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(54) BATTERY HOLDER DETACHABLY FIXED FOR TRANSPORT TO A PUMP

ZUM TRANSPORT ZU EINER PUMPE LÖSBAR BEFESTIGTER BATTERIEHALTER

SUPPORT DE BATTERIE FIXÉ AMOVIBLE POUR LE TRANSPORT JUSQU'À UNE POMPE

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US-A- 6 146 108

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Description

TECHNICAL FIELD

[0001] The present disclosure relates to submersible pumps. More specifically, the present disclosure relates to a battery holder which provides benefits such as ease of transport when used with the submersible pumps.

BACKGROUND

[0002] Submersible pumps generally make use of one or more batteries for powering purposes. The batteries are generally housed inside a control housing (also referred to as a battery holder) for protection from outside agents such as rains, impurities and the like. Generally, conventional arrangement of the submersible pumps and the control housing make use of a flexible connection (say a fixed wire) to connect them for transfer of power. However, such conventional arrangements have constraints which make it difficult to transport the submersible pumps and the control housing together, which can severely hamper the portability of these arrangements.

[0003] Moreover, while ease of transport is quite crucial for a common user, there are also concerns regarding storage space occupied by the conventional arrangements which usually have a detached configuration of the submersible pumps and the control housing. Presently, there is a requirement to store the submersible pump and the control housing separately leading to a waste of storage space.

[0004] An example of a submersible pump is provided by EP1455092 (hereinafter referred to as '092 reference). The '092 reference provides a battery-driven pump with a motor and a battery, an adjustable control device for adjusting the power output of the battery to the motor. Further, the battery driven pump and the control device are connected by a supply line. However, the '092 reference does not disclose a means allowing convenient transport of the battery-driven pump and the control device together.

[0005] Another example of a submersible pump is provided by DE 10 2005 031420 A1. This pump discloses locking features which allow easy coupling and decoupling of a floating switch with the pump housing.

[0006] Thus, there is a need of a battery holder which can provide various improvements for application with the submersible pumps.

SUMMARY

[0007] In view of the above, it is an objective of the present invention to solve or at least reduce the drawbacks discussed above. The objective is achieved by the submersible pump defined by claim 1, which is also referenced as a battery transport system (BTS). The BTS includes a pump having a pump housing. The BTS includes a power source housed with a control housing. The BTS includes a flexible connection configured between the pump housing and the control housing. The BTS is characterized in that the pump housing has a first locking feature. The control housing has a second locking feature compatible for locking with the first locking feature. Further, locking the first locking feature and the second locking feature couples the pump housing with the control housing. The compatible locking features allow easy coupling and decoupling of the control housing with the pump housing.

[0008] The power source is a battery. The battery can be any common battery (say a universal battery) which can optimally power the pump as per the requirement.

[0009] According to an embodiment of the present invention, the control housing includes at least a first compartment which houses the power source. Further, the control housing includes a second compartment which houses a control unit of the pump. This provides additional and improved options to control the pump even by using the control housing. Further, separate compartments for the power source and the control unit allow for ease of packaging of the power source, the control unit, and the associated wiring etc.

[0010] According to an embodiment of the present invention, the first locking feature and the second locking feature is selected from one or more of a snap-fit coupling, or a push-fit coupling between the pump housing and the control housing. The choice of locking type between the pump housing and the control housing gives an option to easily transport them together with minimum user effort.

[0011] According to an embodiment of the present invention, the control unit is configured to perform variable levels of control of the pump. This can prove useful in cases where there is a requirement to provide only restricted access (say only power control) to control of the pump by using the control housing.

[0012] According to an embodiment of the present invention, the pump housing further includes slots around the first locking feature of the pump. The slots can serve as additional locking feature of the pump housing.

[0013] According to an embodiment of the present invention, the control housing further includes a pin around the second locking feature of the control housing. The pin with or without the second locking feature of the control housing can provide desired coupling action as elaborated later.

[0014] According to an embodiment of the present invention, locking the pin and the slots couples the control housing and the pump housing. This provides a more robust coupling of the control housing and the pump housing.

[0015] Other features and aspects of this invention will be apparent from the following description and the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0016] The invention will be described in more detail with reference to the enclosed drawings, wherein:

FIG. 1A shows a front perspective view of a submersible pump (BTS), in accordance with an embodiment of the present invention;

FIG. 1B shows a side perspective view of the BTS, in accordance with an embodiment of the present invention;

FIG. 1C shows a top perspective view of the BTS, in accordance with an embodiment of the present invention;

FIG. 2A shows a front perspective view of a pump, in accordance with an embodiment of the present invention;

FIG. 2B shows a side perspective view of the pump, in accordance with an embodiment of the present invention;

FIG. 2C shows a top perspective view of the pump, in accordance with an embodiment of the present invention;

FIG. 3A shows a side perspective view of a control housing, in accordance with an embodiment of the present invention;

FIG. 3B shows a perspective view from below of the control housing, in accordance with an embodiment of the present invention;

FIG. 3C shows a bottom perspective view of the control housing, in accordance with an embodiment of the present invention;

FIG. 3D shows a top perspective view of the control housing, in accordance with an embodiment of the present invention;

FIG. 4 shows a cross-sectional view of the BTS, in accordance with an embodiment of the present invention; and

FIG. 5 shows a perspective view of the control housing and the pump before assembly, in accordance with an embodiment of the present invention.

DESCRIPTION OF EMBODIMENTS

[0017] The present invention will be described more fully hereinafter with reference to the accompanying drawings, in which example embodiments of the invention incorporating one or more aspects of the present invention are shown. This invention 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 invention to those skilled in the art. For example, one or more aspects of the present invention can be utilized in other embodiments and even other types of structures and/or methods. In the drawings, like numbers refer to like elements.

[0018] Certain terminology is used herein for convenience only and is not to be taken as a limitation on the invention. 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.

[0019] In the drawings and specification, there have been disclosed preferred embodiments and examples of the invention 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 invention which is solely defined by the following claims.

[0020] **FIG. 1A** illustrates a front perspective view of a battery transport system (BTS) **100.** The BTS **100** of the present invention is a submersible pump. The BTS **100** includes a pump **110** having a pump housing **112.** The BTS **100** further includes a power source (not shown) housed with a control housing **120.** The power source is battery. The BTS **100** includes a control unit **122** of the control housing **120** to change variable levels of control of the pump **110.** The BTS **100** includes a flexible connection **130** configured between the pump housing **112** and the control housing **120** to act as a means for transfer of power.

[0021] **FIG. 1B** illustrates a side perspective view of the BTS **100.** This provides another view of the flexible connection **130** wound on the pump housing **112** for ease of transport of the BTS **100** among other reasons. A user can readily make use of the control unit **122** of the control housing **120** to make desired adjustments to the pump **110** and/or the control housing **120** as per the requirement.

[0022] **FIG. 1C** illustrates a top perspective view of the BTS **100.** As illustrated here, the flexible connection **130** can be a fixed wire which is used to power the pump **110** by the power source (not shown) of the control housing **120.** The flexible connection **130** is long enough to operatively couple the pump **110** housing **112** and the control housing **120** for different arrangements. The flexible

connection **130** can be wound on the pump **110** or any part thereof to avoid any undesirable hindrance by the flexible connection **130** during implementation of the BTS.

[0023] The pump housing **112** and the control housing **120** are generally connected by the flexible connection **130** and positioned near to each other during use. But, there can be a requirement to decouple the flexible connection **130** from any of them in case of a need such as during replacement or transport of any of the pump housing **112** and the control housing **120.**

[0024] As mentioned before, the control housing **120** can be readily decoupled from the pump housing **112** whenever required. Further, there is usually no requirement of any special tool to perform the operation to separate the control housing **120** from the pump housing **112.** There are means such as compatible locking features on both the pump housing **112** and the control housing **120** to couple/decouple them depending upon the requirement.

[0025] **FIG. 2A** illustrates a front perspective view of the pump **110.** The pump housing **112** has a first locking feature **202** (best shown in **FIGS. 2B** and **2C**). The first locking feature **202** can be placed along one side of the pump housing **112** depending upon relative of sizes of the pump housing **112** and the control housing **120.**

[0026] **FIG. 2B** illustrates a side perspective view of the pump **110** while **FIG. 2C** illustrates a top perspective view thereof. The pump housing **112** is preferred to be designed in a cylindrical or container-like shape to allow easy transport thereof and thereby of the BTS **100.** Further, such shape along with a circular base (as shown in **FIG. 2C**) will provide compactness and portability during use of the BTS **100.**

[0027] The first locking feature **202** can be selected taking into account specifications of any/both of the pump housing **112** and the control housing **120.** More particularly, the first locking feature **202** shall be selected based upon dimensions, weights, life and the like of the pump housing **112** and the control housing **120.** This will allow ease of transportation of the pump housing **112** and the control housing **120** with desired safety and convenience.

[0028] **FIG. 3A** illustrates a side perspective view of the control housing **120.** The control housing **120** has a second locking feature **302** compatible for locking with the first locking feature **202.** Further, locking the first locking feature **202** and the second locking feature **302** couples the pump housing **112** with the control housing **120.**

[0029] The present disclosure illustrates general aspects such as position, type, size of the first locking feature **202** and the second locking feature **302** for representative purposes only. A person having ordinary knowledge in the art will appreciate that any modifications to the first locking feature **202** and the second locking feature **302** with implementation of the BTS **100** can be readily used since the present invention is not to be limited by any aspect of the first locking feature **202** and the second locking feature 302 which is not claimed.

[0030] **FIG. 3B** illustrates a perspective view from below of the control housing **120.** This illustrates the general design of the control housing **120** which is compatible with area around the first locking feature **202** of the pump housing **112.** Further, **FIG. 3C** illustrates a bottom perspective view of the control housing **120.** The control unit **122** of the control housing 120 is provided near to the second locking feature **302** as illustrated by **FIG. 3D,** although other placements of the control unit **122** and the second locking feature **302** have been contemplated and are well within the scope of the present disclosure.

[0031] In an embodiment, the first locking feature **202** and the second locking feature **302** can be selected from one or more of a snap-fit coupling, or a push-fit coupling between the pump housing **112** and the control housing **120.** Further, there can be any other locking arrangement, as known or used in the art, to couple the pump housing **112** and the control housing **120** and the present disclosure shall not be limited by choice of any of the locking feature.

[0032] **FIG. 4** illustrates a cross-sectional view of the BTS **100.** As best shown in this view, the control housing **120** includes at least a first compartment **402** which houses the power source. Further, the control housing **120** includes a second compartment **404** which houses the control unit **122** of the pump **110.**

[0033] **FIG. 5** illustrates the control housing **120** and the pump **110** before assembly, in accordance with an embodiment of the present disclosure. The control housing **120** includes a pin **502** around the second locking feature **302** of the control housing **120.** The pump **110,** or more particularly, the pump housing **112** includes slots **504** around the first locking feature **202** of the pump **110.** The pin **502** and the slots **504** are designed such that engagement of the pin **502** and the slots **504** allows coupling of the control housing **120** and the pump housing **112.**

[0034] The pin **502** may be spring loaded. The pin **502** may move between an extended position (as illustrated) and a retracted position. The pin **502** may be inserted between the slots **504** in the retracted position, and then the pin **502** may extend afterwards to lock the control housing **120** with the pump housing **112.** The present disclosure can be implemented with any or a combination of the first locking feature **202** and the second locking feature **302,** and the pin **502** and the slots **504,** however, it may be preferable to additionally have the pin **502** and the slots **504** along with the first locking feature **202** and the second locking feature **302** from consideration such as, but need not necessarily, weight or type or any other specification of the pump **110** and the control housing **120** of the BTS **100.**

[0035] In the drawings and specification, there have been disclosed preferred embodiments and examples of the invention 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 invention which is solely defined by the following claims.

LIST OF ELEMENTS

[0036]

100	Battery Transport System
110	Pump
112	Pump Housing
120	Control Housing
122	Control Unit
130	Flexible Connection
202	First Locking Feature
302	Second Locking Feature
402	First Compartment
404	Second Compartment
502	Pin
504	Slots

Claims

1. A submersible pump (BTS) **(100)** comprising:

a pump **(110)** having a pump housing **(112);**
a power source and a control unit (122) housed within a control housing **(120),** the power source being a battery;
a flexible connection **(130)** configured between the pump housing **(112)** and the control housing **(120),** the flexible connection being configured to act as a means for transfer of power;
wherein the pump housing **(112)** has a first locking feature **(202);** and
the control housing **(120)** having a second locking feature **(302)** compatible for locking with the first locking feature **(202),** the locking features allowing easy coupling and decoupling of the control housing with the pump housing;
wherein the design of the control housing **(120)** is compatible with the area around the first locking feature **(202)** of the pump housing **(112);**
during use, the pump housing **(112)** and the control housing **(120)** are connected by the flexible connection, with the control housing **(120)** being readily decoupled from the pump housing **(112).**

2. The submersible pump **(100)** of claim **1,** wherein the control housing **(120)** includes at least a first compartment **(402)** adapted to house the power source, and a second compartment **(404)** adapted to house the control unit **(122)** of the pump **(110).**

3. The submersible pump **(100)** of any one of the preceding claims, wherein the first locking feature **(202)** and the second locking feature **(302)** are selected from one or more of a snap-fit coupling, or a push-fit coupling between the pump housing **(112)** and the control housing **(120).**

4. The submersible pump **(100)** of any one of the preceding claims, wherein the control unit **(122)** is configured to perform various levels of control of the pump **(110).**

5. The submersible pump **(100)** of any one of the preceding claims, wherein the control housing **(120)** further includes a pin **(502)** around the second locking feature **(302)** of the control housing **(120).**

6. The submersible pump **(100)** of any one of the preceding claims, wherein the pump housing **(112)** further includes slots **(504)** around the first locking feature **(202)** of the pump housing (112).

7. The submersible pump **(100)** of claim **5** and **6,** wherein locking the pin **(502)** and the slots **(504)** couples the control housing **(120)** and the pump housing **(112).**

Patentansprüche

1. Tauchpumpe (BTS) **(100)** umfassend:

eine Pumpe **(110),** die ein Pumpengehäuse **(112)** aufweist;
eine Stromquelle und eine Steuereinheit (122), die innerhalb eines Steuergehäuses untergebracht sind **(120),** wobei die Stromquelle eine Batterie ist;
eine flexible Verbindung **(130),** die zwischen dem Pumpengehäuse **(112)** und dem Steuergehäuse **(120)** konfiguriert ist, wobei die flexible Verbindung konfiguriert ist, um als ein Mittel für eine Übertragung von Strom zu wirken;
wobei das Pumpengehäuse **(112)** ein erstes Verriegelungsmerkmal **(202)** aufweist; und
das Steuergehäuse **(120)** ein zweites Verriegelungsmerkmal **(302)** aufweist, das zum Verriegeln mit dem ersten Verriegelungsmerkmal **(202)** kompatibel ist, wobei die Verriegelungsmerkmale ein einfaches Koppeln und Entkoppeln des Steuergehäuses mit dem Pumpengehäuse ermöglichen;
wobei die Ausgestaltung des Steuergehäuses **(120)** mit dem Bereich um das erste Verriegelungsmerkmal **(202)** des Pumpengehäuses **(112)** kompatibel ist;
wobei während einer Verwendung das Pumpengehäuse **(112)** und das Steuergehäuse **(120)** durch die flexible Verbindung verbunden sind, wobei das Steuergehäuse **(120)** von dem Pumpengehäuse **(112)** leicht entkoppelt werden kann.

2. Tauchpumpe **(100)** nach Anspruch **1,** wobei das Steuergehäuse **(120)** mindestens ein erstes Fach

(402), das angepasst ist, um die Stromquelle unterzubringen, und ein zweites Fach **(404)** einschließt, das angepasst ist, um die Steuereinheit **(122)** der Pumpe **(110)** unterzubringen.

3. Tauchpumpe **(100)** nach einem der vorstehenden Ansprüche, wobei das erste Verriegelungsmerkmal **(202)** und das zweite Verriegelungsmerkmal **(302)** aus einer oder mehreren von einer Schnappverbindungskopplung oder einer Steckverbindungskopplung zwischen dem Pumpengehäuse **(112)** und dem Steuergehäuse **(120)** ausgewählt sind.

4. Tauchpumpe **(100)** nach einem der vorstehenden Ansprüche, wobei die Steuereinheit **(122)** konfiguriert ist, um verschiedene Steuerstufen der Pumpe **(110)** durchzuführen.

5. Tauchpumpe **(100)** nach einem der vorstehenden Ansprüche, wobei das Steuergehäuse **(120)** ferner einen Stift **(502)** um das zweite Verriegelungsmerkmal **(302)** des Steuergehäuses **(120)** einschließt.

6. Tauchpumpe **(100)** nach einem der vorstehenden Ansprüche, wobei das Pumpengehäuse **(112)** ferner Schlitze **(504)** um das erste Verriegelungsmerkmal **(202)** des Pumpengehäuses (112) einschließt..

7. Tauchpumpe **(100)** nach Anspruch **5** und **6,** wobei das Verriegeln des Stifts **(502)** und der Schlitze **(504)** das Steuergehäuse **(120)** und das Pumpengehäuse **(112)** koppelt.

Revendications

1. Pompe immergée (BTS) **(100)** comprenant :

une pompe **(110)** ayant un boîtier de pompe **(112) ;**
une source d'énergie et une unité de commande (122) logées à l'intérieur d'un boîtier de commande **(120),** la source d'énergie étant une batterie ;
une connexion flexible **(130)** conçue entre le boîtier de pompe **(112)** et le boîtier de commande **(120),** la connexion flexible étant configurée pour jouer le rôle de moyen de transfert d'énergie ;
dans laquelle le boîtier de pompe **(112)** a une première caractéristique de verrouillage **(202)** ; et
le boîtier de commande **(120)** ayant une seconde caractéristique de verrouillage **(302)** compatible pour le verrouillage avec la première caractéristique de verrouillage **(202),** les caractéristiques de verrouillage permettant un accouplement et un désaccouplement aisés du boîtier de commande au boîtier de pompe ;
dans laquelle la conception du boîtier de commande **(120)** est compatible avec la zone autour de la première caractéristique de verrouillage **(202)** du boîtier de pompe **(112)** ;
pendant l'utilisation, le boîtier de pompe **(112)** et le boîtier de commande **(120)** sont reliés par la connexion flexible, le boîtier de commande **(120)** étant facilement désaccouplé du boîtier de pompe **(112).**

2. Pompe immergée **(100)** selon la revendication **1,** dans laquelle le boîtier de commande **(120)** comporte au moins un premier compartiment **(402)** conçu pour loger la source d'énergie, et un second compartiment **(404)** conçu pour loger l'unité de commande **(122)** de la pompe **(110).**

3. Pompe immergée **(100)** selon l'une quelconque des revendications précédentes, dans laquelle la première caractéristique de verrouillage **(202)** et la seconde caractéristique de verrouillage **(302)** sont choisies parmi un ou plusieurs parmi un accouplement par encliquetage ou un accouplement par pression entre le boîtier de pompe **(112)** et le boîtier de commande **(120).**

4. Pompe immergée **(100)** selon l'une quelconque des revendications précédentes, dans laquelle l'unité de commande **(122)** est configurée pour effectuer différents niveaux de commande de la pompe **(110).**

5. Pompe immergée **(100)** selon l'une quelconque des revendications précédentes, dans laquelle le boîtier de commande **(120)** comporte en outre une broche **(502)** autour de la seconde caractéristique de verrouillage **(302)** du boîtier de commande **(120).**

6. Pompe immergée **(100)** selon l'une quelconque des revendications précédentes, dans laquelle le boîtier de pompe **(112)** comporte en outre des fentes **(504)** autour de la première caractéristique de verrouillage **(202)** du boîtier de pompe (112).

7. Pompe immergée **(100)** selon la revendication **5** et **6,** dans laquelle le verrouillage de la broche **(502)** et des fentes **(504)** accouple le boîtier de commande **(120)** au boîtier de pompe **(112).**

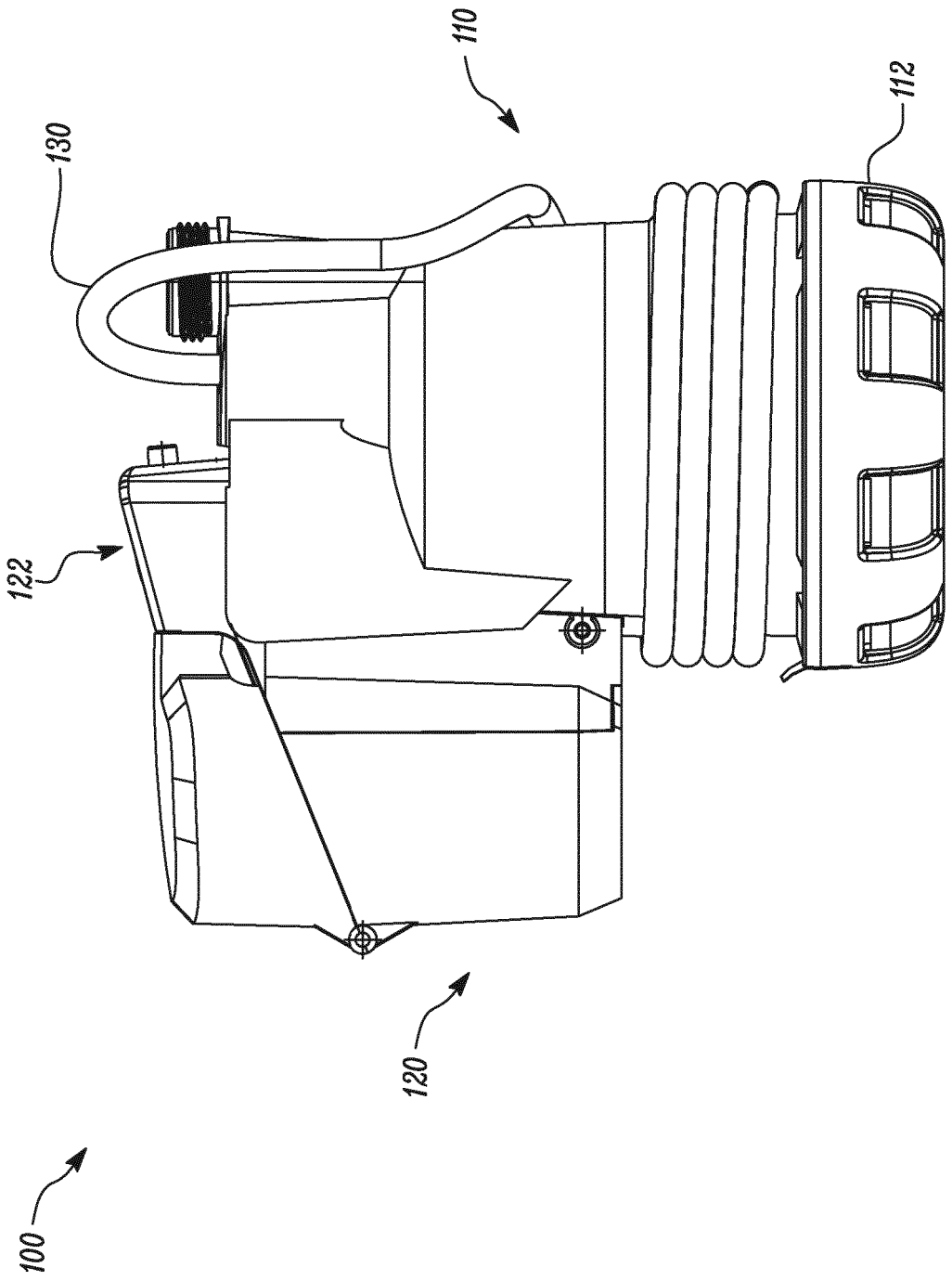

FIG. 1A

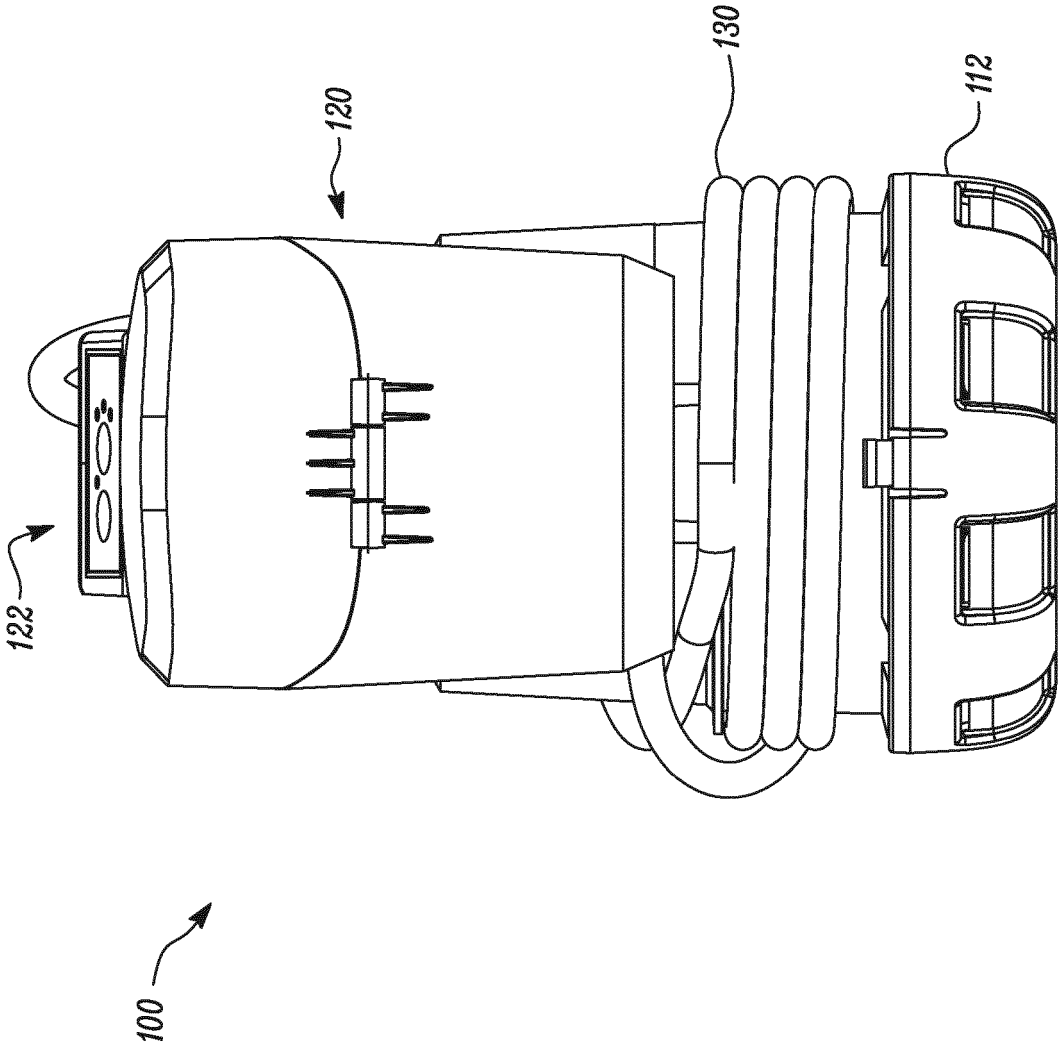

FIG. 1B

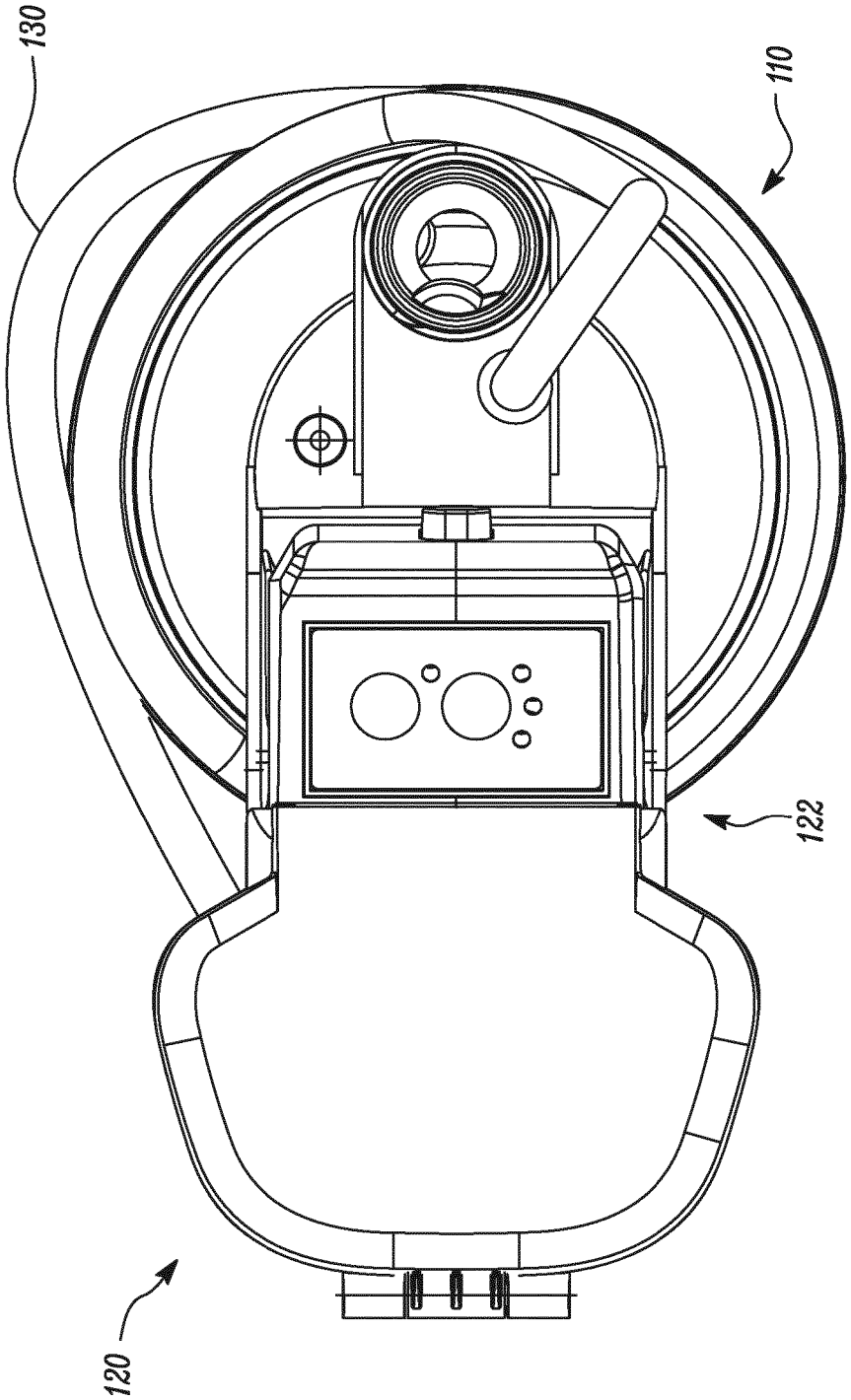

FIG. 1C

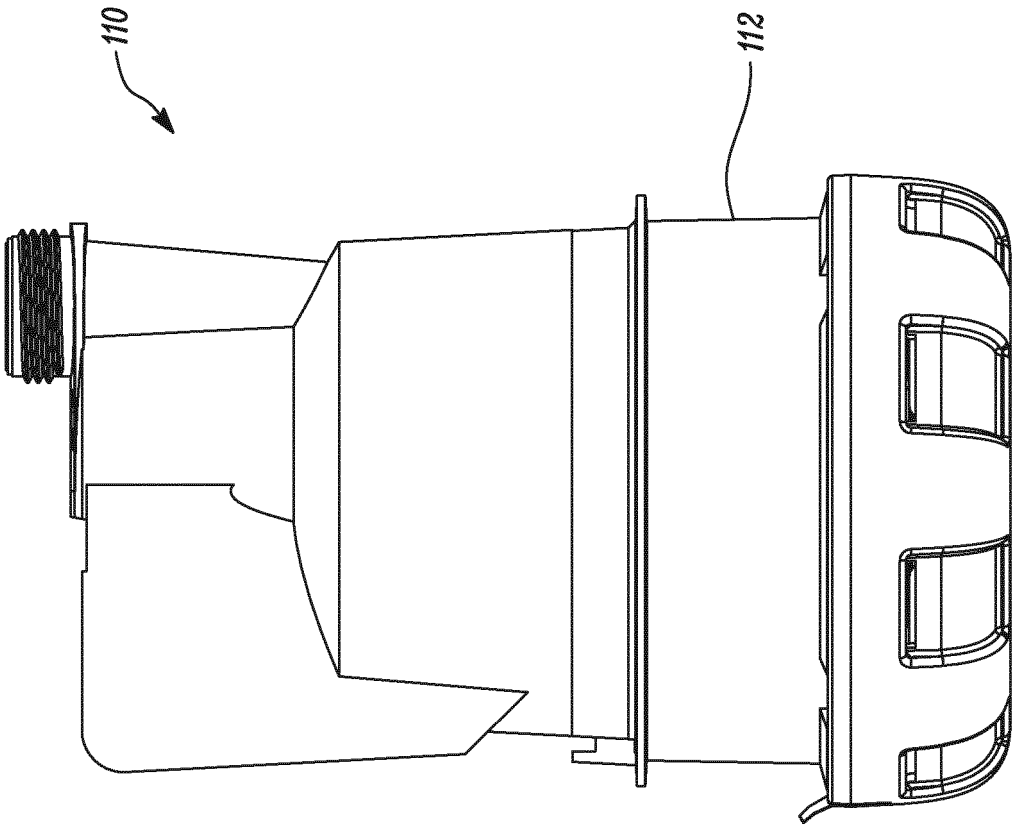

FIG. 2A

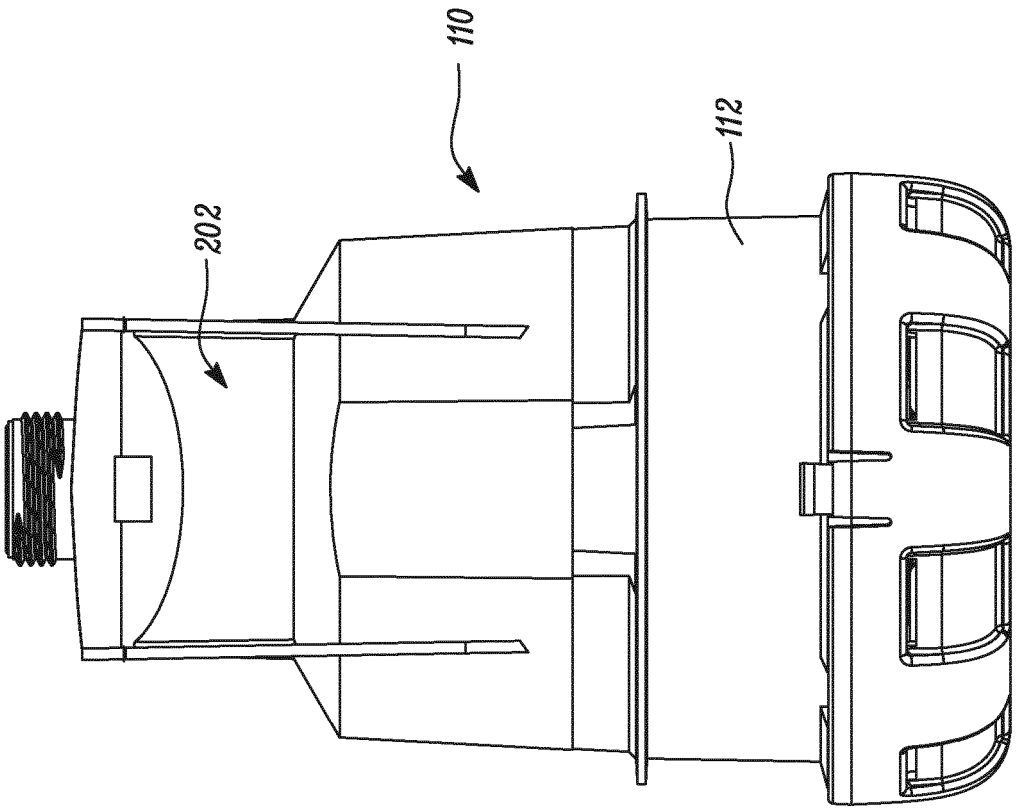

FIG. 2B

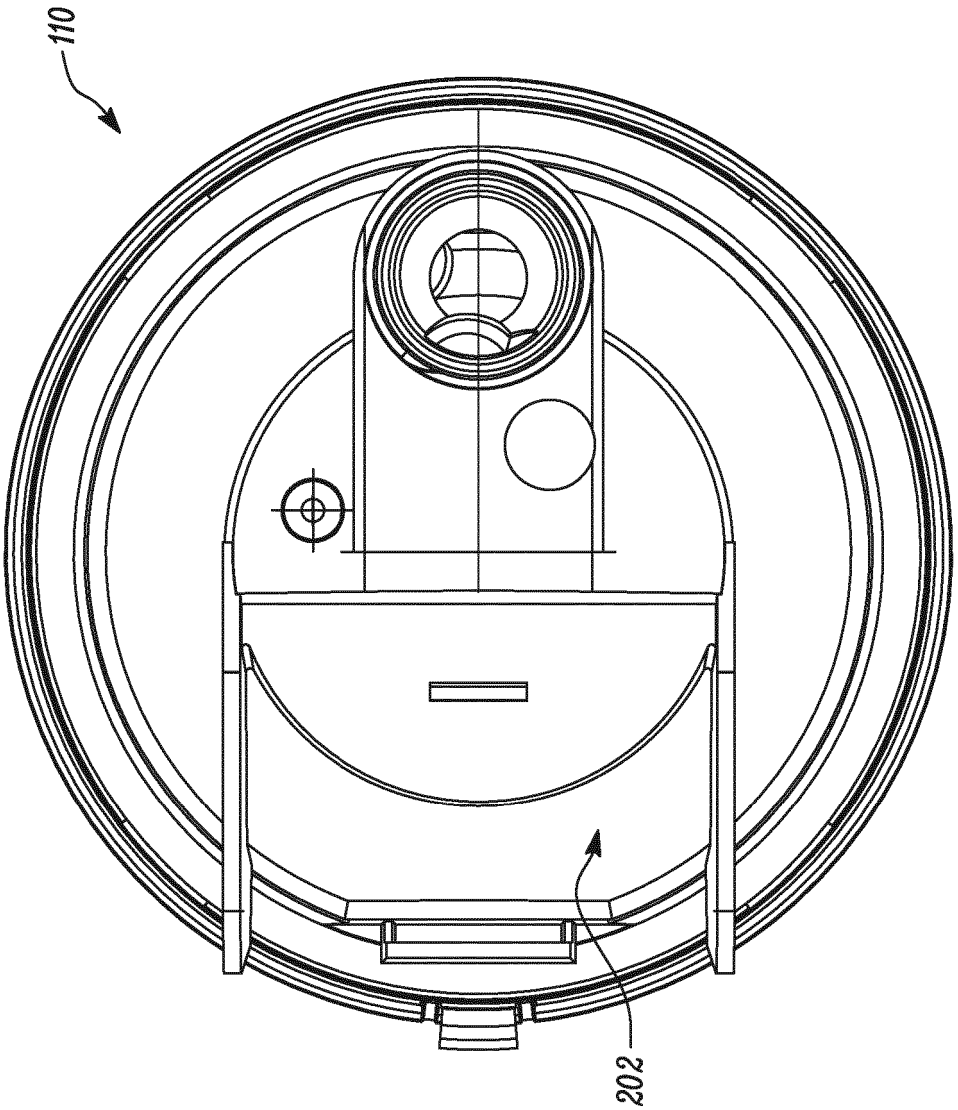

FIG. 2C

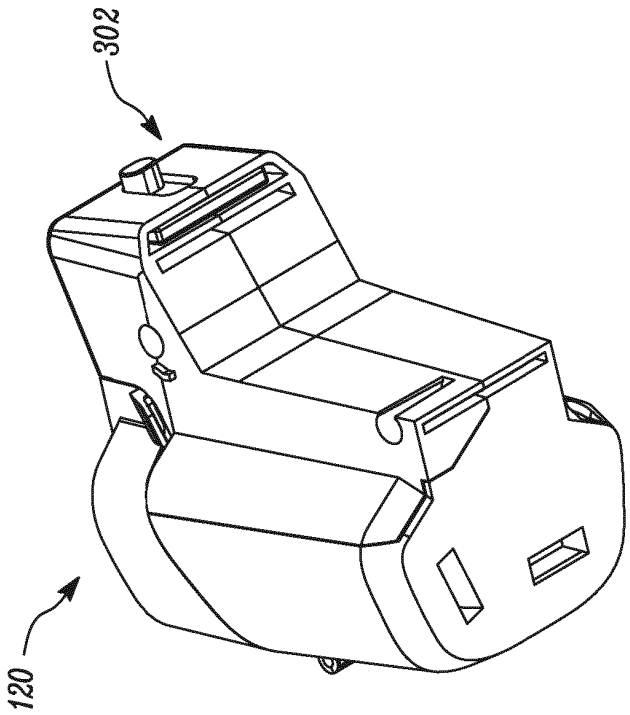

FIG. 3B

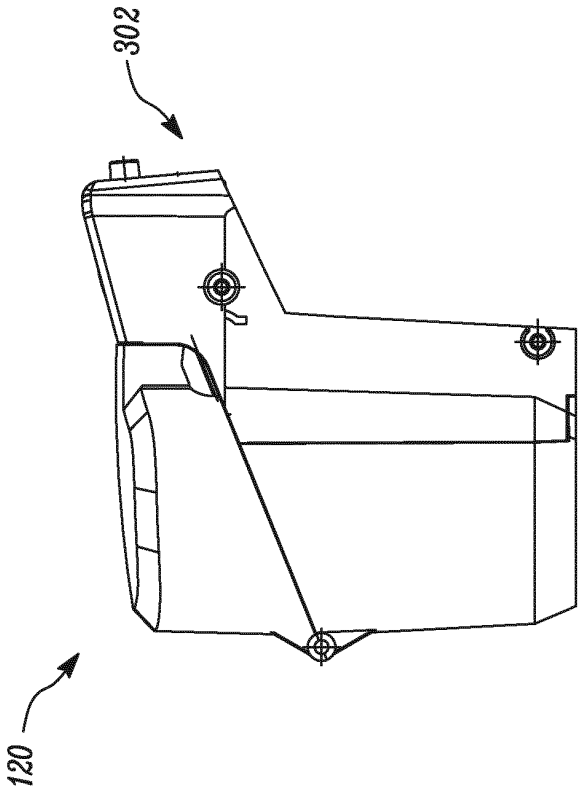

FIG. 3A

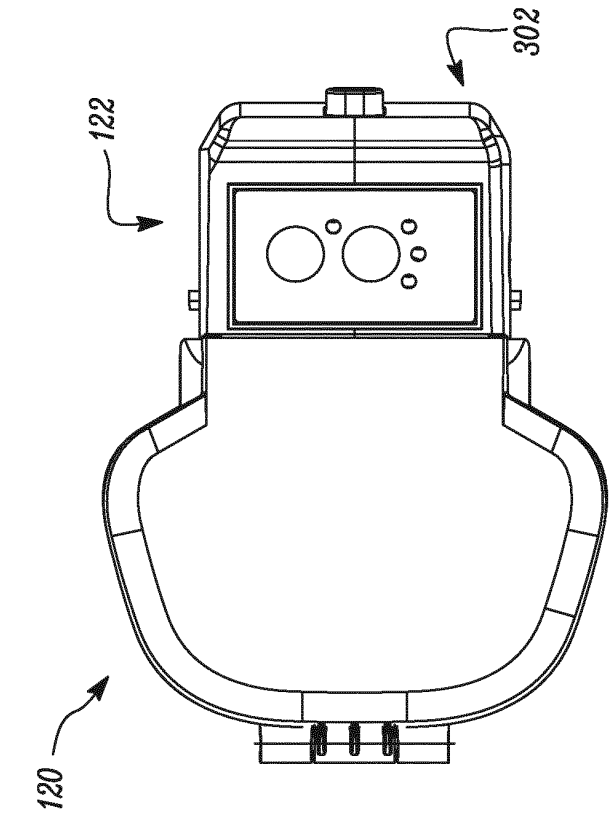

FIG. 3D

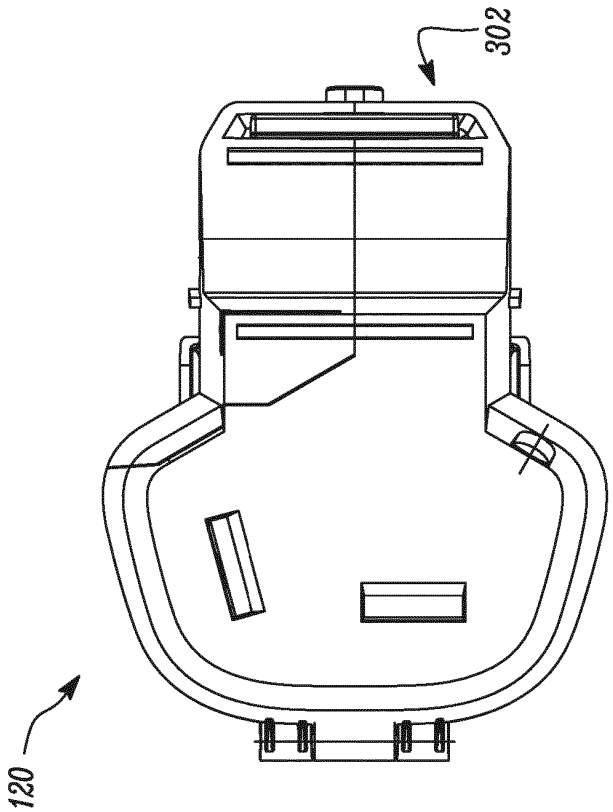

FIG. 3C

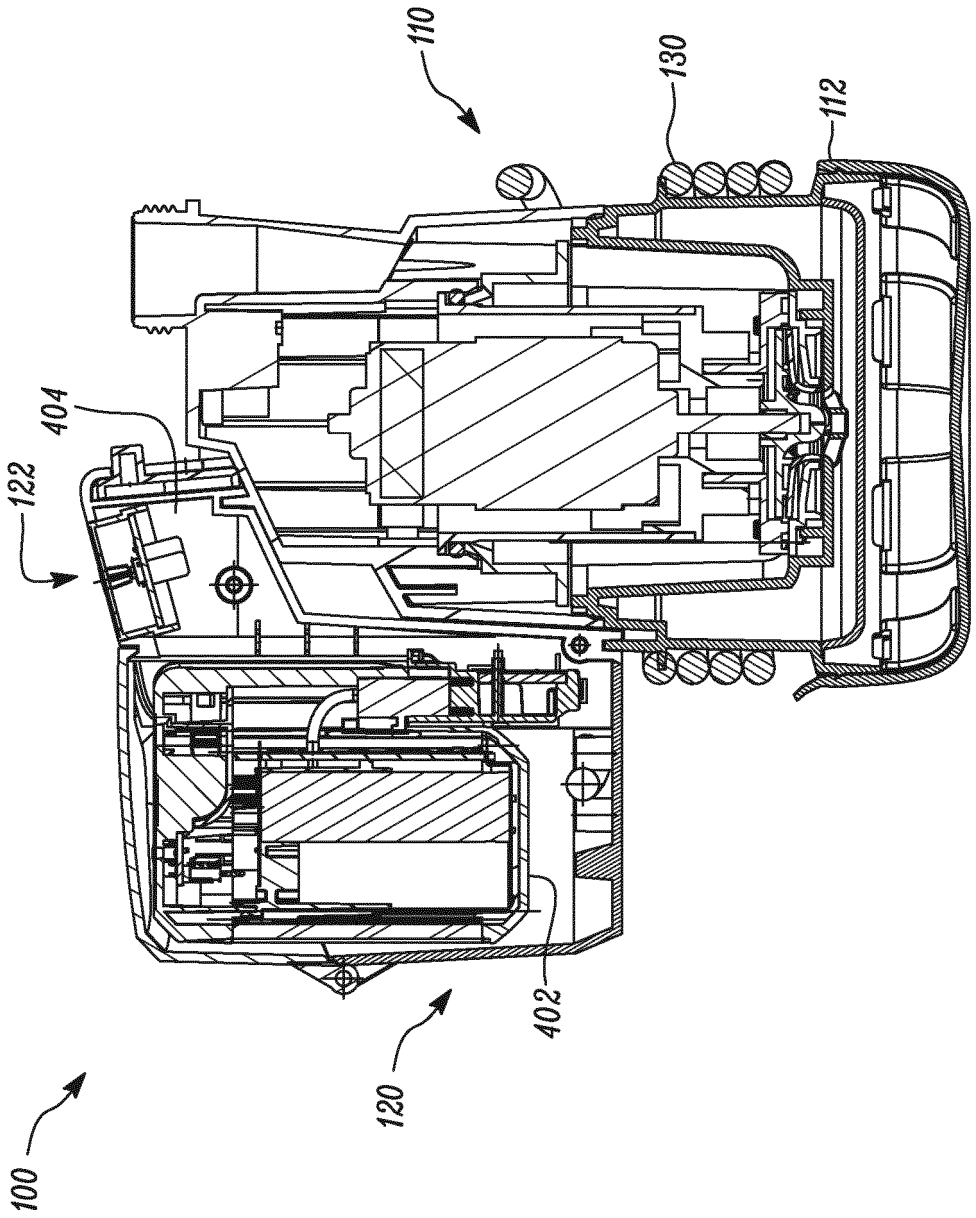

FIG. 4

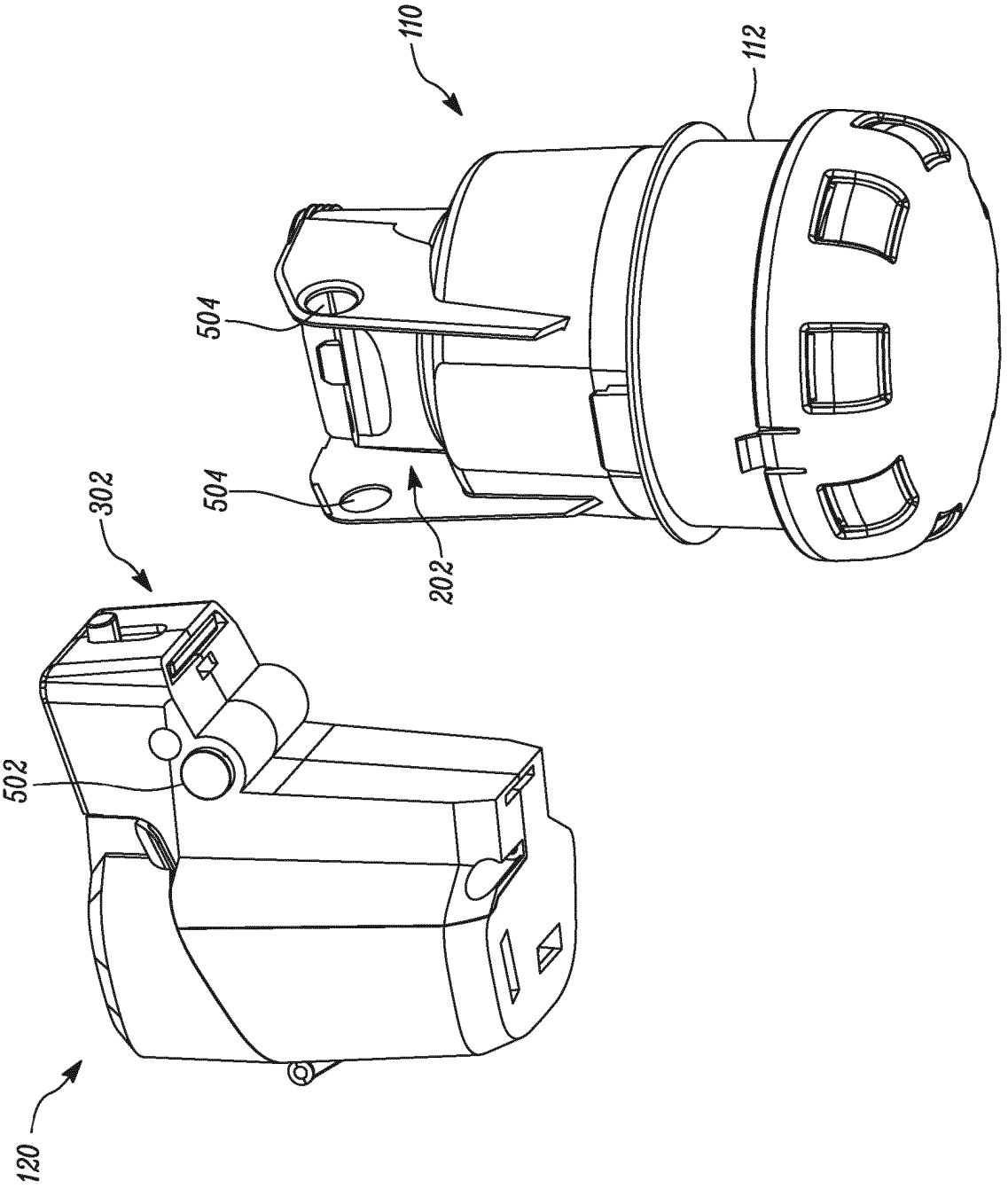

FIG. 5

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- EP 1455092 A **[0004]**
- DE 102005031420 A1 **[0005]**