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(54) **FOIL CAPSULE, BOTTLE, MACHINE AND METHOD FOR MAKING SCORE LINES IN A FOIL CAPSULE**

(57) The present invention relates to a foil capsule, bottle, machine for making score lines in a foil capsule, and method for making score lines in a foil capsule.

The foil capsule is made of a metal alloy that comprises at least 99.5% by weight of aluminum.

The machine for making score lines in a foil capsule comprises a rotary element (30) configured for being inserted in the capsule such that the capsule rotates on a longitudinal axis of the capsule when the rotary element (30) rotates, and at least two cutting elements (31, 32), arranged to make the corresponding cutting lines as the rotary element rotates. The cutting elements (31, 32) are arranged in a mounting (33) configured such that it can rock in a plane about a pivoting axis (35), said longitudinal axis being perpendicular to said plane.

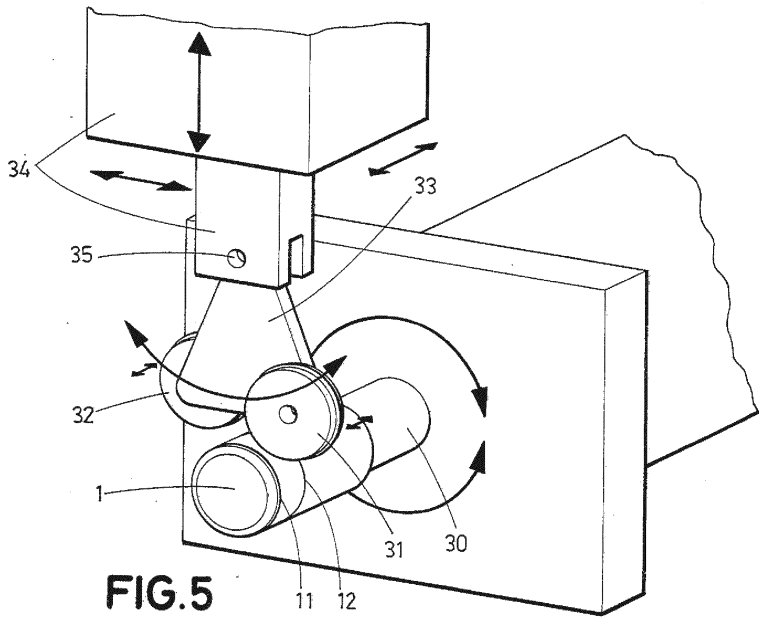


FIG.5

EP 2 835 323 A1

Description

Technical Field of the Invention

[0001] The invention is encompassed in the technical field of bottle capsules or foils.

Background of the Invention

[0002] The use of bottle capsules or foils typically made of tin or aluminum is known in the state of the art. Likewise, different types of devices that make tearing said foils easier are known, such that the capsule part remains attached to the neck of the bottle, whereas the upper part can be separated, allowing access to the cork or stopper.

[0003] Specifically, Spanish utility model publication number ES-1021394-U (corresponding to application number U9201647) provides an arrangement ready to be torn formed by a tearing line perpendicular to the axis of the bottle, a plurality of small oblique sections spaced from one another along the line emerging from said line. The orientation of said sections determines the opening direction of the system. Nevertheless, this design has the drawback that, as a result of tearing away the line, the oblique sections generate burrs that may cut the user.

[0004] Spanish utility model publication number ES-1075642-U (corresponding to application number U201131081) proposes a solution to this drawback. More specifically, ES-1075642-U solves the drawback by means of a tearing device formed by two score lines parallel to one another and perpendicular to the axis of the bottle which, when being torn away, tend to not generate burrs that may be detrimental to the user. The device can also comprise a tongue to start tearing away the band determined by the score lines; this tongue is defined by a cutout in the area marked by the score lines, and the shape of which can vary according to the specific design of the device.

[0005] Foil capsules for wine and liquor bottles were initially made of lead with outer and inner tin coating. New types of capsules had to be developed due to the prohibition on using lead and some other heavy metals in such packagings. Capsules were generally made of pure tin since this metal offers good characteristics due to being ductile and malleable.

[0006] Nevertheless, in recent years and due to the steep increase in tin price, other alternatives were sought and foil capsules made of deep drawn aluminum have been used. In fact, aluminum had already been considered an interesting alternative to tin, but it never really reached the desired popularity as it has a serious drawback in opening the capsule. Since aluminum is harder than tin, upon cutting the capsule to remove it from the bottle, aluminum tends to leave a series of burrs that can cut the consumer. Furthermore, the solution proposed in ES-1075642-U may seem rather unsuitable for capsules made of aluminum, given that, due to the hardness of aluminum, it may be difficult to establish the proposed score lines in capsules made of that material, particularly if said material is of high purity.

[0007] In other words, and although the solution proposed in ES-1075642-U can be used to reduce burrs, it has been considered that it may be necessary to improve such capsules and the methods and machines for production thereof, in order to improve product quality, reduce the risk of being cut by burrs, improve the homogeneity of the score lines, and increase manufacturing process efficiency.

Description of the Invention

[0008] A first aspect of the invention relates to a foil capsule configured for being located in a neck of a bottle to cover a cork or stopper closing the bottle. The capsule comprises at least one score line and is made of a metal alloy comprising aluminum.

[0009] According to this aspect of the invention, the metal alloy comprises at least 99.5% by weight of aluminum.

[0010] In some embodiments of the invention, the capsule can comprise at least two score lines, said score lines being continuous, parallel to one another, and perpendicular to the axis of the bottle. It has been proven that these continuous score lines serve to reduce the tendency to form burrs when tearing the capsule, as described in ES-1075642-U, as well as to make opening the capsule easier. A machine such as that described below can be used to produce these score lines, also in a hard material such as an alloy with 99.5% or more by weight of aluminum.

[0011] The capsule can further comprise a cutout defining a tongue suitable for tearing a strip defined by the score lines upon pulling on said tongue. This serves to make tearing away the capsule easier, as described in ES-1075642-U.

[0012] Another aspect of the invention relates to a bottle comprising a bottle body and a neck, the bottle being closed by a stopper or by a natural or synthetic cork. The bottle comprises a foil capsule as described above covering the stopper or the cork.

[0013] Another aspect of the invention relates to a machine for making score lines in a foil capsule, for example, of the type described above. The machine comprises:

- a rotary element configured for being inserted in the capsule such that the capsule rotates on a longitudinal axis of the capsule when the rotary element rotates, and
- at least two cutting elements arranged to make the corresponding cutting lines as the rotary element rotates.

[0014] The cutting elements are arranged in a mounting configured such that it can rock in a plane about a pivoting axis, said longitudinal axis of the capsule being perpendicular to said plane. It has been proven that this

configuration allows establishing a suitable, balanced and precise pressure on the capsule, through said cutting elements, such that both cutting lines have a substantially identical and controlled depth.

[0015] The two cutting elements can be arranged horizontally separated by a distance such that upon contacting the capsule assembled on the rotary element, said cutting elements contact said capsule each on one side of a plane of symmetry traversing the longitudinal axis of the capsule and the pivoting axis of the mounting. Thereby, since the cutting elements rest on two sides of the capsule, the contact between cutting element and capsule is maintained when the rotating element rotates, since the capsule and the rotary element serve to substantially block the pivoting of the mounting. For cutting a capsule, the rotary or rotating element can rotate at least 360 degrees in one direction or at least 180 degrees in both directions, from the starting position.

[0016] The mounting can be associated with (for example, pivotally assembled in) a moving head the position of which determines the pressure that the cutting elements apply on the capsule. Thereby, a precise pressure adapted to the specific characteristics of a capsule can be applied through the rocking mounting.

[0017] The cutting elements can be rotating cutting elements. It has been proven that the use of rotating cutting elements can be advantageous.

[0018] The two cutting elements can be located on opposite faces of the mounting. Therefore, these cutting elements can be located in two different planes parallel to the rocking plane and separated by a distance corresponding with the distance between the two score lines.

[0019] Another aspect of the invention relates to a method for making score lines in a foil capsule using a machine as described above. The method comprises the steps of:

- locating the capsule in the rotary element,
- positioning the cutting elements such that they exert a specific force on the capsule; and
- rotating the rotary element such that the cutting elements produce respective score lines.

Brief Description of the Drawings

[0020] To complement the description that is being made and for the purpose of aiding to better understand the features of the invention according to several preferred practical embodiments thereof, a set of drawings is attached as an integral part of the description in which the following is depicted with an illustrative and non-limiting character:

Figures 1 and 2 are partial elevational views of two respective bottles according to two alternative embodiments of the invention.

Figure 3 is a schematic elevational view of a capsule according to a possible embodiment of the invention with a part enlarged in section.

Figure 4 is a schematic elevational view of a capsule according to another possible embodiment of the invention with a part enlarged in section.

Figure 5 is a schematic view of a machine for making score lines in a foil capsule according to a possible embodiment of the invention.

Preferred Embodiment of the Invention

[0021] Figure 1 shows the upper part of a bartop-type bottle 10 closed by a stopper 15, as usual. The bottle is closed by a foil capsule 1 having two score lines 11 and 12, between which a cutout 13 has been made giving rise to a tongue 14 which the user can pull on to remove the tape established between the two score lines, whereby the upper part of the capsule 1 is separated from the lower part.

[0022] Similarly, Figure 2 shows the upper part of a bordelaise- or burgundy-type bottle 20 closed by a (natural or synthetic) cork 25, as usual. The bottle is closed by a foil capsule 2 having two score lines 21 and 22, between which a cutout 23 has been made giving rise to a tongue 24 which the user can pull on to remove the tape established between the two score lines, whereby the upper part of the capsule 2 is separated from the lower part.

[0023] These score lines can be continuous to minimize the risk of burrs, even in the case where the capsule is made substantially of aluminum.

[0024] Figure 3 shows a series of levels corresponding to a capsule for a bartop-type bottle such as that of Figure 1; these levels can preferably correspond with the following values (in mm):

Table 1		
Level	Minimum value (mm)	Maximum value
A	1.5	15
B	4	25
C	0.1	0.5
D	0.03	0.10
e	0.06	0.20

[0025] On the other hand, Figure 4 shows a series of levels corresponding to a capsule for a bordelaise- or burgundy-type bottle such as that of Figure 2; these levels can preferably correspond with the following values (in mm):

Table 2		
Level	Minimum value (mm)	Maximum value
A	1.5	6

(continued)

Table 2		
Level	Minimum value (mm)	Maximum value
B	4	25
C	0.1	0.5
D	0.03	0.10
e	0.06	0.20

[0026] Figure 5 illustrates a machine for making score lines 11, 12 in a foil capsule 1. As seen, the machine comprises a rotary element 30 or mandrel on which the capsule is placed such that the capsule rotates with this rotary element 30 about its longitudinal axis. On the other hand, there is a mounting 33 in the form of a rocker which is arranged in a head 34 such that it can pivot about a pivoting axis 35 parallel to the longitudinal axis of the capsule and of the rotary element 30. There are located on both faces of the mounting 33 two respective cutting elements 31 and 32 in the form of rotating cutting discs and with their axes slightly separated and located in two cutting planes the separation of which determines the separation between the score lines. The head 34 can be moved in three directions, and is placed so that the cutting elements rest on the capsule 1, one on each side of the capsule (i.e., one on each side of a vertical plane passing through the longitudinal axis of the capsule and the pivoting axis 35 of the mounting 33), and apply a predetermined pressure on the capsule. The score lines 11 and 12 are produced as the rotary element rotates. It may be sufficient to make a 360-degree rotation, or a first rotation of at least 180 degrees in one direction, followed by a rotation back to the original position, and from there a rotation of 180 degrees in the other direction.

[0027] In this text, the words "comprise" and its variants (such as "comprising", etc.) should not be interpreted in an excluding manner, i.e., they do not exclude the possibility that what is described may include other elements, steps, etc.

[0028] On the other hand, the invention is not limited to the specific embodiments which have been described but also encompasses, for example, the variants which can be made by a person having ordinary skill in the art (for example, in terms of the choice of materials, dimensions, components, configuration, etc.), within what is inferred from the claims.

Claims

1. Foil capsule configured for being located on a neck of a bottle (10, 20) to cover a cork or stopper closing the bottle (10, 20), said capsule (1, 2) comprising at least one score line (11, 12; 21, 22), the capsule being made of a metal alloy comprising aluminum, **characterized in that**
said metal alloy comprises at least 99.5% by weight of aluminum.

2. Capsule according to claim 1, comprising at least two score lines (11, 12; 21, 22), said score lines (11, 12; 21, 22) being continuous, parallel to one another, and perpendicular to the axis of the bottle when the capsule is assembled on a bottle.

3. Capsule according to claim 2, further comprising a cutout (13, 23), said cutout (13, 23) defining a tongue (14, 24) suitable for causing the separation of a strip defined by the score lines (11, 12; 21, 22) upon pulling on said tongue.

4. Bottle comprising a bottle body and a neck, the bottle (10, 20) being closed by a stopper or by a cork, the bottle further comprising a foil capsule (1, 2), **characterized in that**
said foil capsule is a capsule according to any of the preceding claims.

5. Machine for making score lines in a foil capsule configured for being located on a neck of a bottle to cover a cork or stopper closing the bottle,
characterized in that
the machine comprises

- a rotary element (30) configured for being inserted in the capsule such that the capsule rotates on a longitudinal axis of the capsule when the rotary element (30) rotates, and
- at least two cutting elements (31, 32) arranged to make the corresponding cutting lines as the rotary element rotates,

said cutting elements (31, 32) being arranged in a mounting (33) configured such that it can rock in a plane about a pivoting axis (35), said longitudinal axis being perpendicular to said plane.

6. Machine according to claim 5, wherein said two cutting elements (31, 32) are arranged horizontally separated by a distance such that upon contacting the capsule assembled on the rotary element, said cutting elements contact said capsule on both sides of a plane of symmetry traversing the longitudinal axis of the capsule and the pivoting axis (35) of the mounting (33).

7. Machine according to claim 5 or 6, wherein said mounting is associated with a moving head the position of which determines the pressure that the cutting elements apply on the capsule.

8. Machine according to any of claims 5-7, wherein the cutting elements (31, 32) are rotating cutting ele-

ments.

9. Machine according to any of claims 5-8, wherein the two cutting elements (31, 32) are located on opposite faces of the mounting (33).

10. Method for making score lines in a foil capsule using a machine according to any of claims 5-9, comprising the steps of:

- locating the capsule in the rotary element (30),
- positioning the cutting elements (31, 32) such that they exert a specific force on the capsule; and
- rotating the rotary element such that the cutting elements produce respective score lines.

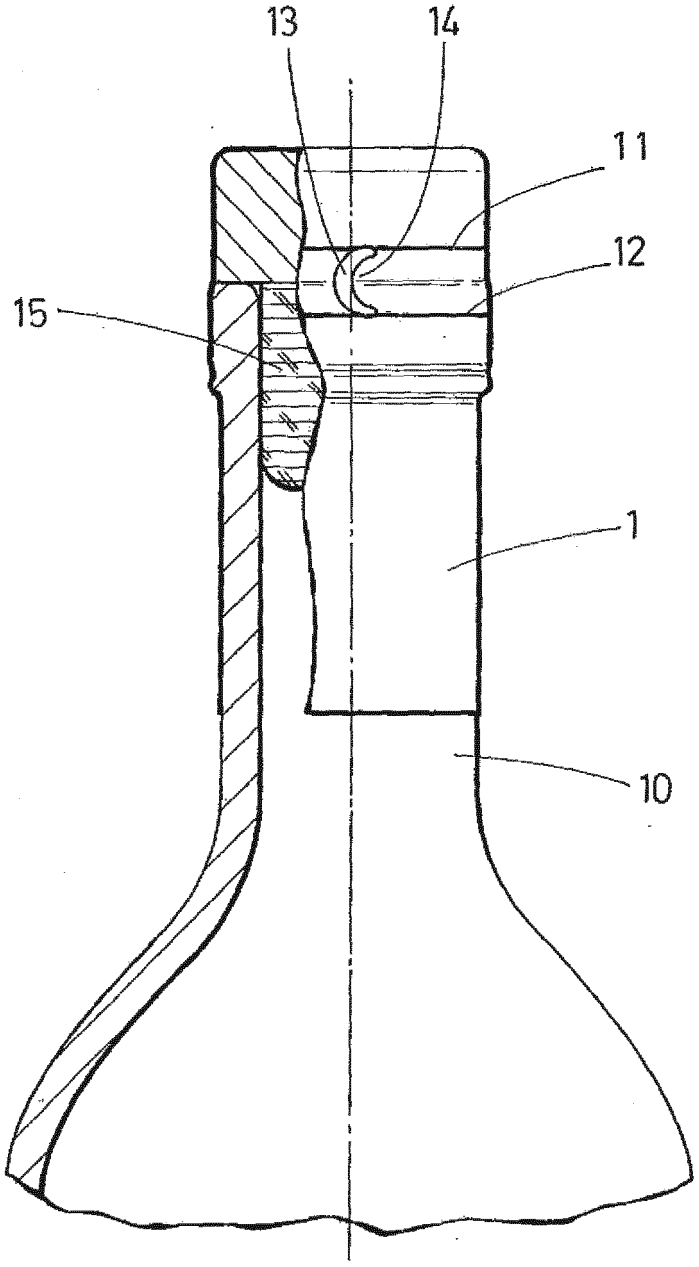


FIG.1

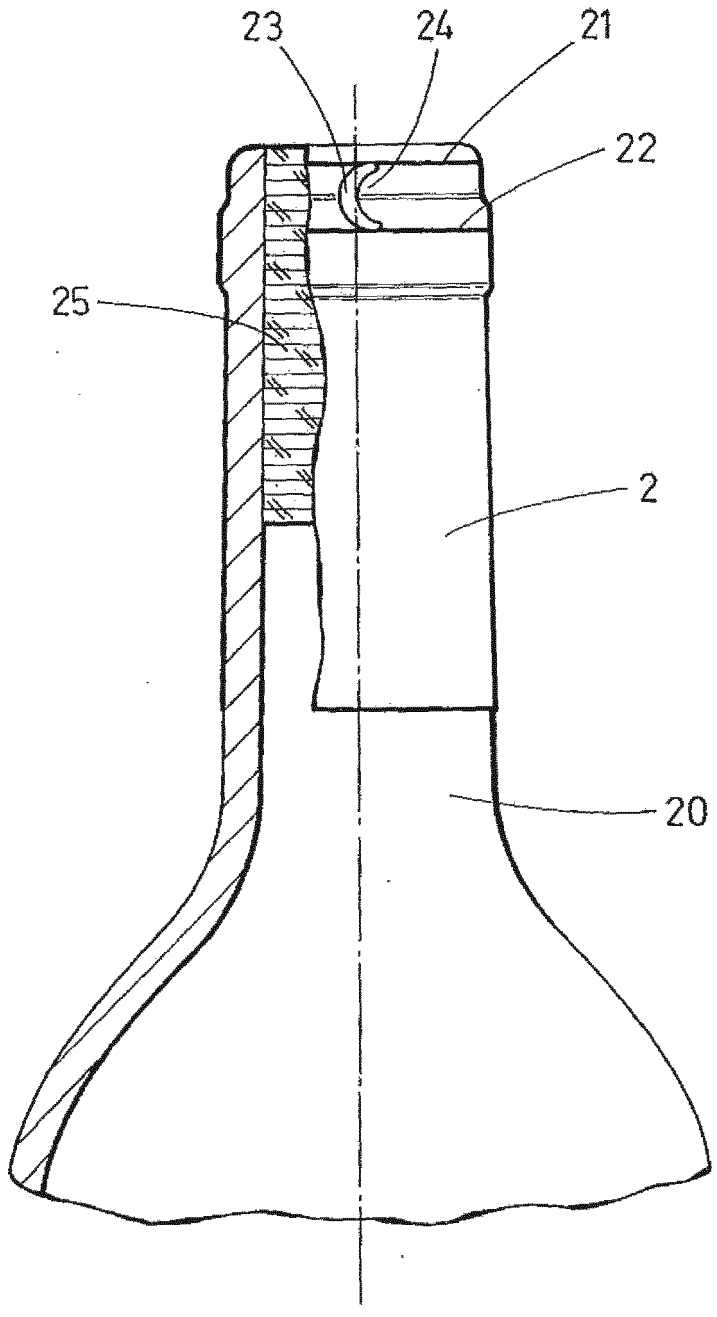


FIG. 2

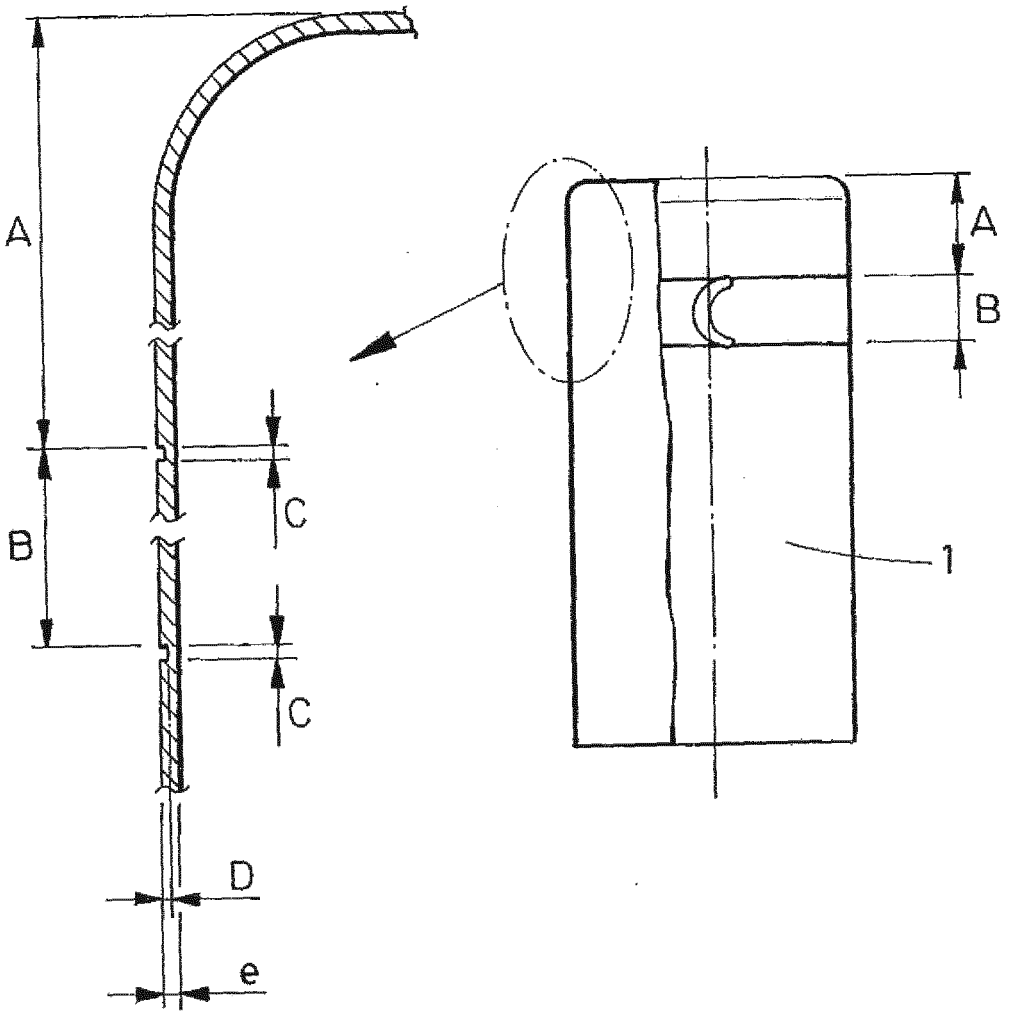


FIG.3

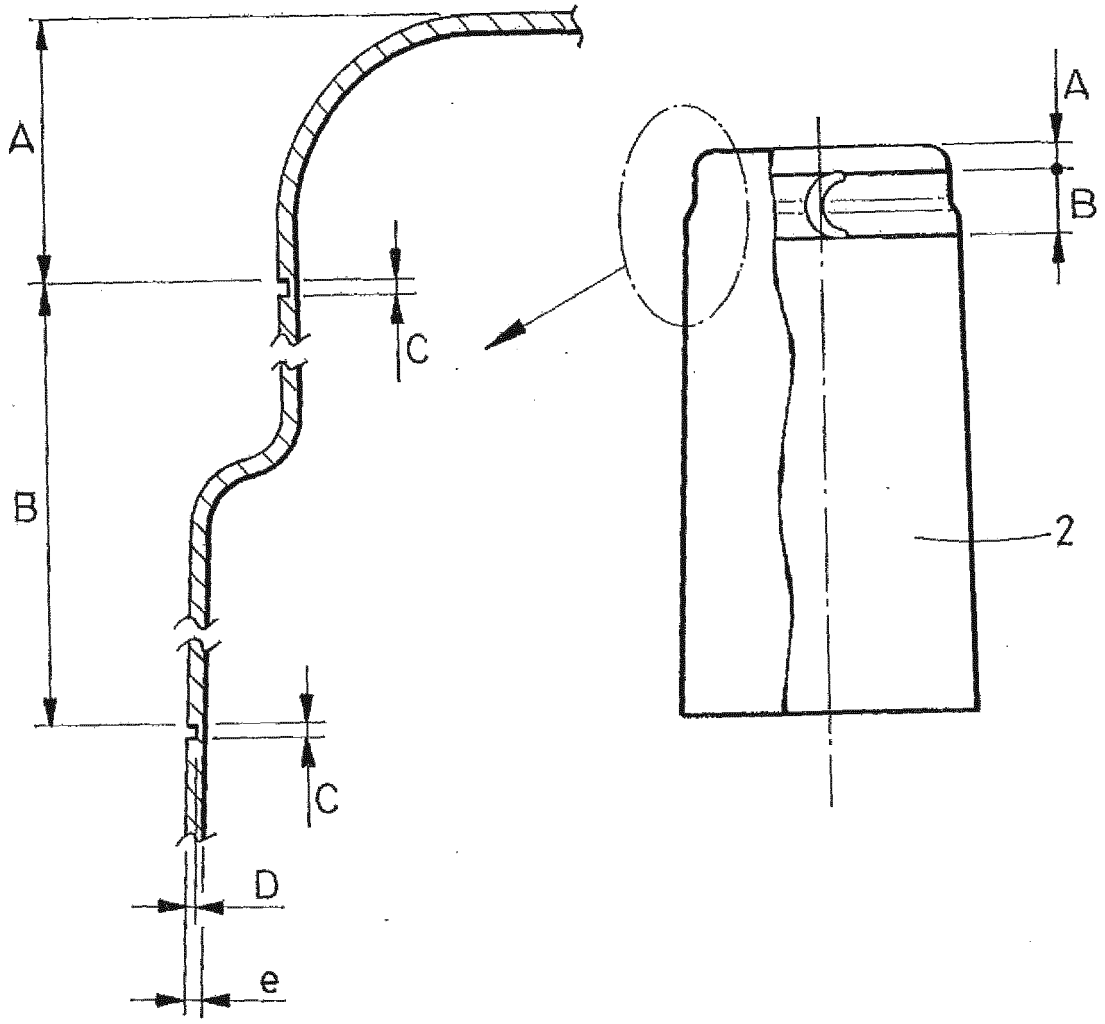


FIG.4

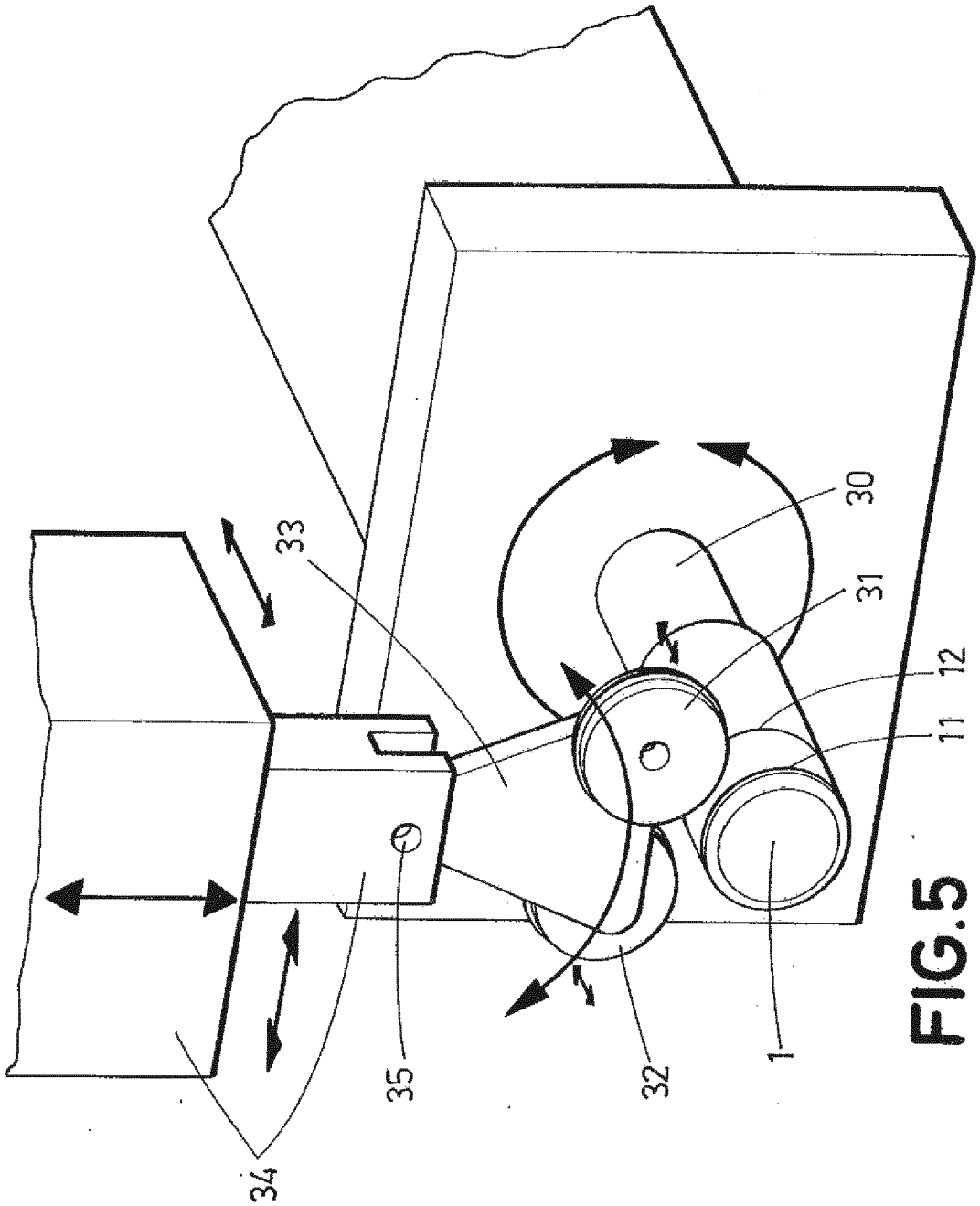


FIG.5

INTERNATIONAL SEARCH REPORT

International application No.
PCT/ES2012/070876

A. CLASSIFICATION OF SUBJECT MATTER

B65D41/62 (2006.01)
B21D51/38 (2006.01)
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, B21D

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)

EPODOC, INVENES

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5222616 A (DRUESNE GUY ET AL.) 29/06/1993, Examples 1 and 4, claims 1 a 6 and figures.	1-4, 10
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X	US 4749096 A (THOMAS ANTHONY J A ET AL.) 07/06/1988, column 1 line 55 a column 2 line 19, figure 3.	1-4
X	ES 1075642U U (RAMONDIN CAPSULAS S A) 15/11/2011, claims.	1-4
A	GB 1351952 A (HANSEN OSCAR ANTON) 15/05/1974, claims and figures.	1-10

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

* Special categories of cited documents:
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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
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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
12/04/2013	**16 de abril de 2013 (16/04/2013)**
Name and mailing address of the ISA/ OFICINA ESPAÑOLA DE PATENTES Y MARCAS Paseo de la Castellana, 75 - 28071 Madrid (España) Facsimile No.: 91 349 53 04	Authorized officer A. Martín Moronta Telephone No. 91 3495377

Form PCT/ISA/210 (second sheet) (July 2009)

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.
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- US 9201647 B **[0003]**
- ES 1075642 U **[0004] [0006] [0007] [0010] [0011]**
- US 201131081 B **[0004]**
- ES 1075642 **[0004]**