



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
23.10.2024 Bulletin 2024/43

(51) International Patent Classification (IPC):
E03D 9/03 ^(2006.01) **E03D 9/02** ^(2006.01)

(21) Application number: **23196311.7**

(52) Cooperative Patent Classification (CPC):
E03D 9/032; E03D 2009/024

(22) Date of filing: **08.09.2023**

(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 ME MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA
Designated Validation States:
KH MA MD TN

• **Burgis, Anne Ava**
Red Hill, Queensland 4059 (AU)

(72) Inventors:
• **BURGIS, Wayne Desmond**
Red Hill, Queensland 4059 (AU)
• **MA, GuoDong**
Red Hill, Queensland 4059 (AU)

(30) Priority: **19.04.2023 AU 2023901160**

(74) Representative: **Braeuning Schubert**
Patentanwälte GbR
Großbeerener Weg 5b
14513 Teltow (DE)

(71) Applicants:
• **Burgis, Wayne Desmond**
Red Hill, Queensland 4059 (AU)

(54) **TOILET HYGIENE APPARATUS**

(57) A toilet bowl hygiene apparatus 100, that makes use of a low volume of plastic for waste reduction purposes, is comprised of a body of hygiene substance 2, a support member 4, at least one engagement member 6, and an adhesive tape 8 extending from the support member 4 for attachment to a toilet bowl at a point above the body of hygiene substance. The at least one engage-

ment member 6 is coupled to, or integrally formed with, the support member 4 and extends from the support member 4 into and/or through the body of hygiene substance 2. The presently described exemplary embodiment the at least one engagement member 6 includes an upwardly extending blade portion 6a and a downwardly extending blade portion 6b.

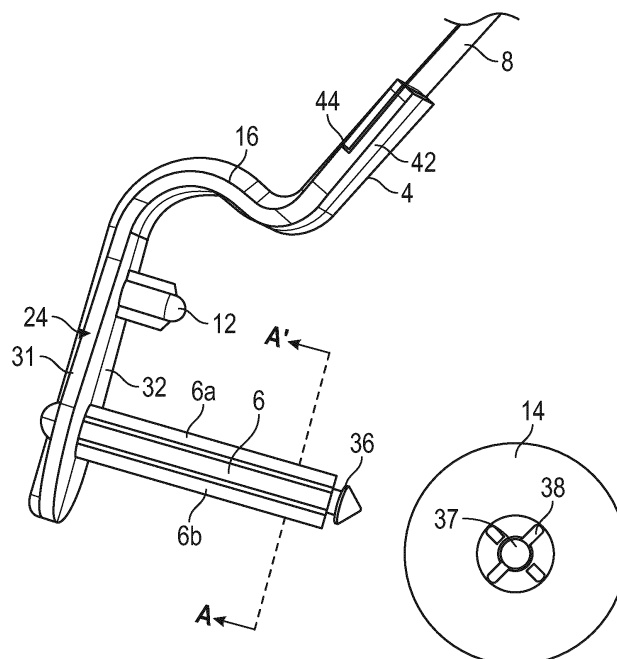


FIG. 3

Description

TECHNICAL FIELD

[0001] The present invention concerns hygiene devices for toilets, (or as they may be alternatively called "water closets" or "flush toilets") and more particularly to hygiene devices for toilet bowls, for example apparatus for dispensing a hygiene substance such as a germicidal and/or cleaning and/or fragrant material into the bowl with each flush. Such apparatus may include toilet cages or "baskets" for holding solid hygiene substances. Other versions may include containers containing liquid or gel wherein the apparatus dispenses the liquid or gel hygiene substance into the bowl with each toilet flush.

BACKGROUND

[0002] Any references to methods, apparatus or documents of the prior art are not to be taken as constituting any evidence or admission that they formed, or form part of the common general knowledge.

[0003] Conventional rimmed toilets typically include a bowl with a lower drain outlet and a rim around an upper end of the bowl which overhangs the remainder of the bowl. Flush water is directed from a cistern into the overhanging rim and the flush water progresses around the inside of the rim and falls downward into the bowl.

[0004] In recent years rimless toilets have developed as an alternative to conventional rimmed toilets. One reason for this is that it is believed that the interaction of the flush water with the overhanging rim of a conventional rimmed toilet tends to cause the flush water to lose energy so that more water must be used than might otherwise be the case for flushing and cleaning. Another reason is that it is impractical to clean under the rim of a rimmed toilet.

[0005] It is known to provide toilet hygiene apparatus that includes a basket or cage containing a hygiene substance and a clip which extends from the basket and attaches to the top of the bowl. Upon flushing the toilet water flows out through the rim and down the sides of the bowl and in so doing passes through the hygiene apparatus and contacts the hygiene substance within so that a cleaning and/or disinfecting solution is released from the hygiene apparatus and flows down the sides of the bowl.

[0006] Bowl attachment hygiene apparatus, such as those previously mentioned, are sold in high volumes in many countries. Accordingly, a consideration that their use raises is that of the amount of plastic waste that they produce once exhausted.

[0007] Various approaches have been taken to reducing the amount of waste associated with bowl attachment hygiene apparatus. For example, extending the number of flushes over which the apparatus can be used reduces the ratio of amount of waste to number of flushes, which is desirable. One way of extending the number of flushes

is to provide an apparatus that can be replenished with a block of the hygiene substance. For example, it may be possible to open the basket and insert a replacement block as needed. However, users may not wish to perform such regular replacement for hygiene and labour reasons. Another way of extending the number of flushes is to make a block of hygiene substance that has a reduced water solubility so that it diminishes more slowly over each flush. However, reducing water solubility may cause less fragrance and hygiene agents to be dispensed so that the product may then become less effective.

[0008] Another approach to reducing the amount of waste is to devise a holder that uses less plastic. For example, the bowl attachment apparatus may be made with less plastic, as described in international patent publication WO 2020/236003 by Oskar Anthoni de Waal. The apparatus described in that patent application uses an adhesive tape, rather than a clip, to attach the holder of the hygiene substance to the top of the bowl. The holder is ring shaped and is said to comprise one or more chambers that may be at least defined by a bottom and one or more sidewalls.

[0009] Other prior art that is of general relevance to toilet hygiene products includes:

EP 2540918 A1 (BOLTON MANITOBA SPA) 2 January 2013;

US 2013/0104304 A1 (WILSON BRIAN et al.) 2 May 2013;

EP 2270286 A1 (RE LE VI SPA) 5 January 2011;

FR 2977264 A1 (EURVEST) 4 January 2013;

DE 8906140 U1 (POLYFILM AG, RORSCHACH, CH) 9 November 1989.

[0010] Whilst the apparatus that are described in prior art documents, such as WO 2020/236003, may address the problem of undue plastic waste, nevertheless it would be desirable if a further improved solution could be provided that is able to withstand numerous flushes and which can be fabricated with a relatively small volume of plastic.

SUMMARY OF THE INVENTION

[0011] According to a first aspect of the present invention there is provided a toilet bowl hygiene apparatus comprising:

a body of hygiene substance;

a support member; and

at least one engagement member coupled to or integrally formed with the support member and extending from the support member into and/or through the body of hygiene substance;

wherein the at least one engagement member includes an upwardly extending blade having an angle of 20 to 80 degrees.

[0012] In an embodiment the edge of the upwardly extending blade has an angle of 40 to 50 degrees.

[0013] In an embodiment the at least one engagement member includes a downwardly extending blade.

[0014] In an embodiment the edge of the downwardly extending blade has an angle of 20 to 80 degrees.

[0015] In an embodiment the edge of the downwardly extending blade has an angle of 40 to 50 degrees.

[0016] In an embodiment the at least one engagement member includes an elongate convex portion wherein the upwardly extending blade extends upwardly from the elongate convex portion and wherein the downwardly extending blade extends downwardly from the elongate convex portion.

[0017] In an embodiment the toilet bowl hygiene apparatus includes a second engagement member coupled to or integrally formed with the support member and extending into and/or through the body of hygiene substance, wherein the second engagement member is spaced from the first engagement member for preventing rotation and associated wearing of the body of hygiene substance about either the first engagement member or the second engagement member.

[0018] In an embodiment an adhesive tape extends from the support member for attachment to a toilet bowl at a point above the body of hygiene substance.

[0019] In an embodiment the toilet bowl hygiene apparatus includes a water diversion portion coupled to or integrally formed with the support member and locatable between a source of flush water and body of hygiene substance, for preventing flush water impacting directly upon a portion of the body of hygiene substance.

[0020] In an embodiment the body of hygiene substance includes a rear side and a front side wherein the support member includes a rear side portion that extends down the rear side.

[0021] In an embodiment the rear side portion includes a trapezoidal portion with sides that diverge downwardly.

[0022] In an embodiment a base of the trapezoidal portion is continuous with a semicircular portion.

[0023] In an embodiment a longitudinal reinforcement rib extends down a rear side of the support member.

[0024] In an embodiment a transverse reinforcement rib extends across a lower end of the trapezoidal portion.

[0025] In an embodiment the at least one engagement member extends from a front side of the support member.

[0026] In an embodiment the at least one engagement member extends through the body of hygiene substance.

[0027] In an embodiment a fastener is attached to a remote end of the at least one engagement member for retaining the body of hygiene substance thereon.

[0028] In an embodiment the first engagement member extends from a front side of the support member adjacent an intersection of the longitudinal reinforcement rib and the transverse reinforcement rib.

[0029] In an embodiment the second engagement member extends from the front side of the rear side portion of the support member, adjacent a point on the lon-

gitudinal reinforcement rib.

[0030] In an embodiment the support member includes a forwardly extending portion that extends from the rear side portion over a top side portion of the body of hygiene substance.

[0031] In an embodiment the support member includes an upwardly extending portion that extends upwardly from the forwardly extending portion.

[0032] In an embodiment the adhesive tape is coupled to an upper end of the upwardly extending portion.

[0033] In an embodiment the forwardly extending portion is serpentine in side profile.

[0034] In an embodiment the upwardly extending portion extends upwardly and forwardly from the forwardly extending portion.

[0035] In an embodiment, opposed sides of the upwardly extending portion diverge upwardly and outwardly to tape engagement formations.

BRIEF DESCRIPTION OF THE DRAWINGS

[0036] Preferred features, embodiments and variations may be discerned from the following Detailed Description which provides sufficient information for those skilled in the art. The Detailed Description is not to be regarded as limiting the scope of the preceding Summary in any way. The Detailed Description will make reference to a number of drawings as follows:

- | | |
|---------------|--|
| Figure 1 | illustrates a front side of a toilet bowl hygiene apparatus. |
| Figure 2 | is a view of the rear of the toilet bowl hygiene apparatus. |
| Figure 3 | shows a support member and fastener of the toilet bowl hygiene apparatus. |
| Figure 3A | is a cross sectional view of an engagement member 6 of Figure 3 along the line A-A' |
| Figures 3B-3C | are cross sectional views of support arms corresponding to engagement member 6 of Figure 3 but with respectively circular, oval and elliptical cross sections. |
| Figure 4 | is a further view of the rear of the toilet bowl hygiene apparatus. |
| Figure 5 | is a cross sectional view of the toilet bowl hygiene apparatus shown in use. |
| Figure 6 | is a diagram showing how flush water is believed to flow along the engagement member 6. |

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

[0037] Referring now to the Figures, a toilet bowl hygiene apparatus 100, according to a preferred embodiment is illustrated. In overview, the toilet bowl hygiene apparatus 100 is comprised of number of parts or por-

tions, being a body of hygiene substance 2, a support member 4, at least one engagement member 6, and an adhesive tape 8 extending from the support member 4 for attachment to a toilet bowl at a point above the body of hygiene substance.

[0038] The at least one engagement member 6 is coupled to, or integrally formed with, the support member 4 and extends from the support member 4 into and/or through the body of hygiene substance 2.

[0039] In the presently described exemplary embodiment the at least one engagement member 6 includes an upwardly extending blade portion 6a and a downwardly extending blade portion 6b.

[0040] The at least one engagement member 6 also includes an elongate convex portion 6c wherein the upwardly extending blade 6a extends upwardly from the elongate convex portion and the downwardly extending blade 6b extends downwardly therefrom. As will be explained, the preferred shape of the at least one engagement member 6 has been found to assist in keeping the body of hygiene substance located about the at least one engagement member 6 in the face of a large number of flush cycles.

[0041] With reference to Figure 3A, which is a cross sectional view along the line A-A' of Figure 3, the edge of the upwardly extending blade 6a preferably describes an angle θ of 20 to 80 degrees, or even more preferably of 40 to 50 degrees. In Figure 3A θ is 45 degrees.

[0042] The edge of the downwardly extending blade 6b preferably describes an angle α of 20 to 80 degrees or even more preferably of 40 to 50 degrees. In Figure 3A α is 45 degrees. It will be realized that θ and α , whilst being the same in the embodiment of Figure 3A, may be non-equal in other embodiments.

[0043] Furthermore, whilst it is preferred that the at least one elongate member 6 has upwardly extending and downwardly extending blade portions 6a, 6b, in other embodiments the elongate member may not have such blade portions and may be cylindrical (Fig 3B) or an extruded oval (Fig 3C) or an extruded ellipse (Fig 3D) or other elongate shape.

[0044] The adhesive tape 8 is typically provided with its adhesive side against a release liner 10 (shown only in Figure 1), from which a user can easily detach the adhesive tape 8 prior to use. The adhesive tape 8 terminates in an enlarged handle portion 11 (shown only in Figure 1) which does not have an adhesive side for ease of handling.

[0045] In an embodiment the toilet bowl hygiene apparatus includes a second engagement member 12, best seen in Figure 3 coupled to or integrally formed with the support member 4 and extending into and/or through the body of hygiene substance 2, wherein the second engagement member 12 is spaced from the first engagement member by a distance "d" for preventing rotation of the body of hygiene substance about either the first engagement member 6 or the second engagement member 12 and associated wearing of the body of hygiene

substance about either member.

[0046] In an embodiment a fastener 14 is attached to a remote end of the at least one engagement member 6 for retaining the body of hygiene substance 2 thereon.

5 The fastener 14 is disk-shaped in the presently described embodiment, though other shapes might also be used.

[0047] The toilet bowl hygiene apparatus 100 may include a water diversion portion 16 (Figure 1), which is coupled to or integrally formed with the support member 4 and locatable between a source of flush water, for example a rim of a toilet bowl, and the body of hygiene substance 2. Whilst not essential, the water diversion portion 16 may assist to reduce flush water impacting directly upon an upper portion 18 of the body of hygiene substance 2 and thus dissolving portions of the body of hygiene substance above the first and second elongate members 6 and 12, so that the body of hygiene substance might fall from the first and second elongate members.

[0048] In an embodiment the body of hygiene substance 2 includes a rear side 20 (Figure 2) and a front side 22 (Figure 1) wherein the support member 4 includes a rear-side portion 24 that extends down the rear side 20 of the body of hygiene substance 2.

[0049] In an embodiment the rear-side portion 24 includes a trapezoidal portion 26 (identified in Figure 4) with sides 26a, 26b, that diverge downwardly.

[0050] A base 26c of the trapezoidal portion 26 is continuous with a semicircular portion 28.

[0051] Reinforcement ribs are integrally formed with the support member so that it includes a longitudinal reinforcement rib 30, which extends down a rear surface 31 (indicated in Figure 2 and Figure 3) of the rear-side portion 24 of the support member 4 and a transverse reinforcement rib 32, that extends across a lower end of the trapezoidal portion 26.

[0052] It will be realized that in other embodiments the shape of the rear side portion 24 may be otherwise, for example it may simply be a rectangle rather than a trapezoid with a semicircle at its base. However, the shape that has been described in the example that is discussed is preferable because it has been arrived at with the objective of minimal use of plastic whilst retaining sufficient strength to support the body of hygiene substance 2.

[0053] In the presently described exemplary embodiment the at least one engagement member 6 extends from a front side 32 (Figure 3) of the rear-side portion 24 of support member 4 and extends all the way through the body of hygiene substance 2 so that its remote end 36 can be captured by fastener 14 to thereby retain the body of hygiene substance 2 to the engagement member 6 and thus to the support member 4.

[0054] The fastener 14 includes a central opening 37, generally shaped as a slit 38 with an enlarged central portion 40 which complements the upper and lower blade portions 6a, 6b and central elongate convex portion 6c of the first engagement member 6. The non-circular complementary shapes of the cross section of the first support member 6 and the central opening 37 ensure that the

fastener 14 does not rotate about the first support member 6, further assisting in preventing rotation of the body of hygiene substance 2 about the first support member 6. The fastener 14 is attached to the tip 36 of the first support member 6 by a snap fit.

[0055] In an embodiment the water diversion portion is provided in the form of a forwardly extending portion 16 that is serpentine in side profile as can best be seen in Figure 3.

[0056] The support member 4 includes an upwardly extending portion 42 that extends upwardly from the forwardly extending portion 16.

[0057] A lower end of the adhesive tape 8 is coupled to an upper end 44 of the upwardly extending portion 42. The upwardly extending portion 42 extends upwardly and forwardly from the forwardly extending portion so that the body of hygiene substance 2 tends to swing rearwardly in use to make contact with flush water. Opposed sides 42a, 42b (Figure 4) of the upwardly extending portion 44 diverge upwardly and outwardly to tape engagement formations 46.

[0058] Figure 5 shows the toilet bowl hygiene apparatus 100 installed in a toilet bowl 50. The adhesive tape 8 has been attached over the upper side 52 of bowl 50 so that the body of hygiene substance locates beneath the rim 54, which is the source of flush water.

[0059] When the toilet is flushed, water flows down from the rim over the body of hygiene substance 2. The body of hygiene substance 2 is securely held on the support member by the first elongate member 6 and fastener 14. Furthermore, the body of hygiene substance does not rotate about the first elongate member due to the presence of the second elongate member 12.

[0060] Over many flushes the body of hygiene substance reduces in volume due to it being partially dissolved. However, the water diversion portion 16 somewhat protects the upper portion 18 of the body of hygiene substance to prevent premature dissolving of that portion and associated early detachment of the body of hygiene substance.

[0061] It has been found that if the at least one elongate member 6 is, for example a square shape or round shape in cross section, then as the body of hygiene substance 2 becomes smaller due to it being dissolved, then the member 6 is exposed to flushing water. With reference to Figure 6, when the flush water 19 passes along the elongate member 6 between the elongate member and the body of hygiene substance 2, then it is believed that the flush water flows with turbulence around the elongate member 6, and after the water flush there is a small amount of water left on the elongate member 6, thus causing the body of hygiene substance 2 around the elongate member 6 to dissolve further. However, it was found through experiment that if the elongate member 6 is formed with the upper, and preferably also lower, edge portions 6a, 6b, as illustrated in cross section in Figure 3A for example, then water passes quickly along the elongate member 6, it is believed without water turbulence

and without substantial water being left on the elongate member 6. Consequently, it is preferable that the at least one elongate member 6 includes at least the upper blade portion 6a and also preferable that it includes the lower blade portion 6b. If the upper and/or lower blade portions are not present then the wear rate of the body of hygiene substance 2 is believed to be greater in that case.

[0062] It will be realized that the toilet bowl hygiene apparatus 100 is able to support the body of hygiene substance 2 whilst being composed of only a small amount of plastic compared to prior basket type apparatus.

[0063] Throughout the discussion, like components and features may be identified from embodiment to embodiment with the same identifier numerals in the figures. Corresponding left hand and right hand side features may be specifically referred to with item numbers that have an "a" or a "b" suffix. In some cases the right hand and corresponding left hand components will be referred to generally without the use of the "a" or "b" suffix depending on context.

[0064] In compliance with the statute, the invention has been described in language more or less specific to structural or methodical features. The term "comprises" and its variations, such as "comprising" and "comprised of" is used throughout in an inclusive sense and not to the exclusion of any additional features. It is to be understood that the invention is not limited to specific features shown or described since the means herein described comprises preferred forms of putting the invention into effect. The invention is, therefore, claimed in any of its forms or modifications within the proper scope of the appended claims appropriately interpreted by those skilled in the art.

[0065] Any embodiment of the invention is meant to be illustrative only and is not meant to be limiting to the invention. Therefore, it should be appreciated that various other changes and modifications can be made to any embodiment described without departing from the spirit and scope of the invention.

[0066] Throughout the description and claims of this specification, the singular encompasses the plural unless the context otherwise requires. In particular, where the indefinite article is used, the specification is to be understood as contemplating plurality as well as singularity, unless the context requires otherwise.

[0067] Features, integers, characteristics, compounds, chemical moieties or groups described in conjunction with a particular aspect, embodiment or example of the invention are to be understood to be applicable to any other aspect, embodiment or example described herein unless incompatible therewith.

Claims

1. A toilet bowl hygiene apparatus comprising:

a body of hygiene substance;

- a support member; and
at least one engagement member coupled to or integrally formed with the support member and extending from the support member into and/or through the body of hygiene substance;
wherein the at least one engagement member includes an upwardly extending blade having an angle of 20 to 80 degrees.
2. The apparatus of claim 1, wherein the edge of the upwardly extending blade has an angle of 40 to 50 degrees.
 3. The apparatus claim 1 or claim 2, wherein the at least one engagement member includes a downwardly extending blade.
 4. The apparatus of claim 3, wherein the edge of the downwardly extending blade has an angle of 20 to 80 degrees.
 5. The apparatus of claim 4, wherein the edge of the downwardly extending blade has an angle of 40 to 50 degrees.
 6. The apparatus of any one of claims 3 to 5, wherein the at least one engagement member includes an elongate convex portion wherein the upwardly extending blade extends upwardly from the elongate convex portion and wherein the downwardly extending blade extends downwardly from the elongate convex portion.
 7. The apparatus of any one of claims 1 to 6, including an adhesive tape extending from the support member for attachment to a toilet bowl at a point above the body of hygiene substance.
 8. The apparatus of any one of claims 1 to 7, including a second engagement member coupled to or integrally formed with the support member and extending into and/or through the body of hygiene substance, wherein the second engagement member is spaced from the first engagement member for preventing rotation and associated wearing of the body of hygiene substance.
 9. The apparatus of any one of claims 1 to 8, including a water diversion portion coupled to or integrally formed with the support member and locatable between a source of flush water and body of hygiene substance, for preventing flush water impacting directly upon a portion of the body of hygiene substance.
 10. The apparatus of claim 9, wherein the body of hygiene substance includes a rear side and a front side wherein the support member includes a rear side portion that extends down the rear side.
 11. The apparatus of any one of claims 1 to 10, wherein the at least one engagement member extends through the body of hygiene substance.
 12. The apparatus of claim 11, wherein a fastener is attached to a remote end of the at least one engagement member for retaining the body of hygiene substance thereon.
 13. The apparatus of any one of claims 1 to 12, wherein the first engagement member extends from a front side of the support member adjacent an intersection of a longitudinal reinforcement rib thereof and a transverse reinforcement rib thereof.
 14. The apparatus of any one of claims 1 to 13, wherein the support member includes a forwardly extending portion that extends from a rear side portion of the support member over a top side portion of the body of hygiene substance.
 15. The apparatus of claim 14, wherein the support member includes an upwardly extending portion that extends upwardly from the forwardly extending portion;
wherein the forwardly extending portion is serpentine in side profile.

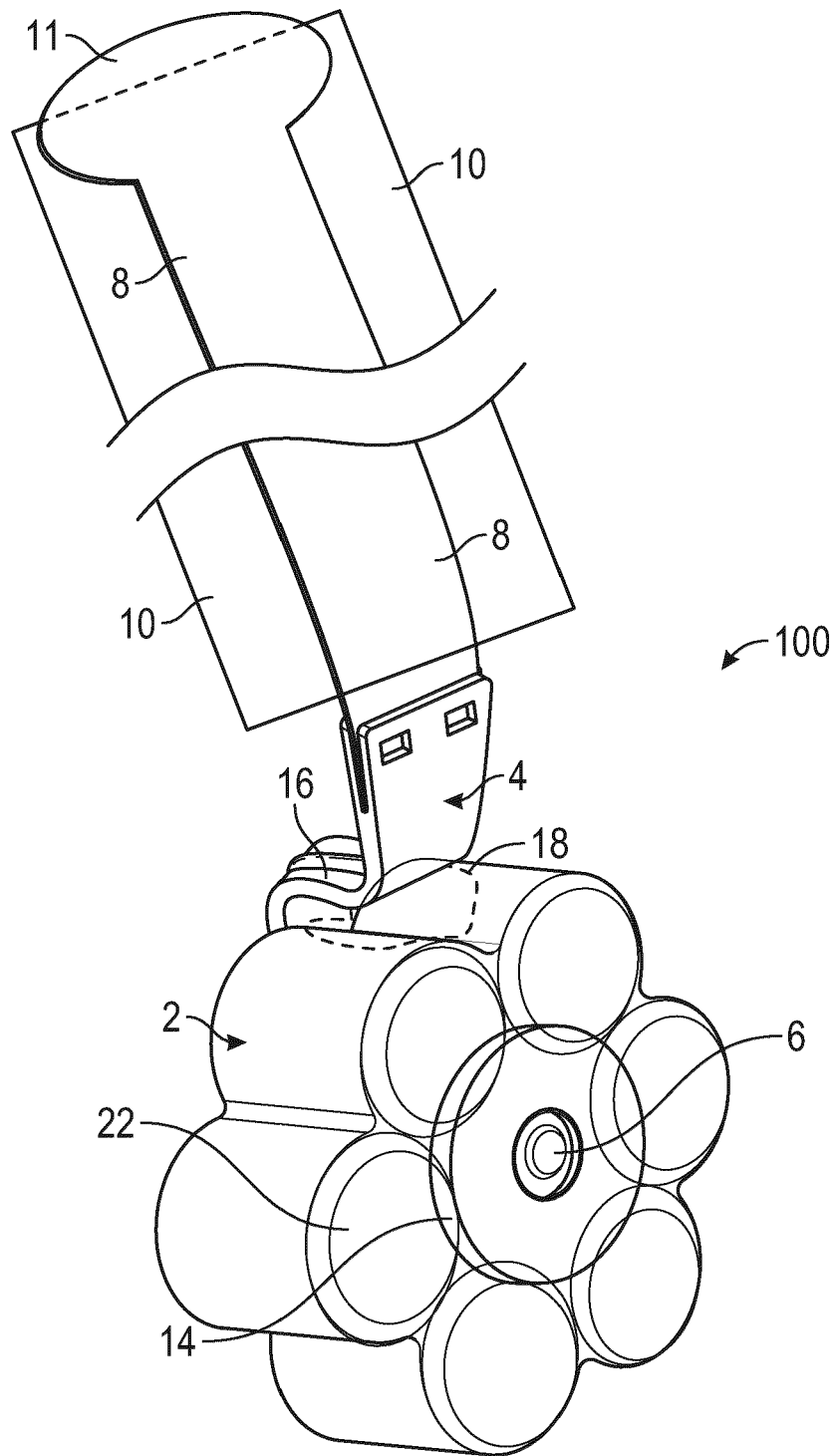


FIG. 1

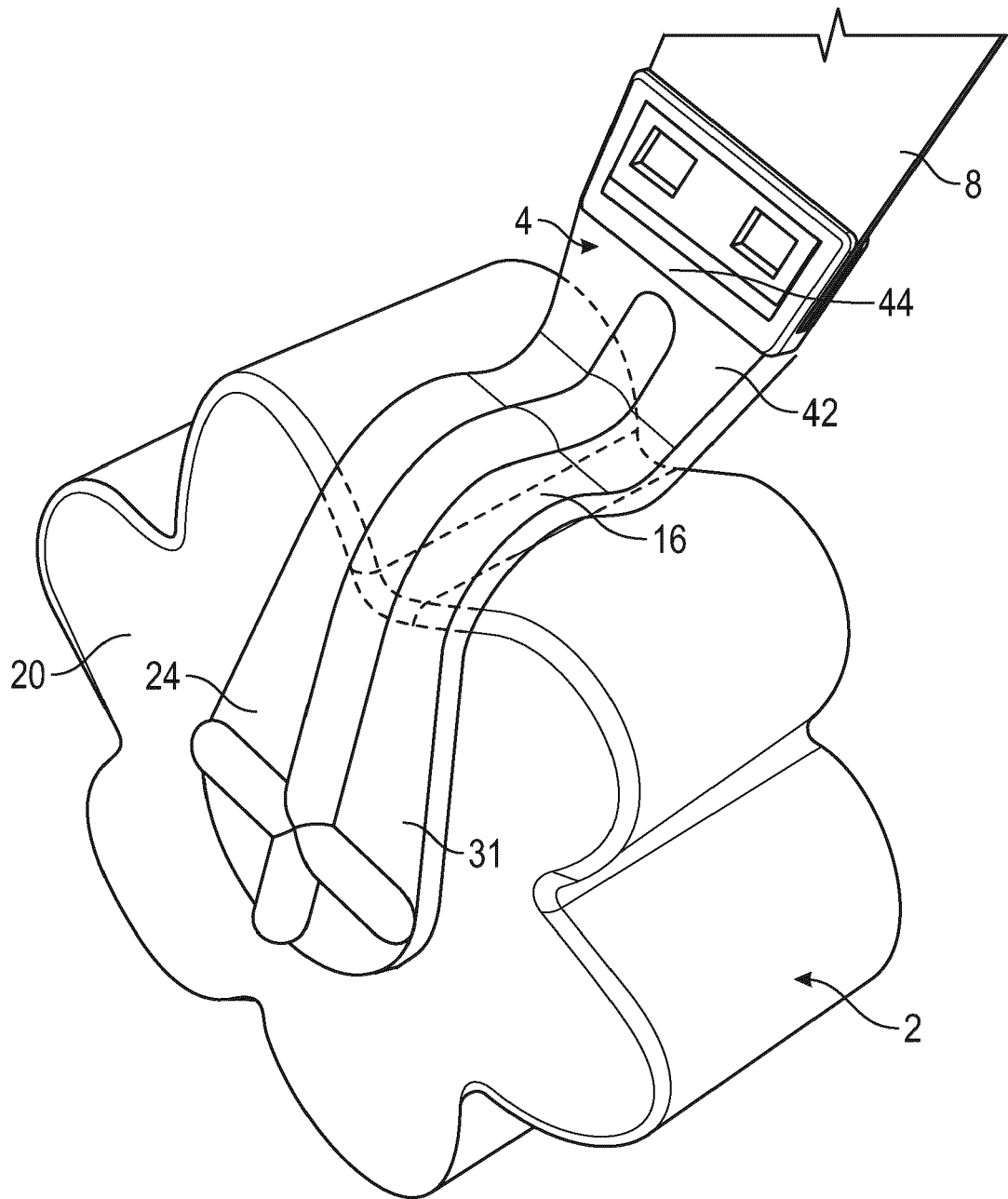


FIG. 2

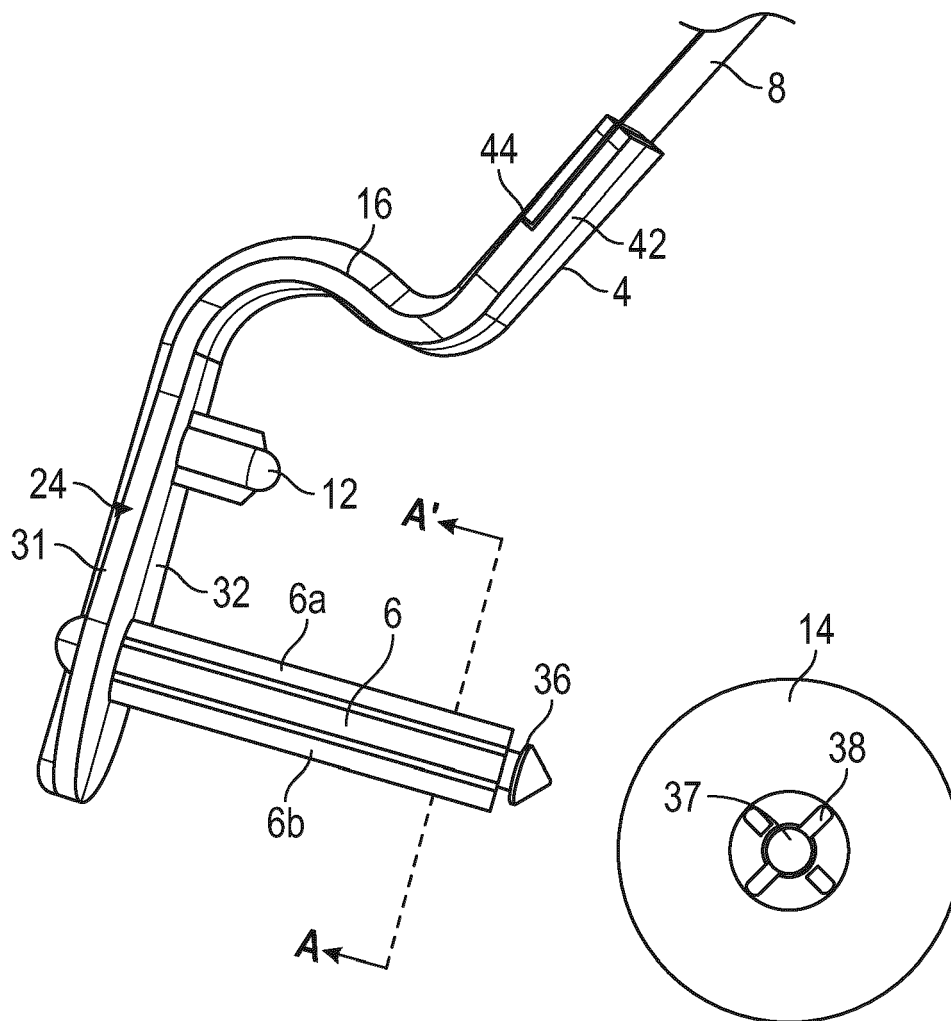


FIG. 3

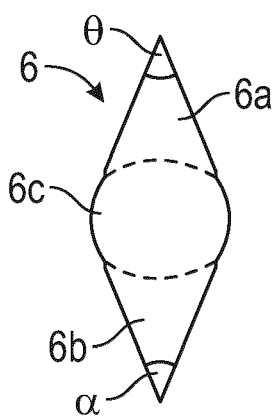


FIG. 3A

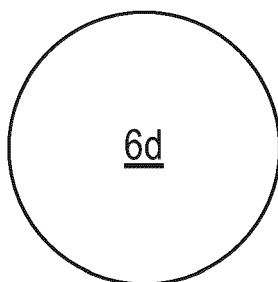


FIG. 3B

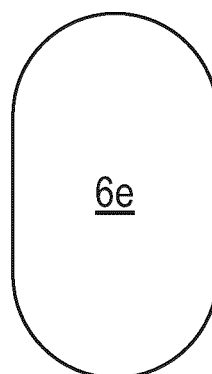


FIG. 3C

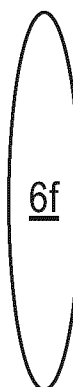


FIG. 3D

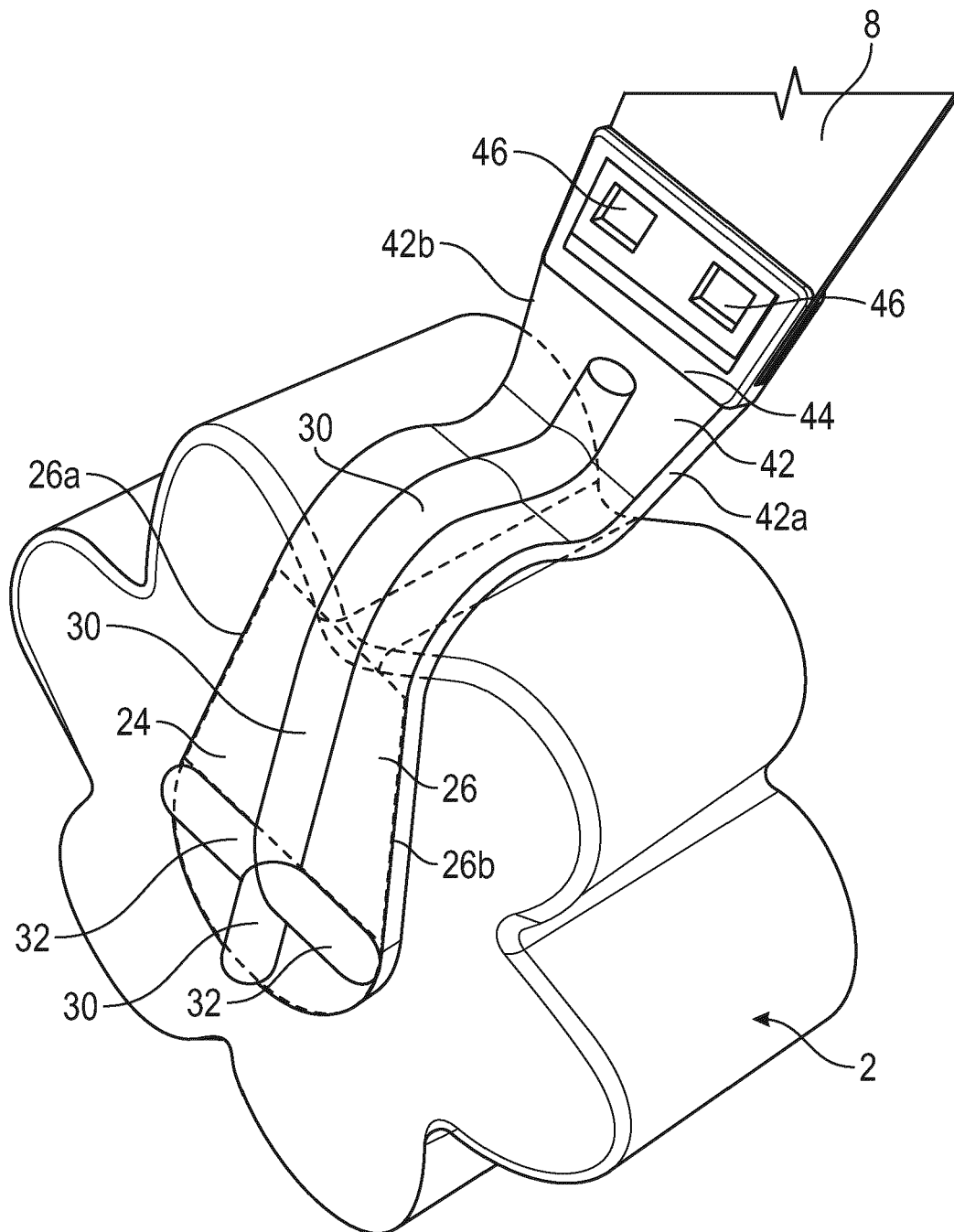


FIG. 4

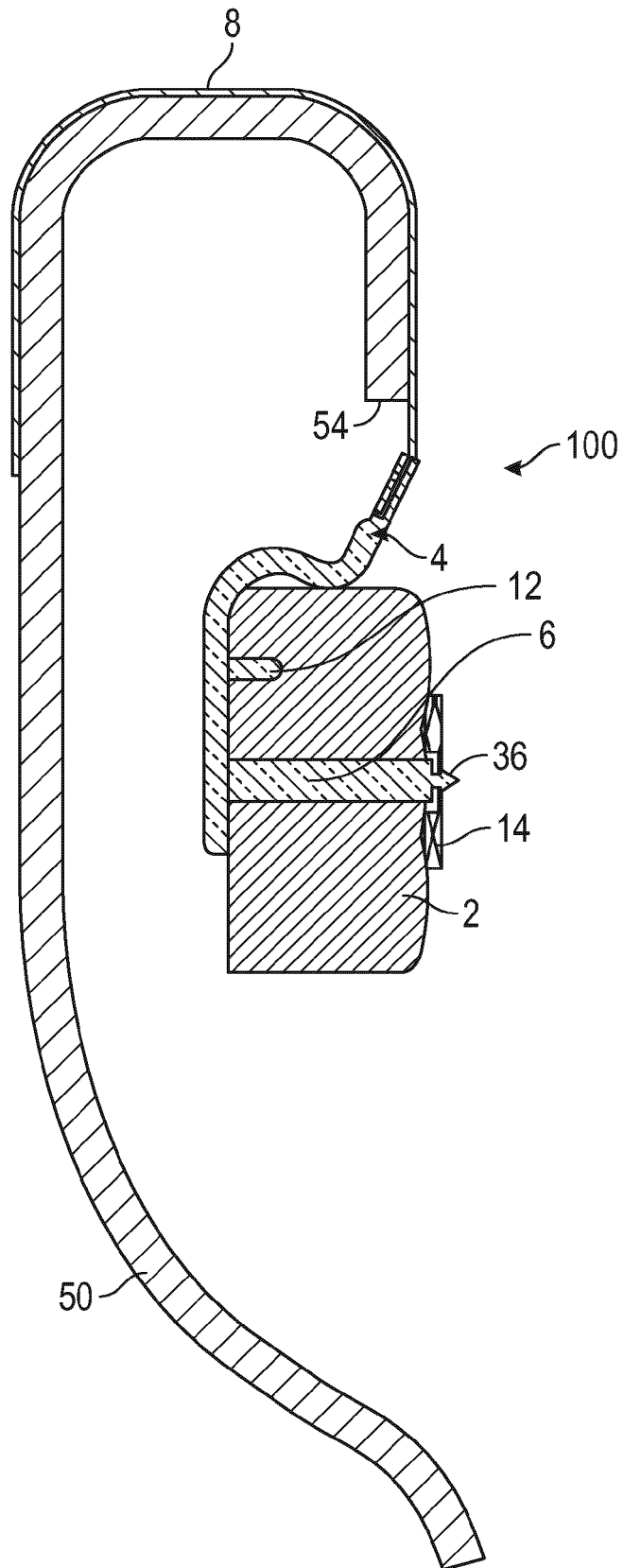


FIG. 5

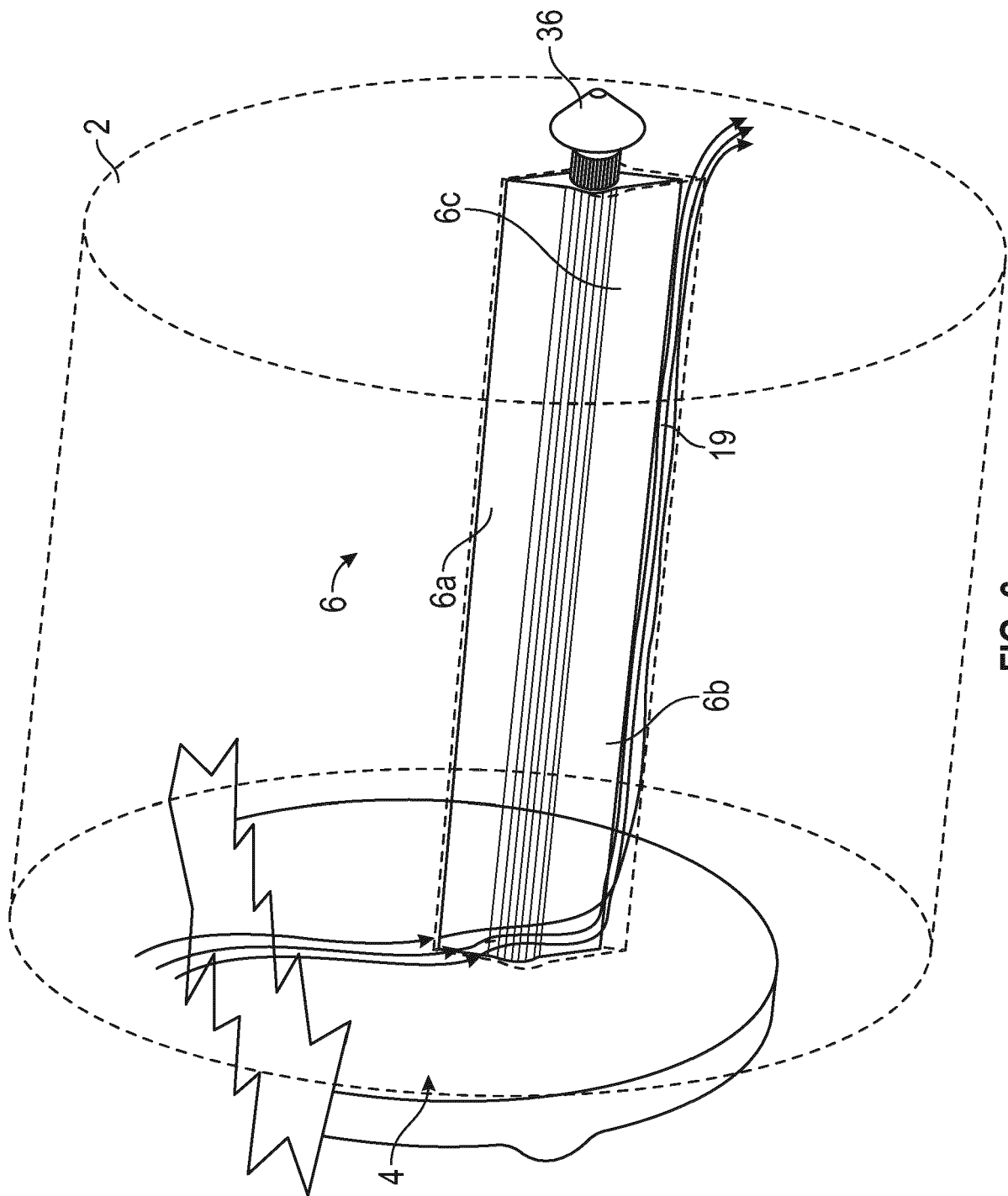


FIG. 6



EUROPEAN SEARCH REPORT

Application Number

EP 23 19 6311

5

10

15

20

25

30

35

40

45

50

55

1

EPO FORM 1503 03.82 (P04C01)

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 4 096 593 A (VLAHAKIS EFTICHIOS VAN) 27 June 1978 (1978-06-27)	1, 2, 8-10, 13-15	INV. E03D9/03
Y	* columns 1-3; figures 1-4 *	7	ADD. E03D9/02
A	-----	3-6	
X	EP 2 270 286 A1 (RE LE VI SPA [IT]) 5 January 2011 (2011-01-05)	1-5, 9-15	
A	* paragraphs [0001] - [0046]; figures 1-6 *	6	

Y	CH 675 140 A5 (POLYFILM AG) 31 August 1990 (1990-08-31)	7	
	* column 3, lines 46-56; figures 1-9 *		

A	EP 2 540 918 A1 (BOLTON MANITOBA SPA [IT]) 2 January 2013 (2013-01-02)	1-15	
	* abstract; figures 1-9 *		

A	WO 2013/072088 A1 (BUCK CHEMIE GMBH [DE]; LEIPOLD JOACHIM [DE] ET AL.) 23 May 2013 (2013-05-23)	1-15	TECHNICAL FIELDS SEARCHED (IPC)
	* abstract; figures 2, 5 *		E03D

A	US 3 947 901 A (WILLERT AUGUST W) 6 April 1976 (1976-04-06)	1-15	
	* abstract; figures 1-5 *		

A	WO 2011/141720 A1 (JEYES GROUP LTD [GB]; WILSON BRIAN [GB] ET AL.) 17 November 2011 (2011-11-17)	1-15	
	* figures 3a-4b *		

A	FR 2 977 264 A1 (EURVEST [BE]) 4 January 2013 (2013-01-04)	1-15	
	* abstract; figures 1-7 *		

The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
Munich		31 January 2024	Posavec, Daniel
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone		T : theory or principle underlying the invention	
Y : particularly relevant if combined with another document of the same category		E : earlier patent document, but published on, or after the filing date	
A : technological background		D : document cited in the application	
O : non-written disclosure		L : document cited for other reasons	
P : intermediate document			
		& : member of the same patent family, corresponding document	

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 23 19 6311

5

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

31-01-2024

10

15

20

25

30

35

40

45

50

55

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 4096593 A	27-06-1978	NONE	
EP 2270286 A1	05-01-2011	EP 2270286 A1	05-01-2011
		SM 201000075 A	03-05-2012
CH 675140 A5	31-08-1990	CH 675140 A5	31-08-1990
		DE 8906140 U1	09-11-1989
EP 2540918 A1	02-01-2013	CY 1120563 T1	10-07-2019
		EP 2540918 A1	02-01-2013
		ES 2668918 T3	23-05-2018
		HR P20180766 T1	29-06-2018
		LT 2540918 T	11-06-2018
		PL 2540918 T3	31-08-2018
		PT 2540918 T	21-05-2018
		SI 2540918 T1	31-07-2018
WO 2013072088 A1	23-05-2013	DE 102011055412 A1	16-05-2013
		EP 2780512 A1	24-09-2014
		WO 2013072088 A1	23-05-2013
US 3947901 A	06-04-1976	NONE	
WO 2011141720 A1	17-11-2011	AU 2011251776 A1	06-12-2012
		CN 102959160 A	06-03-2013
		EP 2569487 A1	20-03-2013
		ES 2616748 T3	14-06-2017
		GB 2480326 A	16-11-2011
		HU E031922 T2	28-08-2017
		JP 2013531152 A	01-08-2013
		KR 20130111223 A	10-10-2013
		PL 2569487 T3	31-07-2017
		US 2013104304 A1	02-05-2013
		WO 2011141720 A1	17-11-2011
		ZA 201209049 B	28-08-2013
FR 2977264 A1	04-01-2013	NONE	

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

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

- WO 2020236003 A, Oskar Anthoni de Waal [0008]
[0010]
- EP 2540918 A1 [0009]
- US 20130104304 A1, WILSON BRIAN [0009]
- EP 2270286 A1 [0009]
- FR 2977264 A1 [0009]
- DE 8906140 U1 [0009]