United States Patent

Boone

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[45] **Mar. 28, 1972**

[54] HERMETICALLY-SEALED PRODUCTS AND RELATED METHOD FOR CLEANSING AND OTHER USES

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[21] Appl. No.: **715,768**

Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 678,600, Oct. 27, 1967, abandoned.

[52] **U.S. Cl.** **401/143,** 222/490

[51] **Int. Cl.** **B65d 5/72**

[58] **Field of Search** 401/132, 196–202; 221/311; 222/107, 490

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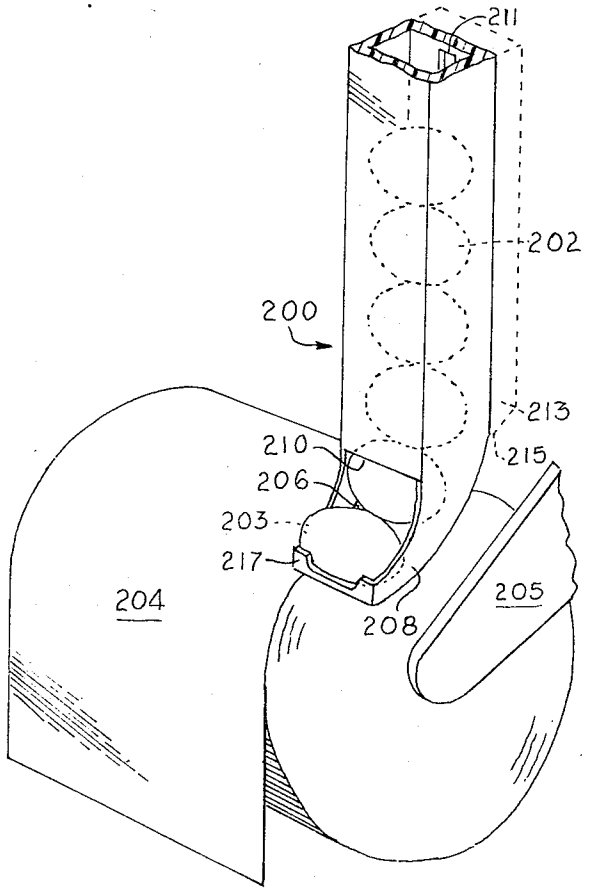
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Primary Examiner—Lawrence Charles

[57] **ABSTRACT**

Products including hermetically sealed, openable, containers enclosing liquid, liquid impregnated, dry and other materials for use alone or in combination with associated or integral components such as sheetlike materials for cleaning, medical or other purposes, together with dispensing components therefor and related method.

6 Claims, 26 Drawing Figures



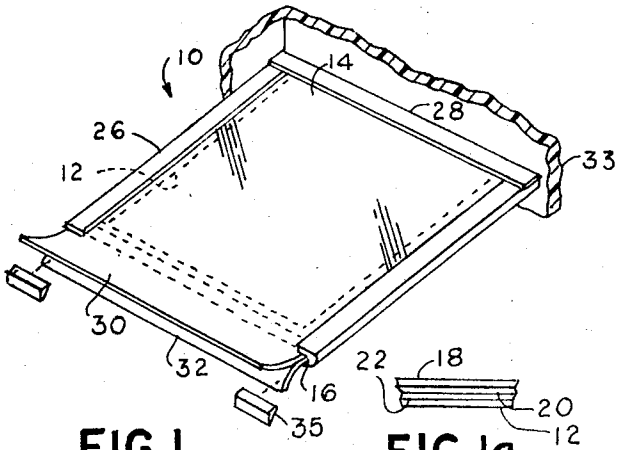


FIG. 1

FIG. 1a

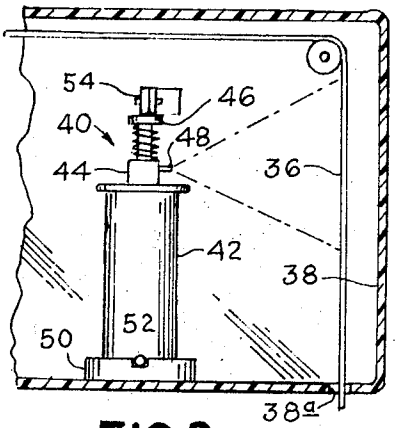


FIG. 2

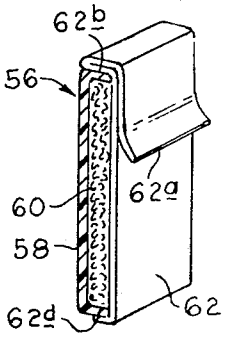


FIG. 3

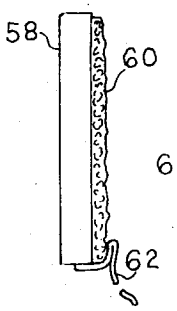


FIG. 3a FIG. 3b

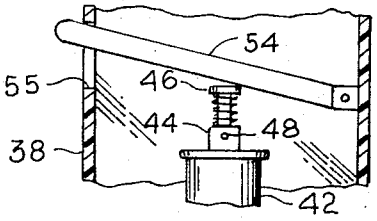


FIG. 2a

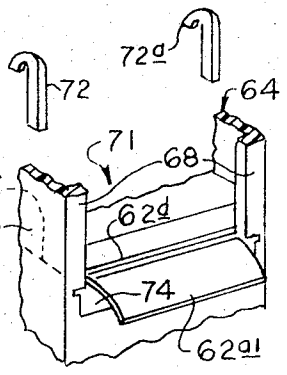


FIG. 4a

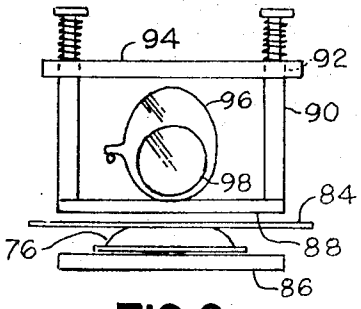


FIG. 6

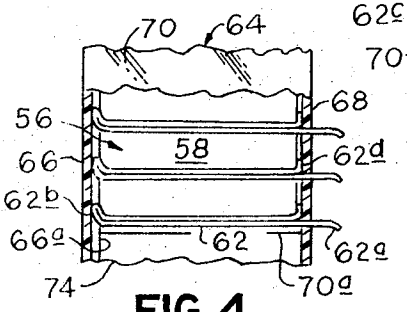


FIG. 4

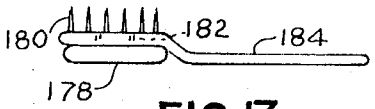


FIG. 17

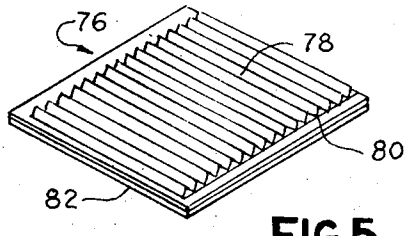


FIG. 5

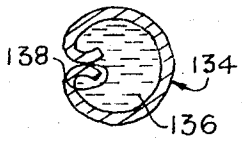


FIG. 11

INVENTOR.

Philip Boone

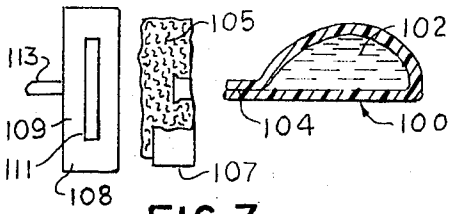


FIG. 7

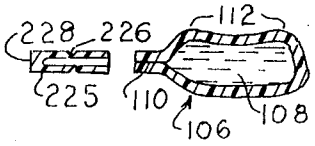


FIG. 8

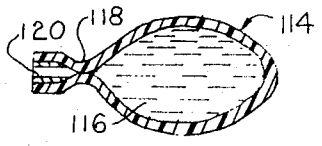


FIG. 9

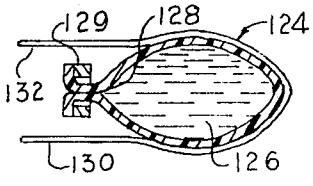


FIG. 10

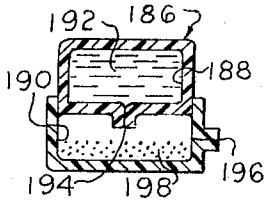


FIG. 18

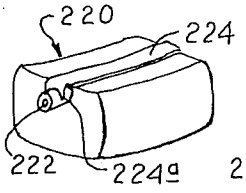


FIG. 21

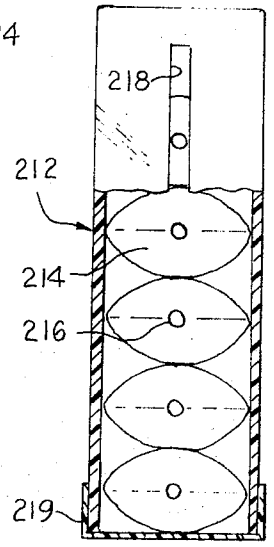


FIG. 20

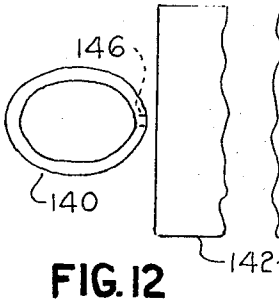


FIG. 12

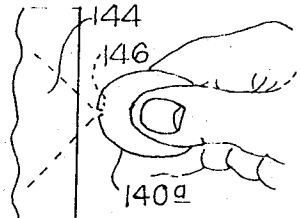


FIG. 13

FIG. 19

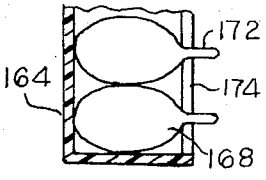


FIG. 15

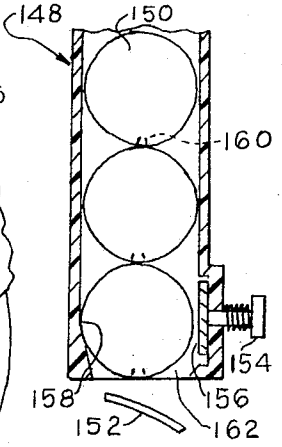


FIG. 14

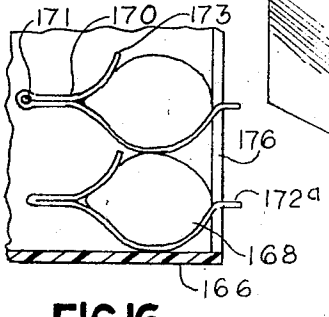


FIG. 16

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HERMETICALLY-SEALED PRODUCTS AND RELATED METHOD FOR CLEANSING AND OTHER USES

The present application is a continuation-in-part of my copending U.S. Pat. application, Ser. No. 378,600 filed Oct. 27, 1967 for "Apparatus for Providing Wetted and Unwetted Materials for Cleansing and Related Uses" now abandoned.

The subject invention covers improvements in structures generally related to those of the above-referenced patent application. These structures, adapted to cleansing, medical treatment, et cetera, embody pad, paper, liquid and other components hermetically enclosed in containers which guard their content against contamination and inadvertent liquid escape but which can be opened with utmost dispatch and efficiency. The present invention develops, simplifies, and enlarges the scope of the previously disclosed optional obtaining of wetted and dry products. It discloses novel structures for dispensing a liquid or other substance directly to bodily portions. The invention also encompasses special mounting and dispensing means cooperating with the aforesaid product structures for making obtainable, for example, in the fields of personal hygiene, hospital treatment, etc., a readily-at-hand continuous supply of the products, such a supply and the rapidity and convenience with which it is provided being concomitants importantly contributing to an improved function and usefulness thereof. In this regard, it is noteworthy that whereas the art usually discloses the necessity of the user's employing both hands to tear open a packet or the like in a cumbrous and time-consuming procedure, the products and mounting means of the present invention, in a majority of instances, function together to permit a facile one-handed operation, from supply to use. Relative to a toilet-tissue adaptation, in which scrupulous cleanliness is an essential, the art shows wetting of a material wherein the wetting agent is supplied in bulk. It is thus subject to contamination and unfit for the use set forth. Again, the art predominantly, if not invariably—discloses oversized dispensing equipment subject to fouling and unsuitable for general acceptance. Little or no regard is given to the possibility of utilizing standard fixtures and providing auxiliary or accessory means for use therewith.

Objects of the invention are to provide hermetically sealed products and related apparatus for conveniently and thoroughly cleansing and otherwise hygienically or medically treating portions of the human body; to provide a product of the foregoing category which renders rapidly available either a dry or a moistened component; to provide products and apparatus of the character described wherein a hermetically sealed but predeterminedly releasable liquid or liquid-impregnated component is included; to provide a predeterminedly collapsible container having openable orifice means of a type adapted to dispense a liquid contained therein to substantially an entire functional area of a sheet material integral with or positioned adjacent thereto through an essentially momentary application of pressure to a given area of the container; to provide a container of the type stated which is collapsed under a manual application of a mechanical stress of a compressive nature; to provide a hermetically sealed envelope having a cleansing or otherwise usable sheet or pad bonded to the inner surfaces of its walls, the envelope being openable along predetermined separable linear portions so that, when opened, the walls and sheet or pad bonded thereto serve together as a treatment or applicator device or in conjunction with a liquid, a powder or other substance impregnated in the pad or sheet; to provide a hermetically sealed applicator including an open-faced chamber component, a resilient pad therewithin and a flexible peelable cover sheet extending across the open face of the chamber component and bonded to marginal areas thereof, the pad springing outwardly of the chamber when the cover sheet is removed, being adapted to perform cleansing or other treatment and being attached either to the chamber component or to the cover sheet, either of which serves as a holder or support for applying the pad; to provide an applicator as defined in which the pad is impregnated with a liquid or other substance; to provide a hermetic liquid-impervious container or capsule enclosing a

liquid suitable for cleansing, medical or other uses having a given sealed or frangible portion which is subject to substantially abrupt opening and ejection of the liquid in a given form when the container is compressed, as by holding it stationary and squeezing it in a direction substantially normal to the walls thereof; to provide a container of the last-named category which is of a so-called "one-shot" type adapted to discharge its content in the form of a stream, a glob, a dispersed spray, or the like so as to cover substantially an entire functional area of a material upon contact therewith without the need of a subsequent spreading operation; to provide a container as characterized which is capable of emitting a liquid to an area in spaced relation thereto; to provide a collapsible container having a puncturable or otherwise openable wall portion adapted to open and to release its liquid content in response to contact therewith of an external opening element; to provide a container of the type set forth which includes nozzle means at an openable portion; to provide a container as described which is attached to a sheet or pad for receiving its released content and which constitutes an applicator for the latter; to provide a container including positioning, pump and nozzle means for dispensing a liquid spray to a predetermined area of a sheet material associated therewith; to provide products of the character described which incorporate functional components readily disposable after usage; to provide containers of the category mentioned adapted to use one or more of such materials as papers, metallic foils and plastic substances in their impermeable wall constructions and thermoplastic substances in portions adapted to heat, ultrasonic or other sealing methods; and to provide holding and dispenser means for readily supplying a plurality of the aforementioned products individually and in a usable condition as, for example, dispenser means in the form of a compact fixture adapted to mounting in a bathroom, a hospital area, or as a portable cartridge or the like which can readily be carried on the person or in a handbag.

Other objects of the present invention will in part be obvious and will in part appear hereinafter.

The invention accordingly comprises the product or device possessing the features, properties, constructions and relation of components, and the method involving the several steps and relation and order of one or more of such steps with respect to each of the others which are exemplified in the following detailed disclosure and the scope of the application of which will be indicated in the claims.

For a fuller understanding of the nature and objects of the invention, reference should be had to the following detailed description taken in connection with the accompanying drawing wherein like reference characters refer to like parts throughout the several views and wherein:

FIG. 1 is a diagrammatic perspective view of a hermetically and releasably sealed applicator packet or container of the invention;

FIG. 1*a* illustrates a fragmentary portion of a wall of the container of FIG. 1;

FIG. 2 is a diagrammatic elevational view of a liquid dispensing device for a toilet tissue;

FIG. 2*a* is a partial view of the device of FIG. 2 taken from a different angle;

FIG. 3, 3*a* and 3*b* are diagrammatic views of a hermetically and releasably sealed container, and an applicator pad carried thereby;

FIG. 4 is a diagrammatic side view of dispensing means for a plurality of containers generally similar to that of FIG. 3;

FIG. 4*a* is a diagrammatic front perspective view of the dispensing means of FIG. 4;

FIG. 5 is a diagrammatic perspective view of a particular form of liquid container;

FIG. 6 is a diagrammatic side view of one form of compression applying means;

FIGS. 7 through 11 are diagrammatic cross-sectional views of various collapsible liquid-containing applicator means of the invention;

FIGS. 12 and 13 are diagrammatic fragmentary views of integral openable liquid containers and sheet materials;

FIGS. 14, 15 and 16 are cross-sectional elevational views of containers supplying means;

FIG. 17 is a diagrammatic view of one form of a combined container and applicator means;

FIG. 18 is a diagrammatic cross-sectional view of a dual-compartmented collapsible container;

FIG. 19 is a diagrammatic perspective view of containers and dispensing means of the invention in combination with a toilet tissue;

FIG. 20 is a diagrammatic view of a cartridge; and

FIG. 21 illustrates a modified release means.

Referring now to the drawing, one embodiment of the invention is shown in FIGS. 1 and 1a in the form of an openable packet or envelope 10 within which is contained, as for example in a sterile condition, a sheet or pad 12 bonded to an inner surface of the envelope walls 14 and 16 for use as a cleansing or medicament applicator or the like. The envelope is formed of a flexible pliant liquid-, air- and gas-impermeable sheet material such as polyethylene or polyvinyl chloride. Or it may be composed of a multilayered sheet comprising, for instance, a paper 18, a metallic foil 20 and a plastic coating 22; or merely the paper, or foil or a material of another category such as a plastic film and the coating; or again, a plastic film only.

The envelope walls 14 and 16 are frangibly sealed together, as by heat sealing, at their juxtaposed edges along two sides and at one end by the binding strips 24, 26 and 28, respectively. The binding strips, formed, for example, of a thermoplastic-coated paper and impermeable to air, gas and water, have a lower tear strength than that of the envelope walls 14 and 16. At its other end, the envelope walls terminate is unsealed portions forming a pair of tabs 30 and 32. Slightly inwardly of the tabs, the inner surface of each envelope wall is coated with a transverse strip of an adhesive substance, preferably of a pressure-sensitive or cohesive type, the two opposed strips being pressed together to form a single bonding strip 34 which provides an air- and water-tight seal thereacross.

When the tabs 30 and 32 are grasped manually and pulled divergently apart, the engaging properties of the bonding strip 34 are overcome and the seal thereat is separated. The side strips 24 and 26 are torn along their entire lengths. THe end strip 28 may also be torn if a complete separation of the two envelope walls is intended to provide two individual usable components. Where, however, a single applicator is to be provided, the strip 28 is not thus torn. In the latter instance the envelope may, advantageously, be composed of a single folded sheet, in which case the strip 28 would neither be necessary nor included.

When the envelope 10 is opened, as above described, the applicator sheet or pad 12, affixed to an envelope inner wall, is ready for use, the wall serving as a backing or support means to facilitate its manipulation and protect the hand from contact with a liquid, where included. As previously intimated, the envelope walls may either be separated to form two units with individual pads 12 bonded thereto or may be in one piece mounting a single folded pad or sheet, as, for example a sheet of toilet or cleansing tissue, where intended usage calls for a single larger area. The enclosed pad or sheet 12 may be in a dry state. On the other hand it may incorporate a powder or a substance chemically or otherwise releasable when moistened. Again, it may already be impregnated with a liquid, a cream a salve, a paste or some other substance depending upon its contemplated use. Where dry, the pad may serve as a swab, an absorbant bandage or the like. Where impregnated with a releasable substance, it may be used to cleanse bodily parts, dress a wound, serve as a bandage in an elongated form, apply a medicament or serve some other function, perhaps in an entirely unrelated field, as described hereinafter.

Although frangible strips or tapes 24, 26 and 28, of a given tear strength, have been specified as a means for initially fastening and thereafter permitting opening of the envelope walls, other means may be employed for the purpose. Thus, for example, the tapes may be so bonded to the envelope walls as to predeterminedly separate therefrom under the divergent stress applied to tabs 30 and 32. Or the tapes may be dispensed with and the marginal portions of the envelope walls bonded together directly, as by heat-sealing together the polyethylene or other coating material of their inner surfaces.

A plurality of the packets 10 may be stacked, e.g., vertically, in a cabinet indicated at 33 with one or both of the tabs 30 and 32 protruding from an open transverse frontal portion or aperture of the cabinet. A pair of cutting blades 35 mounted on the cabinet slightly forwardly of the tabs and positioned to enter the "V" thereof and intercept the outer edges of the tapes 24 and 26 when one of the tabs is manually drawn upon provides a "one-handed" means of obtaining a supply of opened packets in the form of applicator pads or sheets, ready for use. In this adaptation but a single tab of a length suitable for manually grasping and drawing purposes is necessary, the other tab preferably being shortened to a length only sufficient to provide the "V" for entrance of the cutting edges 35. Assuming a releasable seal to be provided along the edges instead of the frangible tapes, a pair of wedge elements or the like supplants the blade 35 so as to enter the "V" just inwardly of the transverse edges and force the sealed margins apart. Assuming an adequate frangibility of the tapes, the wedges could perform the tearing function.

To avoid repetition of language in describing the several structures shown herein, an outline of materials generally appropriate for container and applicator constructions and for substances such as liquids incorporated therewith will be given, it being understood that the materials presented are not all-inclusive, that a considerable choice of materials proof against contamination and dissipation of content is possible and that they are not to be construed in a limiting sense. A liquid- gas- and vapor-proof container wall structure has already been shown in FIG. 1*a* and may be utilized also in other examples, as in the collapsible container showings of FIGS. 5, 7–11 and 18 where but a single wall component is illustrated. A multi-ply wall may, for example, be considered as comprising a kraft-paper outer layer 18, an intermediate metallic layer 20 such as a metallic deposition or an aluminum foil, and an inner layer 22 of a thermoplastic resin such as polyvinyl acetal or polyvinyl chloride. In a modification, the foil or the paper may be eliminated or the layer arrangement may be altered. Other materials suitable for container structures composed of one or more layers comprise the thermoplastics polyethylene, cellulose acetate, and polypropylene, a polyester film, a metallic foil such as a lead foil, and other types of paper or fabric. Where containers or mounting means therefor embodying a substantially rigid component are employed, as in FIGS. 3, 4, 14, 15, 16 and 19, a polystyrene adapted to injection molding may be utilized to advantage both from a structural and cost viewpoint.

Where bonding of marginal or other areas is specified, such techniques as hot-bar heat sealing or radio-frequency and ultrasonic-frequency sealing of thermoplastic and other materials such as those above-mentioned may be utilized, intermediate subcoats being included as necessary. So-called "hot-melt," "pressure-sensitive" or other adhesives may also be employed. To provide a predeterminedly separable bonded area for release purposes, heat-seal temperatures and pressure adapted to the purpose, e.g., a lower temperature and/or pressure than used at areas to remain bonded, hermetic and liquid-impervious, may be selectively employed. Other means for providing an openable area of a container comprise the use of a weaker adhesive for the purpose; a strip coat; a semiperforated or scored area to provide a relatively weaker and rupturable or frangible portion, and other means described hereinafter.

In the examples wherein applicator components such as sheets or pads are specified, as in FIGS. 1, 3, 7, 9, 10, 12 and 13, a wide choice of materials is possible. Thus, for example, an applicator pad may be composed of cotton, wool or

synthetic fibers and in the form of a felt, a batt, a mass, a woven cloth or some other structure. In certain instances, as in FIG. 3*a*, the pad should have a highly resilient characteristic such that it will spring outwardly from its container when released. Where a paper may be employed for cleansing or other purposes in a wetted condition, as either indicated or alternatively possible with respect to the structures of FIGS. **1**, **2**, **3***b*, **4**, **9**, **10**, **12**, **13**, **16** and **19**, it is to be understood that the paper is of a suitable wet-strength, ply, absorptive, dimensional or other characteristic for purpose contemplated. It is also to be understood, in either instance, that is, where either a pad or a paper applicator component is specified, that adequate areas untouched by the liquid are provided surrounding the wetted portion. In this connection somewhat wider sealed marginal portions than those shown in FIGS. **1** and **3** may be provided. Accordingly, a liquid component, where included, is prevented from reaching the back of the structure and the hand of the user is kept free from contact therewith.

The type of liquid employed in any given structure of the present invention is to be considered as dependent upon the particular function contemplated. Thus, for example, a basic liquid for cleansing purposes may consist of water, only, preferably a distilled sterile water. Again, an effective solution may include water and alcohol or water, alcohol and an emollient such as lanolin. Where serving as a refreshant, a so-called "fragrance" may be included. Other possible ingredients include a humectant, e.g., glycerin or propylene glycol; an appropriate antiseptic or germicidal substance or a bacteriostat such as hexachlorophene; a mineral oil and emulsifying agent; and a stabilizing agent. Where an appreciable viscosity of the liquid is desired, it may incorporate a substance such as carboxymethyl cellulose or some other appropriate similarly functional substance. Various additional substances may advantageously be packaged within the containers of the present invention for dispensal in single-application or so-called "one shot" form to provide for example, convenience during travel. Among such contemplated substances are a deodorant, a mouth-wash, a toothpaste, a shaving cream, a skin cream, a hair-grooming substance, a soap, a perfume, a medicine, a beverage, a shoe paste, a clothes or household cleaner, and a lubricant. The size of the container, the form of the release orifice of a collapsible container, and the type of layer or coating contiguous with the contained substance require careful consideration. Thus, the inner container surface must be of a type which would not contaminate or involve a deleterious reaction with the enclosed substance.

Where the terms "container" and "applicator" are used herein somewhat interchangeably, the container is to be understood as possible of incorporation with another component to form an applicator or to serve such a function of itself. The applicator is more particularly to be regarded as a completed entity adapted to serve the ultimate treatment functions.

In FIGS. **2** and **2***a* there is shown apparatus for supplying, optionally, both conventionally dry and wetted sheets of a toilet tissue **36** supplied in semiperforated sections from a roll, not shown, mounted in the cabinet **38**. Means for providing the wetted sheets or sections comprises a liquid-dispenser **40** comprising a container **42**, holding a cleansing liquid suitable for the purpose and including a pump component **44** with spring-biased plunger **46**, nozzle **48** of given angular dispensal characteristics, and internal valve or sealing means, not shown. The dispenser **40** which, alternatively, may be of the aerosol type disclosed in the aforementioned copending patent application, is adapted to emit a spray of given volume and angular direction so that when plunger **46** is depressed, a predetermined area of the sheet **36** is wetted to a given degree. For the purpose, mounting means **50** establishes a correct distance of the nozzle **48** from the sheet providing therewith the dimensions of the area covered, and keying means **52** insures a proper direction of liquid emission. The pivotal lever **54** projects through a slot **55** formed in cabinet **38** to enable actuation of the apparatus externally of the cabinet. The width of slot **55** is predetermined to limit the travel of lever **54** therein and control the amount of liquid sprayed upon each section of the tissue. It will be understood that the tissue **36** is of an adequate wet strength and that means such as a visible index mark at cabinet aperture **38***a* establishes a correct sectional position of the tissue for receiving the liquid.

The applicator device **56** of FIG. **3** includes a substantially rigid rectangular container **58**, preferably formed of an inexpensive plastic material such as a polystyrene and having an open frontal face. A resilient pad **60**, composed, for example, of organic or synthetic fibers, is compressively held in the container by a liquid- and gas-impermeable cover-sheet **62** having a leader portion **62***a*, releasably bonded to marginal and end portions of the container at **62***b* and **62***d*, as by a heat seal. When the cover-sheet is manually stripped or peeled from the container either of two forms of applicator are provided, as represented in FIGS. **3***a* and **3***b*, respectively. In FIG. **3***a* it is to be assumed that the pad **60** is highly resilient and is retained by the container, as by bonding of its innermost surface, the container constituting a convenient holding means for the pad in ultimate usage. In FIG. **3**, the pad is bonded to the cover-sheet, the two being removable as a unit and together constituting the applicator. The pad **60** may, for instance, be a dry sterile component or it may be impregnated with a sterile liquid or with some other substance of a type hereinbefore mentioned. Instead of the pad **60**, it is to be understood that a sheet of paper such as a toilet tissue may be bonded to the inner surface of the cover sheet **62**, the latter serving, in use, as a backing or support therefor.

FIGS. **4** and **4***a* illustrate a rack or dispenser **64** for mounting a plurality of the devices **56**, generally similar to those shown in FIG. **3**, and for supplying, individually and conveniently, the applicators of FIGS. **3***a* or **3***b*, or a modification embodying a backed sheet of toilet tissue, through a one-handed procedure of merely grasping and drawing upon the leader **62***a*^{1}, the latter being somewhat longer and narrower for this purpose than was shown in FIG. **3**. THe dispenser **64** includes the vertically disposed rear wall **66**, two front partial-wall portions **68** and the sidewalls **70**, together forming a chamber **71** within which the applicator devices **56** are preloaded and adapted to slidable downward movement due to gravity or to supplemental biasing means, not shown. The foremost or leading device **56** is held fixed by the shoulder **66***a* extending inwardly from the rear wall and by a pair of shoulders or flanges **70***a* extending inwardly along the sidewalls. The shoulder **66***a* is adapted to engage the folded-over portion **62***b* of the cover sheet, while sidewall flanges **70***a* sustain marginal portions **62***c* of the cover sheet, not shown in the illustration of FIG. **3**, which slightly overhang the sides of container **58**. The narrower dimension of the leader or tab **62***a*^{1}permits free downward movement thereof in the open face area between the front wall portions **68**.

The dispenser **64** is intended to be mounted on a wall or the like. The two vertical arms **72**, having hooked extremities **72***a* constitute an alternate mounting means and, if included, are to be assumed as integral with and extending upwardly from the sidewalls **70**. They are adapted to engage the two spindles or stub shafts of a standard toilet-tissue mounting device and provide a simple means of mounting the dispenser **64** just beneath the latter. Alternatively, the arms **72** may extend downwardly from the walls **70** to position the dispenser immediately above the toilet-tissue fixture. Assuming the dispenser **64** to be fixedly mounted, as above described, an applicator, ready for use and in a wetted, a dry, or an otherwise-treated condition, as previously described, is obtained by merely drawing upon the leader **62***a* to withdraw the applicator from the dispensing fixture. The exhausted container portion **58**, freed from the cover sheet **62** which formerly sustained it and being of smaller dimensions than the chamber **71**, drops downwardly to a disposal chamber **74**. The succeeding applicator devices **56** then move downwardly to assume new positions similar to those shown. Of course, if the applicator of FIG. **3***a* were that to be obtained the component **58**

would be that retained for use and the cover sheet **62** would be discarded.

FIGS. **5**, **5***a* and **6** relate to a liquid-carrying container **76** of relatively large dimensions adapted to release its content simultaneously throughout an area with which it is superimposed. To enable such a performance the container embodies a plurality of frangible areas throughout a functional wall **78** which is otherwise impervious to a gas or a liquid. The frangible areas shown comprise relatively thinned and/or partially scored or semiperforated rupturable areas **80**. The opposite wall **82**, to which wall **78** is heat-sealed or otherwise maintained integral, along its margins, is, of course, impervious to passage of a liquid. When the container is compressed throughout its area, as indicated in FIG. **6**, the liquid exudes or ejects in a somewhat sideways angular direction from the plurality of release areas and is transferred to the superimposed sheet material **84**. Rudimentary means for compressing the container is shown merely for illustrative purposes and includes a fixed support **86**, a pressure plate **88** having integral posts **90**, the latter being mounted for slidable movement in apertures **92** of the fixed bar **94**. Functional actuation of the pressure-plate is obtained by turning the cam **96**, as by means of the knob **98**. A modification of the container wall **78** contemplates a structure comprising a plurality of slightly overlapping sealed strips throughout one surface, the sealed portions being adapted to separate when the container is compressed to a given degree.

In FIGS. **7–11** there are illustrated various types of collapsible throw-away liquid container or applicator devices contemplated by the invention. THese devices may be considered as adapted to a somewhat syringelike function relative to their liquid compression and emission characteristics. The liquid is, for example, emittable either directly to a portion of the human body or through the medium of an associated or integral applicator component. As previously intimated, although the container walls are generally shown as of a single-layer construction, they may be of a multilayered form and composed of such materials as those previously described with respect to FIG. **1** or of other materials or suitable gas-, vapor- and liquid- impermeable characteristics. The capsulelike container **100** of FIG. **7** contains a liquid **102**. Its upper and lower walls are to be regarded as sealed together along side marginal areas, not shown, and less strongly at a release area **104**. The container is adapted to release its liquid content in a measured amount when manually compressed, as between the thumb and first finger, the liquid being emitted forcibly between predeterminedly separable portions at **104**. In a modification, an applicator pad **105**, composed of cotton or the like, may be bonded to the container, the liquid being introduced thereinto when released at area **104**.

The container **106** of FIG. **8** encloses the liquid **108** and includes an openable releasably sealed area at **110**. It exemplifies two structural differences relative to the container of FIG. **7**, namely, the specially formed upper wall portions at **112**, and the offset spacing or intermediate positioning of the release area at **110** with respect to the upper and lower walls. Assuming the container to be positioned on an accompanying sheet material and forming therewith a composite structure, the location of the release area **110** permits an unimpeded transmittal, that is, a transmittal at least partially through space, of the liquid to an area of the sheet material which is largely determined by the dimensional characteristics of the liquid stream.

The structure of FIG. **9** includes the container **114**, the liquid **116**, the releasably sealed area at **118**, and the orifice means or nozzle **120**. The nozzle enables a particular control of the liquid emission as, for example, it provides a discharge thereof in the form of a spray. Although the nozzle **120** is shown as positioned externally of the releasably sealed area at **118**, it may advantageously be located interiorly thereof to insure a sterile condition of the orifice.

The modification of FIG. **10** includes the container **124**, the liquid **126**, the releasably sealed orifice at **128**, the sheet material **130**, and a second sheet material **132**. The latter, in one embodiment, is a relatively short sheet serving as an apron to prevent an unwanted dispersion and escape of the liquid. In an alternate structure the sheet **132** is to be regarded as dimensionally generally similar to sheet **130**, the discharged liquid being deposited between the two sheets, one of them being relatively rapidly permeable to the liquid so as to provide a substantially immediately moistened external surface. Alternatively, the container is enclosed within a single folded sheet of material one section of which may be treated to be less permeable than the other.

FIG. **11** represents a container **134** formed, for example by any suitable known method of fabricating a plastic material, as one continuous wall or "bubble" enclosing a liquid **136** and having a release area at **138**, it being assumed that the liquid has been introduced into the already-formed wall structure, hypodermically or by some other suitable process. The liquid-release area is provided in the form of a selected one of a thinner, semiperforated, releasably plugged or other means located at **138**.

FIGS. **12** and **13** illustrate an association of a liquid-carrying container **140** and **140***a*, of a type such as any of those above-described or one constructed of two separate bonded sheets, as suggested in FIG. **12**, and a sheet material **142**, for example, a toilet tissue. A liquid **144** is emitted through a nozzle or other control aperture at **146**, divergently as from a point-source, to a predetermined area of the sheet when the container is compressed, as shown. Wherein a frangible seal or the like has generally been specified as a liquid-release means of the containers, above described, it is to be understood that a valve as, for example, one biased to a closed position or a releasably sealed valve, is to be considered as falling within the scope of the closure means.

In FIG. **14** there is shown a device **148** for mechanically effecting a compression of a succession of liquid containers **150** to provide a distribution of a liquid, in spray form, to given portions of a sheet material **152**, supplied from a source such as a roll, which is brought to a predeterminedly adjacent relation. The device comprises a plunger **154** having a pressure-plate **156** at one extremity. Upon pushing the plunger inwardly, the container is compressed against an anvil portion **158** and its liquid content ejected through an orifice at **160**, for example as a spray, through out a given area of the sheet **152**. Each exhausted and compacted container drops through an aperture **162**, the remaining containers moving forwardly to assume the positions illustrated under the influence of gravity and/or biasing means, not shown.

FIGS. **15** and **16** illustrate dispenser means in the form of wall-racks **164** and **166**, respectively, suitable for installation in a bathroom or other appropriate area. These racks enable one-handedly obtaining a supply of the subject containers **168** adapted to release a liquid or other substance when compressed, or a supply of the containers and sheets **170**, as integral assemblages. The containers may be provided with tabs **172** and **172***a* which permit their being withdrawn one-at-a-time through a substantially open face of each rack. The tab **172***a* is merely an extension of the sheet **170** shown considerably shortened at **173**. Alternatively, means such as a movable and manually actuatable apertured release port or means suggested by FIG. **19** may be employed for their individual withdrawal. The rack **164** includes a pair of vertically disposed retaining flanges **174** at its sides, between which each foremost container may be slidably withdrawn. The rack **166** includes an open transverse face portion or slot **176** which permits unimpeded withdrawal of the container-and-sheet assemblage. Movement of the containers downwardly is effected by gravity or in conjunction with biasing means, not shown.

In FIG. **17** there is represented an assemblage comprising the container **178** enclosing a cleansing substance and an applicator **180** in the form of a brush such as a toothbrush, composed, for example, of a plastic material such as polyethylene and formed by an injection-molding process. A releasably sealed orifice of the container is aligned with or extends within

an aperture **182** formed within the support **184**, the aperture passing through the support to a location adjacent to the bristles. When the container is manually compressed, the seal thereof is broken and its content is dispensed to the brush. While the assemblage is suitable as a miniature, one-application or "throw-away" device which may, for instance, include a protective sheath and be carried on the person for an emergency or other single use, it will be apparent that it could include a self-sealing component or valve at its orifice to permit several applications of the contained substance, spaced in time. Other brush adaptations comprise a shoe brush and paste; a spot remover; a nail brush, etc. It will be evident that the container component **178** could be otherwise located as, for example, on a modified handle portion or on a removable protective element or sheath such as a bar passing across the bristles. It will also be apparent that a container of the character described may readily be combined with other applicators of various shapes, forms and functional characteristics, including its being embedded within a pad or the like, to form a variety of composite structures.

The example of FIG. **18** illustrates a collapsible multicompartmented container **186** including the chamber areas **188** and **190**. The container, when manually compressed permits a mixing or a chemical reaction of contained substances, at least one of which is a liquid **192**, by the initial passage of the liquid through a first releasable seal or otherwise openable area at **194**, followed by ejection of the resulting combination as a liquid through a releasably sealed or otherwise openable area **196**. Merely by way of example, a powder **198** adapted to a functional combination with the liquid is shown.

In FIG. **19** there is shown a relatively simple dispensing means or fixture **200** for supplying and positioning a plurality of containers **202** of the general type illustrated in FIGS. **8, 9, 11** and **13**. The fixture is mounted at one side of a roll of toilet tissue **204** rotatably mounted on a bracket **205** and so positioned as to provide a distribution of a liquid ejected from each foremost container on a given area of a sheet or section of the tissue when the container is compressed, as shown in FIG. **13**. It will be understood, of course, that the container release orifice **203** faces the surface of the paper to be moistened. The containers are successively delivered by gravity or supplemental biasing means to the open chute or ramp **206**, having the side rails **208** and the frontal indented or cutaway plate **210**, the latter permitting the thumb to be inserted for compressing the foremost container in conjunction with the first finger which is positioned beneath the chute. The base of the chute may either be closed or of a partially open construction for grasping a container, as required. After its compression, the exhausted container is removed and thrown away, a succeeding container being brought to a foremost position, automatically. The mounting fixture can be of a throw-away type or of a permanent category accepting, for example, a cartridge loaded with the containers. Such a cartridge **212** is illustrated in FIG. **20** wherein the containers **214** are protected against an inadvertent release of their contained liquid by the rigid enclosing structure thereof. The containers are provided with small protuberances or lugs **216** on their walls which serve as guides in conjunction with channel means **218** of the cartridge or similar means of the mounting fixture. The cartridge may be inserted in the fixture, the releasable strip **219** first being removed or the containers may be removed from the cartridge and loaded in the fixture. The fixture is releasably attached to a wall bracket, to the roll mounting means or otherwise as desired. The devices of FIGS. **2, 14** and **19** enable the obtaining, optionally, of dry or moistened sheets using but a single paper supply source, the liquid being supplied from a sealed and hence protected source in each instance to assure its antiseptic characteristic.

Alternatively, the fixture **200** may incorporate a compressive mechanism, such as shown in FIG. **14** or of another form. The fixture may, of course, by otherwise positioned with respect to the sheet material **204**. It is to be understood, also, that each container **202** may be manually removed from the fixture and the liquid then applied to a sheet section, or it may be applied directly to a portion of the human body or other area to be treated. Flange means of a container wall, as well as its orifice portions may be utilized in conjunction with guide means such as a channel or guide rails of the dispensing fixture to insure correct and most convenient positioning of the containers during their movement and compression therewith, for removal therefrom, or for a direct discharge of the liquid content by the hand of a user.

As a modification of the embodiment of FIG. **19** which includes the sheath **213** for accommodating the pad **105** of FIG. **7**, it would readily be feasible, as, for example, in a cleansing or medicament-applying pad adaptation for hospital usage or the like, to delete the sheath **213** and, for the purpose of insuring a sterile condition of the pad **105**, to enclose all but the functional surface portions of each individual pad in a protective sheath **107**. A removable cap **109** overlying these functional surface portions and having outwardly projecting engageable lug or flange means **111** on its outer surface would be adapted to engagement by complementary yokelike elements **217** of the fixture, at the exit extremity of ramp **206**. Accordingly, the cap would automatically be removed while the applicator device was undergoing removal from the fixture, as a one-handed operation, and the applicator would then be in complete readiness for use in performing a given function.

In FIG. **16**, unitary compressible containers **168** and sheets **170** for receiving the flowable content thereof have been illustrated. Here again, as in a medical usage, it may be imperative to insure a sterile condition of the functional surface of each sheet **170**. This can readily be accomplished by folding or coiling the upper surface of the sheet **170** on itself, the ejection outlet of the container being positioned just inwardly of the extremity of the folded or coiled sheet for protective purposes, and utilizing a small transverse cross-member or rod **171** at the fold or coil center, the rod fixedly engaging at its extremities complementary holding means of the rack, such as flange means, not shown. As a one-handed operation, the container may be grasped, as by the tab **172***a*, and the assembly of container and sheet pulled from the rack **166**. The sheet is unfolded or uncoiled, as the case may be, and, when opened, the container is squeezed and the liquid applied to the sterile surface of the sheet.

Various additional modifications of the structures shown are contemplated. Among these modifications is the sealing of longitudinal edges of the applicator sheets **130** and **132** of FIG. **10** to insure a more positive confinement of the dispensed liquid between the facing sheet surfaces. Another construction involves a treatment of a given restricted area of a sheet to render it preferentially or selectively hydrophillic, thereby to provide a controlled flow of the dispensed liquid exclusively within that area. The sizes and shapes of the containers or applicators are, of course, subject to variation. Where a manual compression is to be undertaken, a generally oval or round contour, adapted to grasping and compression by the fingers, as in a direction normal to the opposed walls, is a preferred form but a rectangular contour, such as illustrated in FIGS. **18** and **21**, may be advantageous for certain purposes. In the several container structures described, where the orifices are small relative to the liquid holding areas and may be of a tubular or nozzlelike structure, it will be understood that a considerable back-pressure is developed during their compression which contributes to the forcefulness of the ejection.

Means for puncturing, cutting or otherwise opening a given portion of a hermetically sealed, liquid impervious container, namely, a separate element, or one integral with the container, or one provided in conjunction with means of a dispensing fixture for effecting its compression, are considered to be within the scope of the invention relative to the liquid-release means above-described. Means of a type for cutting a container portion to release a substance such as a liquid is shown in FIG. **21**. The collapsible container **220** includes a sealed release aperture or orifice means **222**. A formed metallic band or strip **224**

having a cutting edge at 224a is bonded to the upper surface of the container. When the container is compressed, as previously described, the cutting-edge 224*a* penetrates or severs the release orifice 222, the applied compressive force ejecting the liquid. Various modifications such as a wall-piercing means, a valve-actuating prong etc., located exteriorly or internally of the container to achieve a related operation will be apparent. Where the container incorporates a release-valve, supplemental means of the fixture or separate means for opening the valve may, alternatively, be provided.

Where a dispensing fixture or cartridge mounting a plurality of containers or container-and-sheet elements is shown, as in FIGS. 4, 4*a*, 14, 15, 16 and 19, the fixture may suitably be composed of an inexpensive plastic material such as a polystyrene, a methacrylate or another plastic substance, and be considered as merchandised in a loaded state and of a disposable type. Alternatively, the fixture may be of a permanent category, fastened to a wall or other surface by a bracket or by one or more suction cups, the containers being provided and loaded individually or in the form of a releasable pack inserted therein. Whereas the dispensing fixtures have been shown as vertically disposed, it would be feasible to position them horizontally and employ biasing means such as a pressure plate therewith to effect advancement of the containers or applicators.

It would be possible to incorporate a liquid container, e.g., one such as that of FIG. 7 or FIG. 9, within the packet of FIG. 1 adjacent to either end, and to indicate to the user a compression point printed on the envelope surface to be manually pressed, or incorporate compression-applying means in a mounting cabinet 33. In such a modification the liquid would not initially be distributed throughout the interior, of course, and the envelope walls could possibly be composed of a material less impervious to liquid permeation than that previously described. Accordingly, the walls could also be composed of a softer more pliant material than that previously indicated and would thereby be more suitable as applicator means, either alone or in conjunction with a lining material affixed to their inner surfaces.

It is to be understood that the liquid capacities and the orifices of a given container, such as any of those shown in FIGS. 7–11, can be so chosen as to permit a plurality of compressive and liquid-ejection steps prior to its exhaustion and discard, each of which steps would serve a wetting function, without contamination of the liquid, assuming a self-sealing adjunct or valve or merely a short period of time encompassing the steps. Thus, for example, a single container 202 of FIG. 19 would serve to provide moistening of a succession of the complementary sheets 204. A device or plurality of devices of the type shown in FIG. 7, including the component 105, bonded to an elongated release portion at 104, could, advantageously, be positioned in proximity to a supply of the paper 204 of FIG. 19. It may be assumed, for example, that they are supplied from a modified fixture 200 which could be centered with respect to the roll of paper 204. A simple alteration of the fixture would permit the elongated portion 104 of the applicator to extend through an open slot or channel 211 formed longitudinally of the rear wall thereof throughout its length. The pads 105 would thus be positioned beyond the slot at the rear of the fixture. A protective sheath 213 having an openable, e.g., pivotal bottom wall or door 215 would enclose and guard the pads against environmental contamination. Both the fixture and sheath are, of course, to be understood as provided with covers at their upper extremities. Upon release of the liquid 102 and impregnation of the pad 105, as previously described, assuming, of course, the container to be that foremost in the fixture, the pad could be brought into contact with a sheet of the paper 204 to be wetted, as by a pivotal or translationally movable mounting of the fixture, or the paper could, optionally, be brought into contact with the pad. Again, a single liquid-impregnated portion 105 could be utilized to moisten a plurality of sheets, either through a single compression of the container component to provide sufficient liquid in the pad, or by a succession of partial compressions, assuming in both instances the liquid containing capacity to be predeterminedly adequate for the purpose.

The dimensions of the containers illustrated herein depend, naturally, upon such factors as the nature of the substances enclosed therein and the contemplated usage. Wall thicknesses may, for instance, lie within a practical range of from 0.002 inch to 0.025 inch. Assuming, for example, a generally circular collapsible container of 1 inch diameter, carrying approximately 1 plus cc. of a water solution, an orifice of 1/16 inch to ⅛ inch diameter such as that provided by the outlet means 225 of FIG. 8, 120 of FIG. 9, 129 of FIG. 10, etc., would enable, upon compression of the container, an ejection having the propulsive characteristics necessary for discharge to an area slightly spaced therefrom, e.g., by 1 inch or more, and in the form of a stream, a spray, etc., depending upon the type of orifice provided. Where the required force of ejection is less, larger release apertures, as in the example of FIG. 7, are, of course, possible. Similarly, larger container capacities would depend upon contemplated usage.

With regard to the various adaptations of the present invention shown herein, it will be appreciated that, generically, the combination of one or more hermetically sealed, predeterminedly openable containers and cooperative mounting means therefor embodying various means for, or contributing to, the opening of the container and providing an availability or release of its content in a form adapted to an ultimate defined usage may be considered as a single entity. As such it constitutes a device of given characteristics for providing measured amounts of a contained flowable substance such as a liquid while safeguarding the substance against deleterious influences prior to its release for usage. Because of the somewhat fragile structure of the containers and the need of avoiding an inadvertent release of their content, a mounting means in the form of a cartridge, fixture, dispenser or otherwise designated component is an important adjunct to the container and applicator means described herein. Inasmuch as such mounting means are especially pointed toward particular container and applicator structures of the invention, they may be regarded as having no utility separate therefrom.

While the packet 10 of FIG. 1 has been described both as to its openings by a two-handed and a one-handed operation, the latter in conjunction with opening means of a dispenser, it would also be possible to perform a one-handed opening thereof without recourse to means of a dispenser component for the purpose. This could be achieved by providing an engaging means such as an overturned rigid extremity or "hook" with one of the tabs, adapted to engage any convenient surface or edge, and manually drawing upon the other tab. Alternatively, one tab could be held between the teeth and the other tab manually drawn away therefrom. A similar approach is relevant to the opening of the containers of FIG. 3, the tab 62*a* being adapted, for example, to gripping by the teeth while the container component 58 is drawn away therefrom by one hand.

Again, the assemblages of FIG. 7 and FIG. 16 would be adapted to be rendered functional as a one-handed operation, without utilizing an adjunct of the dispenser for the purpose. In FIG. 7, the cap 109 could, for example, be removed by gripping the tab 113 between the teeth and drawing away the other components. A further means contemplates a water-soluble bond of the cap 109 to the pad 105 which is relinquished by compressing the container and wetting the pad. In FIG. 16, assuming the assembly of container 168 and sheet 170 to be located externally of the mounting means 166, it would be possible to hold an elongated tab portion 173 between the teeth, unfold the sheet 170, release the tab, and finally compress the container 168.

A further modification visualizes the provision of elongated frangible release outlets or "snouts" on containers of the types shown in FIGS. 7–11 and 18 in place of the releasable-seal means illustrated. As employed in conjunction with a container such as that of FIG. 8, the outlet means 225 would, in

manufacture, be inserted between portions of the container at **110** prior to sealing thereof and the latter then bonded to the outlet component. The outlet **225**, composed of a brittle plastic such as a polystyrene, would be severed at the breaking point provided by the thinned peripheral groove **226**, as be striking its tip **228** against any hard fixed surface, or by using the teeth for the purpose. A dosage would then be ejected by collapsing the container.

Since certain changes may be made in the above product and method without departing from the scope of the invention herein involved, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

What is claimed is:

1. A device for providing the release in a given form and to a given surface of a suitable material of measured amounts of a flowable substance while protecting said substance prior to its release against dissipation, contamination or other deleterious factor, said device comprising a first mounting means for providing a supply of said material, means for positioning said material to render surface areas thereof adapted to receive said substance, a second mounting means, a plurality of capsules of given form containing said substance mounted in said second mounting means so as to be in spaced relation to said material, each of said capsules having a given openable portion rendering functional, when opened, an orifice directed toward a given surface area of said material when each said capsule is positioned foremostly in said second mounting means, said second mounting means comprising an elongated chamber having entrance and egress means, guide means of said chamber for cooperating with complementary guide portions of said capsules for positioning said capsules correctly therewithin, means for urging said capsules forwardly within said chamber, and means adjacent to said egress means for effectively compressing each said foremost capsule to collapse said capsule, to open said openable portion and to forcibly eject said substance across a space to that surface area of said material which is positioned for reception thereof.

2. A device, as defined in claim **1**, wherein said chamber of said second mounting means includes said egress means in the form of an open ramp permitting a manually applied compression of diametrically opposed outer surfaces of each capsule.

3. A device, as defined in claim **2**, wherein said chamber includes a pressure plate movably mounted adjacent to said egress means and adapted to contact one side of a foremost capsule in said chamber, an anvillike inner surface of said chamber opposite said pressure plate adapted to contact an opposite side of said capsule, means for moving said pressure plate toward said capsule, and spring means for retracting said pressure plate.

4. A device, as defined in claim **3**, wherein said means for moving said pressure plate is in the form of a plunger.

5. A device, as defined in claim **1**, wherein said chamber guide means includes at least one longitudinal slot formed in an inner wall thereof cooperating with a protuberant portion of each said capsule for maintaining its orifice directed toward said material.

6. A device, as defined in claim **1**, wherein a plurality of said capsules are releasably contained in a protective cartridge adapted to be inserted in said second mounting means.

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