

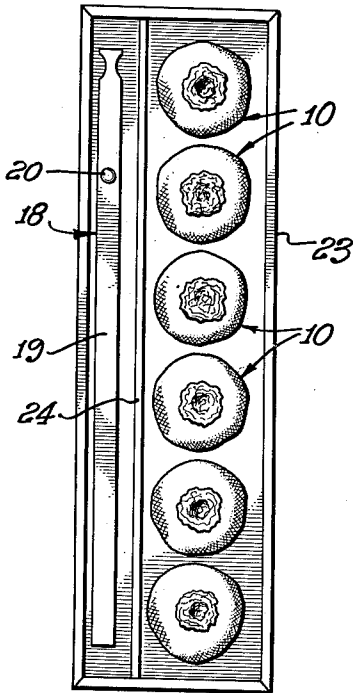
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W. H. D. HORNADAY  
DISPOSABLE CLEANER DEVICE

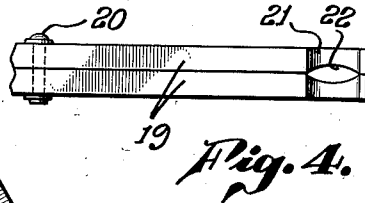
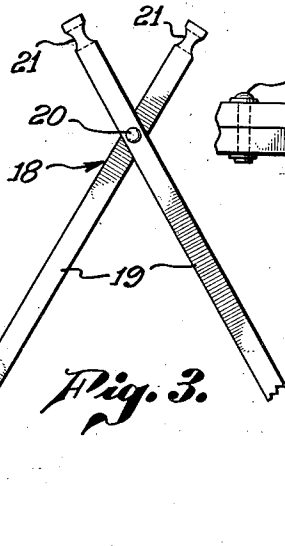
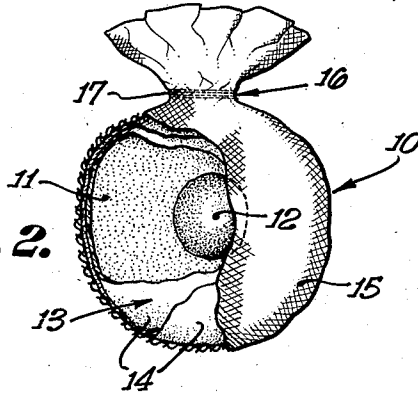
2,560,649

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*Fig. 1.*

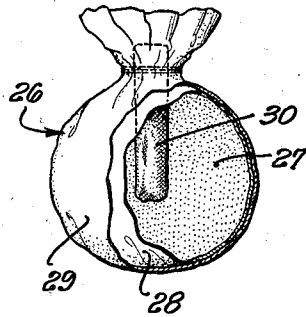
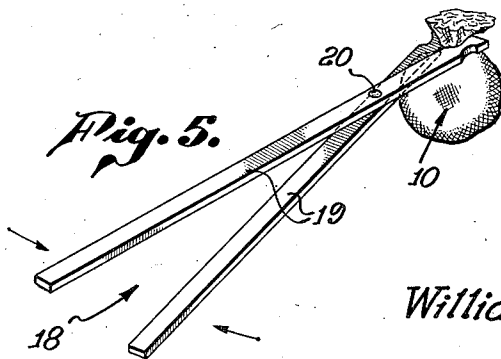


*Fig. 2.*



*Fig. 3.*

*Fig. 6.*



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## DISPOSABLE CLEANER DEVICE

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19 Claims. (Cl. 15—208)

1

This invention has to do generally with cleaning devices and associated cleansing compounds, and is directed particularly to a novel bag type device especially adaptable with its contained composition, to the cleansing of toilet bowls.

Considering the general purposes of the invention, one of my primary objectives is to avoid the various objectionable aspects of conventional toilet bowl cleaning procedures, compositions and appliances, in favor of a distinctly different cleanser form and composition characterized by its capacity for relatively simple and convenient use to readily and thoroughly cleanse and remove stains from all internal surfaces of the bowl. The customary practice of course is to deposit in the bowl a cleaning compound which often, if not ordinarily, requires for its effectiveness dissolution in the bowl water and standing over an extended period of time. Thereafter the resulting solution is applied by a brush to the bowl surfaces. Among the apparent disadvantages are those of having to allow the solution to remain in the bowl for a considerable period, and of having to keep a brush available for the final cleansing.

In accordance with the invention, I have provided a cleaning device in the nature of an applicator for a cleaning composition, the latter being characterized by its capacity for effervescence to cause most effective formation, dissolution and distribution of the ultimate cleaning solution, and the bag portion of the device being characterized and particularly related to its effervescent contents, by the capacity of the bag to cause effervescence and release of the cleaning composition at a properly retarded rate, while at the same time affording a rubbing instrument or swab which is applicable to the bowl surfaces during continued effervescence of the bag contents. A further feature of the bag, and a matter of practical importance and convenience, is its substantial disintegrability in water so that after use, the bag may be left in and flushed out of the bowl. Thus the disadvantages of ordinary bowl cleaning methods are overcome in that the present applicator permits immediate and easy cleaning of the bowl surfaces without the usually required delay, and further in that after use, the residual portion of the bag or applicator can be flushed away.

More specifically, the invention contemplates the use of an effervescent cleaning composition in a flexible container or bag, the form and composition of which is particularly related to the requirement that the bag be permeable by fluids released by the cleaning composition upon its effervescence,

2

that the bag withstand its use as a wetted swab, and finally the bag be disintegrable or reducible to a degree safely permitting its being flushed out of the bowl. Referring first to the cleaning compound, the invention broadly contemplates the use of any suitable composition which is effervescent when wetted, and containing a suitable cleansing agent, preferably, though typically, a water soluble wetting agent. The cleaning composition may also include a suitable germicide and odorant or deodorizing agent.

In its preferred form, the bag wall is made in multiple layers, one or more inner layers comprising a fluid permeable material which tends also to disintegrate in water. Effective results have been had using layers of fibrous, non-woven cellulose tissue, such as the commonly known cleaning tissue, which will readily pass carbon dioxide and water solutions released by the effervescence. The thickness or number of tissue layers may be predetermined to control the rate of water access to the effervescent composition. Best results have been had using two thicknesses of ordinary cleansing tissue.

Because of its water-disintegrability, the inner tissue thickness of the bag is externally reinforced by a material serving the dual purposes of a support for the inside substances and materials, and also of presenting a surface sufficiently irregular to function effectively in rubbing off all foreign matter from the bowl surfaces as the bag is used as a swab. Preferably, I use as the outside reinforcement a layer of loose or open weave material such as cotton or other cellulosic netting.

The invention will be understood further and to best advantage by reference to the typical embodiment shown by the accompanying drawing, in which:

Fig. 1 is a general view illustrating an arrangement in which the individual bags and applicator handle may be accommodated in a package or box;

Fig. 2 is an enlarged view, partly in section, illustrating the bag formation;

Fig. 3 is a view of the applicator in a spread condition;

Fig. 4 is a fragmentary view illustrating the formation of the applicator gripping tips;

Fig. 5 is a view showing a bag gripped by the applicator; and

Fig. 6 is a view similar to Fig. 2 showing a variational form.

Referring first to Fig. 2, the cleaning device is shown to comprise in a preferred though typi-

3

cal form, a flexible bag 10 containing a suitable effervescent composition 11 of granular form and freely mobile to conform with deformation of the bag as it is used to swab the surfaces to be cleaned.

Typically the composition 11 will include an alkaline metal carbonate which, upon reaction with an acidic constituent of the composition, will produce effervescence by release of carbon dioxide. As the carbonate, I may use from about 20 to 30 parts (by weight) of sodium carbonate or sodium bicarbonate. The preferred solid acidic constituent is citric acid or tartaric acid, the amount of which preferably is sufficient to neutralize all the carbonate, with some residual acidity, so that a water solution of the entire composition 11 is on the acid side. Typically, the proportion of acid may range between about 30 to 45 parts. Caking or agglomerizing of the composition particles is prevented by the addition of a suitable material, such as from 15 to 20 parts of starch, talc, flour or so-called whitening. The cleansing agent of primary effectiveness may comprise a detergent or wetting agent such as a petroleum sulfonate alkali metal alginate, or such generally known commercial wetting agents as sold under the trade names "Aerosol," "Acimul," "D-140" and "Nacanol." The wetting agent content may range between about 10 to 20 parts. Added to the above ingredients may be a small percentage of a germicide such as thymol, soluble pine oil, or pine needle oil.

The invention contemplates the possible desirability of including in the bag, a scouring material, preferably of a water soluble composition, which desirably is accommodated in the form of an integrated or cake-like core 12 which, upon dispersion through the bag wall of the composition 11, can then be released for scouring purposes. Typically the core 12 may consist of a mass of particles of volcanic ash, diatomaceous earth, seismotite or the like. The combined effects of wetting and pressure exerted in using the bag as a swab, may cause the core 12 to disintegrate and its particles to be released through the bag onto the surfaces being cleaned.

As previously indicated, the bag proper comprises an inside material, layer or pair of layers generally indicated at 13, readily permeable by the gas and solution formed upon wetting of the composition 11, and having the further property of disintegrability in water to the extent that after use the bag may be safely flushed out of the bowl. Preferably, the inner material 13 comprises two layers 14 of thin cellulose fiber sheet tissue, tests having demonstrated that two layers of the ordinary cleansing tissue are readily gas and liquid permeable, and yet have, when supported by the outer open mesh layer, sufficient resistance to liquid permeation, that will assure release of the effervescing composition 11 at a properly retarded rate. The outer reinforcing layer 15 preferably consists, as explained, of an open mesh fabric such as a cellulosic netting, the weave of which is sufficiently close to properly support the tissue lining, and yet such that after use, the bag will reduce down to a very small bulk presenting no restriction in the bowl siphon.

It is to be understood that the bag may be generally shaped and closed in any desired manner. Preferably it is formed with a neck 16, closed as by stitching at 17, to provide a reduced portion for engagement by an applicator handle. The latter is shown to comprise typically a handle tong 18 consisting of a pair of sections 19 pivoted

4

together by a snugly set rivet or other fastener 20. The ends of section 19 are recessed at 21 and 22 for application and adherence to the bag neck 16 when the applicator is applied thereto as shown in Fig. 5. For convenience in packaging and domestic use, the bags 10 may be accommodated within a box-like package 23, see Fig. 1, having a longitudinal partition 24 at the opposite side of which the handle 18 may be received in collapsed condition.

In use, the applicator is grasped by the handle and immersed in the bowl water, causing the composition 11 to become wetted and to effervesce. The carbonate of course reacts with the acid, while at the same time the wetting agent goes into solution in the water penetrating into the bag. The resulting effervescence effectively carries the wetting agent and germicide solution out through the bag layers 13 and 15, the combined effects of gas release and fine porosity of the bag wall, causing an extremely intimate and thorough dispersion of the released gas and solution. Accordingly, as the bag is applied to and rubbed over the bowl surfaces, the active release of the gas and cleaning solution produces a high y effective cleansing action on the surfaces. Having retarded release, the composition 11 will continue to effervesce and disperse over a period of time sufficient to permit thorough cleansing of all surfaces of the bowl. And ultimately, the bag will reduce down to a negligible bulk presenting no disposal problem.

Fig. 6 illustrates a variational form of the invention differing primarily from the embodiment of Fig. 2, with respect to the form of the scouring core, and the water disintegrability of the entire outer wall structure of the bag. Here the bag 26 contains an effervescent composition 27 of the type above described, retained within two-ply thicknesses 28 and 29 of the thin, permeable and water disintegrable tissue. The core 30 may typically have the form of a cellulose fiber compact uniformly impregnated with fine particles of a water insoluble scouring material. As illustrated, the core may be extended up through the neck of the bag, so as to be within the direct grasp of the applicator tongs. If used in the absence of an outer reinforcing layer, such as the netting 15 in Fig. 2, the tissues 28 and 29 will rapidly disintegrate in water and more suddenly release the effervescing composition 27. Thus an agitated, and carbonated water solution of the cleansing agent is quickly formed upon immersion of the bag in the water. Thereafter, the bowl surfaces may be effectively scoured, in the presence of the froth-like solution, by working or swabbing the surfaces with the scouring core 30.

I claim:

1. A cleansing device comprising a flexible bag containing a solid cleaning composition which effervesces when wetted, the wall of said bag being readily permeable by water passing through the wall into said solid composition and including a material initially readily permeated by fluids released by said composition upon its effervescence and thereafter disintegrable in water, said composition being enclosed within the bag so that the rate of water passage into the bag and the fluid release therefrom are controlled by the permeability of the bag wall.

2. A cleansing device comprising a flexible bag containing a solid mobile granular cleaning composition which effervesces when wetted, the wall of said bag being readily permeable by water passing through the wall into said solid composition and

5

including a material initially readily permeated by fluids released by said composition upon its effervescence and thereafter disintegrable in water, said composition being enclosed within the bag so that the rate of water passage into the bag and the fluid release therefrom are controlled by the permeability of the bag wall.

3. A cleansing device comprising a flexible bag containing a solid cleaning composition which effervesces when wetted, the wall of said bag being readily permeable by water passing through the wall into said solid composition and including a non-woven cellulosic material initially readily permeated by fluids released by said composition upon its effervescence and thereafter disintegrable in water, said composition being enclosed within the bag so that the rate of water passage into the bag and the fluid release therefrom are controlled by the permeability of the bag wall.

4. A cleansing device comprising a flexible bag containing a solid cleaning composition which effervesces when wetted, the wall of said bag being readily permeable by water passing through the wall into said solid composition and including thin cellulose fiber tissue initially readily permeated by fluids released by said composition upon its effervescence and thereafter disintegrable in water, said composition being enclosed within the bag so that the rate of water passage into the bag and the fluid release therefrom are controlled by the permeability of the bag wall.

5. A cleansing device comprising a flexible bag containing a solid cleaning composition which effervesces when wetted, the wall of said bag being readily permeable by water passing through the wall into said solid composition and including an inner layer of material initially readily permeated by fluids released by said composition upon its effervescence and thereafter disintegrable in water, and an outer reinforcing layer permeable by liquid entering and released from the bag and resistant to disintegration in water, said composition being enclosed within the bag so that the rate of water passage into the bag and the fluid release therefrom are controlled by the permeability of the bag wall.

6. A cleansing device comprising a flexible bag containing a solid mobile granular cleaning composition which effervesces when wetted, the wall of said bag being readily permeable by water passing through the wall into said solid composition and including an inner layer of material initially readily permeated by fluids released by said composition upon its effervescence and thereafter disintegrable in water, and an outer reinforcing layer permeable by liquid entering and released from the bag and resistant to disintegration in water, said composition being enclosed within the bag so that the rate of water passage into the bag and the fluid release therefrom are controlled by the permeability of the bag wall.

7. A cleansing device comprising a flexible bag containing a solid cleaning composition which effervesces when wetted, the wall of said bag being readily permeable by water passing through the wall into said solid composition and including an inner layer of thin cellulose fiber tissue initially readily permeated by fluids released by said composition upon its effervescence and thereafter disintegrable in water, and an outer reinforcing layer permeable by liquid entering and released from the bag and resistant to disintegration in water.

8. A cleansing device comprising a flexible bag

6

containing a solid cleaning composition which effervesces when wetted, the wall of said bag being readily permeable by water passing through the wall into said solid composition and including an inner layer of material initially readily permeated by fluids released by said composition upon its effervescence and thereafter disintegrable in water, and an outer reinforcing layer of woven open mesh material permeable by liquid entering and released from the bag, said composition being enclosed within the bag so that the rate of water passage into the bag and the fluid release therefrom are controlled by the permeability of the bag wall.

9. A cleansing device comprising a flexible bag containing a solid cleaning composition which effervesces when wetted, the wall of said bag being readily permeable by water passing through the wall into said solid composition and including a pair of inner layers of thin cellulose fiber tissue initially readily permeated by fluids released by said composition upon its effervescence and thereafter disintegrable in water, and an outer reinforcing layer of woven open mesh material permeable by liquid entering and released from the bag and resistant to disintegration in water, said composition being enclosed within the bag so that the rate of water passage into the bag and the fluid release therefrom are controlled by the permeability of the bag wall.

10. A cleansing device comprising a flexible bag containing a solid cleaning composition which effervesces when wetted, said composition including a mixture of a water soluble wetting agent, a solid organic acid and a carbonate reactive with the acid to release carbon dioxide, the wall of said bag being readily permeable by water passing through the wall into said solid composition and including a material initially readily permeated by fluids released by said composition upon its effervescence, said composition being enclosed within the bag so that the rate of water passage into the bag and the fluid release therefrom are controlled by the permeability of the bag wall.

11. A cleansing device comprising a flexible bag containing a solid cleaning composition which effervesces when wetted, said composition including a mixture of a water soluble wetting agent, a solid organic acid and a carbonate reactive with the acid to release carbon dioxide, the wall of said bag being readily permeable by water passing through the wall into said solid composition and including an inner layer of material initially readily permeated by fluids released by said composition upon its effervescence and thereafter disintegrable in water, and an outer reinforcing layer permeable by liquid entering and released from the bag and resistant to disintegration in water, said composition being enclosed within the bag so that the rate of water passage into the bag and the fluid release therefrom are controlled by the permeability of the bag wall.

12. A cleansing device comprising a flexible bag containing a solid cleaning composition which effervesces when wetted, said composition including a mixture of a water soluble wetting agent, citric acid and a carbonate of the group consisting of sodium carbonate and sodium bicarbonate, the wall of said bag being readily permeable by water passing through the wall into said solid composition and including a material initially readily permeated by fluids released by said composition upon its effervescence, said com-

position being enclosed within the bag so that the rate of water passage into the bag and the fluid release therefrom are controlled by the permeability of the bag wall.

13. A cleansing device comprising a flexible bag containing a solid cleaning composition which effervesces when wetted, said composition including a mixture of a water soluble wetting agent, citric acid and a carbonate of the group consisting of sodium carbonate and sodium bicarbonate, the wall of said bag being readily permeable by water passing through the wall into said solid composition and including an inner layer of material initially readily permeated by fluids released by said composition upon its effervescence and thereafter disintegrable in water, and an outer reinforcing layer permeable by liquid entering and released from the bags and resistant to disintegration in water, said composition being enclosed within the bag so that the rate of water passage into the bag and the fluid release therefrom are controlled by the permeability of the bag wall.

14. A cleansing device comprising a flexible bag containing a solid cleaning composition which effervesces when wetted, said composition including a mixture of a water soluble wetting agent, citric acid and a carbonate of the group consisting of sodium carbonate and sodium bicarbonate, the wall of said bag being readily permeable by water passing through the wall into said solid composition and including a pair of inner layers of thin cellulose fiber tissue initially readily permeated by fluids released by said composition upon its effervescence and thereafter disintegrable in water, and an outer reinforcing layer of woven open mesh material permeable by liquid entering and released from the bag and resistant to disintegration in water, said composition being enclosed within the bag so that the rate of water passage into the bag and the fluid release therefrom are controlled by the permeability of the bag wall.

15. A cleansing device comprising a flexible bag containing a solid cleaning composition which effervesces when wetted, the wall of said bag being readily permeable by water passing through the wall into said solid composition and including a material initially readily permeated by fluids released by said composition upon its effervescence and thereafter disintegrable in water, and said bag having a reduced size neck portion engageable by an applicator handle, said composition being enclosed within the bag so that the rate of water passage into the bag and the fluid release therefrom are controlled by the permeability of the bag wall.

16. A cleansing device comprising a flexible bag containing a solid cleaning composition which effervesces when wetted, the wall of said bag being readily permeable by water passing through the wall into said solid composition and including an inner layer of material initially readily per-

meated by fluids released by said composition upon its effervescence and thereafter disintegrable in water, and an outer reinforcing layer permeable by liquid entering and released from the bag and resistant to disintegration in water, and said bag having a reduced size neck portion engageable by an applicator handle.

17. A cleansing device comprising a flexible bag containing a solid cleaning composition which effervesces when wetted, the wall of said bag being readily permeable by water passing through the wall into said solid composition and including a material initially readily permeated by fluids released by said composition upon its effervescence and thereafter disintegrable in water, said bag containing also a water insoluble scouring material, said composition being enclosed within the bag so that the rate of water passage into the bag and the fluid release therefrom are controlled by the permeability of the bag wall.

18. A cleansing device comprising a flexible bag containing a solid cleaning composition which effervesces when wetted, the wall of said bag being readily permeable by water passing through the wall into said solid composition and including a material initially readily permeated by fluids released by said composition upon its effervescence and thereafter disintegrable in water, the core of said bag containing a cake of scouring material.

19. A cleansing device comprising a flexible bag containing a solid mobile cleaning composition which effervesces when wetted, the wall of said bag being readily permeable by water passing through the wall into said solid composition and being formed of a material initially readily permeated by the wetted effervescing composition being released and thereafter being disintegrable in water, said bag having a neck portion engageable by an applicator, and the bag containing a scouring composition core extending within said neck portion of the bag, said composition being enclosed within the bag so that the rate of water passage into the bag and the fluid release therefrom are controlled by the permeability of the bag wall.

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#### REFERENCES CITED

The following references are of record in the file of this patent:

#### UNITED STATES PATENTS

Number	Name	Date
680,052	Lynch	Aug. 6, 1901
680,308	Atkins	Aug. 13, 1901
1,346,441	Cannon	July 13, 1920
1,450,865	Pelc	Apr. 3, 1923
1,661,512	Sullivan	Mar. 6, 1928
1,786,513	Zuckerman	Dec. 30, 1930
1,927,350	Schopp	Sept. 19, 1933
2,083,193	Grassiani	June 8, 1937