PCT WORLD INTELLECTUAL PROPERTY ORGANIZATION
International Bureau

INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 5 :		(11) International Publication Number:
B65D 83/04	A1	WO 94/11272
		(43) International Publication Date: 26 May 1994 (26.05.94)

(21) International Application Number: PCT/US93/11003

(22) International Filing Date: 12 November 1993 (12.11.93)

(30) Priority data:
07/977,519 17 November 1992 (17.11.92) US

(71) Applicant: SENETICS, INC. [US/US]; 75 Manhattan Drive, Suite 105, Boulder, CO 80303 (US).

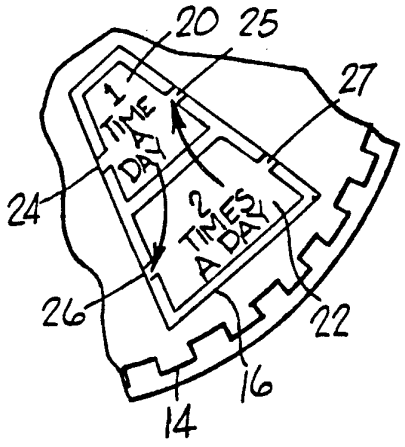
(72) Inventors: GARBY, Gage ; 3153 9th Avenue, Boulder, CO 80304 (US). OLIVAS, Jerome, L. ; 1225 Harrison Avenue, Phoenixville, PA 19463 (US).

(74) Agents: BEATON, Glenn, K. et al.; Beaton & Swanson, 4582 S. Ulster Street Parkway, Suite 403, Denver, CO 80237 (US).

(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
With international search report.
Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.

(54) Title: INDICATOR CAP HAVING SELECTABLE DOSAGE SCHEDULE



(57) Abstract

A device (12) for indicating compliance with a schedule, such as the removal of a closure from a medicine container according to a dosage schedule. A plurality of schedules is indicated on an indicating device (12), and a window (16) is provided to view the schedule one event at a time. A set of window covers (14) is used to cover the schedules. The user can select the desired schedule by removing the window cover that covers that schedule. Therefore, the device (12) can be used with more than a single schedule in accordance with the desires of the user.

FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AT	Austria	**GB**	United Kingdom	**MR**	Mauritania
AU	Australia	**GE**	Georgia	**MW**	Malawi
BB	Barbados	**GN**	Guinea	**NE**	Niger
BE	Belgium	**GR**	Greece	**NL**	Netherlands
BF	Burkina Faso	**HU**	Hungary	**NO**	Norway
BG	Bulgaria	**IE**	Ireland	**NZ**	New Zealand
BJ	Benin	**IT**	Italy	**PL**	Poland
BR	Brazil	**JP**	Japan	**PT**	Portugal
BY	Belarus	**KE**	Kenya	**RO**	Romania
CA	Canada	**KG**	Kyrgystan	**RU**	Russian Federation
CF	Central African Republic	**KP**	Democratic People's Republic of Korea	**SD**	Sudan
CG	Congo			**SE**	Sweden
CH	Switzerland	**KR**	Republic of Korea	**SI**	Slovenia
CI	Côte d'Ivoire	**KZ**	Kazakhstan	**SK**	Slovakia
CM	Cameroon	**LI**	Liechtenstein	**SN**	Senegal
CN	China	**LK**	Sri Lanka	**TD**	Chad
CS	Czechoslovakia	**LU**	Luxembourg	**TG**	Togo
CZ	Czech Republic	**LV**	Latvia	**TJ**	Tajikistan
DE	Germany	**MC**	Monaco	**TT**	Trinidad and Tobago
DK	Denmark	**MD**	Republic of Moldova	**UA**	Ukraine
ES	Spain	**MG**	Madagascar	**US**	United States of America
FI	Finland	**ML**	Mali	**UZ**	Uzbekistan
FR	France	**MN**	Mongolia	**VN**	Viet Nam
GA	Gabon				

INDICATOR CAP HAVING SELECTABLE DOSAGE SCHEDULE

BACKGROUND OF THE INVENTION

The present invention relates to closure members for containers, bottles and the like and, more particularly, to closure members having indicator means to indicate the number of times the container has been opened. The invention can also be used for any other application in which the number of times a given activity is performed must be indicated.

In the medical field, medical drugs have a predetermined therapeutic range in which the effects of taking the drug are beneficial. Under-utilization of a drug may endanger the user with the drug's side effects without reaching levels necessary for a therapeutic action. On the other hand, over-utilization may cause side effects or toxicity to a much greater extent than any possible benefit. Thus it is critically important that a patient follow prescribed directions on medications, yet frequently patients forget whether they have taken medication and either omit doses or repeat them.

A considerable number of pill-timing schemes have been used to solve the problem of reminding a patient to take a dose of medicine or reminding him that he has already taken the dose. The most common ones involve some scheme of compartmentalization of the necessary medication, such that the pills are placed in compartments that are labeled by day, dose number or time of day, or that are serially numbered. These

devices are reasonably satisfactory if a responsible person is available and has the time and patience to fill the compartments properly.

In dispensing pills of a single type, a number of bottle caps have been invented having a window through which an index symbol is visible. In only a few devices does the indicating element index in position relative to the window each time the cap is loosened, removed, replaced, and re-tightened. Thus, by looking at the index mark displayed through the window, a user can see where in repetitive sequence of dose he or she is.

A drawback to the window arrangements in the prior art is that they are usable only with a single dosing regimen. For example, a window which displays consecutively "M, Tu, W, Th, F, Sa, Su" is usable only with medicine that is to be taken once a day. If it is used with medicine that is to be taken twice a day, the symbols visible through the window will not match the actual day and the device will confuse more than assist the user. Conversely, a window which displays consecutively "M1, M2, Tu1, Tu2, W1, W2, Th1, Th2, F1, F2, Sa1, Sa2, Su1, Su2" for medicine that is to be taken twice a day, will not be usable with medicine that is to be taken once a day. Of course, it is possible to use a set of symbols that are simply numerical integers such as "1, 2, 3, 4, . . ." rather than symbols that include abbreviations for days of the week, but then the device is much less useful because it requires the user to keep count of where he is in the sequence.

One of the most serious disadvantages of prior art devices of the window indexing type is that there is no warning to the user in case the user does not turn the device far enough during the opening or closing to properly advance the window. Unless the

user is alert to the index value before opening and then after closing such devices, the user will be unaware that the window failed to advance to a new index. Most users, especially the elderly who may not understand how the device operates, will not be this alert to the functioning of the device. In addition, most prior art devices fail to provide positive locking in both directions of movement; thus, the index may be moved appropriately when the device is opened or closed, but additional movement is not prevented when the device is moved in the opposite direction. This allows the index to drift, often causing failure or an incorrect reading, particularly after the device has been used over a period of time.

The device of U.S. Patent 4,011,829 issued March 15, 1977 to Wachsmann, et al., attempts to provide positive locking in both directions, but because of the direction of the tooth designed to prevent movement of the index upon closure, the device may not work reliably, particularly after wearing with use. Also, the device of Wachsmann does not provide space for the ratchet teeth to slide past the engagement teeth when the device is moving in a direction wherein such teeth should disengage, which may cause unreliable operation over a period of time. Another drawback of this device is its inclusion of a complicated "child proofing" feature with the indexing feature, which makes the device quite complex. Other features of this device, such as the method of providing the lost motion drive and the requirement of a post in the middle of the elements to hold the device together, also increase its complexity.

The device of U.S. Patent 3,151,599 issued October 6, 1964 to Livingston provides positive locking in both directions, but it does so by means of very closely spaced projections that would be difficult to

manufacture economically. Furthermore, this device does not provide space for the projections to move while sliding past each other when not engaged.

The device of U.S Patent 4,666,051 issued May 19, 1987 to Trick has an indicator wheel with a serrated rim projecting above and below the plane of the wheel. The serrations engage mating serrations in upper and lower elements in order to drive the indicator mechanism. The serrations are rigid and, therefore, tend to wear excessively as they slide past one another.

The device of European Patent Application No. 87100917.2, published July 27, 1987, by Schwab, has a cup-shaped exterior element that engages a frustoconical closure cap. The Schwab device is somewhat complicated in design and manufacture. The device of U.S. Patent 4,220,247 issued September 2, 1980 to Kramer also includes a cup-shaped exterior element which engages an inner element. It appears that Wachsmann, Livingston, Trick and Schwab all utilize an ordinary symbol arrangement which is usable only with a single dosing regimen.

Other devices in the art include U.S. Patents 4,511,050 by Nicol; 4,365,722 by Kramer; 4,749,093 by Trick; 4,782,966 by Thackrey; 4,753,189 by Mastman; 4,705,182 by Newel-Lewis; 4,662,520 by Griffen; 4,641,759 by Kelley; 4,634,012 by Kelley; 4,562,933 by Dennis; 4,528,933 by Allen; 4,511,050 by Nicol; 4,548,157 by Hevoyan; 4,501,370 by Kelley; 4,489,834 by Thackrey; 4,432,300 by Lyss; 4,419,016 by Zoltan; 4,405,045 by Villa-Real; 4,357,192 by Moser; 4,347,804 by Villa-Real; 4,094,408 by Ford; 3,996,879 by Walton; 3,960,713 by Carey; 3,926,326 by Grau; 3,921,568 by Fish; 3,887,099 by Gillman; 3,753,417 by Garby; 3,446,179 by Bender; 3,334,731 by Dale; 2,943,730 by

Tregilgas; 2,939,597 by Greene; 2,587,147 by Guion; and 498,851 by Adsit.

It is thus apparent from a review of this art that there is a need for an improved indicator cap in the manner of the present invention that allows an indicator device to be used on a medicine container for use with more than a single dosing regimen. Preferably, the dosing regimen to be indicated by the device could be chosen simply and effectively at the time the device is to be used. Additionally, there is a need for an indicator cap that provides positive controlled movement of the index on both opening and closing of the device, while also providing an indication to the user that the index has functioned properly each time the device is used. Preferably, the basic design of such a device can also be used in other applications where it is necessary to have a record of the number of times a given event occurs. Also, it would be desirable for such a device to include the option of not utilizing the indicator system at all if that is the desire of the user.

It is also apparent from a review of this art that there is a need for an improved indicator cap that can be used as a child-resistant closure. Preferably, such a cap would have a minimum of parts, would be easily manufactured and assembled using standard injection molding and assembly methods, and could be used with ordinary containers that are not necessarily specially designed for the cap.

SUMMARY OF THE INVENTION

It is an object of the present invention to provide an indicator device to indicate the number of times a given event has occurred. Such an invention may have applicability in the control of chemical containers, the development of photographic film and

many other areas. More particularly, it is an object of the present invention to provide an indicator cap for a medication dispensing bottle or the like that provides an indication each time the bottle is opened and then reclosed.

It is a further object of the present invention to provide an indicator device for use with more than one medicine dosing regimen. Another objection of the invention is to provide a device where the choice of dosing regimens can be made simply and effectively by the user at the time the device is put into use, rather than at a manufacturing facility beforehand.

Another object of this invention is to provide an indicator device in which the indicator system can either be operated or not operated by the user.

It is another object of this invention to provide a device that has positive control of the index member during both the opening and the closing motions and to require the advancement of the index member by one and only one new index during each complete opening and closing cycle.

Yet another object of the invention is to provide an audible sound to confirm that the device has been rotated sufficiently to move the index to the next location and to also provide an audible sound when the device has been rotated sufficiently to re-cock the device for the next open-close sequence.

Still another object is to provide space within the device for the locking mechanisms to slide past each other when not engaged to allow such mechanisms to work reliably over a long period of time.

Another object of the present invention is to combine functions usually requiring several components into single components to reduce the complexity of the device and provide ease of manufacturability and

assembly using standard injection molding and assembly techniques.

Another object of the present invention is to provide an indicator assembly that can easily be fitted to an ordinary container without requiring any special modifications to the container itself.

Another object is to provide a device with indicator symbols that can be sensed by touch such as raised letters or braille.

Another object is to provide a device that can be easily grasped by elderly or impaired patients, as by including grasp-facilitating elements on the device.

Another object is to provide a device which is easily manufactured and assembled with a minimum of parts.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of a medicine container with an indicator device of the present invention.

FIG. 2 is a plan view of an indicator wheel with a set of indicator symbols according to the present invention.

FIG. 3 is a plan view of the outer cover with a window and a set of window covers according to the present invention.

FIG. 4 is a detail of the window and window covers of the present invention.

FIG. 5 is a sectional view taken along line 5-5 of FIG. 4.

FIG. 6 is a sectional view taken along line 6-6 of FIG. 4.

FIG. 7 is a detail of the window and window covers showing certain labelling in the present invention.

FIG. 8 is a perspective view of an alternative embodiment of the invention.

FIG. 8A is a sectional view taken along line 8A-8A of FIG. 8.

FIG. 9 is a perspective view of a further alternative embodiment of the invention.

FIG. 9A is a sectional view taken along line 9A-9A of FIG. 9.

FIG. 10 is a perspective view of a further alternative embodiment of the invention.

FIG. 10A is a sectional view taken along line 10A-10A of FIG. 10.

DETAILED DESCRIPTION OF THE INVENTION

A pictorial view of a medicine bottle 12 with an indicator cap 14 is shown in FIG. 1. Such devices in general are known in the art and are not described in detail here. In particular, such a device is described in detail in U.S. Patent No. 5,009,388 by Barker of which the present invention is a continuation-in-part, and in U.S. Patent No. 4,011,829 by Wachsmann. Briefly, the medicine bottle 12 is of the ordinary plastic type for holding a number of medicinal pills or tablets. The neck of the bottle is threaded to receive the threaded indicator cap 14. The indicator cap in the preferred embodiment includes an outer cap with a window 16 therethrough, an inner retainer and an indicator wheel disposed between the outer cover and inner retainer having a set of indicator symbols selectively visible through the window 16. A pawl on one of the indicator wheel and the inside surface of the outer cover and a set of engaging teeth on the other of the indicator wheel and the inside surface of the outer cover allow rotation of the outer cover relative to the indicator wheel in a first rotational direction but not in a second

rotational direction opposite the first rotational direction. A pawl on one of the indicator wheel and the inner retainer and a set of engaging teeth on the other of the indicator wheel and the inner retainer allow rotation of the indicator wheel in the second rotational direction but not in the first rotational direction.

"Lost motion" is provided between the outer cover and the inner retainer by a set of circumferential tabs on one of those members and circumferential engaging grooves on the other of those members. The tabs have a shorter circumferential length than the grooves, so that the outer cover has a limited range of rotational motion relative to the inner retainer.

The effect of this configuration is that rotating the outer cover in the first direction (such as clockwise) causes it to rotate while the indicator wheel and inner retainer remain stationary, thereby advancing the window in the outer cover to the next indicator symbol on the indicator wheel. This also causes an advancement of the pawl past another tooth of the teeth and pawl on the outer cover and indicator wheel, thereby producing an audible "click" to confirm proper operation to the user. When the limited range of rotational motion between the outer cap and the inner retainer is exhausted by the tabs reaching a circumferential end of the grooves, the inner retainer begins rotating with the outer cover. Because the retainer directly or indirectly includes the threads which engage the threaded neck of the bottle, the device is thereby screwed onto the bottle to close and seal the bottle. When the outer cover is then rotated in the opposite direction (such as counterclockwise), the outer cover together with the indicator device rotate relative to the inner retainer through the

limited range of motion available from the tabs and grooves, while the inner retainer stays stationary. This causes an advancement of the tooth past another pawl in the teeth and pawl on the indicator wheel and inner retainer to produce another audible "click" to confirm the proper operation of the device to the user. When the limited range of rotational motion between the outer cover and inner retainer is exhausted by the tabs reaching the opposite circumferential end of the grooves, the inner retainer begins rotating with the outer cover to unscrew the device from the bottle and access the contents.

It will be apparent that a number of other variations are possible on this lost motion system. In particular, the lost motion indicator device using the window described herein may be used in combination with a child-resistant mechanism which resists the removal of the closure from the bottle by a child. Common child-resistant mechanisms include the "push and turn" type which require the application of an axial force urging the closure toward the container simultaneous with the rotation of the closure. The axial force may cause the engagement of lugs and notches that are positioned on the closure and the indicator device in the manner of parent application no. 07/718,354 filed June 21, 1991, or may disengage a set of lugs and bayonet grooves on the closure and the container neck in the case of a closure and container that use that type of closing mechanism rather than threads.

The aspect of the indicator cap 12 to which the present invention is particularly pertinent concerns the window 16 for the display of indicator symbols on the indicator wheel. The indicator wheel 30 having a set of indicator symbols 32 is shown in FIG. 2; a top plan view of the outer cover 14 showing the window 16 is shown in FIG. 3; details of the window 16 are shown

in FIGs. 5-6; and the combination of the indicator wheel 30 and the overlying outer cover 14 with window 16 to display the indicator symbols 32 on the indicator wheel 30, is shown in FIG. 4.

The indicator wheel 30 (see FIG. 2) in the preferred embodiment is a circular disk-shaped element having a diameter allowing it to rest within the outer cover 16 (from FIG. 1) and a thickness sufficient to impart some rigidity to the disk. An indicator wheel 30 in a commonly sized indicator device might have a diameter on the order of an inch and a thickness of a sixteenth to an eight of an inch. The indicator wheel 30 will also generally include a means to engage the outer cover 16 such as a pawl on its upper or circumferential surface (not shown) to engage mating teeth on the inside surface of the outer cover as mentioned above.

The indicator wheel 30 has printed onto the top surface a set of indicator symbols. In the embodiment shown in FIG. 2, the symbols include an inner set 34 and an outer set 36 in which the inner set 34 is positioned radially inward from the outer set 36. Both sets of symbols 34 and 36 fit within the window 16. The outer set of symbols 36 is a set of abbreviations for consecutive days of two weeks, namely "M, Tu, W, Th, F, Sa, Su, M, Tu, W, Th, F, Sa, Su". These fourteen symbols correspond to fourteen teeth on the teeth that mate with the pawl on the indicator wheel 30 and outer cover 14, so that each click of the pawl past a tooth positions one new symbol in the window 16. Like the outer set of symbols 36, the inner set of symbols 34 is a set of fourteen abbreviations for consecutive days of the week. However, the outer symbols 36 include two numbers for each day, as in "M1, M2, Tu1, Tu2, W1, W2, Th1, Th2, F1, F2, Sa1, Sa2, Su1, Su2". The formatting of the symbols shown in FIG. 2

positions the numeral below the day abbreviation for the inner set of symbols 36.

It can be appreciated that the outer symbols 36 can be used when the device is to remind the user to take one dose a day. In that event, each time the device is removed from and replaced onto the container to obtain a dose of medication, the outer symbols 36 will advance one position to a new day. The user thereby is alerted whether he has taken his medication that day or not. Similarly, the inner symbols 34 can be used to remind the user to take two doses a day. In that event, each time the device is removed from and replaced onto the container to obtain a dose of medication, the inner symbols will advance one position. Because each day includes a "1" position and a "2" position, the user is thereby alerted to take two doses a day.

Other sets of symbols could also be used depending on the dosage schedule desired. For example, it will be readily apparent that a set of symbols could be used including every other day such as "M, W, F". . . for medicine to be administered every other day, and a set of symbols could be used including three numerals for each day such as "M1, M2, M3, Tu1, Tu2, Tu3" . . .. It is also possible to include more than two sets of symbols, such as three, four or more sets. Each set would have an appropriate window cover in the manner described below, so that the user could choose the appropriate set depending on the desired dosage schedule.

The outer cover 14 is shown in a top plan view in FIG. 3. That view also shows the window 16 through the outer cover 14, and the inner window cover 20 and outer window cover 22. The inner window cover 20 covers the radially inner portion of the window 16 while the outer window cover 22 covers the radially

outer portion of the window 16. The inner window 20 and outer window 22 are joined to the boundary of the window 16 by tabs 24 and 25 for the inner window cover 20, and tabs 26 and 27 for the outer window cover 22. The tabs 24, 25, 26 and 27 are shown best in FIGs. 4 and 5. They are essentially narrow tabs that extend from the window covers 20 and 22 to the boundary of the window 16. The tabs 24, 25, 26 and 27 may be approximately the same thickness as the window covers 20 and 22, or may be thinned in comparison to the window covers 20 and 22 in the manner shown in FIG. 6. The inner window cover 20 fits within the radially inner portion of the window 16 and therefore has a slightly smaller perimeter than the boundaries of that portion of the window. Similarly, the outer window cover 22 fits within the radially outer portion of the window and therefore has a slightly smaller perimeter than that portion of the window. The dimension of the inner window 20 in the radial direction is sufficient to cover the inner set of symbols 34 on the indicator wheel 30 while the dimension of the outer window 22 in the radial direction is sufficient to cover the outer set of symbols 36 on the indicator wheel 30.

The external surface of each window cover 20 and 22 may include printed labels to indicate which portion of the window is to be used for a desired dosing schedule. Such instructions can be on the outer cover 14 or on the window covers 20 and 22 as shown in FIG. 7. The inner window cover 24 has a label stating "1 Time A Day" with an arrow pointing to a tab 26 attaching the outer window cover 22 to the outer cover 14. If the device is desired for use with medicine to be taken once a day, the user knows from this label to break tab 26 (and then tab 27) to remove the outer window cover 22 and expose the twice a day outer symbols 36 on the indicator wheel 30. The removal of

the outer window cover 22 also effects a removal of the labelling on the outer window cover, leaving only the labelling on the inner window cover 20. Thus, the user is left with a device for once a day dosing that is labelled as such. Similarly, if the device is for use with twice a day dosing, the user is instructed by the label "2 Times A Day" and the accompanying arrow to break tab 25 (and tab 24) attaching the inner window cover 29 to the outer cover 14 to remove the inner window cover 20 and expose the twice a day symbols of the inner symbols 34 on the indicator wheel 30. The removal of the inner window cover 20 also effects a removal of the labelling on the inner window cover 20. Thus, the user is left with a device for twice a day dosing that is labelled as such.

The chosen window cover 20 or 22 is removed from the window 16 by the user breaking at least one of the tabs 24, 25 26 or 27 and pulling the window cover 20 or 22 away from the window 16. The breaking of the tabs 24, 25, 26 or 27 may be assisted by the use of a pencil, toothpick, knife, fingernail or other somewhat sharp object which can be used to press the window cover 20 or 22 downward to shear the tabs 24, 25, 26 or 27, or which can be used to insert in a slot between the window cover 20 or 22 and the boundary of the window 16 to pry the window cover 20 or 22 away from the outer cover 14.

The outer cover 14 and window covers 20 and 22 are injection-moldable plastic in the preferred embodiment, but it will be apparent that other materials may be used. The means for attaching the window covers 20 and 22 to the outer cover 14 is described as the tabs 24, 25, 26 and 27, which are preferably injection-moldable plastic that is formed with the forming of the outer cover 14, but any other attachment means is satisfactory provided it allows the

window covers 20 and 22 to be removed from obstructing the window 16. For example, the window covers could be paper or plastic sheets which are simply adhered to the boundaries of the window 16. They could also be part of a larger paper or plastic sheet which covers part or all of the type of the outer cover 14, and is separable from that larger sheet by scored lines or tearable folds.

Alternative embodiments of the invention are shown in FIGs. 8-10 which depict some of the variations mentioned above. FIG. 8 shows a perspective view of the outer cover 14 with the widow 16 therethrough, along with an inner window cover 120 and outer window cover 122. The inner window cover 120 is attached to the outer cover 14 by a tab 124 similar to the tab 24 that attaches the inner window cover 20 to the outer cover 14 in the embodiment described above and shown in FIGs. 2-7. However, in the embodiment of FIG. 8, the tab 124 connects the inner window cover 120 to the outer cover 14 at the radially inner boundary of the window 16 rather than at one of the sides of the window 16 as in the embodiment of FIGs. 2-7. In addition, the inner window cover 120 has an upstanding lip 121 at its radially outer edge. The purpose of the inner window cover lip 121 is to provide something for a user to grasp in order to pull the inner window cover 120 from the window 16. Similarly, the outer window cover 122 is attached to the outer cover 16 by a tab 126 at the radially outer boundary of the window 16 rather than at the sides of the window 16, and the outer window 122 has its own upstanding lip 123 so that the user can grasp and remove the outer cover 122. Therefore, this embodiment would not require any tool such as a pencil to punch the window covers 120 and 122 from the window 16.

The embodiment shown in FIG. 9 utilizes an inner window cover 220 and outer window cover 222 which slide to open the window 16. The inner window cover 220 is fitted into a slot 221 which extends into the thickness of the top of the outer cover 14 as better shown in the cross-sectional view of FIG. 9A taken along line 9A-9A of FIG. 9. One side of the inner window cover 222 has an upstanding edge 235 which allows the user to easily slide open the inner window cover 220. Similarly, the outer window cover 222 slides through an outer window cover slot 223 in the thickness of the top of the outer cover 14 (which may be undivided from the inner window cover slot 221 as shown in FIG. 9) and has an upstanding edge 237. The user operates this embodiment by selecting the window cover 220 or 222 to be opened, and then opens it by sliding it into its respective slot 221 or 223 using the upstanding edge 235 or 237. This embodiment has the notable advantage that the user's selection of a window cover to be opened is reversible; the user can simply close an opened window cover by sliding the window cover back over the window and then open the other window cover instead.

The embodiment shown in FIG. 10 includes a paper or plastic sheet for the inner window cover 320 and another paper or plastic sheet for the outer window cover 322. Each window cover 320 and 322 is adhered to the outer cover 14 in the region surrounding the window 16 by an adhesive on the side of the sheet facing the outer cover 14. Each of the window covers 320 and 322 is wider in the circumferential direction than the window 16, so that it overlaps the outer cover 14, thereby presenting an overlapping surface for application of the adhesive. The window covers 320 and 322 may include ends 321 and 323 which are not adhered to the outer cover 14, so that they stand apart from

the outer cover 14 to be grasped by the user, as better shown in FIG. 10A. To operate this embodiment, the user selects the window cover 320 or 322 to be removed, and then removes it by grasping the unadhered portion 321 or 323 and peeling the window cover 230 or 322 off the outer cover 14 to expose the desired portion of the window 16.

It will also be apparent that, although the preferred embodiment described above uses a single window with two coverings for concentric circles of indicator symbols, the device could instead use more than one window each with its own cover to cover the respective sets of indicator symbols. In such a configuration, the indicator symbol sets need not be concentric circles but could be located anywhere on the device. It will also be apparent that the window covers 20 and 22 of FIG. 7 could be hingedly attached to the outer cover 14 by breaking away only one of the two tabs that attach each of them to the outer cover so that the remaining tab acts as a hinge. Alternatively, a so called living hinge could extend along one side of the window cover to allow hinged opening.

CLAIMS

1. A device for indicating the removal and replacement of a closure on a container, comprising:an indicator symbol carrier having at least a first set of symbols indicating a first desired schedule for the removal and replacement of the closure and at least a second set of symbols indicating a second desired schedule for the removal and replacement of the closure; and an outer cover rotatably engaged with said indicator symbol carrier cover, the outer cover having at least one window to selectively view one of said first and second sets of symbols.

2. The device of claim 1, wherein said outer cover includes a first window cover for covering the portion of the window through which the first set of symbols is visible and a second window cover for covering the portion of the window through which the second set of symbols is visible.

3. The device of claim 2, wherein the first set of symbols is arranged in a first circle on the indicator symbol carrier and the second set of symbols is arranged in a second circle on the indicator symbol carrier, the first and second circles being substantially concentric.

4. The device of claim 3, wherein the first window cover covers the first set of symbols and the second window cover covers the second set of symbols.

5. The device of claim 4, wherein said window has a first dimension sufficient to extend radially through the first circle having the first set of symbols and the second circle having the second set of symbols, and a second dimension substantially perpendicular to the first dimension sufficient to extend circumferentially through the width of a single symbol of said first set of symbols and a single symbol of said second set of symbols.

6. The device of claim 4, wherein the window has a base at the radially outer edge of a set of symbols extending circumferentially along the circle of said set of symbols, a top at the radially inner edge of a set of symbols extending circumferentially along the circle of said set of symbols and two radially-extending sides connecting the base and top.

7. The device of claim 4, wherein the first and second window covers are removably attached to the outer cover by breakable tabs extending from the window covers to the outer cover.

8. The device of claim 4, wherein the window covers are slidably mounted on the outer cover so that they can be slid to open the window and expose the indicator symbols.

9. The device of claim 4, wherein the window covers are removably adhered to the outer cover.

10. The device of claim 9, wherein the window covers are flexible sheets removably adhered to the outer cover.

11. The device of claim 4, wherein the window covers are hingedly attached to the outer cover.

12. The device of claim 4, wherein at least one of said first and second sets of indicator symbols includes symbols of the days of the week to indicate a daily schedule.

13. The device of claim 12, wherein at least one of said first and second sets of indicator symbols includes symbols of days of the week and numbers to indicate a schedule of more than once per day.

14. The device of claim 4, wherein the first schedule is an integral multiple of the second schedule.

15. A method for indicating the removal and replacement of a closure on a container, wherein the closure includes an indicator device to indicate the

removal and replacement of the closure on the container according to a first schedule indicated by a first set of indicator symbols viewable through a first portion of a window removably covered by a first window cover and according to a second schedule indicated by a second set of indicator symbols viewable through a second portion of the window removably covered by a second window cover, the method comprising: selecting one of said schedules; and removing the window cover that removably covers the portion of the window through which the indicator symbols indicating said schedule are viewable.

16. The method of claim 15, wherein the indicator device advances the window to a new indicator symbol each time the closure is removed and replaced on the container.

17. The method of claim 16, wherein the first set of indicator symbols are arranged in a first circle on an indicator symbol carrier and the second set of indicator symbols are arranged in a second circle on the indicator symbol carrier, the first and second circles being substantially concentric; the window is through an outer cover that covers and is rotatably engaged with said indicator symbol carrier; and said window extends radially and circumferentially to expose one symbol of said first set of indicator symbols and one symbol of said second set of indicator symbols.

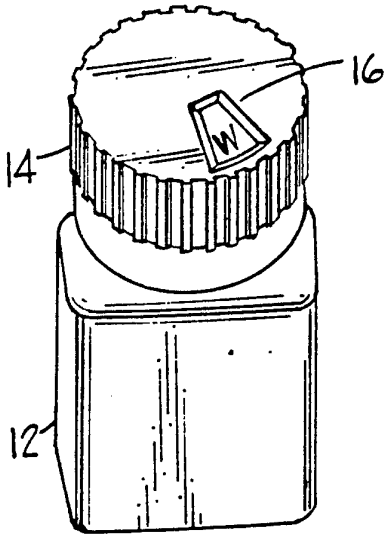


FIG.1

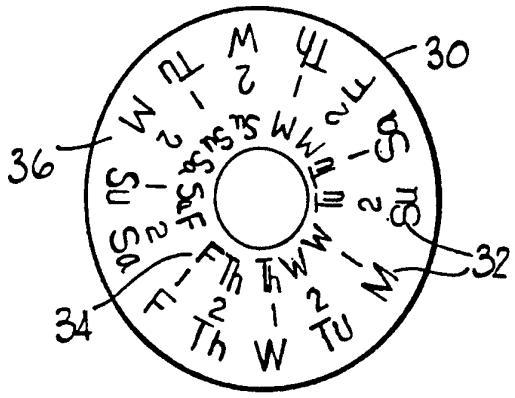


FIG.2

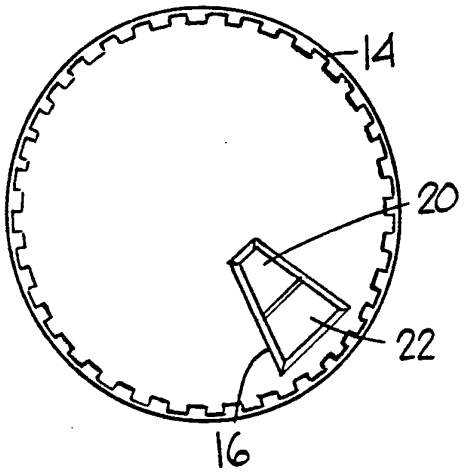


FIG.3

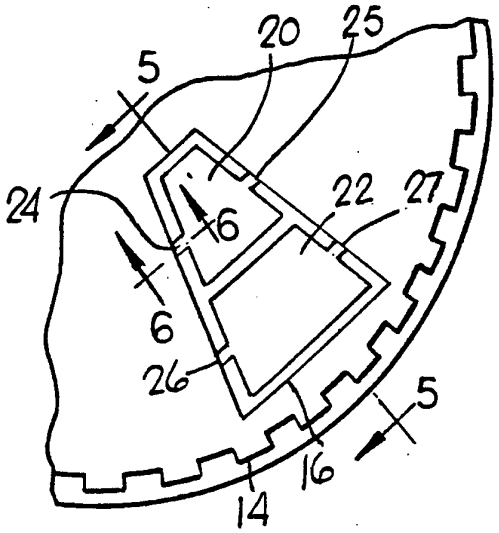


FIG.4

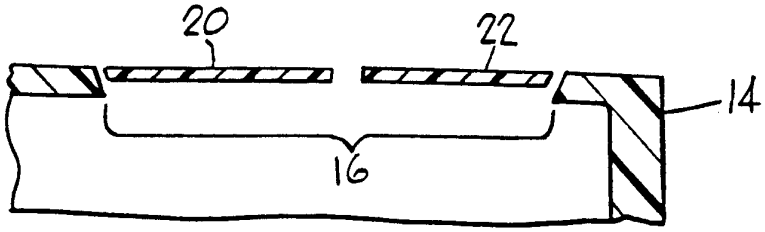


FIG.5

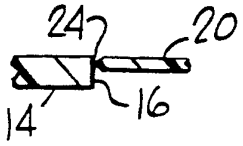


FIG.6

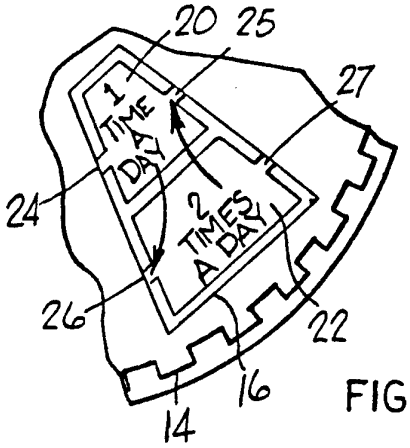


FIG.7

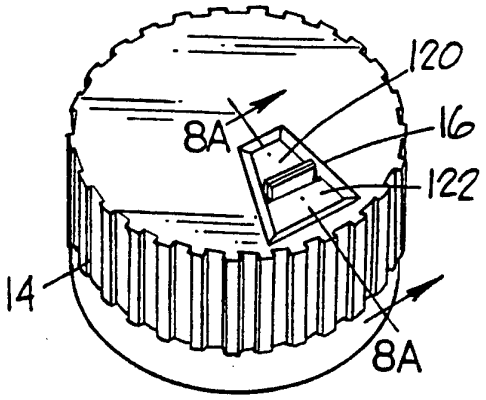


FIG.8

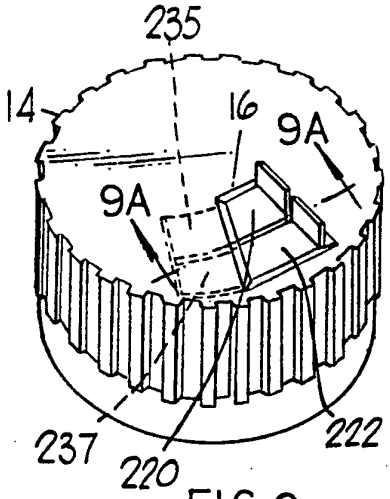


FIG.9

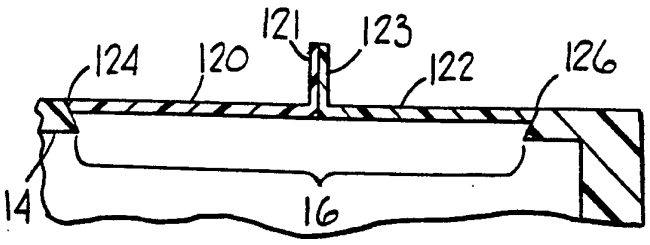


FIG.8A

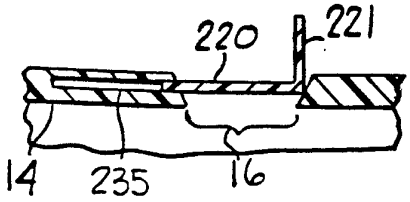


FIG.9A

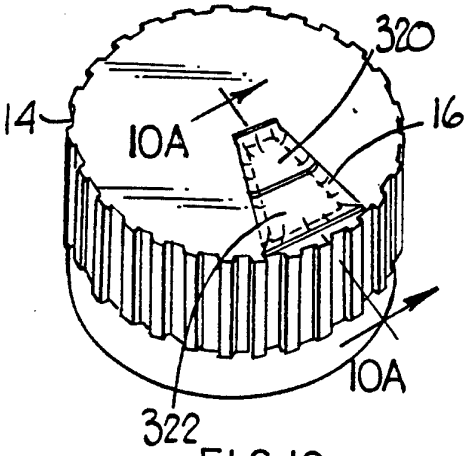


FIG.10

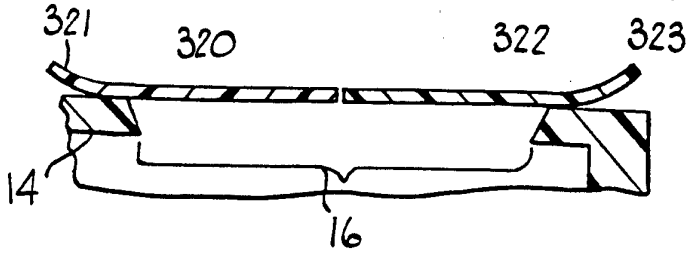


FIG.10A

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US93/11003

A. CLASSIFICATION OF SUBJECT MATTER

IPC(5) :B65D 83/04
US CL :206/534, 215/230
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. :

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.
Y	US, A, 4,572,376 (WRENNALL) 25 February 1986 see entire documents.	1-7
Y, P	US, A, 5,226,539 (CHENG) 13 July 1993	1-17
A, P	US, A, 5,188,251 (KUSZ) 23 February 1993	1
A	US, A, 4,920,912 (KIRKLING) 01 May 1990	1

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

*	Special categories of cited documents:	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A"	document defining the general state of the art which is not considered to be of particular relevance	"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E"	earlier document published on or after the international filing date	"Y"	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L"	document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&"	document member of the same patent family
"O"	document referring to an oral disclosure, use, exhibition or other means		
"P"	document published prior to the international filing date but later than the priority date claimed		

Date of the actual completion of the international search 04 APRIL 1994	Date of mailing of the international search report 18 APR 1994
Name and mailing address of the ISA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. (703) 305-3230	Authorized officer JOSEPH MAN-FU MOY Telephone No. (703) 308-0608

Form PCT/ISA/210 (second sheet)(July 1992)★