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

(11) **EP 4 049 957 A1**

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
31.08.2022 Bulletin 2022/35

(21) Application number: **21158863.7**

(22) Date of filing: **24.02.2021**

(51) International Patent Classification (IPC):
B65H 75/36 *(2006.01)*

(52) Cooperative Patent Classification (CPC):
B65H 75/366; B65H 2701/33

(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:
KH MA MD TN

(71) Applicant: **HUSQVARNA AB**
561 82 Huskvarna (SE)

(72) Inventors:
- **Frey, Reiner**
  89231 Neu-Ulm (DE)
- **Sauter, Thomas**
  89150 Laichingen (DE)

(74) Representative: **Finkele, Rolf**
Gardena Manufacturing GmbH
Hans-Lorenser-Straße 40
89079 Ulm (DE)

(54) HOSE STORAGE UNIT FOR STORING HOSE

(57) A hose storage unit (100) for storing a hose (102) at a tap (104). The hose storage unit (100) includes a storage hook (106) to receive the hose (102). The hose storage also includes a tap connector (134) to fluidly connect the hose (102) and the tap (104). The hose storage unit (100) is characterized in that an adaptor (130) is removably coupled with the tap (104) and engaged with the tap connector (134). The adaptor (130) fluidly couples the tap (104) with the tap connector (134). Further, the storage hook (106) is associated with the adaptor (130).

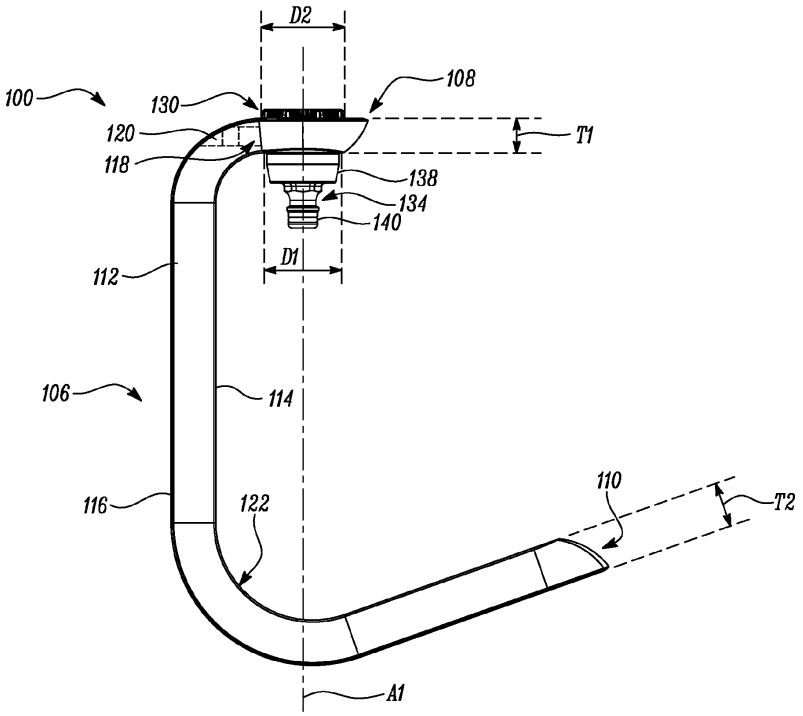

FIG. 1

EP 4 049 957 A1

Description

TECHNICAL FIELD

[0001] The present disclosure relates to a hose storage unit for storing a hose.

BACKGROUND

[0002] A hose storage device for storing a hose, specifically a water hose, is well-known. Such hose storage devices are generally mounted on a wall, a cabinet, and the like, which may increase components associated with the hose storage devices. This additional mounting of such components of the hose storage device may be challenging in some situations. The hose storage device typically includes a hose trolley or a hose box. The hose trolleys or the hose boxes require increased space on a floor or may have to be firmly mounted to the wall. Typically, such arrangements are not useful for short hoses. Further, the hose trolleys or the hose boxes are expensive which increase an overall cost associated with the hose storage device.

[0003] Additionally, different hose storage devices have been developed for storing the water hose around a water tap. Such hose storage devices generally include a hose holder or hanger which is coupled to the water tap. However, such hose storage device also face constraints due to involvement of a large number of components, connection joints, attachments, and the like. The hose holder or hanger may also put pressure on connection of the hose storage device with the tap. Thus, there is a need for an improved design of the hose storage device which provides a simple and cost-effective means for hose storage and can be used for different (say short) hoses.

[0004] An example of a hose holder is provided in WO Patent Application 2017/148,522 (hereinafter referred to as '522 reference). The '522 reference discloses the hose holder for storing a hose at a water tap. The hose holder includes a connection portion for connecting a holding device with the water tap and a holding portion for receiving the hose. The connection portion includes a tap connection portion for mechanically and fluidly coupling the hose holder with the water tap. The holding portion includes a hose receiving area for supporting the coiled hose in a hanging position such that the windings of the coiled hose are arranged in a vertical plane. However, in this type of the hose holder a weight of the hose is directly supported by the tap connection portion, which may lead to unintended disassembly or accidents. Moreover, hoses having a longer length are generally heavier which may damage the tap connection portion leading to leakage or complete break-off.

SUMMARY

[0005] In view of the above, it is an objective of the present disclosure to solve or at least reduce the drawbacks discussed above. The objective is at least partially achieved by a new design of a hose storage unit for storing a hose at a tap. The hose storage includes a storage hook to receive the hose. The hose storage also includes a tap connector to fluidly connect the hose and the tap. The hose storage unit is characterized in that an adaptor is removably coupled with the tap and engaged with the tap connector. The adaptor fluidly couples the tap with the tap connector. Further, the storage hook is associated with the adaptor.

[0006] The present disclosure provides an improved design of the hose storage unit which allows quick and easy installation of the hose at the tap. The new design of the hose storage unit can be installed in a compact space and is readily compatible. Further, the hose storage unit does not require an external structure such as a wall for mounting the hose storage units or components thereof. The hose storage unit includes fewer parts thus making the assembly simple and cost effective. Further, the storage hook is directly connected to the adaptor which acts as a screw element. Therefore, a liquid can be fed directly into the hose through the adaptor, and the tap connector. A circular arrangement of the hose storage unit allows the storage hook to rotate around a central axis of the adaptor which makes the hose storage unit user friendly and provides improved ergonomics. Further, the tap connector includes a sealing element that provides tightness of the hose storage unit with an existing tap. Moreover, the hose is stored on the storage hook which is associated (or coupled) to the adaptor hence a weight of the hose is supported by the adaptor which prevents damage and breakdown at the hose connection.

[0007] According to an embodiment of the present disclosure, the storage hook is associated with the adaptor by coupling the storage hook (106) around the adaptor (130). This may allow implementation benefits along with ease of assembly or disassembly of the storage hook with the adaptor.

[0008] According to an embodiment of the present disclosure, the storage hook is associated with the adaptor by fixing the storage hook with the adaptor. The fixing of the storage hook with the adaptor may include application of one or more of a glue, fasteners, and the like.

[0009] According to an embodiment of the present disclosure, the storage hook is associated with the adaptor by having the storage hook to be integral with the adaptor. This may lead to manufacturing and service benefits, for application of the storage hook and the adaptor.

[0010] According to an embodiment of the present disclosure, the coupling between the adaptor and the tap connector is a thread coupling. The coupling may be any type of coupling such as the thread coupling which provides ease in assembly and rigidity to a connection between the adaptor and the tap connector.

[0011] According to an embodiment of the present disclosure, the adaptor is threadably coupled with the tap.

The thread coupling provides ease in assembly and rigidity to a connection between the adaptor and the tap, though the coupling may be any coupling such as snap-fit, press-fit or any other as used or known in the art.

[0012] According to an embodiment of the present disclosure, the storage hook is removably coupled around the adaptor and the tap connector. Such a removable coupling provides flexibility to use the hose storage unit for different taps thereby providing a versatile and modular hose storage unit. Further, the hose storage unit may be quickly dissembled when not in use.

[0013] According to an embodiment of the present disclosure, the storage hook includes a hose receiving portion to receive the hose. The hose receiving portion allows the user to store (say winding or looping) the hose on the storage hook.

[0014] According to an embodiment of the present disclosure, the hose receiving portion of the storage hook is substantially horizontal. The substantially horizontal hose receiving portion provides a larger and stable area for holding of the hose in a horizontal configuration.

[0015] According to an embodiment of the present disclosure, the hose receiving portion of the storage hook is inclined with respect to the central axis of the adaptor. Such an inclined hose receiving portion allows the hose to be stored in an inclined configuration which provides easy and secure storage of the hose.

[0016] According to an embodiment of the present disclosure, the storage hook has a "U" shape. The storage hook may have any shape (say "V", "L" and like shapes), size, type as per application requirements. This arrangement (i.e., the "U" shape of the present disclosure) of the storage hook may provide easy, stable, and secure storage of the hose.

[0017] According to an embodiment of the present disclosure, the storage hook includes a hole to receive the adaptor. This arrangement provides easy assembly of the storage hook around the adaptor and thereby with the tap.

[0018] Other features and aspects of this disclosure will be apparent from the following description and the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0019] The disclosure will be described in more detail with reference to the enclosed drawings, wherein:

FIG. 1 illustrates a side view of a hose storage unit, according to an embodiment of the present disclosure;

FIG. 2 illustrates an exploded view of the hose storage unit, according to an embodiment of the present disclosure;

FIG. 3 illustrates a top view of the hose storage unit, according to an embodiment of the present disclosure;

FIG. 4A illustrates a perspective view of the hose storage unit and a tap in a first position, according to an embodiment of the present disclosure;

FIG. 4B illustrates a perspective view of the hose storage unit and the tap in a second position, according to an embodiment of the present disclosure;

FIG. 4C illustrates a perspective view of the hose storage unit and the tap in a third position, according to an embodiment of the present disclosure;

FIG. 4D illustrates a perspective view of the hose storage unit and the tap in a fourth position, according to an embodiment of the present disclosure; and

FIG. 5 illustrates a perspective view of the hose storage unit and a hose, according to an embodiment of the present disclosure.

DESCRIPTION OF EMBODIMENTS

[0020] The present disclosure will be described more fully hereinafter with reference to the accompanying drawings, in which example embodiments of the disclosure incorporating one or more aspects of the present disclosure are shown. This disclosure may, however, be embodied in many different forms and should not be construed as limited to the embodiments set forth herein; rather, these embodiments are provided so that this disclosure will be thorough and complete, and will fully convey the scope of the disclosure to those skilled in the art. For example, one or more aspects of the present disclosure may be utilized in other embodiments and even other types of structures and/or methods. In the drawings, like numbers refer to like elements.

[0021] Certain terminology is used herein for convenience only and is not to be taken as a limitation on the disclosure. For example, "upper", "lower", "front", "rear", "side", "longitudinal", "lateral", "transverse", "upwards", "downwards", "forward", "backward", "sideward", "left," "right," "horizontal," "vertical," "upward", "inner", "outer", "inward", "outward", "top", "bottom", "higher", "above", "below", "central", "middle", "intermediate", "between", "end", "adjacent", "proximate", "near", "distal", "remote", "radial", "circumferential", or the like, merely describe the configuration shown in the Figures. Indeed, the components may be oriented in any direction and the terminology, therefore, should be understood as encompassing such variations unless specified otherwise.

[0022] **FIG. 1** illustrates a hose storage unit **100** for storing a hose **102** (as shown in **FIG. 5**) at a tap **104** (as shown in **FIG. 5**). The hose storage unit **100** may be used to store hoses **102** having different lengths and types. The length and the type of the hose **102** may vary depending upon application requirements. The hose **102**

may be used for a number of indoor and outdoor applications. Further, the tap **104** may supply any type of liquid, without limiting the scope of the present invention. In the illustrated embodiment, the tap **104** supplies water. In application, water from the tap **104** may flow through the hose **102.** The tap **104** may include any type of tap such as a wall mounted tap, a pillar tap, a mixer tap, and the like.

[0023] The hose storage unit **100** includes a storage hook **106** to receive the hose **102.** The storage hook **106** has a substantially C-shaped, or U-shaped structure. The storage hook **106** includes a first end **108,** a second end **110,** and a vertical portion **112.** The vertical portion **112** extends between the first and second ends **108, 110.** The storage hook **106** also includes a first surface **114** and a second surface **116.** The first surface **114** and second surface **116** include a generally curved shaped profile. The first end **108** defines a first thickness **"T1"**. The storage hook **106** defines a through hole **118** (as shown in **FIG. 3**) proximate the first end **108** to receive a screw lock **120** (as shown in **FIG. 3**). In some embodiments, the screw lock **120** may allow selective locking i.e., rotational locking of the storage hook **106.** The screw lock **120** may allow selective locking of the storage hook **106** at any angular position or orientation with respect to a central axis "**A1"** of an adaptor **130.** In some embodiments, the screw lock **120** may be movable within the through hole **118** to allow locking of the storage hook **106** with one or more of the adaptor **130,** and the tap **104.**

[0024] The second end **110** defines a second thickness **"T2".** Further, in some embodiments, the second thickness **"T2"** is greater than the first thickness **"T1"**. Alternatively, the second thickness **"T2"** may be equal to the first thickness **"T1".** The storage hook **106** may be manufactured using a material such as a synthetic plastic, a metal alloy, and the like. It should be noted that the material of the storage hook **106** does not limit the scope of the present invention.

[0025] The storage hook **106** further includes a hose receiving portion **122** to receive the hose **102.** The hose receiving portion **122** is disposed proximate the second end **110** of the storage hook **106.** The hose receiving portion **122** may include a rough surface (or elements or features such as knurling) to promote gripping and/or inadvertent movement of the stored hose **102.** Further, the hose receiving portion **122** receives the hose **102** in a coiled or wound form. The hose **102** may be folded into a number of coils to store the coiled hose **102** on the hose receiving portion **122.** In the illustrated embodiment, the hose receiving portion **122** of the storage hook **106** is inclined with respect to the central axis "**A1"** of an adaptor **130** (as shown in **FIG. 2**). Further, the inclination of the hose receiving portion **122** with respect to the central axis "**A1"** may vary between 0 degree to 90 degrees. In some embodiments, the inclination of the hose receiving portion **122** with respect to the central axis "**A1"** may lie between 35 degrees and 70 degrees. In some embodiments, the hose receiving portion **122** of the storage hook **106** is substantially horizontal. In such an example, the hose receiving portion **122** may be substantially perpendicular to the vertical portion **112.** In yet other embodiments, the storage hook **106** has a "U" shape. In such an example, the second end **110** may be disposed substantially parallel to the vertical portion **112.**

[0026] Referring to **FIG. 2,** the storage hook **106** includes a hole **132** to receive the adaptor **130.** The hole **132** may be embodied as a through-hole. The hole **132** may define an internal threading (not shown). The hole **132** may include a counterbore hole, a countersink hole, and the like. The hole **132** is disposed proximate the first end **108** of the storage hook **106.** The hole **132** defines a hole diameter **"D1".** A shape and a size of the hole **132** is designed based on the shape and size of the adaptor **130.**

[0027] The hose storage unit **100** also includes a tap connector **134** to fluidly connect the hose **102** (see **FIG. 5**) and the tap **104** (see **FIG. 5**). The tap connector **134** includes a first coupling portion **138** to couple the tap connector **134** with the adaptor **130** and a second coupling portion **140** forming a liquid outlet. The second coupling portion **140** receives a hose connector **142** (as shown in **FIG. 5**). Further, a washer **136** may be provided within the first coupling portion **138** to provide a liquid-tight connection between the tap connector **134** and the adaptor **130.**

[0028] The hose storage unit **100** further includes the adaptor **130.** The adaptor **130** fluidly couples the tap **104** with the tap connector **134.** The adaptor **130** is removably coupled with the tap **104** and engaged with the tap connector **134.** In particular, the adaptor **130** is threadably coupled with the tap **104.** The adaptor **130** receives an outlet portion **144** (as shown in **FIGS. 4A** and **4B**) of the tap **104.** Furthermore, the coupling between the adaptor **130** and the tap connector **134** is a thread coupling, or any other coupling such as a press-fit, a snap-fit and like coupling as used or known in the art.

[0029] The adaptor **130** includes a first portion **146** defining a diameter **"D2** and a thickness **"T3".** The first portion **146** may define a blind hole to receive the screw lock **120** (see **FIG. 3**). The first portion **146** may also define a number of internal threads (not shown). The adaptor **130** also includes a second portion **148** defining a diameter **"D3"** and a thickness **"T4".** Further, the diameter **"D2"** of the first portion **146** is greater than the diameter **"D3"** of the second portion **148.** Moreover, the second portion **148** defines a number of external threads **152.** In the illustrated embodiment, the tap connector **134** receives the second portion **148** of the adaptor **130.** The adaptor **130** further includes a sealing element **154** disposed between the first portion **146** thereof and the outlet portion **144** of the tap **104** for a leak-proof coupling between the adaptor **130** and the tap **104.** The sealing element **154** may include one or more washers, seals and the like and provides water as well as connection tightness at a connection between the adapter **130** and the tap **104.**

[0030] As shown in **FIGS. 1** and **3,** the storage hook **106** may be secured to the adaptor **130** using the screw lock **120.** Further, the storage hook **106** is associated with (say coupled around) the adaptor **130.** in the illustrated embodiment, the storage hook **106** is removably coupled around the adaptor **130** and the tap connector **134.** More particularly, the storage hook **106** is coupled around the adaptor **130** proximate the first end **108** of the storage hook **106.** The adaptor **130** is received by the hole **132** of the storage hook **106** since the diameter **"D2"** of the first portion **146** of the adaptor **130** is approximately equal to the hole diameter **"D1"**of the hole **132.** The hole **132** may partially receive the adaptor **130** since the thickness **"T3"** of the first portion **146** of the adaptor **130** is greater than the thickness **"T1"** of the first end **108** of the storage hook **106.** Further, the counterbore or countersink profile of the hole **132** may receive the second portion **148** of the adaptor **130.** A combined thickness **"T2", "T3"** of the adapter **130** is greater than the first thickness **"T1"** of the first end **108** of the storage hook **106.** Further, a portion of the adapter **130** at the first portion **146** extends out partially in an upward direction from the storage hook **106** to couple with the outlet portion **144** of the tap **104** and a portion of the adapter **130** at the second portion **148** extends out partially in a downward direction from the storage hook **106** to receive the tap connector **134** (see **FIG. 5**). Furthermore, the thickness **"T4"** of the second portion **148** of the adaptor **130** is greater than the thickness **"T1"** of the first end **108** of the storage hook **106.**

[0031] In some embodiments, the storage hook **106** may be coupled around the adaptor **130.** This may allow implementation benefits along with ease of assembly or disassembly of the storage hook **106** with the adaptor **130.** In some embodiments, the storage hook **106** may be fixed with the adaptor **130.** The fixing of the storage hook **106** with the adaptor **130** may allow selective locking or rotation of the storage hook **106** with respect to the adaptor **130.** Further, the fixing of the storage hook **106** with the adaptor **130** may include application of one or more of a glue, fasteners, and the like, or any fastening means as used or known in the art. In some embodiments, the storage hook **106** may be integral with the adaptor **130.** This may lead to manufacturing and service benefits, for application of the storage hook **106** and the adaptor **130.** The present disclosure allows any association, arrangement, coupling, fixing, and the like between the storage hook **106** and the adaptor **130,** and all such variations are well within the scope of the present disclosure.

[0032] **FIGS. 4A, 4B, 4C,** and **4D** show the assembly of the hose storage unit **100** with the tap **104** (see **FIG. 5**). Referring to **FIG. 4A,** in a first position, the adaptor **130,** the storage hook **106,** the tap connector **134,** and the tap **104** are shown in an unassembled configuration. Referring to **FIG. 4B,** in a second position, the adaptor **130** is threadably coupled to the outlet portion **144** of the tap **104.** The outlet portion **144** of the tap **104** may define external threads (not shown) for threadable coupling of the adaptor **130.** Referring to **FIG. 4C,** in a third position, the storage hook **106** is coupled around the adaptor **130.** This removable coupling of the storage hook **106** allows the storage hook **106** to be rotated at 360 degrees about the central axis "**A1"** of the adaptor **130.** Referring to **FIG. 4D,** in a fourth position, the tap connector **134** is threadably coupled to the second portion **148** of the adaptor **130** to fluidly connect the tap connector **134** (and thereby the hose **102,** see **FIG. 5**) and the tap **104.** As shown in **FIG. 5**, the hose connector **142** is coupled to the second coupling portion **140** of the tap connector **134.** The hose connector **142** may include a body portion (not shown) having an arrangement such as threads that allow engagement of the hose **102** with the hose connector **142.**

[0033] The present invention provides an improved and simplified design of the hose storage unit **100** which allows easy installation. The new design of the hose storage unit **100** can be accommodated in compact spaces. Further, the hose storage unit **100** does not require an external structure such as a wall for mounting the hose storage unit **100** or components thereof and can be directly stored proximate the tap **104.** The hose storage unit **100** includes fewer parts thus making the assembly simple in design and cost effective. Further, the storage hook **106** is directly connected to the adaptor **130** as a screw element. Therefore, a liquid can be fed directly into the hose **102** through the adaptor **130.**

[0034] Moreover, the storage hook **106** can be rotated relative to the tap **104** around the central axis "**A1"** of the adaptor **130,** thereby allowing storage of the hose **102** at various positions relative to the tap **104.** Such a design makes the hose storage unit **100** user friendly and improves ergonomics. Additionally, the hose **102** can be quickly assembled and disassembled from the tap **104** using the hose storage unit **100** described herein. Further, the adaptor **130** includes the sealing element **154** that provides tightness between the hose storage unit **100** and the tap **104.** Moreover, the hose **102** is stored on the storage hook **106** which is coupled to the adaptor **130** hence the weight of the hose **102** is supported by the adaptor **130** thereby preventing damage and breakdown at the hose connection.

[0035] In the drawings and specification, there have been disclosed preferred embodiments and examples of the disclosure and, although specific terms are employed, they are used in a generic and descriptive sense only and not for the purpose of limitation of the scope of the disclosure being set forth in the following claims.

LIST OF ELEMENTS

[0036]

100	Hose Storage Unit
102	Hose
104	Tap
106	Storage Hook

108 First End
110 Second End
112 Vertical Portion
114 First Surface
116 Second Surface
118 Through Hole
120 Screw Lock
122 Hose Receiving Portion
130 Adaptor
132 Hole
134 Tap Connector
136 Washer
138 First Coupling Portion
140 Second Coupling Portion
142 Hose Connector
144 Outlet Portion
146 First Portion
148 Second Portion
152 External Threads
154 Sealing Element
A1 Central Axis
D1 Hole Diameter
D2 Diameter of First Portion
D3 Diameter of Second Portion
T1 Thickness of First End
T2 Thickness of Second End
T3 Thickness of First Portion
T4 Thickness of Second Portion

Claims

1. A hose storage unit **(100)** for storing a hose **(102)** at a tap **(104),** comprising:

a storage hook **(106)** adapted to receive the hose **(102);** and
a tap connector **(134)** adapted to fluidly connect the hose **(102)** and the tap **(104);**

characterized in that:
an adaptor **(130)** removably coupled with the tap **(104)** and engaged with the tap connector **(134),** wherein the adaptor **(130)** fluidly couples the tap **(104)** with the tap connector **(134),** and wherein the storage hook **(106)** is associated with the adaptor **(130).**

2. The hose storage unit **(100)** of claim 1, wherein the storage hook **(106)** is associated with the adaptor **(130)** by coupling the storage hook (106) around the adaptor (130).

3. The hose storage unit **(100)** of claim 2, wherein the storage hook **(106)** is removably coupled around the adaptor **(130)** and the tap connector **(134).**

4. The hose storage unit **(100)** of claim 1, wherein the storage hook **(106)** is associated with the adaptor **(130)** by fixing the storage hook (106) with the adaptor (130).

5. The hose storage unit **(100)** of claim 1, wherein the storage hook **(106)** is associated with the adaptor **(130)** by having the storage hook (106) to be integral with the adaptor (130).

6. The hose storage unit **(100)** of any of the preceding claims, wherein the coupling between the adaptor **(130)** and the tap connector **(134)** is a thread coupling.

7. The hose storage unit **(100)** of any of the preceding claims, wherein the adaptor **(130)** is threadably coupled with the tap **(104).**

8. The hose storage unit **(100)** of any of the preceding claims, wherein the storage hook **(106)** includes a hose receiving portion **(122)** to receive the hose **(102).**

9. The hose storage unit **(100)** of claim 8, wherein the hose receiving portion **(122)** of the storage hook **(106)** is substantially horizontal.

10. The hose storage unit **(100)** of claim 8, wherein the hose receiving portion **(122)** of the storage hook **(106)** is inclined with respect to a central axis (**"A1"**) of the adaptor **(130).**

11. The hose storage unit **(100)** of any of the preceding claims, wherein the storage hook **(106)** has a "U" shape.

12. The hose storage unit **(100)** of any of the preceding claims, wherein the storage hook **(106)** includes a hole **(132)** to receive the adaptor **(130).**

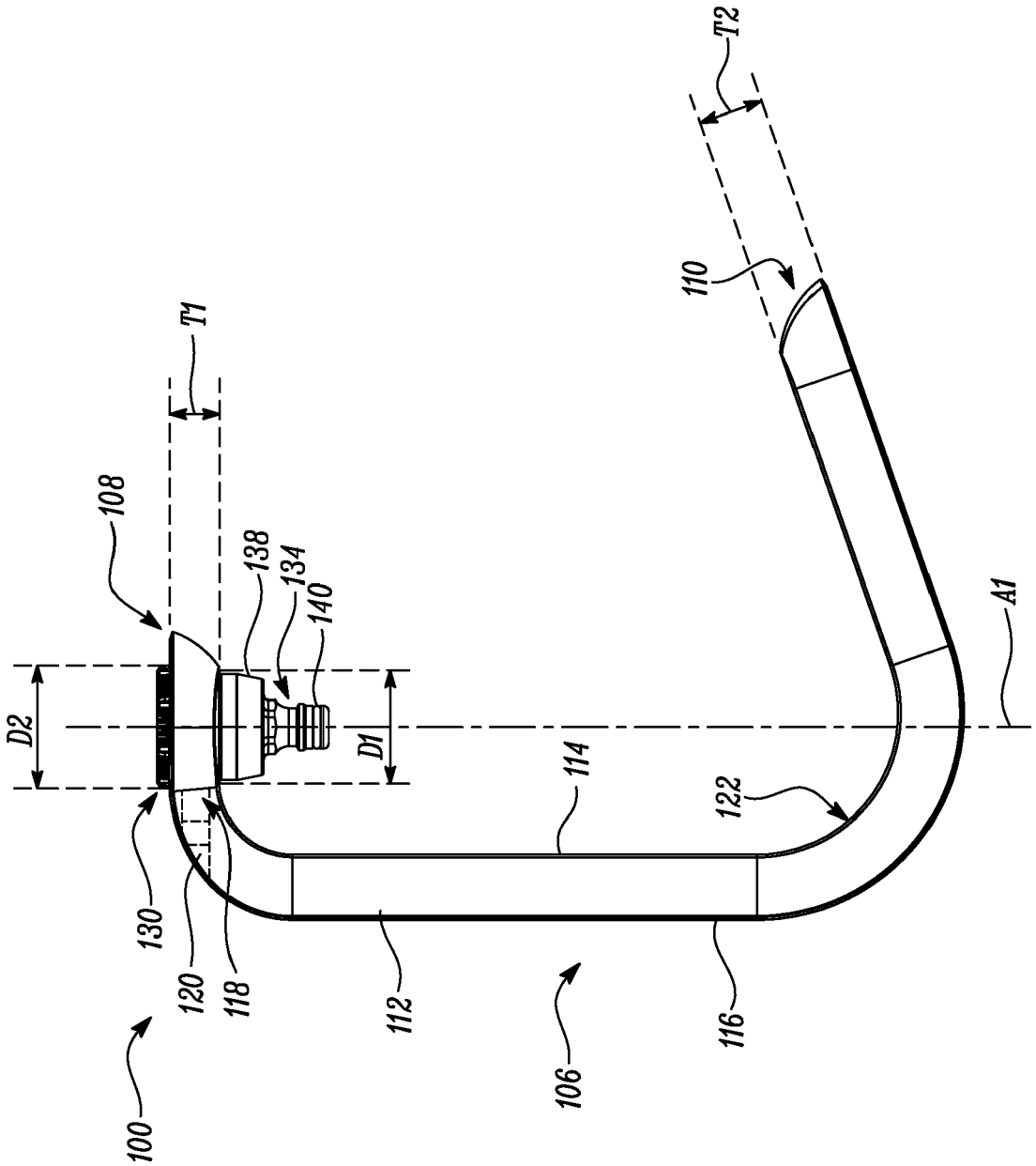
T2
110
T1
108
138
134
140
D2
D1
A1
114
122
130
120
118
112
106
116
100

FIG. 1

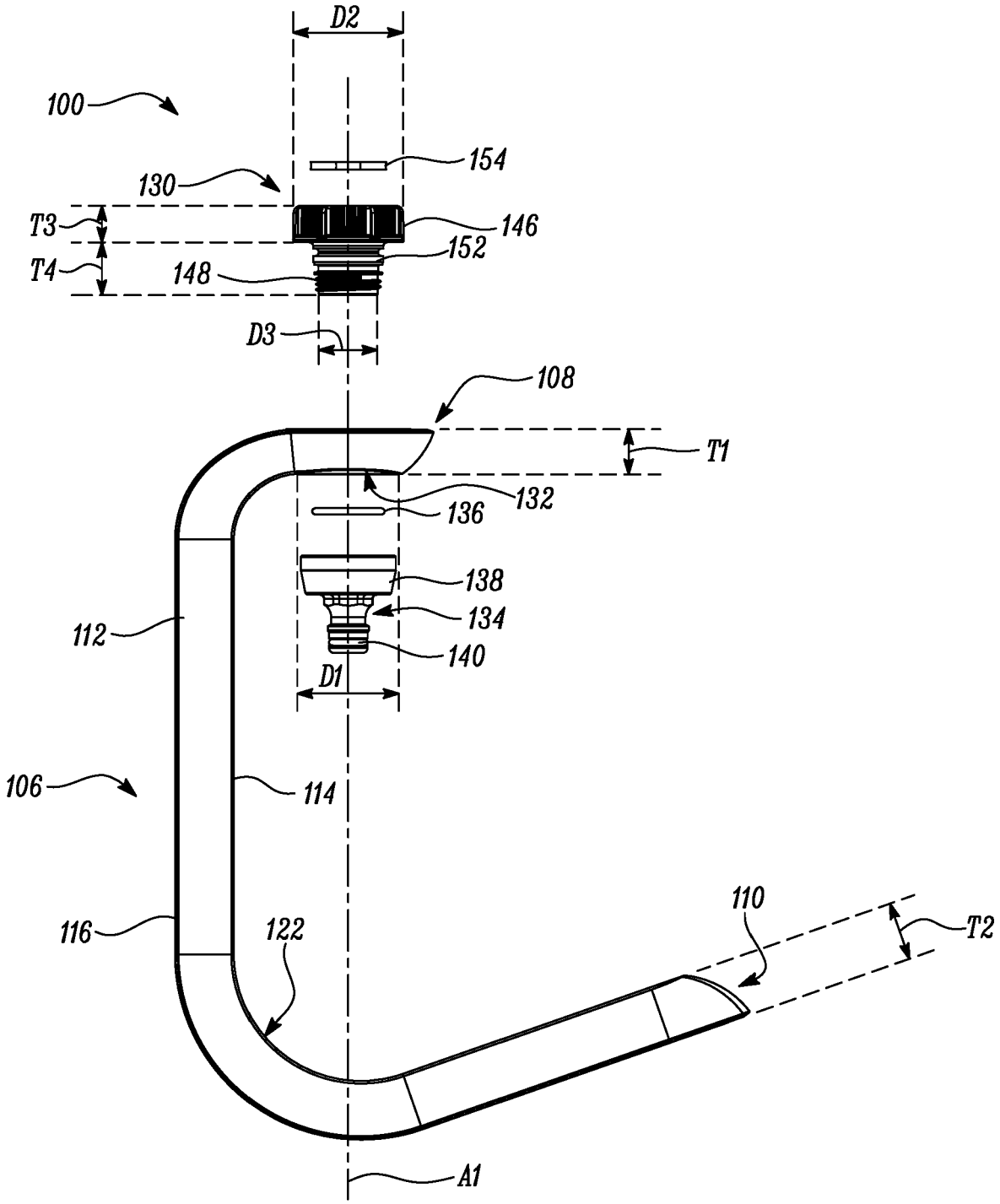
D2
100
154
130
T3
146
152
T4
148
D3
108
T1
132
136
138
134
112
140
D1
106
114
110
T2
116
122
A1

FIG. 2

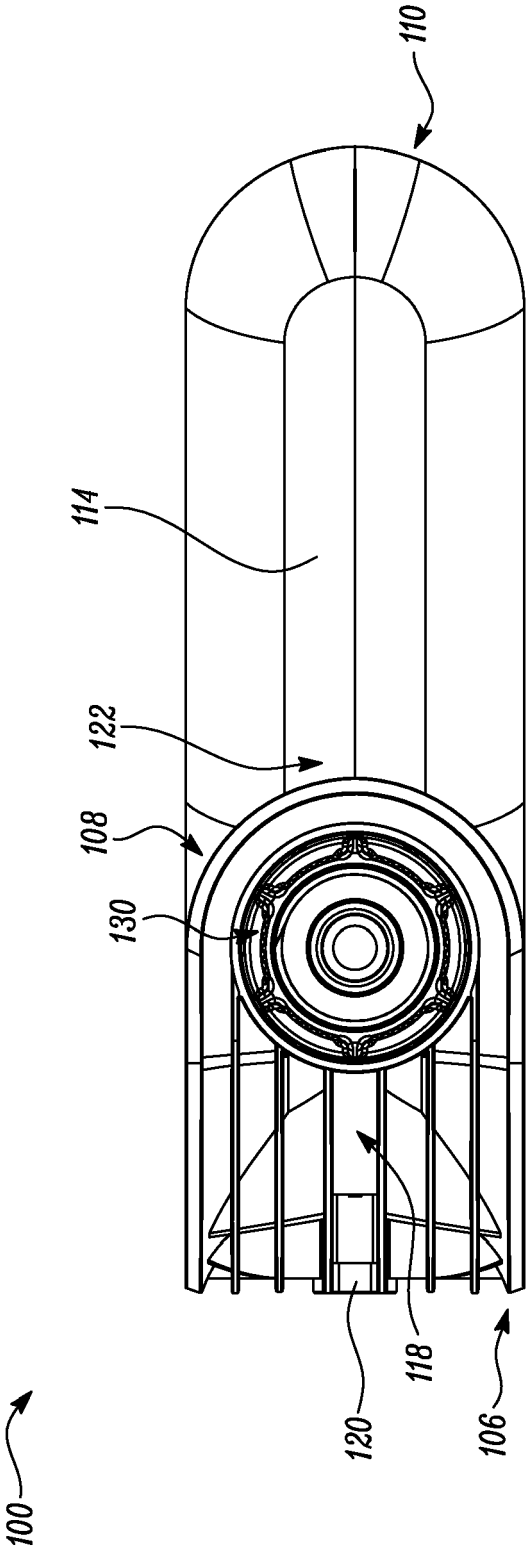

FIG. 3

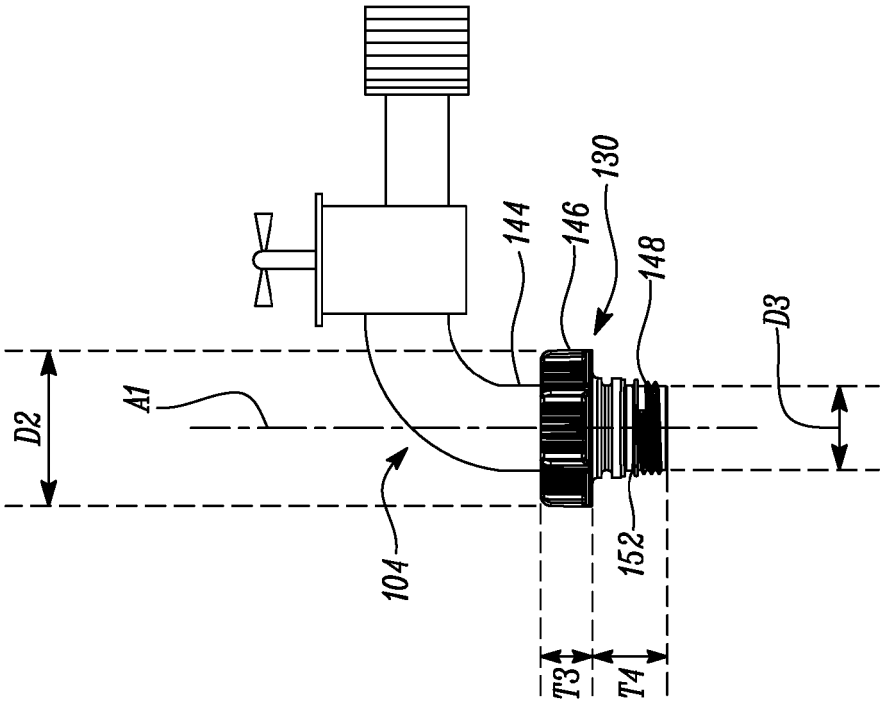
D2
A1
104
144
146
130
148
D3
152
T3
T4

FIG. 4B

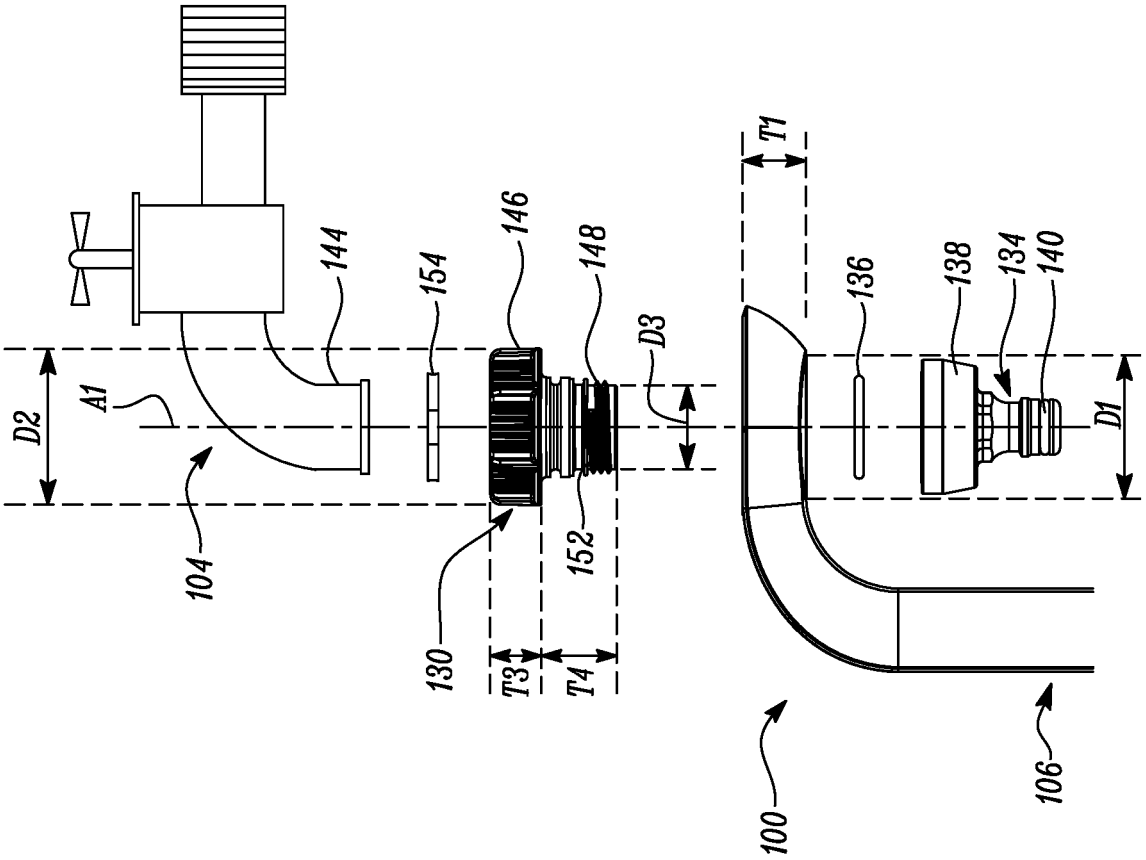
D2
A1
104
144
154
146
148
D3
130
152
T3
T4
T1
136
138
134
140
D1
100
106

FIG. 4A

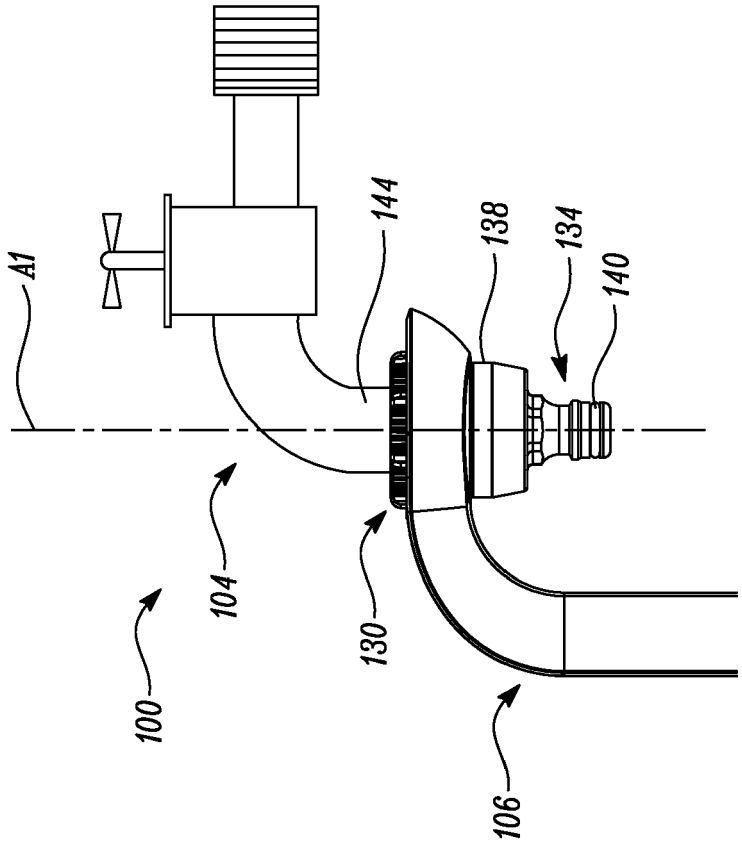

FIG. 4D

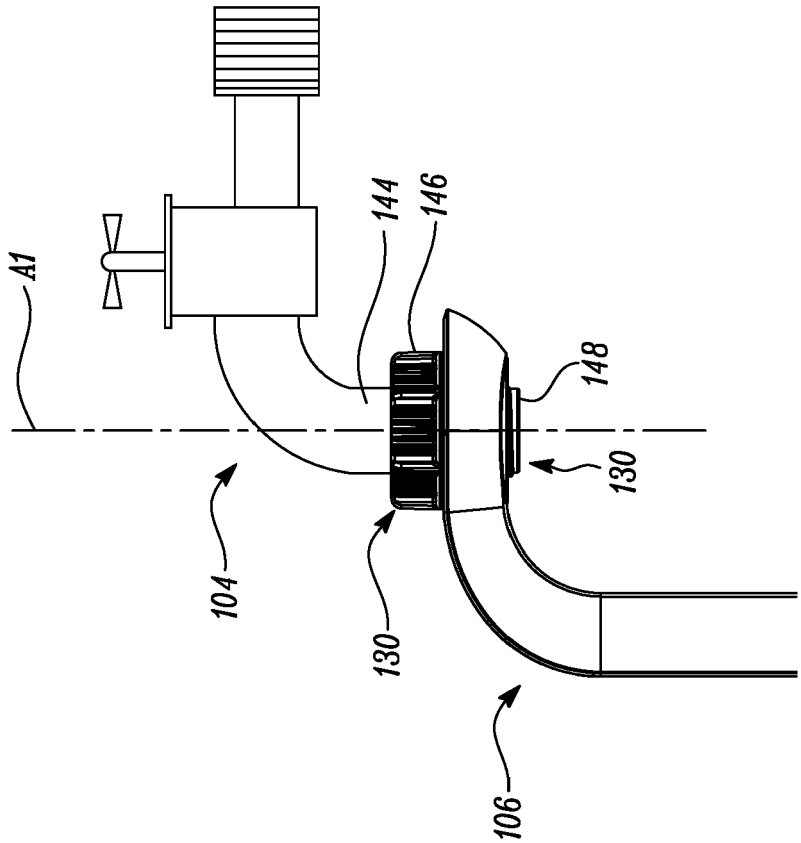

FIG. 4C

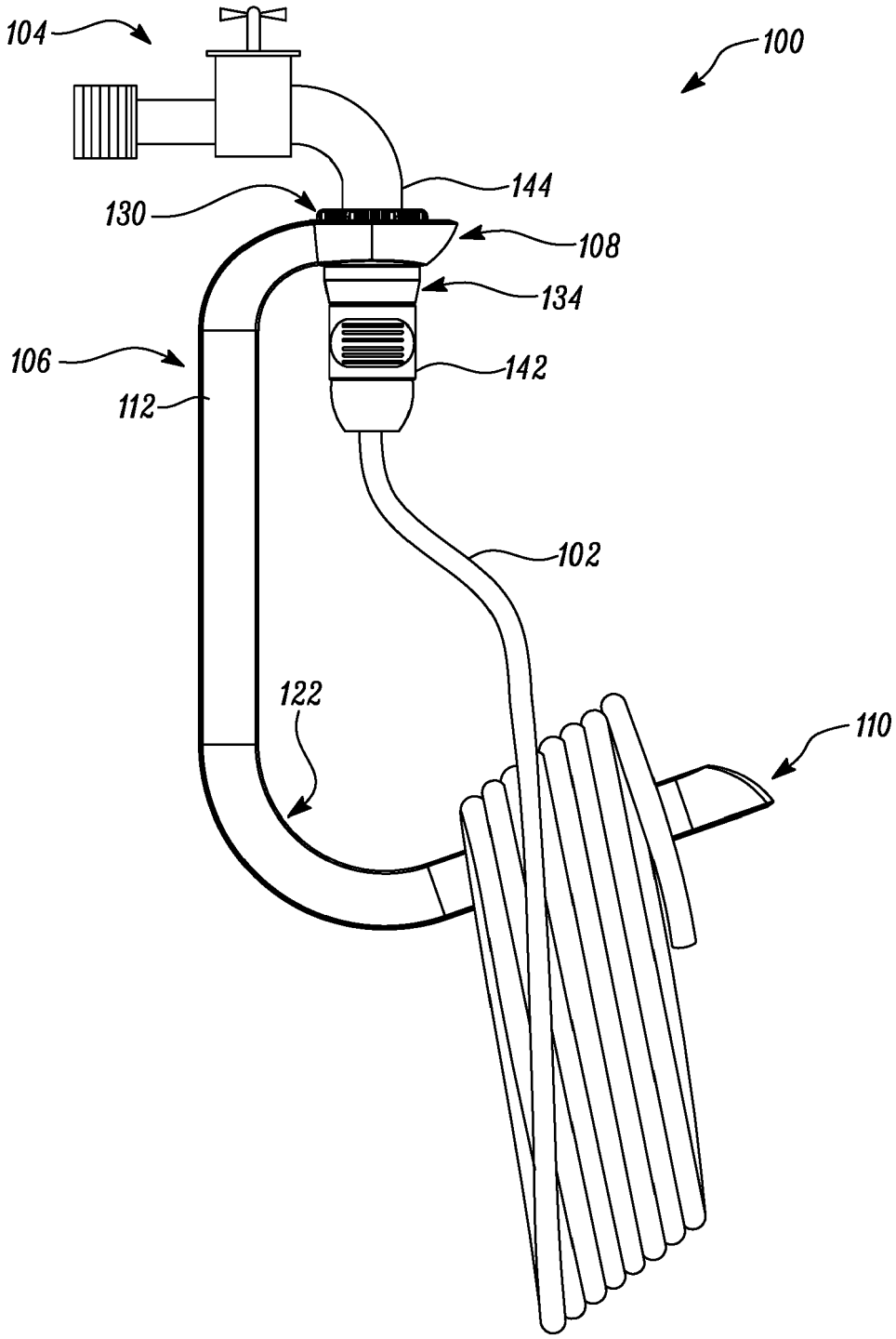

FIG. 6

Europäisches Patentamt
European Patent Office
Office européen des brevets

EUROPEAN SEARCH REPORT

Application Number
EP 21 15 8863

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	KR 2011 0024876 A (LEE JEONG SHIN [KR]) 9 March 2011 (2011-03-09) * paragraphs [0010] - [0017]; figures *	1-12	INV. B65H75/36
X	US 2 569 857 A (JAEGLE WILLIAM C ET AL) 2 October 1951 (1951-10-02) * column 2, line 1 - column 3, line 15; figures *	1,4,6-8,10	
X	US 2 111 811 A (SCHICHTEL JOHN N) 22 March 1938 (1938-03-22) * page 2, left-hand column, line 12; figures *	1-4,6,8,9,11,12	
A	US 2009/272857 A1 (HARDING RICHARD E [US]) 5 November 2009 (2009-11-05) * paragraphs [0017] - [0019]; figures *	1-12	
A,D	WO 2017/148522 A1 (HUSQVARNA AB [SE]) 8 September 2017 (2017-09-08) * page 8, lines 4-24 * * page 10, lines 24-31; figures *	1-12	

TECHNICAL FIELDS SEARCHED (IPC)

B65H

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	20 July 2021	Lemmen, René

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 21 15 8863

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.

20-07-2021

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
KR 20110024876 A	09-03-2011	NONE	
US 2569857 A	02-10-1951	NONE	
US 2111811 A	22-03-1938	NONE	
US 2009272857 A1	05-11-2009	NONE	
WO 2017148522 A1	08-09-2017	CN 108602642 A	28-09-2018
		EP 3423388 A1	09-01-2019
		PL 3423388 T3	01-06-2020
		TW 201731755 A	16-09-2017
		WO 2017148522 A1	08-09-2017

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 2017148522 A **[0004]**