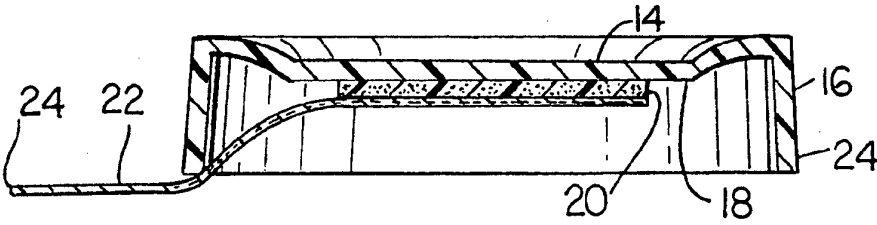




INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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<p>(21) International Application Number: PCT/US94/01435 (22) International Filing Date: 9 February 1994 (09.02.94) (30) Priority Data: 08/015,207 9 February 1993 (09.02.93) US (71) Applicant: SENETICS, INC. [US/US]; Suite 105, 75 Manhattan Drive, Boulder, CO 80303 (US). (72) Inventors: GARBY, Gage; 3153 9th Street, Boulder, CO 80303 (US). BALLAS, Jeff; 890 McIntire, Boulder, CO 80303 (US). (74) Agents: BEATON, Glenn, K. et al.; Beaton & Swanson, Suite 403, 4582 S. Ulster Street Parkway, Denver, CO 80237 (US).</p>		<p>(81) Designated States: AU, CA, JP, European patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE). Published <i>With international search report.</i></p>
<p>(54) Title: CAP REMOVER</p>		
		
<p>(57) Abstract</p>		
<p>A device (10) for aiding in the removal of a twist-off closure (30) from a container (32), having a diameter larger than the diameter of the closure to increase the torque applied to the closure and to facilitate grasping by the user. The device is attached to the closure in the preferred embodiment by an adhesive sponge-like pad (20) having one side adhered to the bottom of the device and the opposite side covered with adhesive for adhering to the closure. The side covered with adhesive is covered by a protective sheet (22) which is peeled off just prior to the device being attached to the closure. The sponge-like elasticity of the adhesive pad allows the device to be attached to closures having surface irregularities such as raised letters or symbols.</p>		

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CAP REMOVER5 FIELD OF THE INVENTION

The present invention relates to the field of closures for bottles or cans and, in particular, to an overcap for attachment to a small twist-off cap such as a prescription vial cap to aid in the removal and
10 replacement of the cap to the bottle.

BACKGROUND OF THE INVENTION

Small bottles such as medicine vials are typically closed with a screw cap closure which is
15 referred to as "twist-off" cap. The twist-off cap can be engaged with the vial through a set of threads on the skirt of the cap which mate with mating threads on the neck of the vial, or alternatively with a set of
20 lugs on the skirt of the cap which engage mating bayonet lugs or other engagement means on the neck of the container. Both embodiments require that the cap be rotated in relation to the container to remove the cap from the container and to replace the cap back on to the container.

25 It is often difficult to apply sufficient rotative force to the twist-off cap to remove it from the container, especially if it was previously tightened securely onto the container. Similarly, it may be difficult to securely tighten the cap onto the
30 container when replacing the cap, in order to obtain a tight seal to protect the contents of the container. This is a particular problem in the case of medicine vials, since the user of a medicine vial may be sick or infirm and may therefore find the mechanism
35 particularly difficult to operate. At the same time, it may be very important that the medicine be taken at the regular prescribed intervals in order to be effective, and it may also be very important that the cap be securely replaced onto the container to protect
40 the medicine. For example, drugs to relieve the

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symptoms and effects of a chronic illness like arthritis must be taken regularly, kept fresh, protected from environmental spoilage, and are of course taken by a patient whose motor skills and dexterity are diminished by the effects of the arthritis itself.

An additional problem is posed by the increasing usage of medicine vials having closures that are designed to be resistant to operation by children. These child resistant closures are often of the "push-and-turn" type, in which the closure cannot be removed from the container unless a force is applied urging the closure toward the container simultaneous with the application of a rotative force to the closure in relation to the container to disengage the two. The operation of these devices is purposefully difficult so that the device is resistant to operation by children, and can even be somewhat inconvenient for operation by healthy, alert adults under ideal circumstances. One can only imagine the difficulties of operating such a device by a person who is elderly, ill or arthritic in the less than ideal circumstances of a home bathroom late at night.

The prior art contains numerous examples of devices to assist in removing a closure from a container, but there is little in the prior art specifically designed to assist in the removal of a small cap from a medicine vial and there is nothing in the prior art along the lines of the present invention. For example, there are examples of beverage bottle openers in U.S. Patent Nos. 4,414,865 by Brooks, et al., 4,627,548 by Thompson, Des. 249,452 by Gendron, and Des. 287,693 by Janiszski. Such devices are primarily intended and designed for assisting in the

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removal of a twist-off bottle cap from a beverage bottle. Examples of devices to remove a twist-off lid from a jar are in U.S. Patent Nos. Des. 261,854 by Nielsen, Des. 320,916 by Riddle, et al., 3,600,982 by Tholen, and 1,924,579 by Waterhouse. These devices are primarily designed for removing a lid from a canning jar or some other food jar. In particular, none of these devices teach a method for permanently attaching the device to the closure with which it has operated. Examples of devices specifically designed for use with a medicine vial are in U.S. Patent Nos. 4,172,532 by Palsson, 4,731,512 by Barriac, 3,966,082 by Hopkins, and 4,573,598 by Perry. Again, these devices do not teach a method for permanently attaching the device to the closure with which it is operated, but instead rely upon peculiar design of the closure itself. The Palsson patent uses a closure having a slot which accepts a coin or key which in theory allows the user to apply extra leverage in rotating the closure. The Barriac patent discloses a closure having protrusions on the top which can be engaged with a pencil, table edge or other device to apply extra leverage in rotating the closure. Other references having marginal relevance to the present invention include U.S. Patent Nos. 3,303,953 by Frank which discloses a decorative cap skirt, and 4,418,832 by Schneider which discloses a container and closure which can be separate using one hand.

30 BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of a closure remover in accordance with the present invention, showing the upper surface of the remover.

FIG. 2 is a perspective view of a closure

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remover in accordance with the present invention, showing the bottom surface of the remover.

FIG. 3 is a sectional view, taken along line 3-3 of FIG. 1.

5 FIG. 4 is a side sectional view of the invention attached to a closure and vial.

DETAILED DESCRIPTION OF THE INVENTION

10 A perspective view of the closure remover 10 of the present invention is in FIG. 1. The remover 10 includes an upper surface 14 and a depending skirt 16 around the periphery of the upper surface. Although the upper surface 14 of the embodiment shown in the drawings is circular, it will be appreciated that a
15 circular shape is not necessary, and that other shapes such as square, oblong or irregular could also be used without departing from the spirit of the invention.

As better shown in FIGs. 2 and 3, in which FIG. 2 shows a perspective view of the invention upside down and FIG. 3 shows a sectional view taken along line 3-3
20 of FIG. 1, there is an adhesive pad 20 adhered to the bottom surface 18 of the remover. The adhesive pad 20 is preferably a soft sponge pad which will deform somewhat to receive irregularities in the closure to which the remover is attached as shown in FIG. 4.
25 Alternatively, the pad 20 may be simply double sided tape, although it has been found that the remover 10 will attach to a closure 30 less effectively if it has no capacity to deform to accept irregularities in the enclosure. An effective material for the pad 20 has
30 found to be 3M brand Very High Bond (VHB) foam tape.

One side of the adhesive pad 20 is permanently attached to the bottom 18 of the remover 10. This is accomplished by simply removing any protective cover on

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the adhesive pad 20, applying the exposed adhesive side to the bottom 18 of the remover 10, and pressing the pad onto the bottom 18 for permanent attachment. The other side of the adhesive pad 20 is covered with a protective sheet 22. Preferably, the protective sheet 22 covers the entire surface of the adhesive pad, in order to protect the adhesive material on the adhesive pad 20 from contamination. In addition, the protective sheet 22 extends beyond at least one edge of the adhesive pad 20, as best shown in FIGs. 2 and 3, so that there is a free end 24 of the protective sheet 22 to be grasped by the user in the manner described below.

There is preferably an axial skirt 16 extending from the top 14 of the remover 10 as previously mentioned. The skirt 16 extends downward and away from the top surface 14, to result in a circumferential surface 24 to be grasped by the user. The circumferential surface 24 may include one or more grip-enhancing elements, such as the longitudinal ribs 26 shown in the embodiment of the drawings. The skirt 16 facilitates the grasping of the remover 10 by the user, and it also extends downward far enough to obscure most or all of the closure 30 as shown in FIG. 4 so that the user readily recognizes that the closure is removed by grasping the remover 10 rather by attempting to grasp at the hidden closure 30. However, even though the skirt is useful, it could also be omitted and the device would still function. The user would then grasp the circumferential edge of the top surface 14 during the removal and replacement operations. It is also to be recognized that while the skirt 16 is shown as an annular extension of the circumferential edge of the top surface 14 in the

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embodiment shown in the drawings, a top surface having other than a circular edge would employ a skirt that was not annular but instead was shaped like the top surface. In the embodiment shown in the drawings and explained above, the cap remover is attached to a closure using double-sided adhesive tape attached to the bottom surface, but it can be appreciated that the adhesive could instead be on the inside of the skirt so that it adhered to the outside of the closure skirt.

10 The upper surface 14 may be recessed from the top of the axial skirt 16 in the manner shown in FIG. 1. This establishes a flat recessed surface to receive a printed label which does not readily peel away.

15 In operation, the protective sheet 22 is removed from the adhesive pad 20 by holding the free end 24 and peeling the protective sheet 22 from the adhesive pad 20. Protective sheets of this type are very easily removed from an adhesive pad, and so this step presents no difficulty at all, even to a patient who is ill or infirm. The remover 10 without the protective sheet 22 is then immediately applied to the top surface of a closure 30 in the manner shown in FIG. 4, before the exposed adhesive on the bottom of the adhesive pad 20 can become dirty or contaminated. A force is applied to the top surface 14 of the remover 10, urging the remover 10 toward the closure 30 to securely adhere the remover 10 to the closure 30 through the adhesive of the adhesive pad 20. This step is easiest if the closure 30 is left on the container 32, so that it is easy to manipulate the closure 30. At this point, the remover 10, absent the protective sheet 22, is essentially permanently attached to the closure 30, and cannot be detached from the closure 30 except with a deliberate and fairly high level of

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prying force between the two. As mentioned above, one of the desirable features of the present invention is that the adhesive pad 20 is sponge-like. This allows the remover 10 to be securely attached to a closure 30 even if the closure 30 has an irregular upper surface. This is commonly the case, for many closures have raised writing or symbols on their upper surface.

After the remover 10 is attached to the closure 30 in the manner shown in FIG. 4, the closure 30 has an effective diameter equal to the diameter of the remover 10. By increasing the effective diameter of the closure, removal or replacement of the closure 30 on the container 32 is greatly facilitated. For example, if the diameter of the closure 30 is effectively doubled by the application of the remover 10, then a given force applied tangentially to the edge of the closure produces double the torque. In addition, it has been found that the larger diameter of the remover 10 is easier to grasp than the smaller diameter of the closure 30. While the small diameter closure 30 is grasped principally by the thumb and forefinger, the larger diameter of the remover 10 can be grasped using the entire palm or using the thumb and several fingers. Thus, not only does the remover 10 multiply the torque produced by a given tangential force applied to the device, it also increases the amount of such tangential force that can be applied.

CLAIMS

What is claimed is:

1. A method for removing a closure having an upper surface from a container, comprising: adhering to the upper surface of the closure a removal device, the removal device having a bottom and having a dimension parallel to the upper surface of the closure that is greater than the upper surface of the closure; and applying force to the removal device in relation to the container, to remove the closure from the container.

2. The method of claim 1, wherein the closure is a twist-off closure, and wherein said force is a rotative force.

3. The method of claim 2, wherein the removal device adhesive surface includes a deformable pad having one side adhered to the removal device and an opposite side with an adhesive to adhere to the closure.

4. The method of claim 3, wherein the deformable pad is adhered to the bottom of the removal device.

5. The method of claim 3, wherein the side of the adhesive pad to adhere to the closure is substantially covered with a protective sheet, and further comprising the step of removing said protective sheet from the adhesive pad prior to adhering the removal device to the closure.

6. The method of claim 5, wherein the protective sheet extends past the adhesive pad so that the protective sheet has at least one free portion that is not adhered directly to the adhesive pad, and wherein said step of removing the protective sheet from the adhesive pad is by grasping a free portion of the protective sheet and peeling the protective sheet from

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the adhesive pad.

7. The method of claim 3, wherein the upper surface of the closure includes raised elements, and wherein said step of adhering the removal device to the closure includes pressing the adhesive pad onto the upper surface of the closure so that the raised elements deform and are received by the adhesive pad.

8. The method of claim 1, wherein the removal device includes a depending skirt extending from the bottom surface to at least partially cover the closure.

9. The method of claim 8, wherein the removal device depending skirt also extends away from the closure.

10. The method of claim 8, wherein the skirt includes surface irregularities to facilitate the grasping of the device.

11. The method of claim 8, wherein the removal device is substantially circular with a disk-shaped bottom surface and an annular skirt.

12. A device to assist in the removing of a closure having an upper surface from a container, comprising an upper portion having a bottom surface, and an adhesive surface attached to the device for adhering the device to the closure, the upper portion being wider than the closure.

13. The device of claim 12, wherein said adhesive includes an adhesive pad having one side adhered to the device and an opposite side with adhering material for adhering to the closure.

14. The device of claim 13, wherein said adhesive pad is readily deformable to receive irregularities in the upper surface of the closure.

15. The device of claim 14, wherein said adhering material is covered with a removable

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protective sheet to prevent contamination of the adhering material prior to use.

5 16. The device of claim 15, wherein said removable protective sheet extends past the adhesive pad to leave a free portion not directly attached to the adhesive pad.

10 17. The device of claim 12, wherein the device is substantially circular and includes an annular skirt attached to the upper portion, and has a diameter greater than the diameter of a circular closure to which it is attached.

 18. The device of claim 17, wherein the annular skirt includes surface irregularities for facilitating the grasping of the device.

15 19. The device of claim 17, wherein the device has a top recessed from the annular skirt and has a label in the recessed portion.

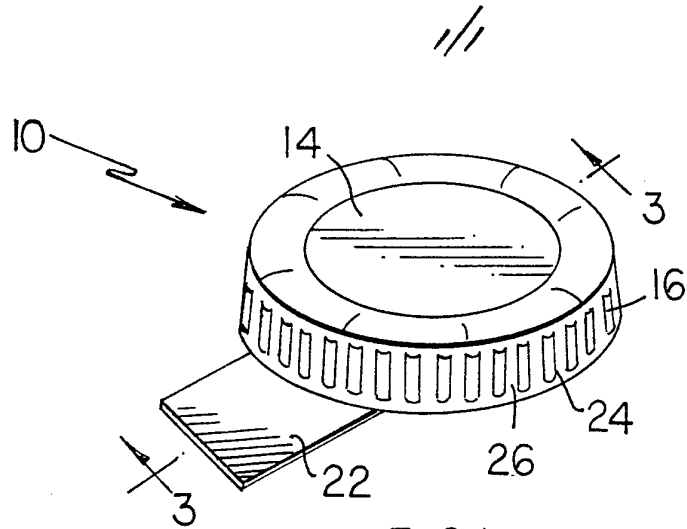


FIG. 1

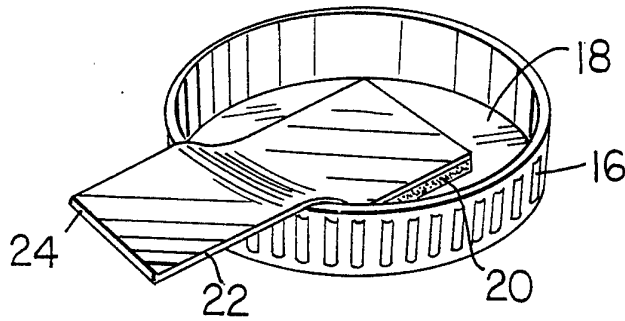


FIG. 2

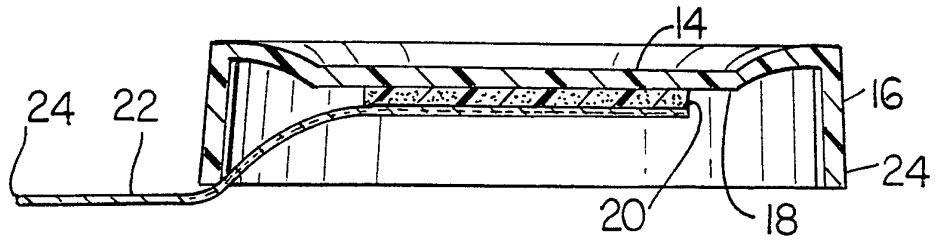


FIG. 3

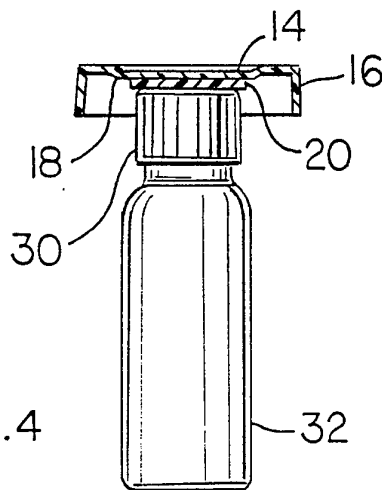


FIG. 4

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INTERNATIONAL SEARCH REPORT

In: tional application No.
PCT/US94/01435

A. CLASSIFICATION OF SUBJECT MATTER IPC(5) :B25B 27/00; B67B 7/00; B65B 43/40 US CL :29/426.5, 456; 81/3.4; 215/303 According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED Minimum documentation searched (classification system followed by classification symbols) U.S. : Please See Extra Sheet. Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US, A, Des. 320,916 (RIDDLE ET AL.) 22 October 1991, see figure 4.	12
X	US, A, 5,009,338 (BARKER) 23 April 1991, see column 5, lines 60-65 and figure 1.	1-4, 8-14, 17 and 18
Y		5-7, 15 and 16
A	US, A, 4,760,763 (TRICK ET AL.) 02 August 1988, see figure 5.	1 and 12
Y	US, A, 4,605,577 (BOWYTZ) 12 August 1986, see figure 1.	5-7, 15 and 16
A	UK, A, 2,096,111 (JENSENS) 13 October 1982, se figure 3.	1 and 12
<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C. <input type="checkbox"/> See patent family annex.		
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Date of the actual completion of the international search 18 MARCH 1994		Date of mailing of the international search report 29 MAR 1994
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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US94/01435

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US, A, 3,303,953 (FRANK) 14 February 1967, see column 1, lines 33-42.	1, 2, 8-12 and 17-19

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International application No.

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B. FIELDS SEARCHED

Minimum documentation searched

Classification System: U.S.

29/426.5, 456, 240, 270, 278, 280; 81/3.07, 3.15, 3.4, 3.41; 215/226, 295, 301, 302, 303, 305, 329; 220/260;
428/40, 352; 156/247, 289