(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 3 321 207 A1**

(12) **EUROPEAN PATENT APPLICATION**
published in accordance with Art. 153(4) EPC

(43) Date of publication:
16.05.2018 Bulletin 2018/20

(21) Application number: **16821200.9**

(22) Date of filing: **16.06.2016**

(51) Int Cl.:
B65D 41/34 *(2006.01)*

(86) International application number:
PCT/JP2016/067869

(87) International publication number:
WO 2017/006730 (12.01.2017 Gazette 2017/02)

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME
Designated Validation States:
MA MD

(30) Priority: **08.07.2015 JP 2015136839**

(71) Applicant: **Nippon Closures Co., Ltd.**
Tokyo 141-0022 (JP)

(72) Inventor: **NAKAMURA Shin**
Tokyo 141-0022 (JP)

(74) Representative: **dompatent von Kreisler Selting Werner -**
Partnerschaft von Patent- und Rechtsanwälten mbB
Deichmannhaus am Dom
Bahnhofsvorplatz 1
50667 Köln (DE)

(54) CAP AND CONTAINER WITH CAP

(57) To provide a cap and a capped container that prevent a user from feeling a sense of discomfort about a torque when the cap is opened while reliably preventing the inversion of a flap when the cap is opened. Provided is a cap (10) having a TE band (30) connected to a lower end of a cap body (20) via a weakening part (40), with this TE band (30) having a flap (32) folded back toward an inner peripheral side of a band body part (31), the flap (32) has a flange engaging part (32b) capable of engaging with a lower side of a container flange (53) when the cap is attached to a container and an attitude maintaining piece (32c) arranged on an outer peripheral side of the container flange (53) when the cap is attached to the container, and an inner peripheral wall of the band body part (31) has a release part (22c) that forms a gap between an outer peripheral wall of the attitude maintaining piece (32c) and the inner peripheral wall of the band body part (31) when the cap is attached to the container.

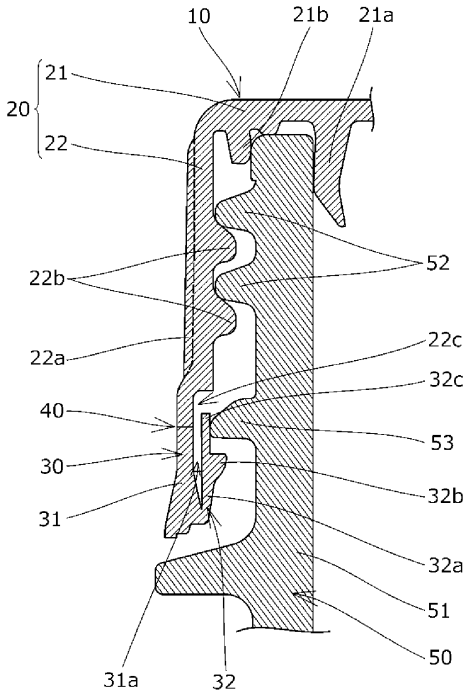

FIG. 2

EP 3 321 207 A1

Description

Technical Field

[0001] The present invention relates to a container cap having a TE band connected to the lower end of a cap body via a weakening part and a capped container.

Background Art

[0002] In recent years, caps having a TE band (Tamper Evident band) connected to the lower end of a cap body via a weakening part have been adopted in a wide range of fields such as beverage containers in order to prevent the caps from being falsely opened in a circulation process or the like.

[0003] As one of such caps having a TE band, a cap 110 having a TE band 130 connected to the lower end of a cap body 120 via a weakening part 140 as shown in Fig. 4 has been conventionally known in which a flap 132 folded back toward the inner peripheral side of the TE band 130 is connected consecutively to the lower end of the TE band 130, whereby the flap 132 engages with the lower side of a container flange 153 to break the weakening part 140 when the cap 110 is rotated and moved upward with respect to a container 150 during its opening.

[0004] In the cap 110, however, the flap 132 formed at the lower end of the TE band 130 is folded back upward on the inner peripheral side of the TE band 130. Therefore, when the outer diameter of a container mouth cylindrical part 151 below the container flange 153 is small, the flap 132 falls down toward the side of the container mouth cylindrical part 151 due to its elasticity to increase an angle α between the flap 132 and the TE band 130. Therefore, as shown in Fig. 5, there is a case that, when the cap is opened, the flap 132 elastically deforms and falls downward when engaging with the container flange 153 whereby the container flange 153 is inverted. When the flap 132 is inverted like this, the TE band 130 comes off the container mouth cylindrical part 151 without breaking the weakening part 140. As a result, the false opening of the cap becomes unobvious.

[0005] Accordingly, as a cap 110 having the function of preventing the inversion of a flap 132, there has been proposed one in which the inner peripheral wall of the flap 132 has a flange engaging part 132b capable of engaging with the lower side of a container flange 153 and an angle α between the flap 132 and a TE band 130 is kept with an attitude maintaining piece 132c serving as the tip end part of the flap 132 held between the outer peripheral wall of the container flange 153 and the inner peripheral wall of the TE band 130 as shown in Fig. 6 (see Patent Literature 1).

Citation List

Patent Literature

[0006] Patent Literature 1: Japanese Examined Utility Model Application Publication No. H05-13735

Summary of Invention

Technical Problem

[0007] In the cap 110 described in Patent Literature 1, however, the attitude maintaining piece 132c is held between the outer peripheral wall of the container flange 153 and the inner peripheral wall of the TE band 130, and the outer peripheral side of the attitude maintaining piece 132c is supported by the TE band 130. Therefore, the contact pressure between the inner peripheral wall of the attitude maintaining piece 132c and the outer peripheral wall of the container flange 153 increases, and the friction between the inner peripheral wall of the attitude maintaining piece 132c and the outer peripheral wall of the container flange 153 increases when the cap 110 is rotated with respect to a container 150.

[0008] As a result, a so-called first torque required to start the rotation of the cap 110 when the cap is opened becomes greater compared with the normal cap 110 as shown in Figs. 4 and 5, i.e., the normal cap 110 in which an attitude maintaining piece 132c or the like is not interposed between the inner peripheral wall of the TE band 130 and the outer peripheral wall of the container flange 153, which causes a problem that a user feels a sense of discomfort about a torque when the cap is opened.

[0009] The above problem becomes remarkable particularly when manufacturing errors occur in respective dimensions such as the thickness dimension of the flap 132, the outer diameter dimension of the container flange 153, and the inner diameter dimension of the TE band 130.

[0010] Accordingly, the present invention has been made in order to solve the above problems and has an object of providing a cap and a capped container that prevent a user from feeling a sense of discomfort about a torque when the cap is opened while reliably preventing the inversion of a flap when the cap is opened. Solution to Problem

[0011] In order to solve the above problem, the present invention provides a cap having a cap body and a TE band connected to a lower end of the cap body via a weakening part, wherein the TE band has an annular band body part connected to the lower end of the cap body and a flap provided consecutively to a lower end of the band body part and folded back toward an inner peripheral side of the band body part, the flap has a flap body provided consecutively to the lower end of the band body part, a flange engaging part formed on an inner peripheral side of the flap body and capable of engaging with a lower side of a container flange when the cap is

attached to a container, and an attitude maintaining piece formed on an upper end side of the flap body and arranged on an outer peripheral side of the container flange when the cap is attached to the container, and an inner peripheral wall of the band body part has a release part that forms a gap between an outer peripheral wall of the attitude maintaining piece and the inner peripheral wall of the band body part when the cap is attached to the container.

[0012] In order to solve the above problem, the present invention provides a capped container having the cap and a container, wherein the container has a container mouth cylindrical part, a container-side thread part formed on an outer periphery of the container mouth cylindrical part, and the container flange formed on the outer periphery of the container mouth cylindrical part below the container-side thread part, and a gap is formed between the outer peripheral wall of the attitude maintaining piece and the inner peripheral wall of the band body part when the cap is attached to the container.

Advantageous Effects of Invention

[0013] According to the inventions of claims 1 and 5, the inner peripheral wall of the band body part of a TE band has a release part that forms the gap between the outer peripheral wall of the attitude maintaining piece of a flap arranged on the outer peripheral side of a container flange when a cap is attached to a container and the inner peripheral wall of the band body part. Thus, since the gap is formed between the outer peripheral wall of the attitude maintaining piece and the inner peripheral wall of the band body part in a state in which the cap is attached to the container, it becomes possible to prevent the outer peripheral side of the attitude maintaining piece from being supported by the band body part and fold the attitude maintaining piece to its outer peripheral side. Therefore, the contact pressure between the inner peripheral wall of the attitude maintaining piece and the outer peripheral wall of the container flange can be prevented from increasing, and the friction between the inner peripheral wall of the attitude maintaining piece and the outer peripheral wall of the container flange can be prevented from increasing when the cap is rotated with respect to the container. Thus, the angle between the flap and the TE band is kept by the contact between the attitude maintaining piece and the container flange, and a user can be prevented from feeling a sense of discomfort about a torque when the cap is opened, while the inversion of the flap when the cap is opened is reliably prevented.

[0014] According to the invention of claim 2, a circumferential width of the attitude maintaining piece is formed to be narrower than a circumferential width of the flap body. Thus, compared with a case in which the attitude maintaining piece is formed to have the same width as the circumferential width of the flap body, the friction between the inner peripheral wall of the attitude maintaining piece of the flap and the outer peripheral wall of the container flange can be further reduced besides a reduction in material costs . As a result, a torque required to open the cap can be made closer to a torque required in a normal cap.

[0015] According to the invention of claim 3, the attitude maintaining piece is formed at each of both ends in a circumferential direction of the flap body. Thus, the friction between the inner peripheral walls of the attitude maintaining pieces and the outer peripheral wall of the container flange can be reduced, while the angel between the flap and the TE band is reliably kept by the attitude maintaining pieces formed at both the ends.

[0016] According to the invention of claim 4, a thickness of the attitude maintaining piece is formed to be thinner than a thickness of the flap body at the thinnest spot thereof. Thus, the flexibility of the attitude maintaining piece is improved, and the attitude maintaining piece is easily folded toward its outer peripheral side when the cap is opened. Therefore, the friction between the inner peripheral wall of the attitude maintaining piece of the flap and the outer peripheral wall of the container flange can be remarkably reduced, while the engagement between the container flange and a flange engaging part is satisfactorily secured.

Brief Description of Drawings

[0017]

[Fig. 1] Fig. 1 is an explanatory view showing a cap according to an embodiment of the present invention.

[Fig. 2] Fig. 2 is a cross-sectional view partially showing a state before the cap shown in Fig. 1 is opened.

[Fig. 3] Fig. 3 is a cross-sectional view partially showing a state after the cap shown in Fig. 1 is opened.

[Fig. 4] Fig. 4 is a cross-sectional view partially showing a state before a conventional cap is opened.

[Fig. 5] Fig. 5 is a cross-sectional view partially showing a state after the conventional cap is opened.

[Fig. 6] Fig. 6 is a cross-sectional view showing another conventional cap.

Reference Signs List

[0018]

10	Cap
20	Cap body
21	Upper surface wall
21a	Inner ring
21b	Outer ring

22 Skirt wall
22a Knurl part
22b Cap-side thread part
22c Release part
30 TE band
31 Band body part
31a Release part
32 Flap
32a Flap body
32b Flange engaging part
32c Attitude maintaining piece
40 Weakening part
50 Container
51 Container mouth cylindrical part
52 Container-side thread part
53 Container flange

Description of Embodiments

[0019] Hereinafter, a cap 10 according to an embodiment of the present invention will be described based on the drawings.

[0020] First, the cap 10 is made of a synthetic resin or the like and has, as shown in Figs. 1 and 2, a cap body 20 and a TE band 30 connected to the lower end of the cap body 20 via a weakening part 40.

[0021] As shown in Figs. 1 and 2, the cap body 20 has a discoid upper surface wall 21 and a cylindrical skirt wall 22 suspending from the outer peripheral edge of the upper surface wall 21.

[0022] As shown in Figs. 1 and 2, the upper surface wall 21 has an inner ring 21a protruding downward from the lower surface of the upper surface wall 21 and an outer ring 21b protruding downward from the lower surface of the upper surface wall 21 on the outer peripheral side of the inner ring 21a. In a state in which the cap 10 is attached to a container 50, the inner ring 21a and the outer ring 21b adhere closely to the inner peripheral side and the outer peripheral side of a container mouth cylindrical part 51, respectively.

[0023] In addition, the outer peripheral wall of the skirt wall 22 has knurl parts 22a, and the inner peripheral wall of the skirt wall 22 has cap-side thread parts 22b that are to threadedly engage with container-side thread parts 52 formed on the outer peripheral wall of the container mouth cylindrical part 51 of the container 50.

[0024] As shown in Figs. 1 and 2, the weakening part 40 is a breakable annular part connecting the lower end of the skirt wall 22 of the cap body 20 and the upper end of a band body part 31 of the TE band 30 to each other. In the embodiment, the weakening part 40 is constituted of a plurality of bridges and slits alternately formed in a cap circumferential direction. Note that the specific mode of the weakening part 40 is not particularly limited so long as the weakening part 40 is provided to be breakable.

[0025] As shown in Figs. 1 and 2, the TE band 30 has the annular band body part 31 and flaps 32 connected consecutively to the lower end of the band body part 31 and folded back upward on the inner peripheral side of the band body part 31. The plurality of flaps 32 is formed along the cap circumferential direction with an interval placed therebetween.

[0026] As shown in Fig. 2, the band body part 31 is formed in a tapered shape made thicker toward the lower end of its inner peripheral side, and the folded starting points between the band body part 31 and the flaps 32 are formed to be positioned closer to the inner peripheral side than the inner peripheral surface on the upper end side of the band body part 31. Thus, since it is possible to cause the flaps 32 to contact a container flange 53 with their attitude held in a vertical direction when the cap is attached, the TE band 30 can be prevented from coming off when the cap is opened.

[0027] As shown in Figs. 1 and 2, each of the flaps 32 has a flap body 32a connected consecutively to the lower end of the band body part 31, a flange engaging part 32b formed to protrude from the inner peripheral wall of the flap body 32a and capable of engaging with the lower side of the container flange (coupler) 53 formed on the outer periphery of the container mouth cylindrical part 51 below the container-side thread parts 52 in a state in which the cap 10 is attached to the container 50, and a plurality of attitude maintaining pieces 32c formed to protrude from the upper end of the flap body 32a and arranged on the outer peripheral side of the container flange 53 in a state in which the cap 10 is attached to the container 50.

[0028] As shown in Fig. 2, the flap bodies 32a are formed in a tapered shape made thinner toward the lower end of their inner peripheral side, whereby the folding resistance of the flaps 32 can be reduced when the cap is attached.

[0029] In addition, as shown in Fig. 2, vertical gaps are formed between the flange engaging parts 32b and the container flange 53 in a state in which the cap 10 is attached to the container 50.

[0030] The vertical gaps are formed to have such a size that, in the process of opening the cap, the upper surfaces of the flange engaging parts 32b engage with the lower surface of the container flange 53 to break the weakening part 40 before the close adhesion state between the inner ring 21a and the outer ring 21b and the container mouth cylindrical part 51 is cancelled.

[0031] As shown in Fig. 1, the flange engaging parts 32b are formed at the central parts of the flap bodies 32a in the cap circumferential direction, and the attitude maintaining pieces 32c are formed at both ends of the flap bodies 32a in the cap circumferential direction.

[0032] In the embodiment, as shown in Fig. 2, the upper surfaces of the flange engaging parts 32b are formed to be substantially horizontal, and the flange engaging parts 32b are formed in a tapered shape made thinner toward the lower end of their inner peripheral side (i.e., a substantially triangle of which the cross-sectional shape is made thinner downward).

[0033] Note that the specific shape of the flange en-

gaging parts 32b is not limited to the above one. However, in consideration of a likelihood that the TE band 30 could come off when the cap is opened or the like, it is preferable to form the upper surfaces of the flange engaging parts 32b to be substantially horizontal and cause the lower surface of the container flange 53 and the upper surfaces of the flange engaging parts 32b to contact each other in a horizontal position as shown in Fig. 3.

[0034] In addition, the flange engaging parts 32b and the attitude maintaining pieces 32c are formed so as not to overlap each other in the cap circumferential direction, whereby the moldability of the cap 10 by injection molding, particularly the moldability of the flaps 32 can be improved.

[0035] Moreover, the widths of the flange engaging parts 32b and the attitude maintaining pieces 32c in the cap circumferential direction are formed to be narrower than the circumferential width of the flap bodies 32a.

[0036] Further, the thickness of the attitude maintaining pieces 32c in a cap radial direction is formed to be thinner than the thickness at the thinnest spots of the flap bodies 32a.

[0037] Note that in the embodiment, the attitude maintaining pieces 32c are formed to have a rectangular cross section as shown in Figs. 1 and 2. However, the specific mode of the attitude maintaining pieces 32c is not limited to this. For example, the attitude maintaining pieces 32c may be formed to have a triangular or arc-shaped cross section, or the inner peripheral surfaces of the attitude maintaining pieces 32c contacting the container flange 53 may be subjected to a process for reducing resistance due to contact such as a satin process.

[0038] As shown in Fig. 2, concave release parts 22c and 31a forming the gaps between the outer peripheral walls of the attitude maintaining pieces 32c and the inner peripheral wall of the band body part 31 are formed on the upper end side of the inner peripheral wall of the band body part 31 and lower end side of the inner peripheral wall of the skirt wall 22, respectively, in a state in which the cap 10 is attached to the container 50. By the release parts 22c and 31a, the attitude maintaining pieces 32c can be folded toward the outer peripheral side.

[0039] Note that the specific modes of the release parts 22c and 31a are not particularly limited so long as the release parts 22c and 31a form the gaps between the outer peripheral walls of the attitude maintaining pieces 32c and the inner peripheral wall of the band body part 31 in a state in which the cap 10 is attached to the container 50.

[0040] In addition, when the length of the attitude maintaining pieces 32c is short, only the release part 31a may be formed on the upper end side of the inner peripheral wall of the band body part 31 without forming the release part 22c on the lower end side of the inner peripheral wall of the skirt wall 22.

[0041] The embodiment of the present invention is described above. However, the present invention is not limited to the above embodiment, and various design modifications are made possible without departing from the present invention described in claims.

[0042] For example, the specific arrangements, numbers, and dimensions of the flange engaging parts and the attitude maintaining pieces are not particularly limited. For example, the widths of the flange engaging parts and the attitude maintaining pieces in the cap circumferential direction may be set to be the same as the width of the flap bodies in the circumferential direction. In addition, the flange engaging parts may be formed at two separated spots of the flap bodies, or the attitude maintaining pieces may be formed at three separated spots of the flap bodies.

[0043] Moreover, it is also possible to additionally form annular connection parts, which are integrated with the outer peripheral sides of the respective attitude maintaining pieces and connect the plurality of attitude maintaining pieces arranged in the cap circumferential direction to each other, in the cap circumferential direction.

Claims

1. A cap having a cap body and a TE band connected to a lower end of the cap body via a weakening part, wherein
the TE band has an annular band body part connected to the lower end of the cap body and a flap provided consecutively to a lower end of the band body part and folded back toward an inner peripheral side of the band body part,
the flap has a flap body provided consecutively to the lower end of the band body part, a flange engaging part formed on an inner peripheral side of the flap body and capable of engaging with a lower side of a container flange when the cap is attached to a container, and an attitude maintaining piece formed on an upper end side of the flap body and arranged on an outer peripheral side of the container flange when the cap is attached to the container, and
an inner peripheral wall of the band body part has a release part that forms a gap between an outer peripheral wall of the attitude maintaining piece and the inner peripheral wall of the band body part when the cap is attached to the container.

2. The cap according to claim 1, wherein
a circumferential width of the attitude maintaining piece is formed to be narrower than a circumferential width of the flap body.

3. The cap according to claim 2, wherein
the attitude maintaining piece is formed at each of both ends in a circumferential direction of the flap body.

4. The cap according to any of claims 1 to 3, wherein
a thickness of the attitude maintaining piece is

formed to be thinner than a thickness of the flap body at the thinnest spot thereof.

5. A capped container having the cap according to any of claims 1 to 4 and a container, wherein
the container has a container mouth cylindrical part, a container-side thread part formed on an outer periphery of the container mouth cylindrical part, and the container flange formed on the outer periphery of the container mouth cylindrical part below the container-side thread part, and
a gap is formed between the outer peripheral wall of the attitude maintaining piece and the inner peripheral wall of the band body part when the cap is attached to the container.

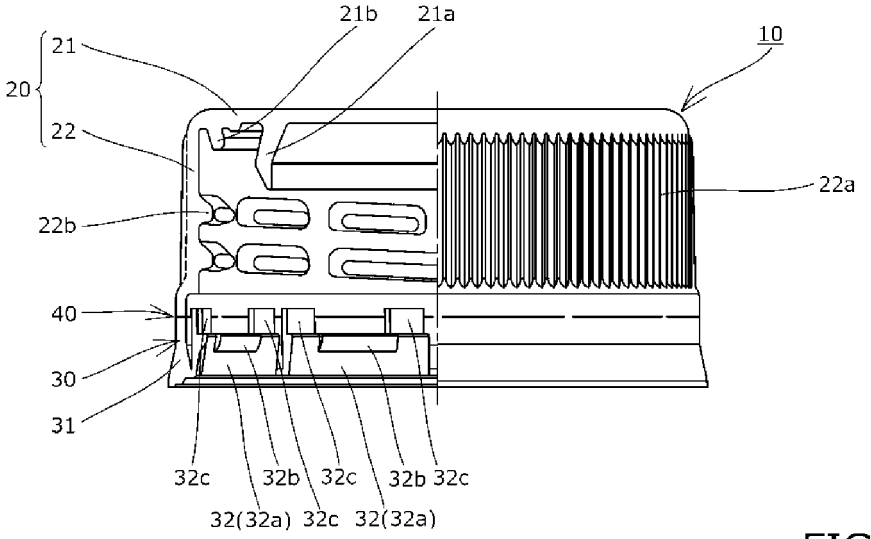
21b
21a
10
21
20
22
22a
22b
40
30
31
32c
32b
32c
32b
32c
32(32a)
32c
32(32a)

FIG. 1

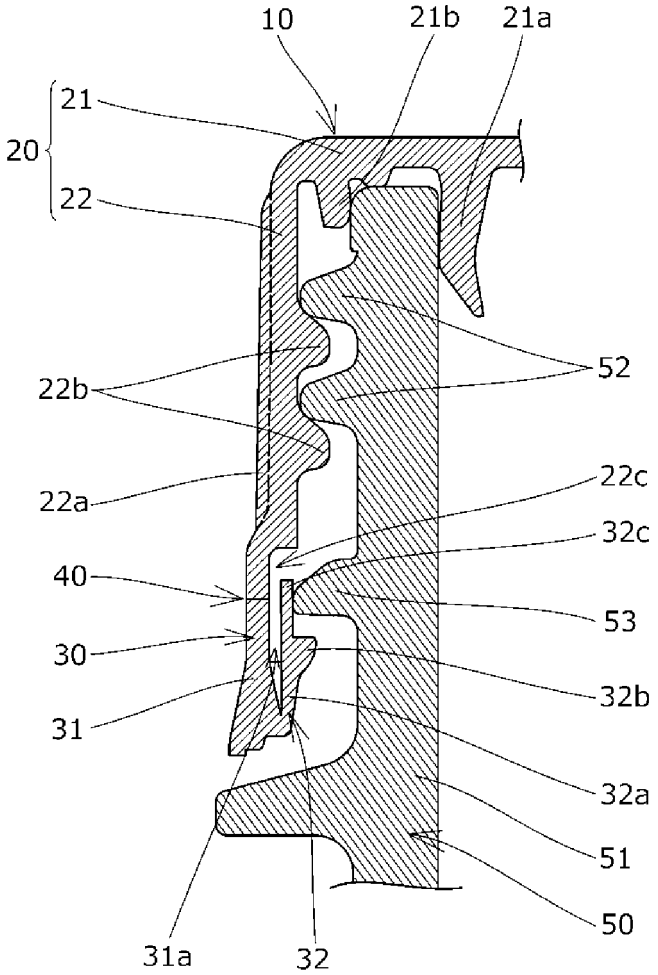
10
21b
21a
21
20
22
52
22b
22c
22a
32c
40
53
30
32b
31
32a
51
50
31a
32

FIG. 2

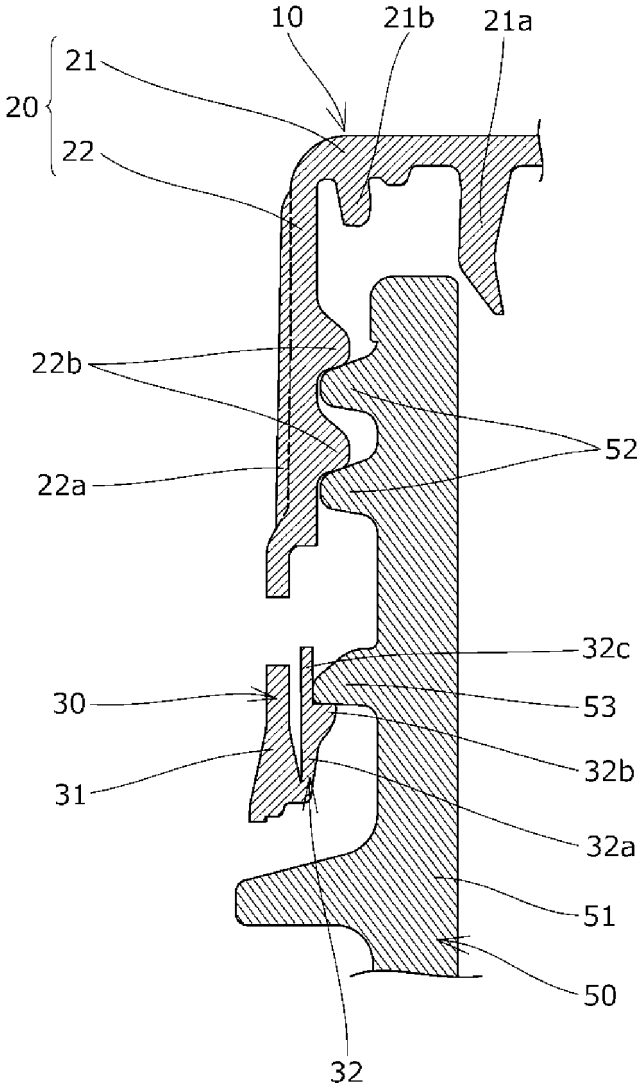

FIG. 3

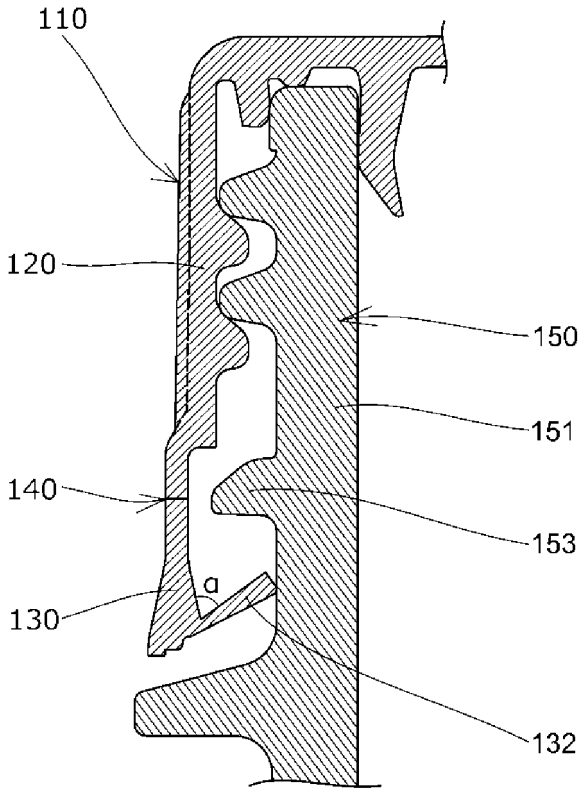

FIG. 4

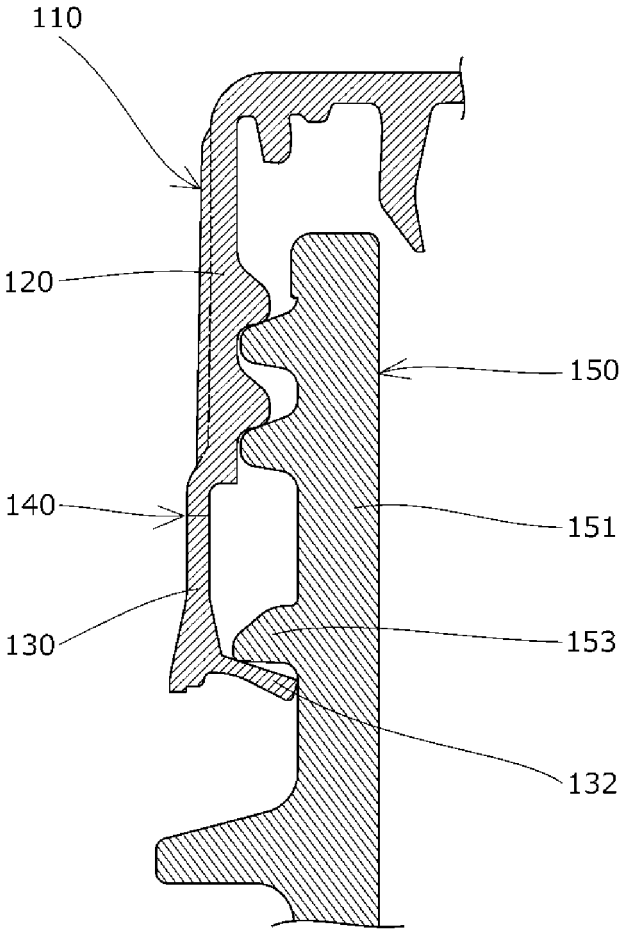
110
120
150
140
151
130
153
132

FIG. 5

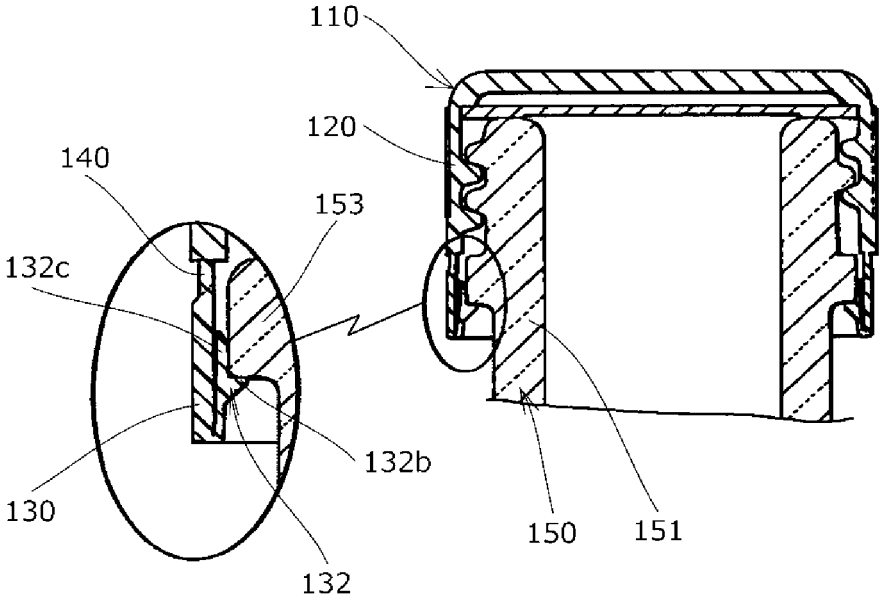
110
120
140
153
132c
132b
130
132
150
151

FIG. 6

INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP2016/067869

A. CLASSIFICATION OF SUBJECT MATTER
B65D41/34(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)
B65D41/34

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
Jitsuyo Shinan Koho 1922-1996 Jitsuyo Shinan Toroku Koho 1996-2016
Kokai Jitsuyo Shinan Koho 1971-2016 Toroku Jitsuyo Shinan Koho 1994-2016

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.
X A	JP 10-324353 A (Toshio HAKATA), 08 December 1998 (08.12.1998), paragraphs [0013] to [0029]; fig. 1, 7, 10 (Family: none)	1,4,5 2,3
A	JP 6-183450 A (Astra Plastique), 05 July 1994 (05.07.1994), & EP 541466 A1 & DE 69205117 T2 & FR 2683509 A1 & AT 128433 T & CA 2082282 A1 & OA 9621 A	1-5

☒ 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
"E" earlier application or patent but published on or after the international filing date
"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)
"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
"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
"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
26 July 2016 (26.07.16)	09 August 2016 (09.08.16)
Name and mailing address of the ISA/ Japan Patent Office 3-4-3,Kasumigaseki,Chiyoda-ku, Tokyo 100-8915,Japan	Authorized officer Telephone No.

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

INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP2016/067869

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	JP 2009-524555 A (Sacmi Cooperativa Meccanici Imola Societa' Cooperativa), 02 July 2009 (02.07.2009), & US 2009/0152229 A1 & WO 2007/085896 A2 & EP 1981771 A2 & DE 602006012378 D & IT MO20060029 A1 & CN 101400578 A & ZA 200806472 B & AT 457932 T & RU 2008134908 A & ES 2341366 T3 & MX 2008009690 A & IT MO20060029 A1	1-5

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

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- JP H0513735 B **[0006]**