FLUID DISPENSER WITH DOCKING STATION

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ABSTRACT

The fluid dispenser includes a storage pouch that defines a storage container with fluid residing therein. The storage container has an exit port. A docking support includes a seat for removably receiving the storage container. The docking support has an input port. The exit port of the storage container is in fluid communication with the input port of the docking support. A conduit is fluidly connected to the input port of the docking support whereby fluid is delivered from the storage container through the docking station and through the conduit and out through the nozzle. A nozzle is preferably attached to the free end of the conduit with a metering pump positioned thereat to control flow of fluid therefrom.
FLUID DISPENSER WITH DOCKING STATION

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application claims priority from prior U.S. Provisional Application Ser. No. 60/891,341 filed on Feb. 23, 2007.

BACKGROUND OF THE INVENTION

[0002] This invention relates generally to dispensing devices and packages. More specifically, the present invention relates to metering devices that can controllably dispense fluid media from a source of fluid media while simultaneously providing a construction for assisting in the delivery and application of the fluid media to a surface for treating that surface. This invention further relates facilitating the preparation and use of dispensing devices and packages.

[0003] Various types of fluid material and media are employed for different purposes through commerce and industry. For example, there are various products in the personal care, home care, air care, transportation care, and food industries that require some type of dispensing of a fluid material from a source of such material. When this material is sold in commerce, it must be contained and stored in some type of container. When that product is used, it must be dispensed from its storage container to a location for use.

[0004] In the prior art, there are many different types of dispensers for delivering fluid material. For example, a flexible container body with a nozzle tip is commonly provided for such a purpose. An application of such use is for the dispensing of ketchup where the container body is squeezed by the user to urge the fluid material out from the nozzle tip and accurately to a desired location. The amount of fluid delivered is determined by the how much the user squeezed the container body. However, this yields erratic results where more or less fluid material is delivered on each successive squeeze of the container body. Also, the container must be held upright to avoid leakage because no valves are employed. Therefore, there is a need for a dispensing package that can deliver the media contained therein a controlled and metered fashion.

[0005] To meet this need, a flexible container holds a volume of fluid material to be delivered. A single one-way check valve is provided as an exit port from the flexible container. When the flexible body is squeezed, the material is urged out under pressure through the valve. In commonly owned Ser. No. 11/074,817, filed on Mar. 8, 2005, and U.S. Ser. No. 11/951,351, filed on Dec. 6, 2007 a dual valve construction is employed to provide for controlled metered dispensing of media from a package. However, these known devices require that the entire package be disposed of when the supply of media to be dispensed has been depleted.

[0006] There has also been a desire to not only dispense the fluid material but also to help apply and direct them to a desired surface or location. In the prior art, such as in the dispensing of laundry detergent and the like, the fluid is simply stored within a container and then poured therefrom for use. Frequently, it is first poured into a measuring cup and then poured into the washer to clean clothes. This process requires that a separate measuring cup be used and, most notably, requires that the container for the detergent be opened and poured from. This open spout is in contact with the detergent and, as a result, gets very messy requiring frequent cleanup. There have been attempts in the prior to prevent dripping of the spout during and after pouring but these structures are not particularly successful or effective.

[0007] There is also a need for the ability to meter out the detergent or similar liquid in a dosed fashion to completely obviate the need for a measuring cup. There is a particular need for an effective device that can dispense fluid materials, such as liquid detergent, directly to the desired location of the detergent, such as directly in the washer or to a detergent input reservoir in the washing machine.

[0008] In view of the foregoing, the structure and configuration of prior art dispensers make them difficult and awkward to use with unexpected results. Therefore, there is a need for a liquid dispenser that is easy to operate. There is a need for a liquid dispenser that can be operated with one hand so that the user’s hand is freed up to hold a measuring cup or reservoir to directly receive the liquid. There is a further need for a liquid dispenser to be as clean and neat as possible. There is a further need for dispenser to be capable of delivering a metered dose of fluid upon each dispensing operation. There is also a need for such a dispenser to be less wasteful than prior art dispensers.

SUMMARY OF THE INVENTION

[0009] The present invention preserves the advantages of prior art liquid dispenser and docking stations and supports therefor. In addition, it provides new advantages not found in currently available devices and overcomes many disadvantages of such currently available devices.

[0010] The invention is generally directed to a novel and unique dispenser for dispensing fluid materials. Many types of fluids may be dispensed using the present invention and liquid laundry detergent is merely one example and will be discussed in detail herein. This invention shall not be considered to be limited to the dispensing of laundry detergent in a washing machine environment. The dispenser and docking station can be used for dispensing any type of liquid material.

[0011] The fluid dispenser of the present invention includes a docking station with an extension fluid conduit, such as in the form of a hose, that is preferably rolled up when at rest. The docking station is configured to provide a seat to receive a storage chamber/pouch of the fluid to be dispensed. In this example, the fluid is liquid laundry detergent. The pouch, which may be rigid, semi-rigid or flexible, includes an optional carrying handle. The fluid conduit preferably includes a valve through which the fluid is dispensed when desired. When empty, the pouch can be easily replaced with refill pouches that are used with same docking station.

[0012] The pouch structure nests into the docking station so that the valve on the pouch is in fluid communication with the conduit hose. The valve may be immediately opened up nesting of the pouch into the docking station or it can be opened when desired, namely, at the time of dispensing. When it is desired to dispense liquid, the conduit hose is unrolled to expose a nozzle with another valve which controls the flow of fluid from the hose. The conduit hose is flexible and can be of any length. The hose can then be directed to any desired location, such as directly over the mouth of a washing machine or to a dispensing cup. The docking station may be mounted to a wall or may be free standing.

[0013] Optionally and preferably, a metering chamber may also be provided to receive an amount of detergent for dosing for controlled and metered delivery from the bladder.
envisioned that each press of the button on the nozzle at the free end of the hose dispenses a specific predetermined amount of fluid from the nozzle. Thus, a metered dose of laundry detergent can be delivered through the nozzle of the hose that could completely obviate the need for measuring and use of a measuring cup. For example, the dosing can be set to a known amount and the user can simply press the button multiple times to achieve the desired total amount. Alternatively, without the use of a metering chamber, the fluid may freely flow, from the storage pouch as long as the user holds down the button on the nozzle.

(0014) In view of the foregoing, a new and unique liquid dispenser, which is particularly well-suited for dispensing liquid, such as laundry detergent, is provided. The new dispenser facilitates the delivery of fluid in a metered and dosed manner while enabling subsequent refill pouches to be easily loaded and used.

(0015) Therefore, it is an object of the present invention to provide a dispensing system that is capable of storing and dispensing liquid in a controlled fashion.

(0016) Another object of the present invention is to provide a dispensing system that dispensing liquid in a metered and dosed fashion.

(0017) It is also an object of the present invention to provide a dispensing device that can be used one handed.

(0018) A further object of the present invention is to provide a liquid dispenser that can be easily re-filled without replacing the entire device.

(0019) Yet another object of the present invention is to provide a liquid dispenser that can be positioned in a convenient location for easy access by the user for facilitated use thereof.

BRIEF DESCRIPTION OF THE DRAWINGS

(0020) The novel features which are characteristic of the present invention are set forth in the appended claims. However, the invention’s preferred embodiments, together with further objects and attendant advantages, will be best understood by reference to the following detailed description taken in connection with the accompanying drawings in which:

(0021) FIG. 1 is a perspective view of the dispensing device with storage container installed in the docking support and ready for use in accordance with the present invention;

(0022) FIG. 2 is an exploded perspective view of the dispensing device of FIG. 1;

(0023) FIG. 3 is a cross-sectional view through the line 3-3 of FIG. 1 showing a preferred embodiment of the pump construction;

(0024) FIG. 4 is a bottom view of the storage container;

(0025) FIG. 5 is a top view of the docking support;

(0026) FIG. 6 is a front perspective view of another embodiment of the bladder and pump construction in accordance with the present invention;

(0027) FIG. 7 is a cross-sectional view through the line 6-6 of FIG. 5;

(0028) FIG. 8 is a cross-sectional view through the line 6-6 of FIG. 5 showing the pump and bladder in the process of dispensing fluid; and

(0029) FIG. 9 is a perspective view of a dual chamber dispenser in accordance with the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

(0030) In FIG. 1, the present invention provides a dispensing device 10 that includes a storage container 12 and docking support station 14 for storing and dispensing liquid 16. An optional handle 21 is provided on the storage container 12 to facilitate transport of the storage container 12 particularly when it is heavier due to being filled with liquid 16. Extending from the bottom of the docking station 14 is an extension conduit 18. The conduit 18 assists in dispensing liquid because it can direct liquid 16 to a location remote from dispenser 10. On the free end of the conduit is a pump 20 that preferably delivers liquid 16 in a dosed and metered fashion. Details of the pump 20 will be discussed in connection with FIGS. 3, and 6-8 below.

(0031) Turning now to FIG. 2, an exploded view of the device 10 of FIG. 1 is shown. The storage container 12 is receivable into seat 26 in the docking station support 14. Fasteners 24 are preferably used to mount the docking stations support 14 on a support surface, such as wall (not shown). This enables the overall dispenser 10 to be mounted off the ground for ease of use and access. The storage container 12 houses a volume of liquid 16 to be dispensed. A one way valve 28 is provided in the bottom of the storage container to secure liquid 16 in the storage container when the storage container 12 is not seated in the docking station support 14, such as when it is being transported or being replaced. In FIG. 2, the conduit 18 is shown in a rolled up condition when not in use. It is preferred that conduit 18 has a memory, by using springs or other structures, so that it is coiled up when it is at rest, as in FIG. 2. However, conduit 18 can be easily unrolled, to a condition as seen in FIG. 1, when it is ready to be used. After use, conduit 18 simply automatically rolls up to a stowed condition. Of course, it is possible that conduit 18 is not pre-coiled and does not roll up when not in use.

(0032) A bottom view of the container 14 with one way valve 28 is further shown in FIG. 4. Any type of valve may be employed for maintaining liquid 16 in container 12. For this purpose, a flapper valve or ball-check valve can be used.

(0033) FIG. 5 shows a top view of the docking station support 14 where a seat 26 is provided to receive the container 14 therein. A port 30 is provided in the bottom of the docking station support 14 to fluidly communicate with valve 28. As a result of port 30, conduit 18 and pump 218 can fluidly communicate with the liquid 16 within container 12. Port 30 can be configured in many different ways. For example, port 30 may be a pass-through aperture or may have structures thereon to engage and open the valve 28 on the bottom of the container 12 to permit the liquid 16 to flow into conduit 18. Alternatively, port 30 may include its own valve to further control the flow of liquid 16 therethrough. Alternatively, valve 28 may be replaced with a membrane that is pierced by a sharp member on the docking station support 14 so that when the container 12 is seated, the membrane is pierced to permit flow of liquid from the container 12 and into the conduit 18.

(0034) Referring now to FIG. 3, a cross-sectional view through the line 3-3 of FIG. 1 is shown. A metering dispensing pump 218 is preferably used. Any type of pump mechanism 218 can be used in the device 10 of the present invention,
however, a metering pump 218 is preferred. A metering dispensing pump 218 for dispensing the liquid 16 in the present invention assists in delivering liquid through exit port 22. Within the housing 209 of the pump mechanism 218, bladder 202 contains liquid 16. When released, a flexible dome 204 pulls liquid 16 upwardly through first valve 206 to fill metering chamber 208. When the dome 204 is depressed, the first valve closes and liquid 16 is urged out through exit conduit 210 down preferably to the surface of the pad 18. The exit conduit 210 preferably acts as a second valve, and, when liquid 16 is not being pumped, the distance A is substantially reduced so that opposing sides of the exit conduit 210 seal the dispensing 10 to prevent accidental dispensing. When dispensing is desired, the dome 204 is pressed and liquid 16 is urged out through the exit conduit 210 to expand it temporarily to permit outflow of liquid 16, as desired. More than one exit conduit 210 may be used to distribute liquid 16 for dispensing to more than one location at a time.

When the liquid 16 in the bladder 202 is depleted, container 12 is replaced with a container 12 that is full of liquid 16. Or, an existing container 12 may be opened, via a port or door so that new liquid 16 can be poured therein. Whether a new container 12 or a re-filled container 12, a container 12 is replaced into the seat 26 of docking station support 14 for further use.

The pump mechanism of FIG. 3 is one example of the type of pump 218 that can be used. Another embodiment of the metering dispensing pump 300 is shown in FIGS. 6-8. In FIG. 6, a perspective view of a metering dispenser 300 that employs the improved valving in accordance with the present invention. An outer storage bladder 320 is provided that may be formed of two sheets of material 304, 306 secured together, such as by welding, or a tube of material. A metering pump, generally referred to as 326, pulls liquid 302 from the bladder 320, meters it, and then dispenses it via an exit port 308. This pump mechanism 218 can be easily placed into fluid communication with the conduit 18 to control the flow of liquid 16 therethrough.

Referring to FIGS. 6 and 8, the dispensing of liquid 302 is shown. When it is desired to actually dispense the liquid product 302, the user’s thumb 430 can depress the flexible dome 404 and the user’s index finger 432 can invert the base plate 410 from convex to concave, by application of force against the stand-off legs 424, such that flexible dome 404, with the assistance of the stand-off legs 422 under the flexible dome, securely seals and provides a positive lock of the flapper valve 408 over and about the aperture 412 thereby closing the liquid flow passage back into the reservoir 434 of the storage container 320.

It is also possible that the base plate 410 is concave and then is inverted to a convex configuration. Other fingers of the user may be used to carry out this operation. Thus, the only path for the liquid 302 contained within the cavity 405 of dome 404 is to exit through the one-way outlet valve 436 for intended dispensing of the product, as indicated by the arrows in FIG. 14.

When applied to the device of the present invention, the surface, such as the bottom of housing 209, as seen in FIG. 3, can replace the functionality of the user’s index finger 432 in FIG. 8 to ensure that flapper valve 408 remains closed when the liquid is dispensed. Further, the exit port 436 is routed into and optionally through the pad to deliver liquid to a desired location for use on a surface. As above, multiple output ports 436 can be used to distribute liquid 16 to multiple locations.

It should be understood that the stand-off legs 422 on the bottom of the flexible dome housing 404 and the stand-off legs 424 on the bottom of the base plate 410 can be modified in size, length and configuration to adjust the amount of squeezing necessary by the user’s fingers 430, 432 to effectuate sealing of the flapper valve 408. For example, preferably four stand-off legs 422 are provided on the bottom of the flexible dome housing 404 in a 2x2 array and can be 1/2 of an inch in length. It is also possible that these stand-off legs 422 can be a single downwardly depending wall, such as in the shape of a circle or square. Such an array is configured to downwardly press against the one-way flapper valve 408 outside of the diameter of the aperture 412 through the base plate 410 to provide a good seal of the flapper valve 408 to the base plate 410.

FIG. 7 illustrates further structure to prevent unwanted dispensing of liquid. In addition to the improved valving, as above, automatic shut-off of the exit port passageway 436, when pressure is exerted on the exterior of the storage container 320, serves to prevent leakage. In FIG. 7, when pressed is applied to the exterior of the storage container or pouch 320, as indicated by arrows referenced A, the exit port passageway 436 tends to collapse, flatten and squeeze closed. As a result, any material residing in the passageway is urged back into the cavity 405 of the flexible dome housing 404, as indicated by arrow referenced B. As a result, unwanted leakage is prevented when accidental or unintentional pressure is placed on the storage container 320. Such a leak prevention system can be easily incorporated into the cleaning device environment of the present invention.

The docking storage support 14 is preferably made of any rigid material, such as plastic or metal, but could be any material. The storage container may be a rigid structure made of plastic, metal, or the like. Alternatively, the container 12 may be a flexible bladder or a flexible bladder that include a skeletal frame (not shown) so it can maintain its structure when seated into the seat 26 of the docking station support.

It is also possible that the present invention can be modified to provide a dual chamber structure to provide to different types of fluid for dispensing in the same device. For example, as seen in FIG. 9, alternative embodiment 400 includes a container 412 that includes two chambers 412a and 412b for respectively containing a first liquid 416a and a second liquid 416b. The container 412, similar to the other embodiments, seats within docking station support 414. The first liquid 416a and 416b are preferably different, such as laundry soap detergent and laundry softener. Separate ports (not shown) are provided in fluid communication with the chambers 412a and 412b so that the respective liquids can be delivered to respective conduits 418a and 418b for controlled dispensing by respective pumps 420a and 420b. As a result, multiple types of liquid can be stored and then dispensed using this embodiment of the present invention.

In view of the foregoing, a new and unique liquid storing and dispensing device 10, with a removable liquid container 12, is provided. The new device 10 can deliver any type of liquid and can be positioned in a location that it out of the way. When ready for use, the conduit 18 can be easily unraveled and pump 218 and exit port 22 can be directed easily to the desired dispensing location. When liquid 16 is depleted from the container 12, it can be replaced with an entirely new container 12 that is full of liquid 16 or re-filled directly. The dispensing of the liquid is in a dosed and metered fashion for controlled delivery.
It would be appreciated by those skilled in the art that various changes and modifications can be made to the illustrated embodiments without departing from the spirit of the present invention. All such modifications and changes are intended to be covered by the appended claims.

What is claimed is:

1. A fluid dispenser, comprising:
   a storage container defining a storage chamber with fluid residing therein; the storage container having an exit port;
   a docking support defining a seat for receiving the storage container; the docking support having an input port; the exit port of the storage pouch being in fluid communication with the input port of the docking support;
   a conduit, having a free end, fluidly connected to the input port of the docking support;
   whereby fluid is delivered from the storage container through the docking station and through the conduit and out through the nozzle.

2. The dispenser of claim 1, further comprising:
a nozzle attached to the free end of the conduit.

3. The dispenser of claim 1, further comprising:
a pump positioned at the nozzle to control flow of fluid therefrom.

4. The dispenser of claim 1, wherein the conduit is rolled up when at rest.

5. The dispenser of claim 3, wherein a metered dose of fluid is dispensed when the pump is actuated.

6. The dispenser of claim 1, wherein the storage container is removably seated in the docking support.

7. The dispenser of claim 1, further comprising:
a storage container with a plurality of storage chambers;
and
a plurality of conduits respectively in fluid communication with the plurality of storage chambers.