(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
01 June 2023 (01.06.2023)

WIPO | PCT

(10) International Publication Number
WO 2023/096551 A1

(51) International Patent Classification:
A01D 34/81 (2006.01) *A01G 3/053* (2006.01)
A01D 34/82 (2006.01) *A01G 3/06* (2006.01)
A01D 34/90 (2006.01) *B25F 5/02* (2006.01)
A01G 3/04 (2006.01)

(21) International Application Number:
PCT/SE2022/051074

(22) International Filing Date:
17 November 2022 (17.11.2022)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
2151452-6 29 November 2021 (29.11.2021) SE

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(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CV, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IQ, IR, IS, IT, JM, JO, JP, KE, KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, WS, ZA, ZM, ZW.

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, CV, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ,

(54) Title: REMOVABLE CYLIDRICAL COVER FOR A BUSHCUTTER AND A BUSHCUTTER COMPRISING SUCH A COVER

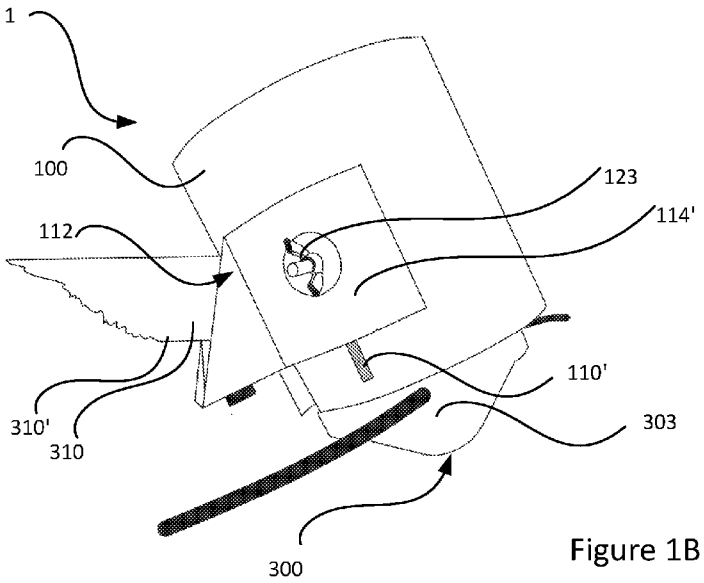

Figure 1B

(57) Abstract: The present invention relates to a removable cover (1) for a bushcutter (300), said cover (1) comprising a cylindrical casing (100). The cylindrical casing (100) comprises an opening (121) for said bushcutter (300) to protrude through and a wall (101) of said cylindrical casing (100) is arranged to cover a bevel gear housing (301) of said bushcutter (300). Further, the wall (101) comprises a first and a second adjusting track (110, 110') for adjusting the casing (100) relative the bushcutter (300). Moreover, the cover (1) further comprises a mounting module (112) for mounting said casing (100) to said bushcutter (300).

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TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, ME, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

Published:

— *with international search report (Art. 21(3))*

REMOVABLE CYLIDRICAL COVER FOR A BUSHCUTTER AND A BUSHCUTTER COMPRISING SUCH A COVER

FIELD OF THE INVENTION

The present invention relates to a removable cover for a bushcutter and a bushcutter comprising such a cover.

BACKGROUND OF THE INVENTION

When using a bushcutter to cut weeds and other vegetation, a user is sometimes faced with the drive or the gearing of the bushcutter becoming entangled in said vegetation. This risk is increased when cutting tall grass or vegetation, as well as when moving fast with the bushcutter through the vegetation. When entangled, the user needs to stop the bushcutter and remove the vegetation that caused the stop by hand. This poses a risk and a time sink for users of a bushcutter.

SUMMARY OF THE INVENTION

It is an object of the present invention to alleviate at least some of the mentioned drawbacks of the prior art and to provide means for protecting a bushcutter from weeds and grass becoming tangled in the drive and/or gearing thereof. This and other objects, which will become apparent in the following, are accomplished by a removable cover for a bushcutter as defined in the accompanying independent claim.

The term exemplary should in this application be understood as serving as an example, instance or illustration.

The present invention is at least partially based on the realisation that covering the upper portion of the trimmer head and the bevel gear housing reduces the risk of vegetation becoming entangled therein. This is beneficial, as it reduces the amount of time the user has to spend clearing vegetation from the drive or gearing of the bushcutter.

The present invention is furthermore based on the realisation that being able to manually adjust the axial position of the cover over the trimmer head allows for the cover to be used with more variants of bushcutters, thus increasing the usability of the removable cover.

According to the first aspect of the present invention, a removable cover for a bushcutter is provided. The cover comprises a cylindrical casing. The cylindrical casing comprises an opening for said bushcutter to protrude through, and a wall of said cylindrical casing is arranged to cover a bevel gear housing of said bushcutter. Further, said wall comprises a first and a second adjusting track for adjusting the casing relative the bushcutter. Moreover, said cover further comprises a mounting module for mounting said casing to said bushcutter. The mounting module comprises a connecting portion arranged to be attached to said bushcutter, wherein said mounting module further comprises a first and a second casing connecting portion extending from opposing side edges of said connecting portion. Each casing connecting portion is adjustably attachable to a corresponding adjusting track thereof by a fastening means. The adjusting track may be formed as an opening in the surface of the wall.

In the context of the present invention, spatial references such as lower, higher, axial or radial are to be understood using their normal meaning, with up being the direction away from the side of the trimmer head that is to face the ground, and down being taken to mean the direction that is towards the ground when the bushcutter to which the cover is to be connected to is in use. Radial is taken to mean in a direction perpendicular to a central axis of the cylindrical casing, and axial is taken to mean a direction parallel thereto.

By covering the bevel gear housing, the wall of the cylindrical casing prevents grass, weeds and other vegetation from becoming entangled in the bevel gear and the drive of the bushcutter.

According to an example embodiment of the present invention, the connecting portion is arranged to be attached to an underside or a top side of a section extending away from the bevel gear housing. The section may be a pipe section connectable to the handle of the bushcutter.

According to an example embodiment of the present invention, each first and second casing connecting portion is arc-shaped having a first radius corresponding to a second radius of the wall of the cylindrical casing.

The fastening means may be a wing-nut, thus allowing for easy attachment of the casing to the bushcutter and also adjustment of the casing relative the bushcutter.

The first and the second adjusting tracks may be arranged on opposing sides of said opening extending in said axial direction of said casing.

The connecting portion may extend radially outwards from said wall when attached thereto.According to an example embodiment of the present invention, a lower edge of said wall of said cylindrical casing is provided such that it is arranged adjacent to an upper surface of a trimmer head of said bushcutter when connected thereto.

By arranging the lower edge of the wall close to the upper surface of the trimmer head, little space is left for vegetation to enter through.

According to an example embodiment of the present invention, said cylindrical casing has an open bottom configured to be arranged adjacent to an upper surface of said trimmer head, and a top that is covered by a mesh arranged to prevent debris from entering while allowing air to pass therethrough. This provides a balance between protection from vegetation and airflow needed for cooling the bevel gearing.

According to an example embodiment of the present invention, said opening in said cylindrical casing is a slit extending from a lower edge of a wall of said cylindrical casing. The width of said slit is equal to or greater than the width of the connection arm, but no more than 15% greater, preferably no more than 10% greater, most preferably no more than 5% greater.

According to an example embodiment of the present invention, said slit extends along part of the axial extension of said cylindrical casing. Said slit extends along no more than 90% of the axial extension of said cylindrical casing, preferably no more than 80%, most preferably no more than 70%. Thus, a sufficient coverage of the bevel gear housing is achieved.

According to a second aspect of the present invention, a bushcutter is provided, said bushcutter having a cover according to the first aspect of the present invention. Said bushcutter comprises a trimmer head connected to a bevel gear housing arranged at one end of the bushcutter, and said cover is connected to the bevel gear housing by means of said mounting module such that said wall of said cylindrical casing is arranged adjacent to an upper surface of said trimmer head.

According to an example embodiment of the present invention, a lower edge of said wall of said cylindrical casing is arranged less than 15 mm, preferably less than 10 mm, and most preferably less than 5 mm from said upper surface of said trimmer head. Thus, a sufficient coverage of the bevel gear housing and the trimmer head is achieved.

According to one example embodiment, the diameter of said wall of said cylindrical casing is larger than the diameter of said trimmer head, and said lower edge of said wall of said cylindrical casing overlaps said upper surface of said trimmer head.

Generally, all terms used in the description are to be interpreted according to their ordinary meaning in the technical field, unless explicitly defined otherwise herein. All references to “a/an/the [element, device, component, means, step, etc.]” are to be interpreted openly as referring to at least one instance of said element, device, component, means, step, etc., unless explicitly stated otherwise.

BRIEF DESCRIPTION OF THE DRAWINGS

These and other features and advantages of the present invention will now be further clarified and described in more detail, with reference to the appended drawings showing an embodiment of a removable cover for a bushcutter and a bushcutter according to the present invention.

Figure 1A is a schematic view showing a the removable cover,

Figure 1B is a schematic drawing showing the removable cover attached to a bushcutter,

Figure 2 is a schematic drawing showing the cylindrical casing:

Figure 3 is an exploded schematic side view of the removable cover and a bushcutter; and

Figure 4 is a bushcutter comprising the removable cover.

DETAILED DESCRIPTION OF EMBODIMENTS

In the following detailed description, some embodiments of the present invention will be described. However, it is to be understood that features of the different embodiments are exchangeable between the embodiments and may be combined in different ways, unless anything else is specifically indicated. Even though in the following description, numerous specific details are set forth to provide a more thorough understanding of the present invention, it will be apparent to one skilled in the art that the present invention may be practiced without these specific details. In other instances, well known constructions or functions are not described in detail, so as not to obscure the present invention.

Figure 1A is a schematic view the removable cover 1 comprising a cylindrical casing 100 having a wall 101 extending in an axial direction thereof. The wall 101 has a lower edge 103 arranged to face a trimmer head 303 of the bushcutter 300 to which the cover 1 is to be connected, and an upper edge 105 arranged opposite thereto. The cylindrical casing 100 is arranged to cover the bevel gear housing 301 of a bushcutter 300 when connected thereto (see Figure 3).

The cylindrical casing 100 has an open bottom 107 configured to be arranged adjacent to an upper surface 305 of the trimmer head 303 (also shown in Figure 3), and a top 109 that may be covered by a mesh 111 arranged to prevent debris from entering while allowing air to pass therethrough.

Furthermore, the cylindrical casing 100 comprises an opening 121 for said bushcutter 300 to protrude through, and a wall 101 of said cylindrical casing 100 is arranged to cover a bevel gear housing (see Fig. 3) of said bushcutter. Further, said wall 101 comprises a first and a second adjusting track 110, 110' for adjusting the casing 100 relative the bushcutter. Moreover,

said cover 1 further comprises a mounting module 112 for mounting said casing to said bushcutter 300. The mounting module 112 comprises a connecting portion 113 arranged to be attached to said bushcutter 300, wherein said mounting module 112 further comprises a first and a second casing connecting portion 114, 114' extending from opposing side edges 115 of said connecting portion 113. Each casing connecting portion 114, 114' is adjustably attachable to a corresponding adjusting track 110 thereof by a fastening means. The adjusting track 110 may be formed as an opening in the surface of the wall 101 as shown in Figure 1A.

Finally, the opening 121 may be in in the form of a slit extending upwards from the lower edge 103 of the wall 101 of the cylindrical casing 100. The opening 121 extends along approximately 60% of the axial length of the cylindrical casing 100.

Figure 1B is a schematic cut-out drawing showing the cylindrical casing 100 attached to the bushcutter 300 by means of the mounting module 112 of said cover 1. The bushcutter 300 is shown as a cut-out view. Further, the trimmer head 303 of the bushcutter 300 is shown. Here, the fastening means 123, in the shape of wing nuts, are used to connect the cylindrical casing 100 to the bushcutter 300. As further illustrated in Figure 1B, the adjusting tracks 110. 110' allow for the cover to be adjusted relative the bushcutter 300, this provides an advantage of allowing for one standard type of cover 1 to be applicable to several different types of bushcutters 300 of different size. The connecting portion 113 may be arranged to be attached to an underside 310' or a top side of a section 310 extending away from the bevel gear housing 301. In figure 1B, it is attached to the underside 310' that makes it less visible.

Each first and second casing connecting portion 114, 114' may be arc-shaped having a first radius corresponding to a second radius of the wall of the cylindrical casing 100. This is illustrated in Figures 1A and 1B. This allows for the mounting module 112 to be secured robustly while having a convenient assembly process. The first and the second adjusting tracks 110, 110' may be arranged on opposing sides of said opening 121, said adjusting

tracks 110, 110' extending in said axial direction of said casing 100. Further, the connecting portion 113 may extend radially outwards from said wall when attached thereto. It may extend in a direction perpendicular to said axial direction of said wall 101 or have an extension having an angle of 45-135 degrees relative the axial direction of said wall 101.

Figure 2 is a perspective view of said cylindrical casing 100 showing the two axially extending adjusting tracks 110, 110' being on opposing sides of said opening and extending in said axial direction of said casing 100.

Figure 3 is an exploded schematic side view of the removable cover 1 and a bushcutter 300. The bushcutter 300 comprises a bevel gear housing 301, to which the mounting module 112 is connected. The mounting module 112 may be connected first to the bushcutter 300 and subsequently the casing 100 can be connected to the mounting module 112. The bushcutter 300 further comprises a trimmer head 303, the upper surface 305 of which the lower edge 103 of the wall 101 is to be arranged adjacent to. As further shown in Figure 3. The mounting module 112 may be connected to the bushcutter 300 by means of e.g. bolts.

Figure 4 is a schematic cut-out side view of the removable cover 1 and a bushcutter 300 mounted together. Figure 4 illustrates how the mounting module 112 allows for convenient connection between the bushcutter 300 and the cover 1.

The person skilled in the art realizes that the present invention by no means is limited to the embodiments described above. The features of the described embodiments may be combined in different ways, and many modifications and variations are possible within the scope of the appended claims. In the claims, any reference signs placed between parentheses shall not be construed as limiting to the claim. The word "comprising" does not exclude the presence of other elements or steps than those listed in the claim. The word "a" or "an" preceding an element does not exclude the presence of a plurality of such elements.

CLAIMS

1. A removable cover (1) for a bushcutter (300), said cover (1) comprising a cylindrical casing (100),

wherein a wall (101) of said cylindrical casing (100) comprises an opening (121) for said bushcutter (300) to protrude through, and

wherein said wall (101) of said cylindrical casing (100) is arranged to cover a bevel gear housing (301) of said bushcutter (300),

wherein said wall (101) comprises a first and a second adjusting track (110, 110') for adjusting the casing (100) relative the bushcutter (300)

wherein said cover (1) further comprises a mounting module (112) for mounting said casing (100) to said bushcutter (300),

the mounting module (112) comprising a connecting portion (113) arranged to be attached to said bushcutter (300), wherein said mounting module (112) further comprises a first and a second casing connecting portion (114, 114') extending from opposing side edges (115) of said connecting portion (113), wherein each casing connecting portion (114, 114') is adjustably attachable to a corresponding adjusting track (110, 110') of the first and second adjusting tracks (110, 110') by a fastening means (123).

2. The removable cover (1) according to claim 1, wherein the connecting portion (113) is arranged to be attached to an underside (310) or a top side (310') of a section extending away from the bevel gear housing (301).

3. The removable cover (1) according to any one claim 1 or 2, wherein each first and second casing connecting portion (114, 114') is arc-shaped having a first radius corresponding to a second radius of the wall (101) of the cylindrical casing (100).

4. The removable cover (1) according to any one of the claims 1-3, wherein the fastening means (123) is a wing-nut.

5. The removable cover (1) according to any one of the claims 1-4, wherein the first and the second adjusting tracks (110, 110') are arranged on opposing sides of said opening (121), said adjusting tracks (110, 110') extending in said axial direction of said casing (100).

6. The removable cover (1) according to any one of the claims 1-5, wherein said connecting portion (113) extends radially outwards from said wall (101) when attached thereto.

7. The removable cover (1) according to any one of the claims 1-6, wherein a lower edge (103) of said wall (101) of said cylindrical casing (100) is provided such that it is arranged adjacent to an upper surface (305) of a trimmer head (303) of said bushcutter (300) when connected thereto.

8. The removable cover (1) according to any one of the claims 1-7, wherein said cylindrical casing (100) has an open bottom (107) configured to be arranged adjacent to an upper surface (305) of said trimmer head (303), and a top (109) that is covered by a mesh (111) arranged to prevent debris from entering while allowing air to pass therethrough.

9. The removable cover (1) according to any one of the preceding claims, wherein said opening (121) in said cylindrical casing (100) is a slit extending from a lower edge (103) of the wall (101) of said cylindrical casing (100).

10. A bushcutter (300) having a cover (1) according to any one of the preceding claims, said bushcutter (300) comprising a trimmer head (303) connected to a bevel gear housing (301) arranged at one end of the bushcutter (300), and wherein said cover (1) is connected to the bevel gear housing (301) by means of said mounting module (112) such that said wall (101) of said cylindrical casing (100) is arranged adjacent to an upper surface (305) of said trimmer head (303).

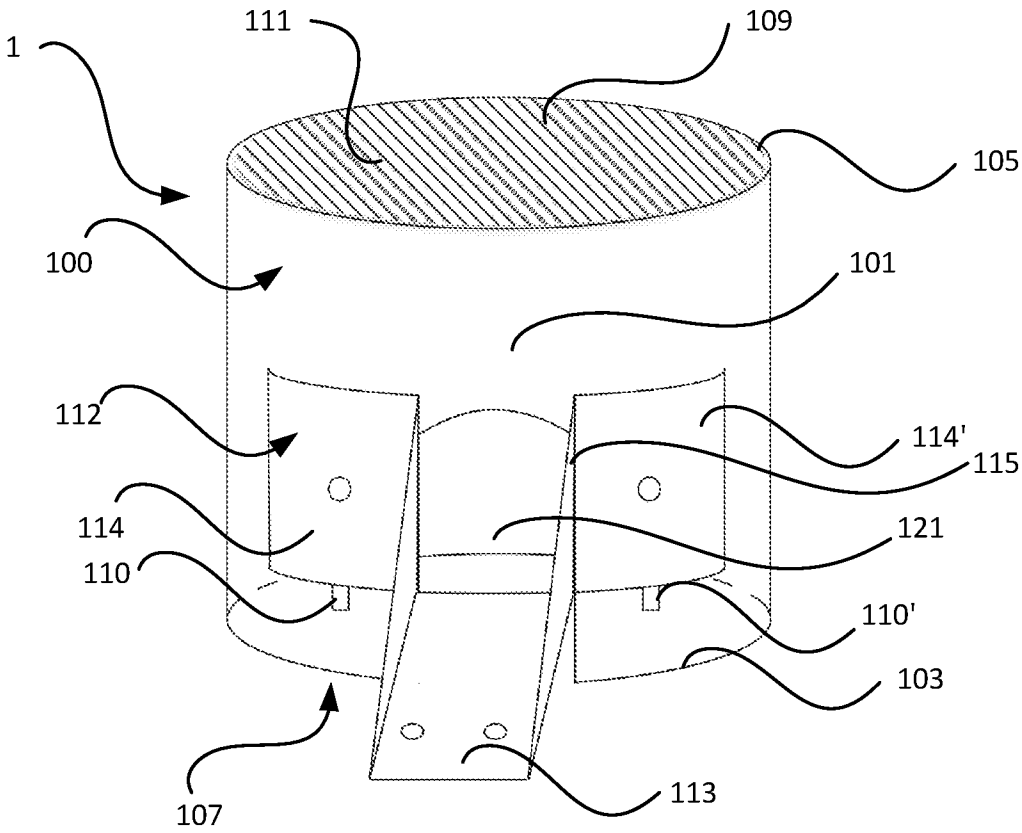

Figure 1A

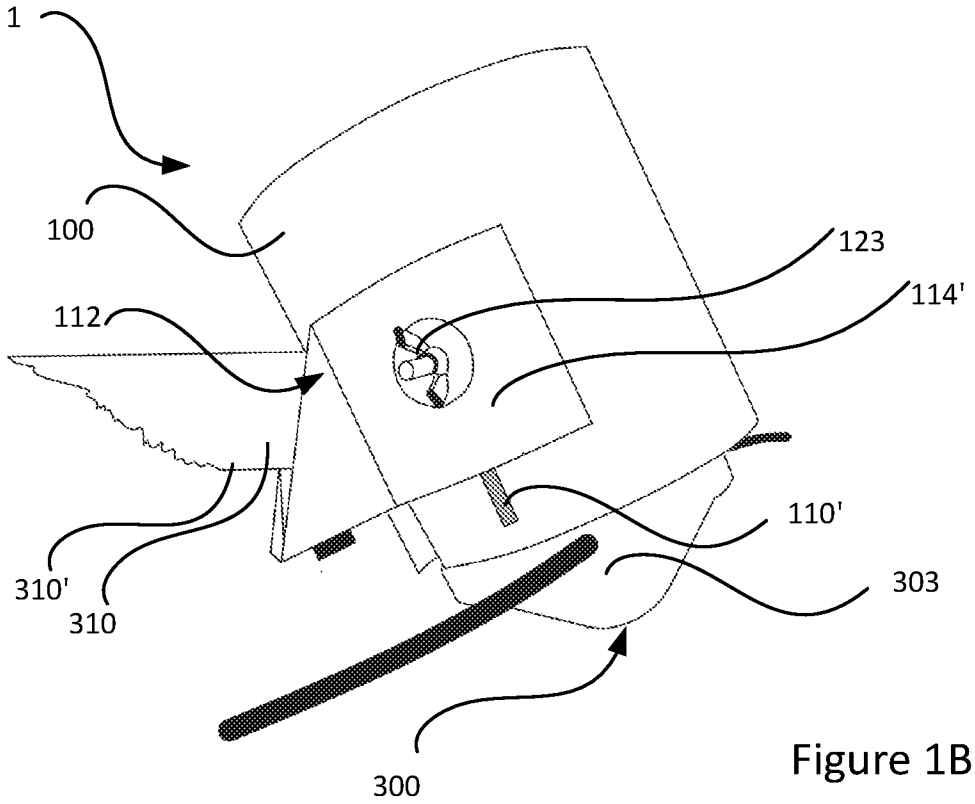

Figure 1B

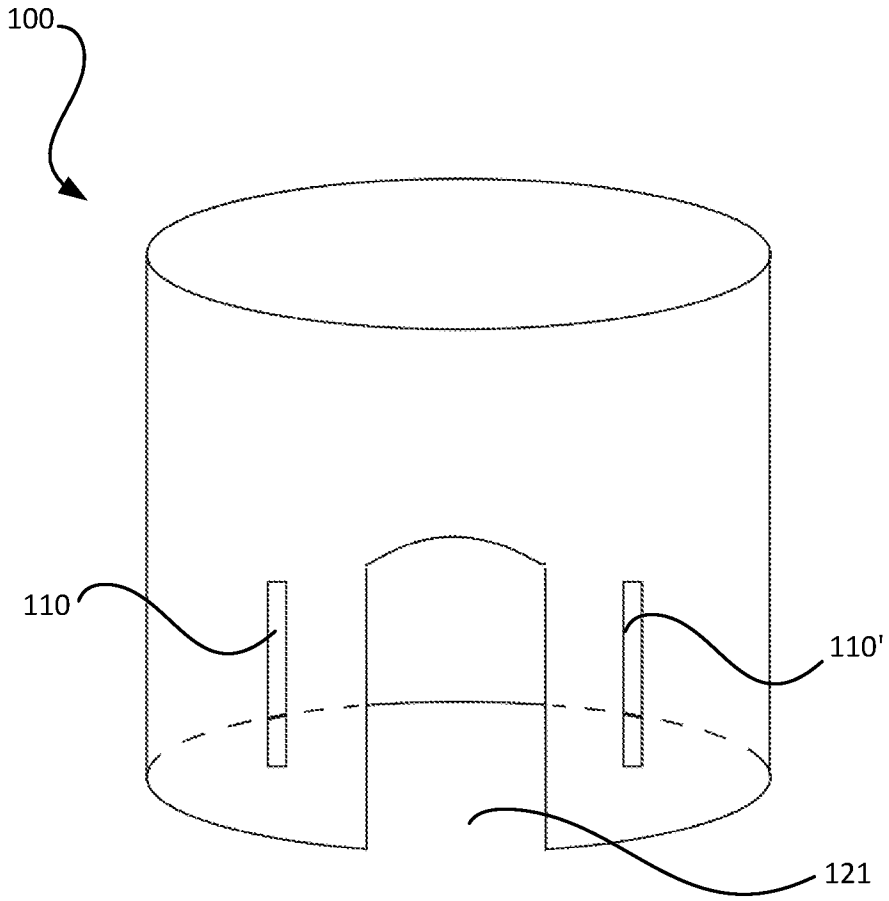

Figure 2

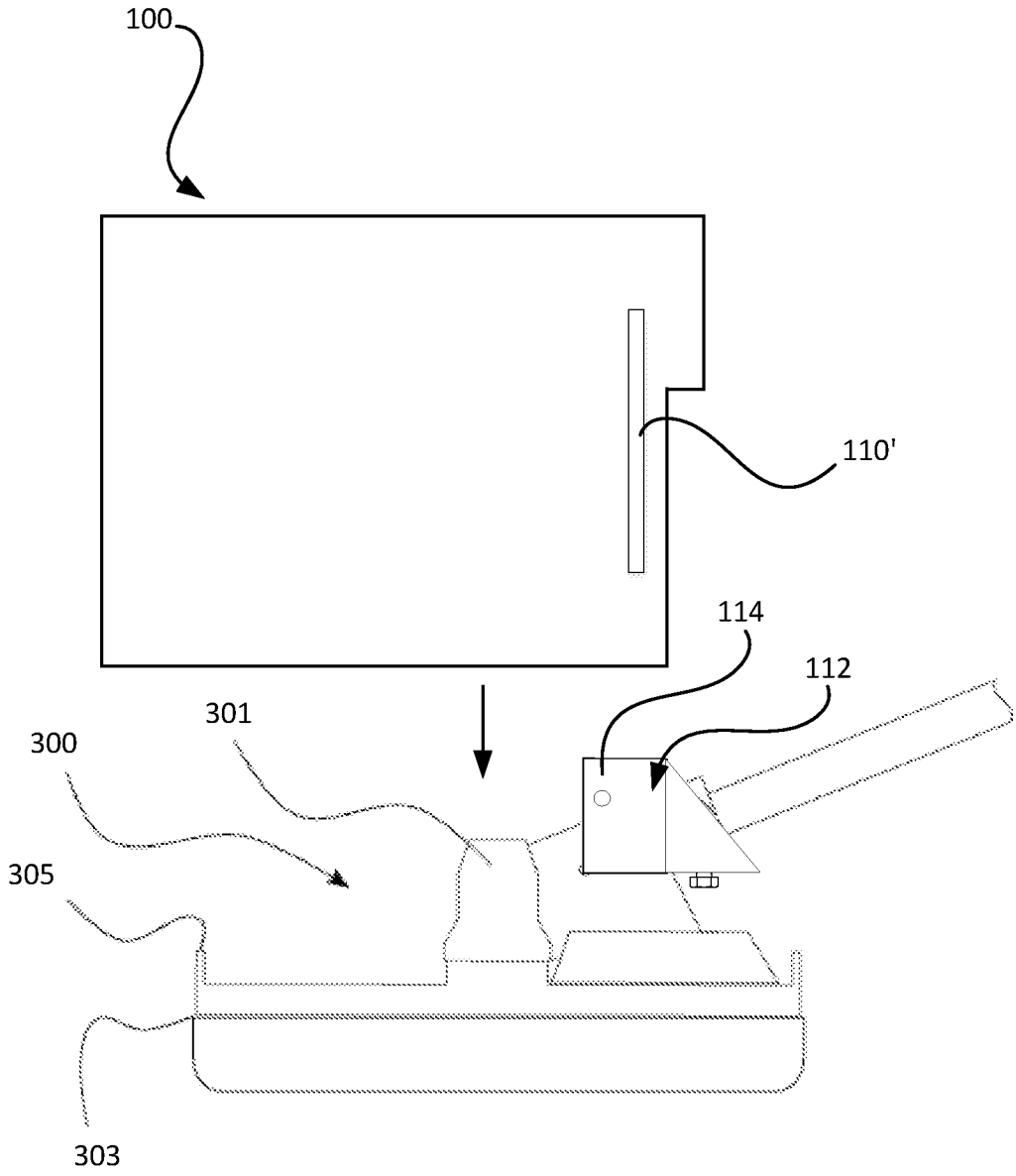

Figure 3

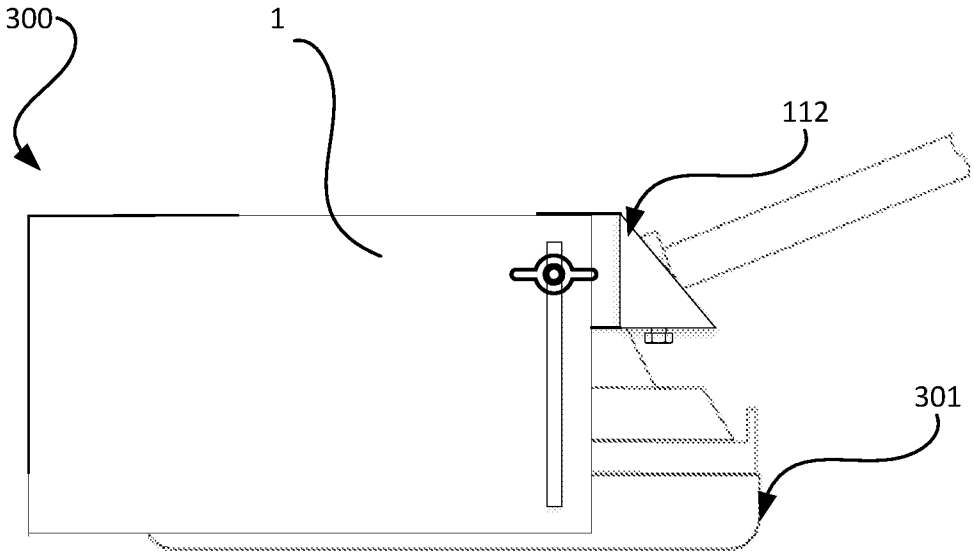

Figure 4

INTERNATIONAL SEARCH REPORT

International application No.
PCT/SE2022/051074

A. CLASSIFICATION OF SUBJECT MATTER

IPC: see extra sheet

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC: A01D, A01G, B25F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE, DK, FI, NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-Internal, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5924205 A (SUGIHARA TOMOHITO ET AL), 20 July 1999 (1999-07-20); column 2, line 21 - column 3, line 50; column 4, line 47 - column 5, line 65; figures 1-17 --	1-10
A	US 20160262306 A1 (MACEDONIO JOHN ET AL), 15 September 2016 (2016-09-15); paragraphs [0005]-[0007], [0019]-[0021]; figures 1-10 --	1-10
A	JP 3222213 U (MAKINO H), 18 July 2019 (2019-07-18); paragraphs [0006]-[0010], [0015]-[0016]; figures 1-2 --	1-10

☒ 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

"D" document cited by the applicant in the international application

"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
08-12-2022	08-12-2022

Name and mailing address of the ISA/SE	Authorized officer
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INTERNATIONAL SEARCH REPORT

International application No.
PCT/SE2022/051074

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 20040093740 A1 (SWANSON RICHARD C), 20 May 2004 (2004-05-20); paragraphs [0003], [0007]-[0010], [0017]-[0018]; figures 1-5	1-10
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A	US 4630371 A (GRAHAM ANDREW J), 23 December 1986 (1986-12-23); column 1, line 41 - line 66; column 3, line 1 - column 4, line 19; figures 1-3	1-10
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A	US 7963041 B1 (SMITH CRAIG A), 21 June 2011 (2011-06-21); column 3, line 32 - line 58; column 4, line 38 - column 6, line 67; figures 1-8	1-10
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A	US 6941738 B1 (STANDISH EDWARD B), 13 September 2005 (2005-09-13); column 1, line 34 - column 2, line 8; figures 1-3	1-10
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A	US 20200084962 A1 (YUAN FENG ET AL), 19 March 2020 (2020-03-19); paragraphs [0007]-[0009], [0026]-[0043], [0053]-[0058]; figures 1-13	1-10
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A	US 20120073146 A1 (HEBERT MICHAEL J), 29 March 2012 (2012-03-29); paragraphs [0008]-[0010], [0015]-[0028]; figures 1-3	1-10
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International Patent Classification (IPC)

A01D 34/81 (2006.01)
A01D 34/82 (2006.01)
A01D 34/90 (2006.01)
A01G 3/04 (2006.01)
A01G 3/053 (2006.01)
A01G 3/06 (2006.01)
B25F 5/02 (2006.01)

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