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(54) **EASY PULL BOTTLE CAP HAVING INVISIBLE CUTTING LINES**

(57) The present application discloses an easy-pull bottle cap with invisible cutting lines, consisting of a circular bottle cap body. A pull ring, two cutting lines, and several evenly arranged teeth are on the bottle cap body. The included angle α between the two cutting lines ranges from 120° to 140°, and each cutting line is located on the center line of the bottle cap body. One end of the pull ring is provided with a lacing hole which is on the upper cap surface of the bottle cap. The other end of the pull ring is fixed on the side of the bottle cap body and located on the bisector of the included angle α between the two cutting lines. The included angle α of 120° to 140° ensures that the bottle cap can open without hurting the hands. This utility model is structurally simple, convenient, and safe.

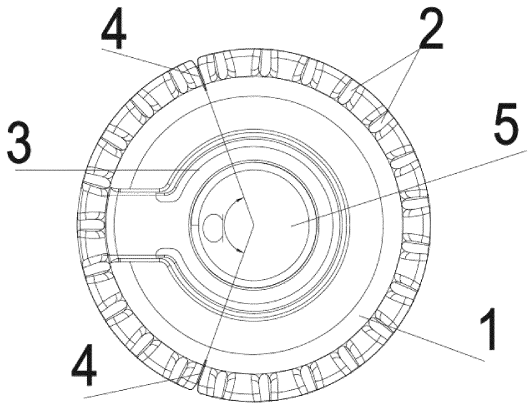

FIG. 1

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Description

TECHNICAL FIELD

[0001] This invention involves an easy-pull bottle cap with invisible cutting lines.

BACKGROUND

[0002] Most bottled drinks now employ easy-pull bottle § tops as a sealing technique since they are simple to use and inexpensive.

[0003] Most of the easy-pull bottle caps on the market are made of thin metal sheets. Cleaning up the used pull ring and cap is inconvenient, and the cap may easily scratch the body. Opening the bottle cap frequently requires a great deal of power, which makes it extremely difficult to open and vulnerable to damage.

[0004] To summarize, the development of an easy-pull bottle cap that will not injure the body and can be opened with a small force is a technological problem that will be solved by technicians in this technology field.

SUMMARY

[0005] To solve the above technical problem, this invention provides an easy-pull bottle cap with invisible cutting lines consisting of a circular bottle cap body. A pull ring, two cutting lines, and many equally arranged teeth are all located on the bottle cap body.. The included angle α between the two cutting lines ranges from 120° to 140° , and each cutting line is located on the center line of the corresponding teeth around the bottle cap body. The pull ring has a lacing hole on one end and is located on the upper cap surface of the bottle cap body.. The other end of the pull ring is fixed on the side of the bottle cap body and located on the bisector of the included angle α between the two cutting lines.

[0006] To further improve the above technical scheme, each of the cutting lines mentioned above is invisibly arranged on the center line's interior corresponding to the teeth and integrally molded with the bottle cap body.

[0007] To further improve the above technical scheme, the cutting lines mentioned above are located on one end of the upper cap surface of the bottle cap body and have an extended section of 0.5mm to 0.8mm long.

[0008] To further improve the above technical scheme, the number of teeth described above is set to 21or 23.

[0009] To further improve the above technical scheme, the lacing hole described above is circular or cross-shaped.

[0010] To further improve the above technical scheme, the bottle cap body mentioned above is molded with the pull ring integrally.

[0011] To further improve the above technical scheme, the bottle cap body described above and lacing hole are made of tinplate or aluminum.

[0012] Compared to the existing technology, the cutting lines mentioned above in this invention are located on the center line of the corresponding teeth around the bottle cap body, forming an included angle of 120° to 140° . The other end of the pull ring is utilized to bisect the included angle between the two cutting lines, ensuring that the bottle cap can be opened with a modest amount of force without causing any harm to the hands.. This invention is structurally simple, convenient, and safe.

BRIEF DESCRIPTION OF DRAWINGS

[0013]

Figure 1 is the perspective drawing of the easy-pull bottle cap with invisible cutting lines in this invention. Figure 2 is the structure diagram of the opened, easy-pull bottle cap with invisible cutting lines in this invention.

[0014] In the figures: 1. Bottle cap; 2. Teeth; 3. Pull ring; 4. Cutting lines; 5. Lacing hole.

DETAILED DESCRIPTION

[0015] The invention is further detailed and combined with the attached drawings below to help professionals in the technology field better comprehend the technical scheme of the invention.

[0016] It is necessary to note that in Figure 1, the surface perpendicular to the paper and facing outward is the upper cap surface. In addition, the surface perpendicular to the paper and facing inward is the lower cap surface.

[0017] As shown in Figure 1 and Figure 2, an easy-pull bottle cap with invisible cutting lines consists of a bottle cap body 1. On the bottle cap body, 1 are several teeth 2, a pull ring 3 and two cutting lines 4. Many teeth are arranged around the circular bottle cap body evenly. Each cutting line 4 is located on the center line of two corresponding teeth 2, forming an included angle of 120° to 140° . The pull ring has a lacing hole 5 on one end and is located on the upper cap surface of the bottle cap body 1.. The other end of the pull ring 3 is fixed on the side of the bottle cap body 1 and located on the bisector of the included angle α between the two cutting lines 4.

[0018] In this embodiment, the cutting mentioned above lines 4 are located on the center line of the corresponding teeth around the bottle cap body and form an included angle of 120° to 140° . The other end of the pull ring 3 bisects the included angle between the two cutting lines 4. To open the easy-pull bottle cap, the user can lift the pull ring 3 through the lacing hole 5, and use the other end of the pull ring 3 fixed on the side of the bottle cap body 1 as a fulcrum to rotate at a certain angle and then pull the bottle cap. At this point, the bottle cap body 1 will crack along the cutting lines 4, allowing the easy-to-open bottle cap to be opened with a minimal amount of force without causing any harm to the hands. This bottle cap

is structurally simple, convenient, and safe.

[0019] Each cutting line 4 is located on the center line of the corresponding teeth 2 around the bottle cap body 1 and integrally molded with the bottle cap body 1. The cutting lines 4 mentioned above are located on one end of the upper cap surface of the bottle cap body 1 and have an extended section of 0.5mm to 0.8mm long.

[0020] In this embodiment, the connection between one end of the cutting lines 4 on the upper cap surface of the bottle cap body 1 mentioned above and the aforementioned extended section is an arc. The Cutting lines 4 are arranged on the center line's interior of the corresponding teeth 2, which can effectively reduce the force to open the bottle cap and keep the user unharmed. One end of the cutting lines 4 on the upper cap surface of the bottle cap body 1 is designed with an extended section 0.6mm long. The arc connection between one end of the cutting lines 4 on the upper cap surface of the bottle cap body 1 mentioned above, and the aforementioned extended section can reduce the force to open the bottle cap and keep a sufficiently large angle while opening the bottle cap. In other embodiments, the extended section's extension distance can be set to a value other than 0.6 mm.

[0021] The number of the teeth 2 mentioned above is set to 21 or 23. In this embodiment, when there are 21 teeth 2 around the bottle cap body mentioned above, the included angle between the two corresponding cutting lines 4 should be 120° . When there are 23 teeth 2 around the cap body bottle mentioned above, the included angle between the two corresponding cutting lines 4 should be 140° . In other embodiments, the number of teeth 2 and the included angle between the two corresponding cutting lines 4 can be modified to ensure that a modest force is required to open the bottle cap while keeping the user safe.

[0022] The lacing hole 5 is a circular hole or a cross-shaped hole. The aforementioned pull ring 3 and the bottle cap body 1 are integrally molded and made of tinplate or aluminum.

[0023] In this embodiment, the pull ring 3 and the bottle cap body 1 mentioned above are integrally molded and made of tinplate. The lacing hole 5 is a circular hole that allows fingers to slide through. This design makes it easier to open the bottle cap and ensures that the pull ring 3 does not break. In other embodiments, the pull ring 3 and the bottle cap body 1 mentioned above can be made of aluminum. The lacing hole 5 can be a cross-shaped hole or a hole of other shapes as long as the fingers can easily lift the pull ring 3 without breaking it.

[0024] This invention's easy-pull bottle cap with invisible cutting lines is described in detail above. Specific examples are provided to demonstrate the invention's principle and implementation. The description of the above embodiment is only used to help understand the core idea of the invention. It should be noted that improvements and modifications can be made to the invention by regular technicians in this technology field under the condition that they do not depart from the invention's guiding principle, and the claims of the invention likewise cover these improvements and modifications.

Claims

1. An easy-pull bottle cap with invisible cutting lines is **characterized by** a circular bottle cap body (1). A pull ring (3), two cutting lines (4), and several evenly arranged teeth (2) are on the bottle cap body (1). The included angle α between the two cutting lines (4) ranges from 120° to 140° , and each of the cutting lines (4) is located on the center line of the corresponding teeth (2) around the bottle cap body (1). One end of the pull ring (3) is provided with a lacing hole (5) and is arranged on the upper cap surface of the bottle cap body (1). The other end of the pull ring (3) is fixed on the side of the bottle cap body (1) and located on the bisector of the included angle α between the two cutting lines (4).

2. The easy-pull bottle cap with invisible cutting lines according to claim 1, is **characterized by** each of the cutting lines (4) mentioned above invisibly arranged on the interior of the center line corresponding to the teeth (2) and integrally molded with the bottle cap body (1).

3. The easy-pull bottle cap with invisible cutting lines according to claim 2, is **characterized by** the cutting lines (4) mentioned above that are located on one end of the upper cap surface of the bottle cap body (1) and have an extended section of 0.5mm to 0.8mm long.

4. The easy-pull bottle cap with invisible cutting lines according to claim 1, is set to 21 or 23 teeth (2).

5. The easy-pull bottle cap with invisible cutting lines according to claim 1, is **characterized by** the lacing hole mentioned above (5) is a circular or cross-shaped hole.

6. The easy-pull bottle cap with invisible cutting lines according to claim 1, is **characterized by** the lacing hole mentioned above (3) and molded with the bottle cap body integrally (1).

7. The easy-pull bottle cap with invisible cutting lines according to claim 6, is **characterized by** the bottle cap body mentioned above (1) and the lacing hole (3) which are made of tinplate or aluminum.

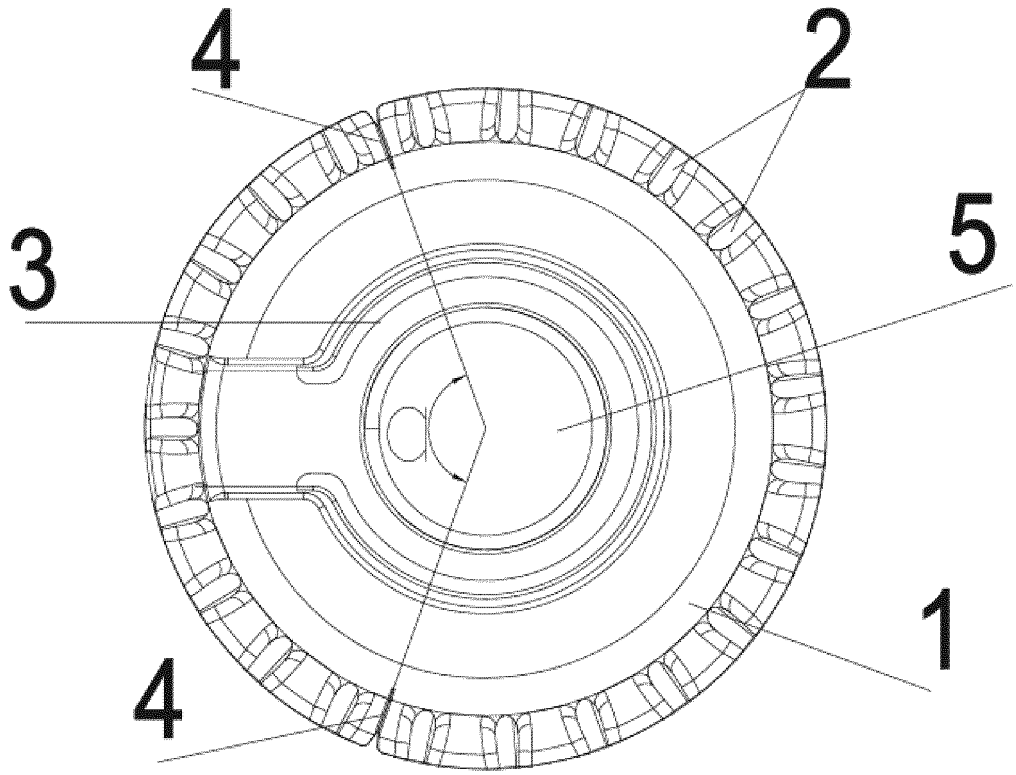

FIG. 1

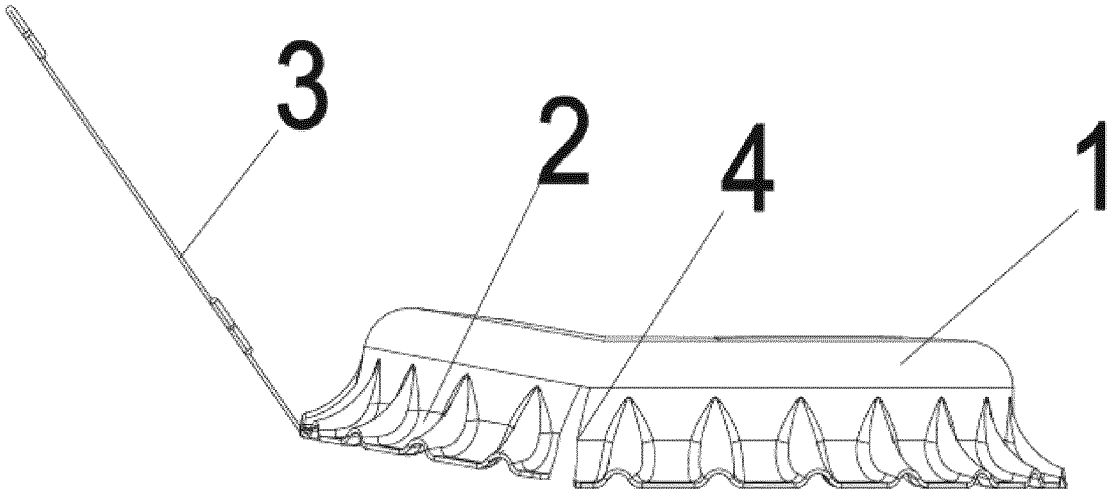

FIG. 2

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2022/072515

A. CLASSIFICATION OF SUBJECT MATTER

B65D 41/32(2006.01)i; B65D 51/24(2006.01)i; B65D 77/38(2006.01)i

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)

B65D

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)

CNABS; CNTXT; CNKI; VEN; USTXT; EPTXT; WOTXT: 唐一军, 易拉, 盖, 拉环, 刻痕, 夹角, 角度, pull, ring, score, line, angle

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
PX	CN 214242048 U (TANG, Yijun et al.) 21 September 2021 (2021-09-21) claims 1-7	1-7
PX	CN 306823280 S (TANG, Yijun et al.) 14 September 2021 (2021-09-14) pictures of designs, and brief description	1-7
X	CN 203047735 U (ZHENG, Chuqian) 10 July 2013 (2013-07-10) description, paragraphs [0024]-[0031], and figures 1 and 2	1-7
X	CN 202464366 U (ZOU, Zhichao) 03 October 2012 (2012-10-03) description, paragraphs [0017]-[0022], and figures 1 and 2	1-7
X	CN 202807353 U (ZHENG, Chuqian) 20 March 2013 (2013-03-20) description, paragraphs [0027]-[0037], and figures 1-3	1-7
X	CN 202728808 U (ZHENG, Chuqian) 13 February 2013 (2013-02-13) description, paragraphs [0028]-[0039], and figures 1-4	1-7
A	JP H09278046 A (DAIWA CAN CO., LTD.) 28 October 1997 (1997-10-28) entire document	1-7

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

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
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"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)
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"P" document published prior to the international filing date but later than the priority date claimed
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"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
"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
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
10 March 2022	**01 April 2022**
Name and mailing address of the ISA/CN **China National Intellectual Property Administration (ISA/CN)** **No. 6, Xitucheng Road, Jimenqiao, Haidian District, Beijing 100088, China** Facsimile No. **(86-10)62019451**	Authorized officer Telephone No.

Form PCT/ISA/210 (second sheet) (January 2015)

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/CN2022/072515

Patent document cited in search report	Publication date (day/month/year)	Patent family member(s)	Publication date (day/month/year)
CN 214242048 U	21 September 2021	None	
CN 306823280 S	14 September 2021	None	
CN 203047735 U	10 July 2013	WO 2014019259 A1	06 February 2014
CN 202464366 U	03 October 2012	None	
CN 202807353 U	20 March 2013	WO 2014012289 A1	23 January 2014
CN 202728808 U	13 February 2013	WO 2014012290 A1	23 January 2014
JP H09278046 A	28 October 1997	JP 3440349 B2	25 August 2003

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