestal; and
[0028] FIG. **12** is a sectional view taken along **12-12** of FIG. **10**.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0029] Referring first to FIGS. **1-3**, a preferred embodiment liquid applicator **10** of the present invention is shown. The applicator **10** has a fluid reservoir **12** in the form of a squeeze bottle, an adapter **14** in the form of a neck, and a scrubber **18** housed in a "blister" type pack **16**.
[0030] The applicator **10** can be displayed on a store shelf or stored in a home upright, as shown in FIG. **1**. Prior to use pack **16** must be removed from the pad **18**, with the pad **18** then being re-connected to the adapter **14**. Then, the applicator **10** can be inverted so that the pad **18** will press against the surface **48** to be cleaned as shown in FIG. **7**.
[0031] Reservoir **12** is but one possible reservoir form. As shown in FIGS. **10-12**, the reservoir can instead be a reservoir **12**A in the form of a molded handle.
[0032] As seen in FIG. **5** the adapter **14** has a centrally-located, axially extending opening **24** in communication with liquid in the reservoir **12**. The opening **24** is bordered on two sides by protruding, L-shaped legs **26** and **28**.
[0033] The pad **18** preferably is multi-layer and includes a sponge layer **32** adhered to an abrasive layer **34**. On the opposite side of the sponge layer is positioned a mounting plate **36**.
[0034] Preferably, the abrasive layer **34** is made from a synthetic material such as polyester fiber which is a carded air-laid resin bonded non-woven plastic, which is heat bonded or otherwise adhered to a conventional synthetic sponge, such as one made from, for example, "semi-open" cellular polyurethane (although other conventional sponge materials may also be used).
[0035] The mounting plate **36** is preferably a hard plastic which is attached by adhesive or other means to the sponge layer **32**. One possible adhesive is hot glue, and one possible hard plastic is polyethylene.
[0036] The mounting plate **36** has a centrally-located, rearwardly-projecting cylinder **38** bordered on two sides by arc grooves **40** and **42** (see FIG. **2**) configured to rotationally receive the L-shaped legs **26** and **28** of the adapter **14**. In a bayonet type connection the legs can be inserted into the wider portion of the grooves. Relative rotation then traps feet of the legs between the mounting plate **36** and the sponge layer **32**, whether or not the pack **16** is present around the pad **18**.
[0037] As shown in FIG. **5**, the pack **16** can be in the form of a cup-shaped well **20** suitable to hold the pad **18**. Peel-off lid **22** removably covers the well **20**. Preferably lid **22** is a synthetic material such as a printed card stock coated with a release adhesive on its rear side such as polyethylene. The well **20** is preferably a transparent plastic such as thermoformed RPET/recycled polyethylene terephthalate so that a consumer can see the nature of the product even when it is protected by packaging.
[0038] As will be understood from FIGS. **3-5**, the pack **16** with pad **18** inside is removable from the adapter **14** by rotating the mounting plate **36** until the L-shaped legs **26** and **28** of the adapter **14** are aligned with the larger portions of the grooves **40** and **42**. Then, the pack **16** can be moved axially away from the adapter **14** as shown in FIG. **5**. The peel-off lid **22** is opened as shown in FIG. **5**.
[0039] At this point, the pack **16** can be separated from the pad **18** and disposed of. Then, as shown in FIG. **6**, the pad can be re-engaged to the adapter **14** by reversing the axial and rotational movements described above. However, before this is done an additional step may be needed depending on whether a plug **27** is present. In this regard, it is preferred to insert a temporary plug downstream of the check valve **46** inside the opening **24** prior to use of the device. This helps avoid leakage prior to use, and should minimize vandalism if a vandal tries to squeeze the bottle at the store.
[0040] Thus, after the FIG. **5** position is achieved, the plug **27** (if present) should be removed before the FIG. **6** reassembly occurs. After re-establishing the bayonet connection without the pack **16** present, the applicator **10** is ready to use. In the FIG. **6** configuration centrally-projecting cylinder **38** of the mounting plate **36** aligns with the opening **24** of the adapter **14**.
[0041] FIGS. **5-9** illustrate the operation and positioning of a one-way check valve **46**. It is essentially a circular disk that is at rest in the FIG. **9** position in the opening **24**. A cross shaped cut is preferably through the center of the disk which fully closes when pressure is not present (as shown in FIG. **8**). Hence, any tendency for reverse flow from the pad back to the reservoir (if the pad is pushed down against a surface being treated) is prevented, and unintended drool from the reservoir is minimized.
[0042] In use, and as shown in FIG. **7**, pad **18** (particularly abrasive layer **34** thereof) is pressed against a surface **48** to be cleaned/treated (e.g. a bathroom wall, a bathtub, a window, or another hard surface). One then squeezes the sides of reservoir **12**, forcing cleaning liquid through the check valve **46** and the opening **24** into sponge layer **32**. The liquid then moves into abrasive layer **34**, particularly when the pad is compressed against a working surface **48**. The sponge thus acts as a form of metering device.
[0043] Note that the compression of the pad **18** tends to provide a significant back flow pressure of liquid. However, that liquid cannot return to the reservoir **12** due to the design of check valve **46**.
[0044] FIGS. **10-12** illustrate a second embodiment of the present invention, in which the reservoir **12**A is in the form of an elongated ergonomic handle. Instead of the entire handle being squeezable, a frontal portion **50** can be pressed to activate a pump to ultimately drive cleaning liquid **52** through

neck **14**A and ultimately to a scrubber pad **18**A made of an abrasive layer **34**A and sponge layer **32**A. Alternatively, the sides of the handle could be squeezable to motivate the squirting of the liquid.

[0045] Importantly, this embodiment is provided with a relatively flat rearward side wall **71**. Thus, between uses, as shown in FIG. **11**, the applicator **12**A can be tipped onto that side wall **71**, and rested on an essentially horizontal pedestal **70**.

[0046] The liquid to be used with such applicators can be chosen to be optimized for the particular application intended. For example, if the device is to be used as a window cleaner, the cleaning liquid could be Windex® brand window cleaner. If the device is to be used as a bathroom tile cleaner, a conventional bathroom tile cleaner could be used (preferably one with bleach). If the device is to be used as a hard surface cleaner, a conventional hard surface cleaner could be used. If the device is to be used to polish furniture or shoes, an appropriate liquid polish would be selected.

[0047] While preferred embodiments of the present invention have been described above, it should be appreciated that the invention could be used in a variety of other embodiments. For example, it is not critical that the pad be a multi-layer structure. Further, the adaptor could be formed integrally with the reservoir.

[0048] Thus, the principles of the present invention can be applied in a variety of ways apart from those specifically noted herein and/or depicted in the drawings. Still other modifications may be made without departing from the spirit and scope of the invention. Thus, the claims (rather than just the preferred embodiments) should be reviewed in order to understand the full scope of the invention.

INDUSTRIAL APPLICABILITY

[0049] Disclosed are liquid applicators particularly well suited for display in packaging, and/or for convenient storage between uses.

What is claimed is:

1. A liquid applicator, comprising:
- a reservoir configured to hold a liquid to be applied to a surface, the reservoir having an adapter at one end;
- the adapter comprising an opening extending axially there through and in communication with the reservoir, and a connection structure adjacent an outward end of the adapter; and
- a pad removably engaged to the adapter;
- wherein the pad comprises a layer attached to a mounting plate;
- wherein the mounting plate has a connection structure suitable to engage the connection structure of the adapter; and
- wherein the connection structures engage each other by a bayonet connection.

2. The liquid applicator of claim **1**, wherein the adapter connection structure is a leg, and the mounting plate connection structure is a groove.

3. The liquid applicator of claim **1**, wherein the adapter connection structure comprises two legs arrayed on opposing sides of the adapter opening at an outward end of the adapter, and the mounting plate connection structure comprises two arc form grooves, each with a widened portion and a narrowed portion.

4. The liquid applicator of claim **1**, wherein there is a one-way check valve in the adapter opening for permitting transfer of liquid from the reservoir past the adapter, but resisting return flow of liquid past the check valve to the reservoir.

5. The liquid applicator of claim **4**, further comprising a removable plug positionable downstream of the one-way check valve in the adapter opening.

6. The liquid applicator of claim **1**, wherein the liquid is a cleaning liquid.

7. A liquid applicator, comprising:
- a reservoir configured to hold a liquid to be applied to a surface, the reservoir having an adapter at one end;
- the adapter comprising an opening extending axially there through and in communication with the reservoir, and a connection structure adjacent an outward end of the adapter;
- a pad removably engaged to the adapter; and
- a well form pack suitable to receive the pad and house it prior to use;
- wherein the pad comprises a layer attached to a mounting plate;
- wherein the mounting plate has a connection structure suitable to engage the connection structure of the adapter; and
- wherein the pad is configured so as to be suitable to be linked to the adapter while housed in the pack through a hole in a rearward wall of the pack, or alternatively be linked to the adapter when not housed in the pack.

8. The liquid applicator of claim **7**, further comprising a peel-off lid attached to the well form pack.

9. The liquid applicator of claim **8**, wherein the pad comprises a rearward sponge layer and a forward abrasive layer.

10. The liquid applicator of claim **8**, wherein the liquid is a cleaning liquid and the pad is a scrubbing pad.

11. A liquid applicator, comprising:
- a reservoir configured to hold a liquid to be applied to a surface, the reservoir having an elongated upper handle and a side surface;
- a scrubbing pad linked to a lower surface of the reservoir and configured to receive liquid there from; and
- means associated with the reservoir to drive liquid out from the reservoir to the scrubbing pad;
- wherein the applicator is suitable to be tipped so that its side surface is downwardly positioned, followed by the applicator being able to stably rest on the side surface when the side surface is placed on a horizontal support.

12. The liquid applicator of claim **11**, wherein the liquid is a cleaning liquid.

* * * * *