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(57) Abstract
Caps for closure of bottles are fitted with additional means as to permit the endless connection of said caps after their regular use for closure.
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"CELL-CAP CONNECTION SYSTEM"

BACKGROUND OF THE INVENTION

The present patent relates to the art of making a cap for closure of bottles, fitted with additional means such as connectors as to permit the endless connection of a number of CELL-CAPs after its regular use as closure.

The massive use of plastic and glass bottles for a wide variety of applications implied in the need of getting closures capable to permit a perfect closing of the inner content at cost level compatible with the of all income classes. That situation resulted in a huge amount of discharged plastic material, part of which is recycled for getting new products. As part of this chain, CELL-CAP is to be used for the creation of a second level in the consumption scale before its recycling.

Previous initiatives for recycling this surplus are reported in the American patents numbers. 4,202,456 dated May 13, 1980 and 5,361,919 dated Nov. 06, 1994, the former much more related to metallic materials such as cans and the former proposing the insertion to the cap of a complex system of connectors.

SUMMARY OF THE INVENTION

The aim of the present patent is to disclose a multi-purpose cap due to the insertion to the same cap structure currently being used by bottlers of a number of connectors that allow the indefinite connection of a number of caps to create an endless quantity of forms and figures.

Another objective of the present patent is to dispose an additional gripping support for users opening and closing the bottle.

BRIEF DESCRIPTION OF THE DRAWINGS

FIGS. from 1a to 1c show a perspective view of a generic model of cap fitted with types of connectors over its upper end and its correspondent internal groove in the lower end;
FIGs. from 1d to 1e show a lateral view of CELL-CAP’s vertical assembling sequence through its upper end connector;

FIG. 2a is a perspective view of a CELL-CAP fitted with a number of lateral connectors along its external periphery;

FIG. 2b represents the horizontal assembling of two CELL-CAPs detailing the attachment of two lateral connectors through figs. 2c and 2d;

FIGs. from 3a to 3c discloses a model of CELL-CAP fitted with square walls, as well as a body formed by the assembling of a number of CELL-CAPs;

FIGs. 4a and 4b show the assembling sequence of an optional sleeve with lateral connectors for regular caps;

FIG. 5 shows an auxiliary element for connecting CELL-CAPs.

Through FIG. 1a we see a regular cap (1a) currently used for closing bottles such as soft drink bottles, fitted however with a disk (2a) over its upper end (3a), said disk (2a) fully adequate in size and shape for the perfect insertion of its prolonged border (2b) inside the correspondent internal groove (2c) located in the lower end (3b) of the CELL-CAP (1).

The assembling sequence of two CELL-CAPs (1) fitted with the upper disk (2a) is demonstrated in FIG. 1d, making it possible to vertically assemble as many pieces as desired.

On FIGs. 1b we see a flat border (2b1) disk and on FIG. 1c a round wall (2a1) over the upper end of the cap, both to be inserted by diameter interference inside the lower open end (3b) of another cap, as demonstrated in the sequence on FIG. 1e, making it possible to vertically assemble as many pieces as desired.

Through FIG. 2a a general view of a CELL-CAP (1), fitted with some vertical connectors (4) along its external periphery is given, such connectors (4), apart of being of great help as additional gripping support for opening and closing the cap, are also capable to permit the horizontal connection of
an undefined number of CELL-CAPs (1), such connection being better demonstrated through the upper view on FIG. 2b.

The sequence on FIGs. 2c and 2d demonstrates the reciprocal insertion of two identical connectors (4), both fitted with a locking portion (4a) to be fixed inside the groove (4b) located in the opposite connector (4), adequate in size and shape for the tight reception of said locking portion (4a).

FIG. 3a discloses a model of CELL-CAP fitted with rectangular square walls (5) around cap’s round structure, and optionally fitted with connectors of the type receptive(8a)/introductive(8b).

FIGs. 3b and 3c disclose firstly the way two rectangular CELL-CAPs (1) are to be connected and secondly, how they have been connected to form a body, after the assembling of a number of CELL-CAPs (1).

Trough FIGs. 4a and 4b, an optional way of getting a regular cap fitted with CELL-CAP’s connectors around its external periphery is disclosed. Said effect is obtained by introducing lateral connectors (4) to the external periphery of a sleeve (6), said sleeve (6) having adequate size and shape to be attached in the regular cap it will cover forming this way a CELL-CAP.

In FIG 4a a regular cap is ready to be inserted in a sleeve (6) opened at both ends and fitted with CELL-CAP lateral connectors (4) around its periphery.

In FIG. 4b the regular cap and the sleeve (6) with CELL-CAP lateral connectors (4) have already been attached and are ready for the connection with another CELL-CAP.

FIG. 5 shows an auxiliary element (9) for connecting CELL-CAPs, element (9) such as those used as ice-cream sticks adequate however in shape and size for the connection with CELL-CAP’s connectors. The auxiliary element (9) could be divided in modular parts (9a) detachable by cutting its dotted (9b) line.
1. A CELL-CAP CONNECTION SYSTEM, primarily destined such as any other regular cap for the closure of bottles, the cap bearing however additional means as to facilitate and permit its use during and after it has expired its performance as closure, characterized by the insertion to its structure of connectors in any quantity, shape, angle, type and position capable to permit the connection between them of any number desired of pieces.

2. A CELL-CAP CONNECTION SYSTEM, according to Claim 1, wherein the connectors have been incorporated to caps both at its external and internal structure and/or over both ends of the cap.

3. A CELL-CAP CONNECTION SYSTEM, according to Claim 1 and 2, wherein the connectors represent additional gripping support for turning caps when opening and closing bottles.

4. A CELL-CAP CONNECTION SYSTEM, according to Claim 1, 2 and 3, wherein the connectors are equal in shape and size as to permit their reciprocal insertion being the connectors identical, such connectors fitted with a locking portion to be fixed inside the correspondent groove located in the opposite connector, such groove adequate in size and shape for the reception of said locking portion.

5. A CELL-CAP CONNECTION SYSTEM, according to Claim 1, 2, 3 and 4, wherein the connectors are of different introductive and receptive shape.

6. A CELL-CAP CONNECTION SYSTEM, according to Claim 1, 2, 3, 4 and 5, wherein the cap has been fitted with a disk connector 1 over its upper end, said connector 1 fully adequate in size and shape for the perfect insertion of its prolonged border 2 inside the correspondent internal groove 3 located in the lower end 3b of the opposite CELL-CAP.

7. A CELL-CAP CONNECTION SYSTEM, according to Claim 1, 2, 3, 4 and 5, wherein the cap has been fitted with a flat border (2b1) disk
over its upper end, said flat border (2b1) disk fully adequate in size and shape for the perfect insertion by diameter interference inside the lower open end (3b) of another CELL-CAP.

8. A CELL-CAP CONNECTION SYSTEM, according to Claim 1, 2, 3, 4 and 5, wherein the cap has been fitted with a round wall (2a1) over its upper end, said round wall (2a1) fully adequate in size and shape for the perfect insertion by diameter interference inside the lower open end (3b) of another CELL-CAP.

9. A CELL-CAP CONNECTION SYSTEM, according to previous Claims 1, 2, 3, 4 and 5, wherein a CELL-CAP has been fitted with rectangular square walls around regular cap’s round structure, to which connectors of identical or receptive/introductive type have been incorporated.

10. A CELL-CAP CONNECTION SYSTEM, according to previous Claims, wherein printing of marks, brands, figures, drawings or any other motive might allow the creation of panels such as puzzles.

11. A CELL-CAP CONNECTION SYSTEM, according to previous Claims, wherein an optional way of getting a regular cap fitted with CELL-CAP connectors around its external periphery is represented by the introduction of connectors to the external periphery of a sleeve preferably opened at both ends, said sleeve having adequate size and shape to be attached in the regular cap it will cover.

12. A CELL-CAP CONNECTION SYSTEM, according to previous Claims, wherein an auxiliary element (9) for connecting CELL-CAPs is present, element (9) such as those used as ice-cream sticks adequate however in shape and size for the connection with CELL-CAP’s connectors, said auxiliary element (9) divided or not in modular parts (9a) detachable by cutting its dotted (9b) line.
**INTERNATIONAL SEARCH REPORT**

**A. CLASSIFICATION OF SUBJECT MATTER**

IPC\(^6\): B 65 D 51/24

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)

IPC\(^6\): B 65 D

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)

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**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

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<td>US 5 361 919 A (HULL) 08 November 1994 (08.11.94), abstract; fig. 1-5.</td>
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<td>X</td>
<td>US 4 202 456 A (SILBER) 13 May 1980 (13.05.80), abstract; fig. 3.</td>
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Date of the actual completion of the international search

27 September 1999 (27.09.99)

Date of mailing of the international search report

18 November 1999 (18.11.99)

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