Some embodiments are directed to caps that include a closure assembly, which permits operational separation between the utilization of the container and utilization of a storage and/or mirrors’ arrangement, such that a user may extract the container’s contents independently from the use of the storage or mirrors’ arrangement, and the storage and/or mirrors’ arrangement may be used independently, without the need to open the container.
A CAP WITH A CLOSURE ASSEMBLY

CROSS REFERENCE TO RELATED APPLICATION

[0001] This application is a National Phase filing under 35 C.F.R. §371 of and claims priority to International Application No.: PCT/IL 2015/050321, filed on Mar. 26, 2015, which claims priority to Israeli Patent Application No.: 232034 filed on Apr. 9, 2014, the contents of which are hereby incorporated in their entirety by reference.

TECHNOLOGICAL FIELD

[0002] The present invention concerns a cap suitable for fitting onto a container’s opening, which comprises a closure assembly.

BACKGROUND ART

[0003] References considered to be relevant as background to the presently disclosed subject matter are listed below:

[0004] U.S. Pat. No. 5,983,905
[0005] U.S. Pat. No. 7,226,227
[0006] CN 103169242
[0007] U.S. Pat. No. 4,782,985

[0008] Acknowledgement of the above references herein is not to be inferred as meaning that these are in any way relevant to the patentability of the presently disclosed subject-matter.

BACKGROUND

[0009] Caps, e.g. flip-top caps, for various containers are known. At times, such caps may hold mirrors, which are typically located on an external surface of the cap, permitting a user to examine his reflection with or without removing the cap from the container. In such an arrangement the size of the mirror is limited to the size of the external surface of the cap, and hence reflection of a limited area of the object to be reflected may be obtained. In addition, once positioned at an outer surface, the mirror is prone to damage and is exposed to external elements, such as dust.

[0010] Another arrangement is that of an internal mirror, being positioned on an internal surface of a container’s closure flap. Such an arrangement does not permit a user to utilize the mirror without opening the container. Further, in such an arrangement the mirror surface serves also as a sealing element of a container’s opening, i.e. without being spaced apart from the container’s opening, often resulting in soiling the mirror surface by the container’s contents.

GENERAL DESCRIPTION

[0011] The invention provides caps comprising a closure assembly, which is designed to permit operational separation between the utilization of the container and utilization of a storage and/or mirrors arrangement, such that a user may extract the container’s contents independently from the use of the storage or mirrors’ arrangement, and the storage and/or mirrors’ arrangement may be used independently, without the need to open the container. When the cap comprises a mirrors’ arrangement, such arrangement provides a user with a relatively broad angle of reflection (i.e. a broader viewing field), as well as preserving the mirrors from damage or soiling during use of the container.

[0012] Thus, by one aspect, the invention provides such a cap for fitting onto a top portion of a container. By another aspect the invention provides a container with such a cap.

[0013] It should be noted that the invention is not limited to a certain type of container and the teaching of the invention may be applied to a variety of different types of containers; for example such that contain or may be intended to contain creams, powder, soap, lotion, etc. A cap suitable to be fitted onto a container that contains or is intended to contain a cosmetic, a personal toiletry composition or a personal care product, is a specific example for a cap of the invention.

[0014] The container may be of a kind having an opening defined in the container’s top portion that allows extraction of container’s content. Such a container typically includes a neck in which the opening of the container is defined. Such a neck may be of any cross-sectional shape, for example squared, rectangular, oval, circular, etc., and the cap will thus have a matching fitting for such a neck. Examples of such containers are tubes with a screw-type neck portion, a bottle-shaped container, etc. The container may also be one in which the opening is defined by upper sections of the container’s walls, or even defined as a rim at the upmost section of the container’s walls. The cap may be integral with its’ suitable container, or may be independent of the container, such that it may be removed from one container and subsequently be fitted onto a similar container. The cap may also be disposable.

[0015] The cap may be fitted onto the container’s top portion by any method known in the art, in a fixed or a removable manner. For example, the cap may be fixedly threaded onto complementary threads in the container’s top portion, may be pressure-fitted onto the top portion or even welded onto the top portion. Alternatively, the cap may be removable, i.e. by a rotational or sliding displacement about the top portion, thereby permitting a user to remove the cap in its entirety from the container.

[0016] The cap may have an upper end in which an orifice is defined. The orifice is in flow communication with the opening of the container, and may be located coaxially or asymmetrically with the container’s opening. The orifice may be of a similar or a smaller cross-sectional dimension compared with the container’s opening. For example, for a circular opening and circular orifice, the orifice’s diameter may be of similar or smaller size than the diameter of the container’s opening.

[0017] The closure assembly comprising a first element and a second element, and is hinged to the cap’s upper end by a first hinge. The first hinge permits the closure assembly to assume (i) a closed state in which the first element seals the orifice and (ii) an open state which permits a user to extract the container’s content.

[0018] The closure assembly may be displaced about the first hinge to assume a first angle with respect to the upper end, typically of up to about 90°, 120°, 150° or even about 180°.

[0019] The first and second elements have each an external face and a mirror-bearing internal face; i.e., at least one, at times both, of the internal faces of the first and second elements bears a mirror. The mirrors may be associated with the internal faces by any means known in the art, for example, but not limited to, gluing, pressure-fitting, etc. The mirror may be made of glass, polished metal, a metal coated plastic material, and others.
[0020] Each of the mirrors may, by some embodiments, be independently of planar, concave or convex geometries (i.e. reflecting an increased or decreased size of the reflected object, respectively). In other embodiments, the mirrors have a planar geometry and slanted with respect to the element’s internal face.

[0021] The first and second elements are hinged to one another by a second hinge. The second hinge permits the second element to be angled with respect to the first element between a collapsed state and an extended state. In the collapsed state the two elements are fitted one against the other and their two internal (in some embodiments, mirror-bearing) faces are opposite one another; and in the extended state the internal (two mirror-bearing) faces are exposed.

[0022] In the extended state, the first and second elements define a second angle therebetween, typically between about 45° and 180°, more typically between about 60 and 150°.

[0023] The cap of the invention can thus assume any one of four states: (a) a closed and collapsed state, in which the container is sealed by the first element and the mirrors are concealed; (b) an open and collapsed state, in which the first element is disengaged from the upper end to permit extraction of the container’s content through the orifice, while the closure arrangement is maintained at the collapsed state to conceal the mirrors; (c) a closed and extended state, in which the container is sealed and the mirrors are exposed; and (d) an open and extended state, in which the first element is disengaged from the upper end and both mirror-bearing internal faces are exposed.

[0024] The first and second angles may be independently adjusted by the user to permit an extended viewing field in the relevant operational states of the cap.

[0025] In order to permit a compact configuration in the closed and collapsed state, each of the internal faces may be slanted with respect to their corresponding external faces. Namely, the internal face of the first element may be slanted in an angle with respect to the external face of the first element; while the internal face of the second element may be slanted in an opposite and complementary angle to the internal face of the first element. When the closure assembly is in the collapsed state, such complementary slanting angles result in substantially parallel external faces, and, therefore, a compact spatial arrangement.

[0026] In an embodiment, the second hinge is adjacent the first hinge, i.e. the first and second hinges are positioned at adjacent points on the circumference of the closure assembly. In such an embodiment, the two hinges are formed at the same side of the closure assembly.

[0027] In another embodiment, the first hinge and the second hinge are distant from one another, i.e. positioned on distant points on the circumference of the closure assembly.

[0028] In such embodiments, the first hinge and the second hinge may be formed at opposite points on the circumference of the closure assembly, i.e. on opposite sides of the closure assembly. In some embodiments, in the extended state, the second hinge may permit rotation of the second element with respect to the first element to provide an additional degree of freedom of the second element vis-à-vis the first one. This allows the user to further adjust the viewing field as needed to obtain an optimal viewing angle.

[0029] Caps of the invention may typically be made of a plastic material, although they may also be made of other materials, including metal, such as aluminum or stainless steel. When formed of plastic materials, the cap may be manufactured by injection molding techniques known in the art. Suitable, however non-limiting, plastic materials for producing the cap of the invention are homopolymers, copolymers, such as for example, block, graft, random and alternating copolymers as well as terpolymers, further including their derivatives, combinations and blends thereof. The polymers may or may not be bio- or environmentally-degradable. Non-limiting examples of such polymers are polyethylene, polypropylene, polypropylene terephthalate, polyphenylene oxide, polystyrene, polyvinyl chloride (PVC), butadiene-styrene block copolymers, butadiene-styrene-butadiene block copolymers, acrylonitrile-butadiene-styrene (ABS), styrene copolymers, etc.

[0030] In an embodiment of the invention, the hinges may be formed of metal or of plastic material, the same of different from the plastic material from which the other parts of the cap are made. Typically, all elements of the cap are integrally formed and made of the same material.

[0031] In another aspect, the invention provides a cap for fitting onto a container’s top portion, the cap having an upper end fitted with a closure assembly for sealing an orifice that is in flow communication with an opening of the container that is defined in said top portion, the closure assembly being hinged to the upper end by a first hinge and having (i) a closed state in which the first element engages the orifice and (ii) an open state in which the first element is disengaged from the orifice.

[0032] The closure assembly comprising a first element and a second element, each of said first and second elements having an external face and an internal face, at least one of the internal faces bears a mirror, and the two elements being hinged to one another by a second hinge permitting the second element to be angled with respect to the first element between a collapsed state and an extended state; such that in the collapsed state the two elements are fitted one against the other and their internal faces are opposite one another, and in the extended state the internal faces are exposed.

[0033] such that the closure assembly is capable of assuming at least the states of: (a) closed and collapsed state; (b) open and collapsed state; (c) closed and extended state; and (d) open and extended state.

[0034] In some embodiments, each of the internal faces bears a mirror.

[0035] As noted above, based on the same principle of operation, the first and second elements may define between them, in the collapsed state, an enclosed space (e.g. for storage). Namely, the first element constitutes a bottom section of the storage space, while the second element may constitute an upper section of the storage space.

[0036] Thus, in another aspect, the invention provides a cap for fitting onto a container’s top portion, said cap having an upper end in which an orifice is defined, as to establish flow communication with an opening defined the container’s top portion, the upper end being fitted with a closure assembly, the closure assembly comprising a first movable element fitted with a first hinge and a second hinge, such that the first hinge links between the first movable element and the upper end, and permits the first movable element to assume (i) a closing state in which the first movable element engages the orifice and (ii) an opened state in which the first movable element is disengaged from the orifice, and a second movable element, linked to the first movable element by said second hinge permitting the second movable element to be angled with respect to the first movable element.
define a collapsed state and an extended state; such that in the collapsed state the two movable elements are fitted one against the other to form an enclosed space, and in the extended state the two movable elements are angled one with respect to the other.

[0037] In some embodiments, the closure assembly is capable of assuming at least the states of: (a) closing and collapsed state; (b) opened and collapsed state; (c) closing and extended state; and (d) opened and extended state.

[0038] According to some embodiments, when in the collapsed state the enclosed space is formed by joining a first recess defined in the first movable element and a second recess defined in the second movable element. According to other embodiments, the space is formed in the collapsed state between a recess formed in one of said first or said second movable elements and the internal face of the other of said first or said second movable elements. Each of said first and second recesses may be empty, or independently filled with the same, or different materials. When the materials stored in the recess is of a loose or fluid form, the each of the recesses may be covered by a removable cover to prevent spillage or undesired missing of the materials.

[0039] The enclosed space may hold, at least in a part of its volume, at least one material, the same or different from that in the container onto which the cap is fitted. The at least one material may be for a single use, i.e., a single dose, or in a form suitable for multiple uses. The at least one material store may be, for example, in the form of a powder, a liquid, a gel, a cream, an ointment, a compacted powder, a solid block, etc. Alternatively, the space may be left empty, leaving the user to decide the material or object to be stored therein.

[0040] In some embodiments, at least one of the first and second movable elements bears a mirror on internal face thereof. In other embodiments, each of the first and second movable elements bears a mirror on internal face thereof.

[0041] In some embodiments, the second hinge is adjacent the first hinge. In other embodiments, the first hinge and the second hinge are distantly positioned on the circumference of the first movable element.

[0042] In some other embodiments, the first hinge and the second hinge are formed at opposite sides of the first movable element. In such embodiments, when in the extended state, the second hinge permits rotation of the second movable element with respect to the first movable element.

BRIEF DESCRIPTION OF THE DRAWINGS

[0043] In order to better understand the subject matter that is disclosed herein and to exemplify how it may be carried out in practice, embodiments will now be described, by way of non-limiting example only, with reference to the accompanying drawings, in which:

[0044] FIG. 1 is a perspective view of a cap according to an embodiment of the invention, in the closed and collapsed state.

[0045] FIG. 2 is a perspective view of the cap of FIG. 1 in the open and collapsed state.

[0046] FIG. 3 is a perspective view of the cap of FIG. 1 in the closed and extended state.

[0047] FIGS. 4A-4C are perspective views of the cap of FIG. 1 in the open and extended state according to an embodiment of the invention.

[0048] FIGS. 5A-5D are perspective views of the cap in its various operative states according to another embodiment of the invention.

DETAILED DESCRIPTION OF EMBODIMENTS

[0049] FIG. 1 depicts a cap 100 according to an embodiment of the invention in its closed and collapsed state. The cap comprises a body 102, suitable for fitting onto a container’s top portion (in this, non-limiting specific embodiment, the top portion is in the form of a container’s neck), and a closure assembly, generally designated as 104. The closure assembly comprises a first element 110 and a second element 112, each having an internal face 110A and 112A respectively, and an external face 110B and 112B, respectively. In some cases, at least one of the internal faces 110A and 112A bear a mirror. Alternatively, none or both of the internal faces 110A and 112A bear mirrors. In addition, the first and second elements 110,112 may be designed such that an enclosed space is formed between their internal faces 110A,112A when in their collapsed state. The function of the first and second elements will now be explained in more detail, for example when both internal faces 110A,112A bear mirrors.

[0050] As can better be seen in FIG. 2, the closure assembly is associated with an upper end 106 of the cap via a first hinge 108, which permits the closure assembly to displace from a closed state into an open state of the cap. Defined in the upper end is an orifice 114 that is in liquid communication with an opening of the container that is defined by the neck. In the closed state of the orifice is sealed by protrusion 116 extending from external face 110B.

[0051] FIG. 3 shows a cap according to an embodiment of the invention that can be seen in the closed and extended state. The first and second elements 110,112 are hinged to one another by a second hinge 118, located at the opposite side of the upper end with respect to the location of the first hinge 108, which permits angular displacement of element 112 with respect to element 110. Once element 112 is displaced, mirrors which are fixed to each of the internal surfaces 110A and 112A are exposed, such that a user is provided with a broad viewing angle. In this position, the first element 110 engages the orifice 114, preventing extraction of the container’s content, while permitting a viewer to independently use the mirror assembly.

[0052] Once returned into the collapsed state, shown in FIG. 4 and 2, the internal faces 110A and 112A are fitted one against the other, such that two internal (mirror-bearing) faces are opposite one another, such that the mirrors are not exposed and are thus protected from damage or soiling.

[0053] Turning to FIGS. 4A-4C, a cap according to an embodiment of the invention can be seen in the open and extended state, in which the mirrors are exposed and the contents of the container may be extracted via orifice 114.

[0054] In another embodiment of the invention, the hinges may reside at the same side of the closure assembly. FIGS. 5A-5D depict such a cap, where similar elements to that of FIGS. 1-4C were given similar numerals, shifted by 100. Namely, element 100 is similar to element 200, element 102 is similar to element 202, etc.

[0055] FIG. 5A depicts a cap 200 in its closed and collapsed state. The cap comprises a body 202, and a closure assembly generally designated as 204. The closure assembly comprises a first element 210 and a second element 212, each having an internal face 210A and 212A respectively,
and an external face 210B and 212B, respectively (as can be more clearly seen in FIG. 5D).

[0056] As seen in FIG. 5B, the closure assembly is associated with an upper end 206 of the cap via a first hinge 208, which permits the closure assembly to displace from a closed state into an open state of the cap. Defined in the upper end is an orifice 214 that is liquid communication with an opening of the container that is defined by the neck. When in the closed state, the orifice is sealed by protrusion 216 extending from external face 210B.

[0057] In FIG. 5C, the can be seen in the closed and extended state. The first and second elements 210,212 are hinged to one another by a second hinge 218, positioned close to and slightly above the first hinge 208, such that both hinges 208,218 reside at the same side of the assembly. Second hinge 218 permits angular displacement of element 212 with respect to element 210. Once element 212 is displaced, the mirrors fixed to the internal surfaces 210A and 212A are exposed, such that a user is provided with a broad viewing angle. In this position, the first element 210 engages the orifice 214, preventing extraction of the container’s content, while permitting a viewer to use the mirror assembly.

[0058] Once returned into the collapsed state, shown in FIGS. 5A and 5B, the internal faces 210A and 212A are fitted one against the other, the two internal (mirror-bearing) faces being opposite one another, such that the mirrors are not exposed.

[0059] In FIG. 4D, the cap is in the open and extended state, in which the mirrors are exposed and the contents of the container may be extracted via orifice 214.

1. (canceled)
2. A cap for fitting onto a container’s top portion, said cap having an upper end fitted with a closure assembly for sealing an orifice that is in flow communication with an opening of the container that is defined in said top portion, the closure assembly being hinged to the upper end by a first hinge and having (i) a closed state in which the first element engages the orifice and (ii) an open state in which the first element is disengaged from the orifice, the closure assembly comprising a first element and a second element, each of said first and second elements having an external face and an internal face, at least one of the internal faces bears a mirror, and the two elements being hinged to one another by a second hinge permitting the second element to be angled with respect to the first element between a collapsed state and an extended state; such that in the collapsed state the two elements are fitted one against the other and their internal faces are opposite one another, and in the extended state the internal faces are exposed, such that the closure assembly is capable of assuming at least the states of: (a) closed and collapsed state; (b) open and extended state; (c) closed and extended state; and (d) open and extended state.
3. The cap of claim 2, wherein each of the internal faces bears a mirror.
4. The cap of claim 2, wherein the second hinge is adjacent the first hinge.
5. The cap of claim 4, wherein the two hinges are formed at the same side of the closure assembly.
6. The cap of claim 2, wherein the first hinge and the second hinge are distantly positioned on the circumference of closure assembly.
7. The cap of claim 2, wherein the first hinge and the second hinge are formed at opposite sides of the closure assembly.
8. The cap of claim 7, wherein, in the extended state, the second hinge permits rotation of the second element with respect to the first element.
9. The cap of claim 2, made of a plastic material.
10. The cap of claim 9, formed by injection molding.
11. The cap of claim 2, wherein all elements of the cap are integrally formed.
12. A cap for fitting onto a container’s top portion, said cap having an upper end in which an orifice is defined, as to establish flow communication with an opening defining the container’s top portion, the upper end being fitted with a closure assembly, the closure assembly comprising a firstmovable element fitted with a first hinge and a second hinge, such that the first hinge links between the first movable element and the upper end, and permits the first movable element to assume (i) a closing state in which the first movable element engages the orifice and (ii) an opened state in which the first movable element is disengaged from the orifice, and a second movable element, linked to the first movable element by said second hinge permitting the second movable element to be angled with respect to the first movable element to define a collapsed state and an extended state; such that in the collapsed state the two movable elements are fitted one against the other to form an enclosed space, and in the extended state the two movable elements are angled one with respect to the other.
13. The cap of claim 12, in which the closure assembly is capable of assuming at least the states of: (a) closing and collapsed state; (b) opened and collapsed state; (c) closing and extended state; and (d) opened and extended state.
14. The cap of claim 12, wherein at least one of the first and second movable elements bears a mirror on internal faces thereof.
15. The cap of claim 12, each of the first and second movable elements bears a mirror on internal face thereof.
16. The cap of claim 12, wherein the second hinge is adjacent the first hinge.
17. The cap of claim 12, wherein the first hinge and the second hinge are distantly positioned on the circumference of the first movable element.
18. The cap of claim 12, wherein the first hinge and the second hinge are formed at opposite sides of the first movable element.
19. The cap of claim 18, wherein, in the extended state, the second hinge permits rotation of the second movable element with respect to the first movable element.
20. A container associated with the cap of claim 12.
21. The container of claim 20, wherein the cap is integral with container.

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