

(19)



(11)

EP 3 978 837 A1

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:

06.04.2022 Bulletin 2022/14

(51) International Patent Classification (IPC):

F25B 43/00 ^(2006.01) **B60H 1/00** ^(2006.01)

(21) Application number: **20461563.7**

(52) Cooperative Patent Classification (CPC):

F25B 43/003; F25B 43/006; F25B 2400/16

(22) Date of filing: **30.09.2020**

(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: **Valeo Autosystemy SP. Z.O.O.**

32-050 Skawina (PL)

(72) Inventors:

- **POKRYWINSKI, Karol**
32-050 Skawina (PL)
- **FICEK, Natalia**
32-050 Skawina (PL)

(74) Representative: **Valeo Systèmes Thermiques**

Service Propriété Intellectuelle

ZA l'Agiot, 8 rue Louis Lormand

CS 80517

La Verrière

78322 Le Mesnil-Saint-Denis Cedex (FR)

(54) A RECEIVER DRIER HOUSING

(57) A housing (100) houses interchangeably at least two receiver drier variants (110a, 110b). The housing (100) includes indication means (125) that moves be-

tween a first position indicative of presence of a first receiver drier variant (110a) and a second position indicative of presence of a second receiver drier variant (110b).

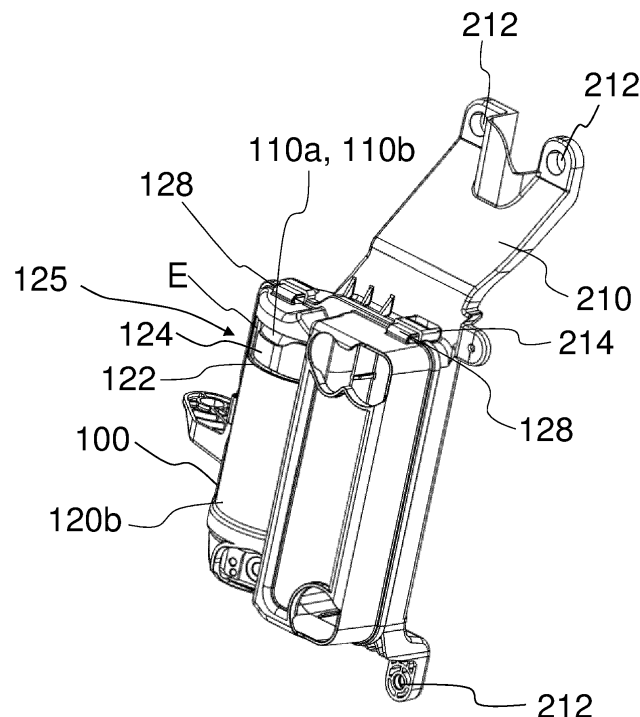


FIG. 1

EP 3 978 837 A1

Description

[0001] The present invention relates to a heat exchanger assembly, particularly a receiver drier housing to receive a receiver drier and connected to a heat exchanger.

[0002] Conventional air conditioning system, for example, air conditioning system for a vehicle, includes a condenser, an evaporator, an expansion device, a compressor and a heater. Generally, the conventional air conditioning system configured with an expansion valve is also configured with a receiver drier that is disposed in a high-pressure section of the air conditioning system/ air conditioning loop. The receiver drier is usually located between a condenser and the expansion valve in the air conditioning loop. The receiver drier traps moisture and debris carried with condensed refrigerant received from the condenser. Accordingly, moisture and debris that is detrimental to critical components such as compressor disposed in the air-conditioning loop is prevented from reaching the compressor. The receiver drier is disposed near the condenser. Preferably, the receiver drier is received in a receiver drier housing that is mounted on the condenser.

[0003] However, different variants of condensers are used corresponding to different configurations of the air conditioning systems. Accordingly, different configurations / versions/ variants of receiver driers are used corresponding to different configurations of the condenser. For example, different sizes of receiver drier are used corresponding to different sizes of the condensers. In some cases, a receiver drier housing is used to receive and house different configurations of the receiver drier, for example different sizes of the receiver driers. A common (i.e. standard) receiver drier housing is preferred over non-standard receiver drier housing, wherein a different receiver drier housing is used to receive different configuration, particularly, different size of the receiver drier. The use of a non-standard receiver drier not only increases the manufacturing costs but also increases the assembly time. This problem is aggravated when there are many variants of the receiver drier. The standard receiver drier housing addresses the above problems. However, it is to be ensured that a particular configuration / version/ variant of receiver drier, for example, a particular size of receiver drier corresponding to a particular condenser size/type is received in the standard housing mounted on the condenser during assembly of the air conditioning system.

[0004] In case a wrong variant of receiver drier corresponding to a particular configuration of the condenser is received in the receiver drier housing, the performance parameters associated with the air conditioning system deviates from intended values, thereby detrimentally affecting the efficiency and the performance of the air conditioning system. Accordingly, it is to be ensured that right variant of the receiver drier corresponding to a particular configuration of the condenser is received in the standard

receiver drier housing.

[0005] As the conventional receiver drier housing completely encloses the receiver drier, it is difficult to determine the variant of the receiver drier received in the receiver drier housing by visual inspection from outside the receiver drier housing. The receiver drier housing is either modular or is removably mounted on a bracket to define an accessible enclosure. In case the receiver drier housing is mounted on the bracket connected to the condenser, the receiver drier housing and the bracket include complementary engagement elements. More specifically, complementary engagement elements formed on the receiver drier housing and the bracket engage and disengage with respect to each other to define assembled and disassembled configuration of the receiver drier housing with respect to the bracket. In the assembled configuration, the receiver drier housing in conjunction with the bracket defines an enclosure complementary to the receiver drier to receive the receiver drier therein. Such modular configuration enables dis-assembly of the receiver drier housing from the bracket to access the receiver drier received in the enclosure for service/ maintenance and replacement thereof. The conventional receiver drier housing is required to be dis-assembled to access, inspect and determine the variant of the receiver drier received in the enclosure and re-assembled. However, such process is inconvenient and time consuming. Further, in case of the conventional receiver drier housing, there is no indication to determine the variant of the receiver drier received in the receiver drier housing without disassembling the receiver drier housing.

[0006] Accordingly, there is a need for a receiver drier housing that obviates the problems faced by the conventional receiver drier housing. Particularly, there is a need for a receiver drier housing that enables determining a variant of a receiver drier received in the receiver drier housing without dis-assembling the receiver drier housing. Further, there is a need for a receiver drier housing configured with redundant features to determine the variant of receiver drier received in the receiver drier housing. Particularly, there is a need for a failsafe arrangement that involves more than one feature to determine the variant of the receiver drier received inside the receiver drier housing, wherein one feature still determines the variant of the receiver drier received in the housing even when other feature fails.

[0007] An object of the present invention is to provide a receiver drier housing that is simple in construction and that is configured with redundant features to determine the variant of the receiver drier received in the receiver drier housing without the need for disassembling the receiver drier housing.

[0008] In the present description, some elements or parameters may be indexed, such as a first element and a second element. In this case, unless stated otherwise, this indexation is only meant to differentiate and name elements which are similar but not identical. No idea of priority should be inferred from such indexation, as these

terms may be switched without betraying the invention. Additionally, this indexation does not imply any order in mounting or use of the elements of the invention.

[0009] A housing is disclosed in accordance with an embodiment of the present invention. The housing house interchangeably at least two receiver drier variants. The housing includes indication means that moves between a first position indicative of presence of a first receiver drier variant and a second position indicative of presence of a second receiver drier variant. One of the positions may also be indicative of the absence of any receiver drier.

[0010] Generally, the indication means includes at least one movable component that moves between a first position and a second position due to mechanical interaction thereof with the first receiver drier variant.

[0011] Further, the housing includes a slot for an external sensor triggerable in case of the first receiver drier variant presence in the housing.

[0012] Generally, the at least one slot is disposed proximal to the at least one end wall of the housing.

[0013] Particularly, the slot receives the movable component.

[0014] More specifically, the movable component extends inwardly into the slot along the wall and at least a portion thereof extends radially inward into an interior of the housing.

[0015] Specifically, the movable component is integrally formed with the housing and is connected to the housing along at least one side thereof.

[0016] Particularly, the movable component is flexible and flexes radially outward, to cause at least a portion thereof to be out of the housing when the first receiver drier variant is received in the housing.

[0017] Alternatively, the movable component further includes a rib extending into an interior of the housing that pushes at least a portion of the movable component out of the housing when the first receiver drier variant is received in the housing.

[0018] Generally, the indication means moves to the first position based on length of the receiver drier variant received in the housing.

[0019] Alternatively, the indication means moves to the first position based on radial dimension of the receiver drier variant received in the housing.

[0020] In accordance with an embodiment of the present invention, the housing includes a first indication means and a second indication means. The first indication means moves to the first position based on length of the receiver drier variant received in the housing and the second indication means moves to the first position based on radial dimension of the receiver drier variant received in the housing.

[0021] Also is disclosed a heat exchanger that includes a housing connected thereto to receive and hold different receiver drier variants therein, wherein the housing is as disclosed above.

[0022] Other characteristics, details and advantages

of the invention can be inferred from the description of the invention hereunder. A more complete appreciation of the invention and many of the attendant advantages thereof will be readily obtained as the same becomes better understood by reference to the following detailed description when considered in connection with the accompanying figures, wherein:

FIG. 1 illustrates an isometric view of a housing in accordance with an embodiment of the present invention in an assembled configuration with respect to a bracket;

FIG. 2 illustrates an isometric view of the housing of **FIG. 1**;

FIG. 3 illustrates an isometric view of the bracket of **FIG. 1**;

FIG. 4a illustrates a schematic representation of a housing receiving a first receiver drier;

FIG. 4b illustrates a schematic representation of the housing of **FIG. 4a** receiving a second receiver drier;

FIG. 5 presents another embodiment of the invention.

[0023] Although, the present invention relates to a housing defining an enclosure for interchangeably receiving at least two receiver drier variants. Particularly, the housing includes an indication means that moves between a first position indicative of presence of the first receiver drier variant and a second position indicative of presence of the second receiver drier variant. More specifically, the housing includes at least one end wall, a peripheral wall, at least one slot and a movable component. The movable component moves between a first position and a second position due to mechanical interaction thereof with the first receiver drier variant. The at least one end wall and a peripheral wall define the enclosure to interchangeably receive one of the at least two receiver drier variants therein. The slot is formed on any of the walls defining the enclosure. The movable element interacts with the receiver drier received inside the housing through the slot to determine the receiver drier variant received in the housing. Further, an external sensor that is part of a manufacturing / assembly on which different receiver drier variants are assembled in the housing interacts with the receiver drier received inside the housing through the slot to determine the receiver drier variant. The external sensor is triggerable in case of the first receiver drier variant presence in the housing. At least one of the movable component and the external sensor interacts with the receiver drier through the slot to identify the receiver drier variant received in the enclosure. However, the present invention is not limited to a housing that defines enclosure for interchangeably receiving at least

two receiver drier variants and is configured with features to determine the receiver drier variant received therein. The housing can be used to receive different tubular articles used in vehicular and non-vehicular applications, wherein it is required to determine variant of tubular article received in the housing by mere visual inspection of an exterior of the housing without requiring dis-assembly of the housing.

[0024] FIG. 1 illustrates an isometric view of a receiver drier housing 100, hereinafter referred to as housing 100 in accordance with an embodiment of the present invention. In one example, the housing 100 is mounted on a bracket 210 complementary to the housing 100. The bracket 210 in turn is mounted on a heat exchanger 200 for a vehicle. More specifically, the bracket 210 includes mounting holes 212 configured thereon. The mounting holes 212 on the bracket 210 are aligned to corresponding complementary mounting holes on the heat exchanger 200 and bolts pass through the aligned mounting holes 212 on the bracket 210 and the mounting holes on the heat exchanger 200 to mount the bracket 210 to the heat exchanger 200. FIG. 2 illustrates an isometric view of the housing 100. FIG. 3 illustrates an isometric view of the bracket 210.

[0025] The housing 100 at least partially houses interchangeably at least two receiver drier variants 110a, 110b. The housing 100 includes indication means 125 that moves between a first position indicative of presence of a first receiver drier variant 110a and a second position indicative of presence of a second receiver drier variant 110b.

[0026] Generally, the indication means 125 moves to the first position based on length of the receiver drier variant received in the housing 100. More specifically, the indication means 125 moves to the first position when the first receiver drier version 110a that is comparatively longer than the second receiver drier version 110b is received in the housing 100. Alternatively, the indication means 125 moves to the first position based on radial dimension of the receiver drier variant received in the housing 100. More specifically, the indication means 125 moves to the first position when the first receiver drier version 110a that is comparatively larger radial dimension than the second receiver drier version 110b is received in the housing 100. In accordance with an embodiment of the present invention, the housing includes a first indication means and a second indication means. The first indication means 125a moves to the first position based on length of the receiver drier variant received in the housing 100 and the second indication means 125b moves to the first position based on radial dimension of the receiver drier variant received in the housing 100.

[0027] The indication means 125 include at least one movable component 124 that moves between a first position and a second position due to mechanical interaction thereof with the first receiver drier variant 110a received in the housing 100. FIG. 4a illustrates a schematic representation of the housing 100 receiving the first re-

ceiver drier variant, hereinafter referred to as the first receiver drier 110a. More specifically, the FIG. 4a depicts interaction between the movable component 124 such as for example, a flap 124 and the first receiver drier 110a, wherein the first receiver drier 110a pushes the movable component 124 radially outward and advances into the housing 100 after crossing the movable component 124. FIG. 4b illustrates a schematic representation of the housing 100 receiving the second receiver drier variant, hereinafter referred to as the second receiver drier 110b. More specifically, the FIG. 4b depicts interaction between a rib 126 of the movable component 124, wherein the second receiver drier 110b rests on the rib 126 and is prevented from further advancing into the housing 100. Particularly, the first receiver drier 110a is comparatively longer than the second receiver drier 110b. The housing 100 includes at least one end wall 120a, a peripheral wall 120b, at least one slot 122, at least one movable component 124 (illustrated in FIG. 4a and FIG. 4b).

[0028] The at least one end wall 120a and the peripheral wall 120b define the enclosure "E" to interchangeably receive one of the at least two receiver driers 110a and 110b variants therein. The housing 100 is either modular in construction or is removably mounted on the bracket 210 to define an accessible enclosure. FIG. 1 illustrates the housing 100 in an assembled configuration with respect to the bracket 210 to define the accessible enclosure "E" there-between. Specifically, the housing 100 is mounted on the bracket 210 that is connected to the heat exchanger 200, particularly, the condenser of an air conditioning system of a vehicle. The housing 100 and the bracket 210 include complementary engagement elements 128 and 214 respectively. The complementary engagement elements 128 and 214 formed on the housing 100 and the bracket 210 are in form of snap fit engagement elements. The first engagement elements 128 formed on the housing 100 are in form of latching elements received in the second engagement elements 214 that are in the form of socket formed on the bracket 210. However, the present invention is not limited to any particular configuration of the first and second engagement elements. The first engagement elements 128 formed on the housing 100 and the second engagement elements 214 formed on the bracket 210 engage and disengage with respect to each other to define assembled and disassembled configuration of the housing 100 with respect to the bracket 210. In the assembled configuration, the housing 100 in conjunction with the bracket 210 defines an enclosure complementary to the receiver drier 110a, 110b to receive the receiver drier therein. Such configuration, enables dis-assembly of the housing 100 with respect to the bracket 210 to access the receiver drier 110a, 110b received in the enclosure "E" for service / maintenance and replacement thereof. Alternatively, the housing includes a first portion 100a and a second portion 100b complementary to each other, wherein the first portion 100a includes first engagement elements 128 that

engage and disengage with the complementary second engagement elements **214** formed on the second portion **100b** to respectively define assembled and dis-assembled configuration of the housing **100**. The movable component **124** is formed on either one of the first portion **100a** and the second portion **100b** of the housing **100**. More specifically, the slot **122** along with the movable component **124** is formed on either one of the first portion **100a** and the second portion **100b** of the housing **100** that are complementary to each other and that in conjunction with each other define the enclosure "E" to interchangeably receive at least two receiver drier variant **110a**, **110b**. Either one of the first portion **100a** and the second portion **100b** is directly mounted on the heat exchanger **200**. The housing **100** further includes additional apertures to allow passage of connecting pipes configuring fluid communication between the receiver drier received in the housing and the heat exchanger **200**, particularly, the condenser. However, the present invention is not limited to any particular configuration of the housing **100** or whether the housing defines the enclosure "E" independently of in conjunction with the bracket as long as the housing is capable of receiving different configuration of receiver driers, particularly, receiver driers of different lengths.

[0029] Generally, the slot **122** can be formed on any of the walls defining the enclosure "E". Preferably, the slot **122** is formed on the peripheral wall **120b** defining the enclosure "E". The slot **122** is disposed proximal to the at least one end wall **120a**. The slot **122** is formed by stamping operation. The slot **122** accommodates at least one of the movable component **124** and an external sensor **130**, simply referred to as sensor **130** to enable at least one of the movable component **124** and the sensor **130** to interact with the receiver drier received in the enclosure "E". The sensor **130** is part of a manufacturing / assembly on which different receiver drier variants **110a**, **110b** are assembled in the housing **100** and interacts with the receiver drier **110a**, **110b** received inside the housing **100** through the slot **122** to determine the receiver drier variant received in the housing **100**. The sensor **130** is triggerable in case of the first receiver drier variant **110a** presence in the housing **100**. The slot **122** is of comparatively larger dimension than the movable component **124**, so that the movable component **124** can move freely across the slot **122** and space is available between the movable component **124** and the slot **122**. Further, the sensor **130** interacts with the receiver drier **110a**, **110b** received inside the housing **100** through space between the movable component **124** and the slot **122**. However, the present invention is not limited to any particular configuration, placement, number and method of forming the slot **122** as long as the slot is capable of accommodating at least one of the movable component **124** and the sensor **130** that interact with the receiver drier received in the enclosure "E" to determine the receiver drier variant.

[0030] At least one of the movable component **124** and

the sensor **130** interacts with the receiver drier received in the enclosure "E" defined by the housing **100** through the slot **122** formed on the housing **100** to identify the receiver drier variant **110a**, **110b** received in the enclosure "E".

[0031] The movable component **124** is integrally formed with the housing **100**. The movable component **124** is connected to the housing **100** along at least one side thereof and extends inwardly into the slot **122** substantially along the surface of the peripheral wall **120b**. Such configuration of the movable component **124** provides flexibility to the movable component **124** to radially flex across the peripheral wall **120b** of the housing **100** near the slot **122**. Due to such flexible configuration, the movable component **124** flexes radially outward to be either aligned to the wall of the housing **100** or cause at least a portion thereof to be out of the housing **100** to define the first position of the movable component **124**, when the first receiver drier **110a** is received inside the housing **100**. In another configuration, when the movable component **124** is not interacting with second receiver drier, the movable component **124** extends inwardly in radial direction of the housing **100** into the enclosure "E". Particularly, the movable component **124** prevents further advance of the second receiver drier **110b** there across when the second receiver drier **110b** is received in the housing **110**. By visually inspecting relative position of the movable component **124** with respect to the peripheral wall **120b**, the receiver drier variant received inside the housing **100** can be determined. For example, in case the movable component **124** is either aligned to the peripheral wall **120b** or at least a portion of the movable component **124** extends out of the housing **100**, the receiver drier received in the housing **100** is the first receiver drier **110a** else the receiver drier received in the housing **100** is the second receiver drier **110b**. The movable component **124** further includes a cut-out to reduce weight of the movable component **124** and enable quick movement thereof when the movable component **124** interacts with the receiver drier received in the housing **100**, thereby enhancing the sensitivity of the movable component **124**. However, the present invention is not limited to any particular configuration, shape of the movable component **124** as long as the movable component **124** is capable of flexing radially outward in case of the first receiver drier variant **110a** presence in the housing **100**.

[0032] In accordance with an embodiment depicted in **FIG. 4a** and **FIG. 4b**, the movable component **124** includes the rib **126** that extends into an interior of the housing **120** to push the movable component **124** radially outward, when the receiver drier received in the housing **100** is the first receiver drier **110a**. Specifically, the rib **126** interacts with the receiver drier received in the housing **100** to push the movable component **124** radially outward to indicate that the receiver drier received in the housing **100** is the first receiver drier **110a**. More specifically, the rib **126** pushes the movable component **124** to be either

aligned to the peripheral wall **120b** or causes at least a portion of the movable component **124** to be outside the housing **100** to indicate that the receiver drier in the housing **100** is the first receiver drier **110a**. The rib **126** also prevents further advance of the second receiver drier **110b** there across, when the second receiver drier **110b** is received in the housing **100**. More specifically, the movable component **124** is capable of moving between radially inward configuration and a radially outward configuration. In the radially inward configuration, at least a portion of the movable component **124** is inside the housing **100** to prevent the second receiver drier **110b** from further advancing into the housing **100** to indicate that the receiver drier received in the housing is the second receiver drier **110b**. In the radially outward configuration, the movable component **124** is either aligned with the wall of the housing **100** or at least a portion of the movable component **124** is outside the housing **100** to indicate that the receiver drier received in the housing **100** is the first receiver drier **110a**. Generally, the rib **126** is disposed along a free edge of the movable component **124**. However, the present invention is not limited to any particular configuration, placement and number of the ribs **126** on the movable component **124** as far as the rib **126** is capable of interacting with the receiver drier received in the housing **100** to push the movable component **124** in the radially outward direction.

[0033] Instead of the rib **126**, the movable component **124** can be a stepped movable component **124** that flexes radially outwardly with respect to the housing **100** when the first receiver drier **110a** is received in the housing **100** but prevents further advance of the receiver driers of smaller lengths there across, when such receiver driers are received in the housing **100**. Generally, the movable component **124** and the housing **100** are of same material. Alternatively, the movable component **124** and the housing **100** are of different material. The movable component **124** is formed during the forming of the slot **122** by the stamping operation. Alternatively, the slot **122** and the movable component **124** are formed together with the housing **100** by moulding process. However, the present invention is not limited to any particular configuration of the movable component **124**, as long as the movable component **124** is flexible and capable of flexing to be either aligned with the peripheral wall **120b** of the housing around the slot **122** or cause at least a portion thereof to be outside the housing **100**, and is also capable of preventing further advance of the second receiver drier **110b** there across. With such configuration, the receiver drier variant received inside the housing **100** can be determined by mere visual inspection of the movable component **124** with respect to the exterior of the housing **100** without requiring disassembly of the housing **100**.

[0034] Instead of the movable component **124** or in addition to the movable component **124** formed on the housing **100** to determine the receiver drier version received inside the housing **100**, the sensor **130** can be used to determine the receiver drier version received in-

side the housing **100**. Generally, the sensor **130** is part of the manufacturing / assembly on which different receiver drier variants **110a**, **110b** are assembled in the housing **100**. More specifically, the spacing between movable component **124** and the slot **122** enables interaction between the sensor **130** and the receiver drier received inside the housing **100** to detect the receiver drier variant received inside the housing **100**. The sensor **130** is selected from a group comprising of ultrasonic, capacitive and photoelectric sensors. Alternatively, the sensor **130** can be configured in the housing **100**. More specifically, the sensor **130** is received in a pocket formed within the slot **122** on the wall **120a**, **120b** of the housing **120**. The sensor **130** detects material based on whether any portion of the receiver drier received in the housing **100** comes in proximity to the sensor **130** or not. Specifically, the sensor **130** detects that the receiver drier received inside the housing **100** is the first receiver drier **110a** based on whether the receiver drier reaches in front of the sensor **130** or not. Such configuration enables the sensor **130** to determine the receiver drier variant without contacting the receiver drier. Based on the detection of the first receiver drier **110a** by the sensor **130**, an audio or visual indication may be provided. The present invention applies different features to determine the receiver drier variant received inside the housing **100**. More specifically, the sensor **130** determines the receiver drier variant received in the housing **100** based on the principle of material detection. Whereas the movable component **124** determines the receiver drier variant received in the housing **100** based on mechanical interaction of the movable component **124** with respect to the receiver drier receiver drier and deformation of the movable component **124** due to such mechanical interaction. Such configuration provides redundancy by determining the receiver drier variant received in the housing **100** even in case one feature fails to determine the receiver drier variant inside the housing **100**. With such configuration, the receiver drier variant received in the housing can still be determined, even if the movable component **124** fails due to wear and tear due to usage of the movable component **124** over a period of time or if the sensor fails due to any other reason.

[0035] FIG. 5 present another embodiment of the invention. In this example, the housing includes a first indication **125a** means and a second indication **125b** means. The first indication means **125a** moves to the first position based on length of the receiver drier variant received in the housing **100** and the second indication means **125b** moves to the first position based on radial dimension of the receiver drier variant received in the housing **100**.

[0036] Although, the present invention is explained with example of a housing configured with a slot, wherein at least one movable component **124** and a sensor interacts through the slot with the receiver drier held inside the housing to determine whether the receiver drier is any one of the two variants. However, there could be

multiple slots, with respective movable components and sensors interacting through such slots with the receiver drier received in the housing to determine different receiver drier variants. More specifically, duplication and changing arrangement of the slots on the housing, wherein the respective movable components and sensors interact with the receiver drier received in the housing to determine different receiver drier variants will still be within the scope of the present invention. Further, although, the present invention is explained with example of a housing configured with a slot, wherein at least one movable component and a sensor interacts through the slot with the receiver drier held inside the housing to determine whether a receiver drier of particular length is received in the housing. However, housing of such configuration with slot, wherein at least one of movable component and sensor interacts through the slot with the receiver drier can be used to determine different sizes, particularly, different volumes and diameters of the receiver driers received in the housing.

[0037] Also is disclosed a heat exchanger **200** in accordance with an embodiment of the present invention. The heat exchanger **200** includes a housing **100** connected thereto. The housing **100** receives and holds different receiver drier variants therein, wherein the housing **100** is as disclosed above. More specifically, the housing **100** includes features to determine the receiver drier variants received in the housing **100**.

Claims

1. A housing (100) adapted to house interchangeably at least two receiver drier variants (110a, 110b), the housing (100) comprising indication means (125) adapted to move between a first position indicative of presence of a first receiver drier variant (110a) and a second position indicative of presence of a second receiver drier variant (110b).
2. The housing (100) in accordance with the previous claim, wherein the indication means (125) comprises at least one movable component (124) adapted to move between a first position and a second position due to mechanical interaction thereof with the first receiver drier variant (110a).
3. The housing (100) in accordance with any of the preceding claims, further comprising a slot (122) for an external sensor (130) triggerable in case of the first receiver drier variant (110a) presence in the housing (100).
4. The housing (100) as claimed in any of the previous claim, wherein the slot (122) is disposed proximal to the at least one end wall (120a) of the housing (100).
5. The housing (100) as claimed in claim 3, wherein

the slot (122) is adapted to receive the movable component (124).

6. The housing (100) as claimed in claim 3 or 5, wherein the movable component (124) extends inwardly into the slot (122) along the wall (120a, 120b) and at least a portion thereof extends radially into an interior of the housing (100).
7. The housing (100) as claimed in any of claims 2-6, wherein the movable component (124) is integrally formed with the housing (100) and is connected to the housing (100) along at least one side thereof.
8. The housing (100) as claimed in any of claims 2-7, wherein the movable component (124) is flexible and flexes radially outward to cause at least a portion thereof to be out of the housing (100) when the first receiver drier variant (110a) is received inside the housing (100).
9. The housing (100) as claimed in any of claims 2-8, wherein the movable component (124) further comprises a rib (126) extending into an interior of the housing (120) that pushes at least a portion of the movable component (124) outside the housing (100) when the first receiver drier variant (110a) is received in the housing (100).
10. The housing (100) as claimed in any of the preceding claims, wherein the indication means (125) is adapted to move to the first position based on length of the receiver drier variant received in the housing (100).
11. The housing (100) as claimed in any of the preceding claims, wherein the indication means (125) is adapted to move to the first position based on radial dimension of the receiver drier variant received in the housing (100).
12. The housing (100) as claimed in any of the preceding claims comprises a first indication means (125a) and a second indication means (125b), wherein the first indication means (125a) is adapted to move to the first position based on length of the receiver drier variant received in the housing (100) and the second indication means (125b) is adapted to move to the first position based on radial dimension of the receiver drier variant received in the housing (100).
13. A heat exchanger (200) comprising a housing (100) as claimed in any of the preceding claims, wherein the heat exchanger (200) comprises a first receiver drier variant (110a) or second receiver drier variant (110b).

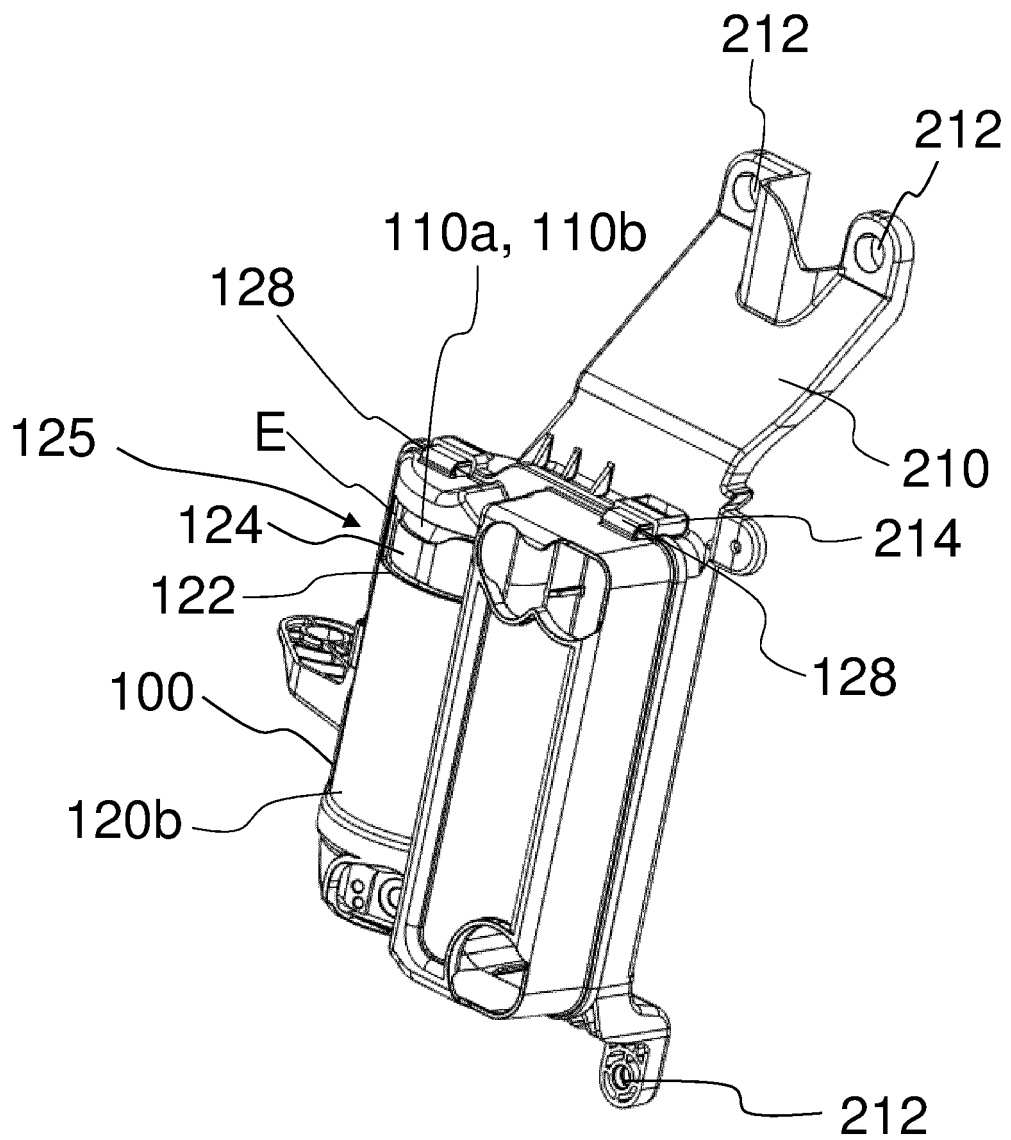


FIG. 1

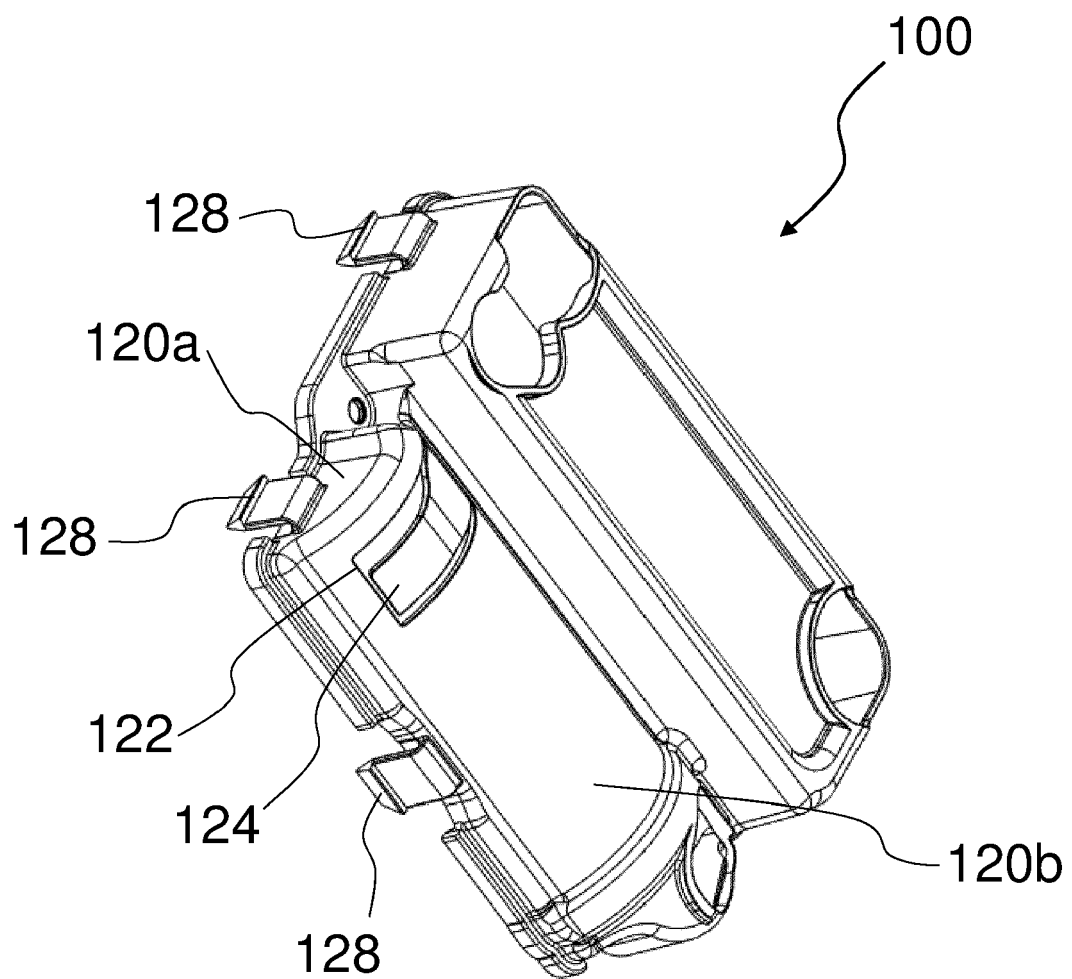


FIG. 2

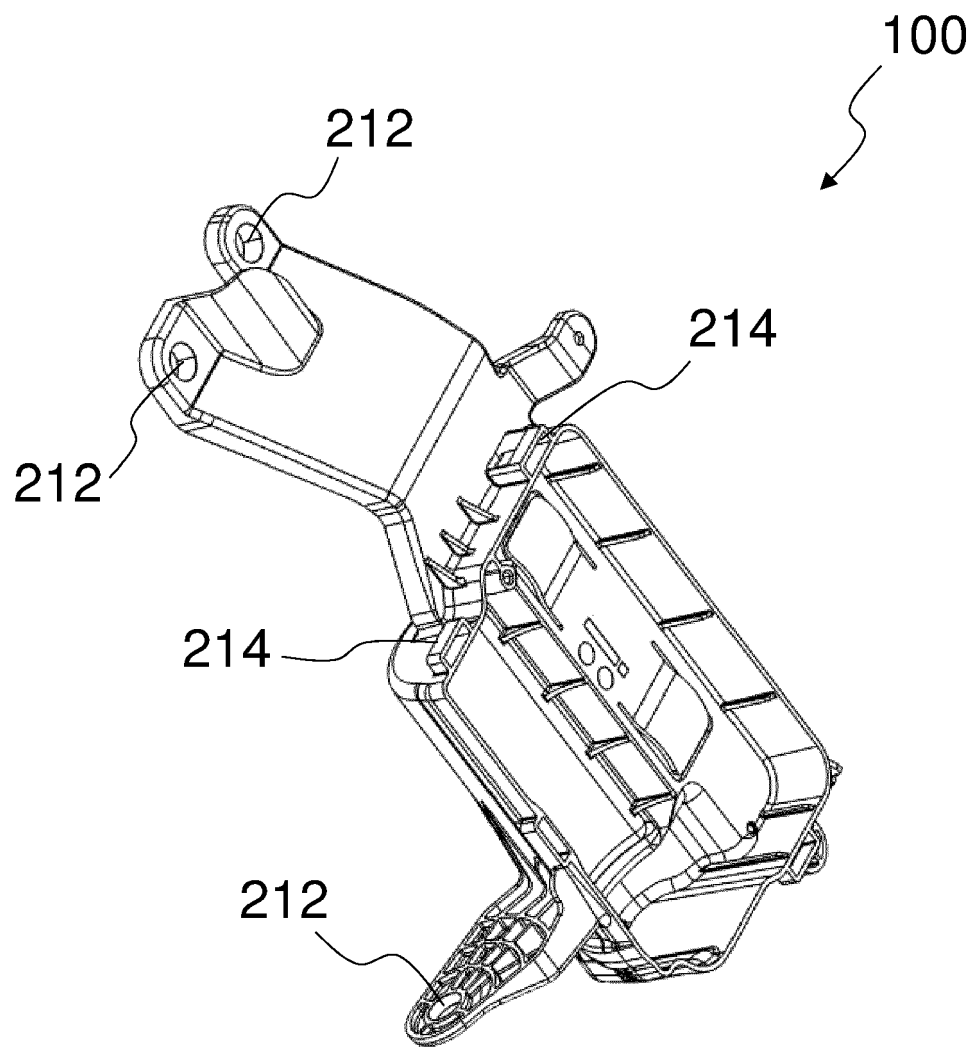


FIG. 3

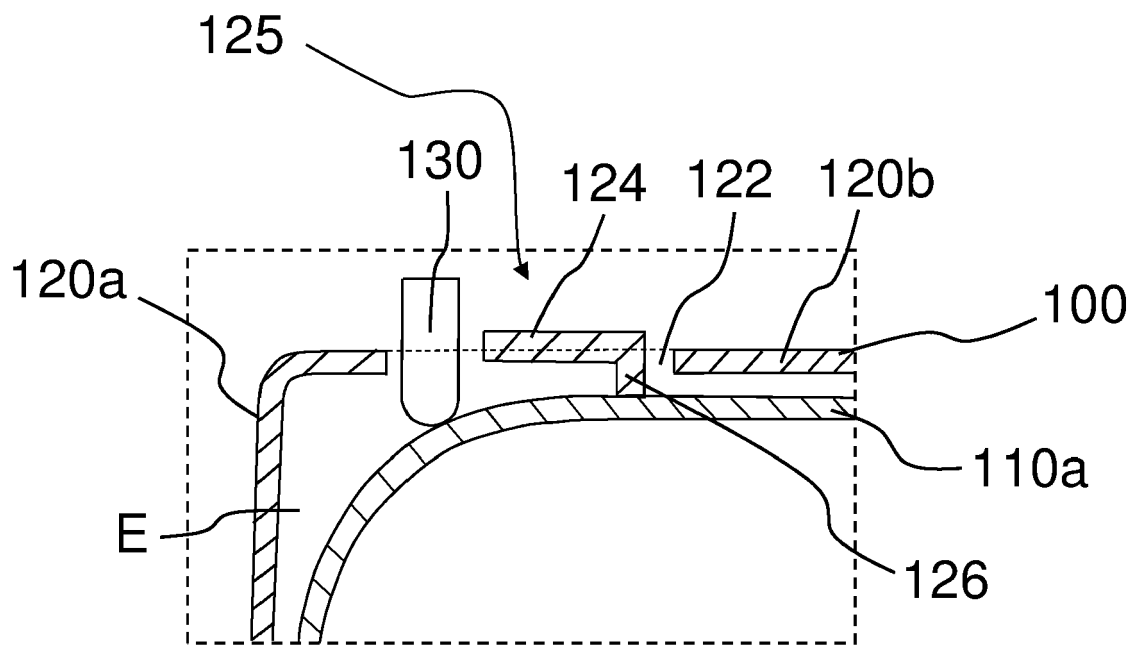


FIG. 4a

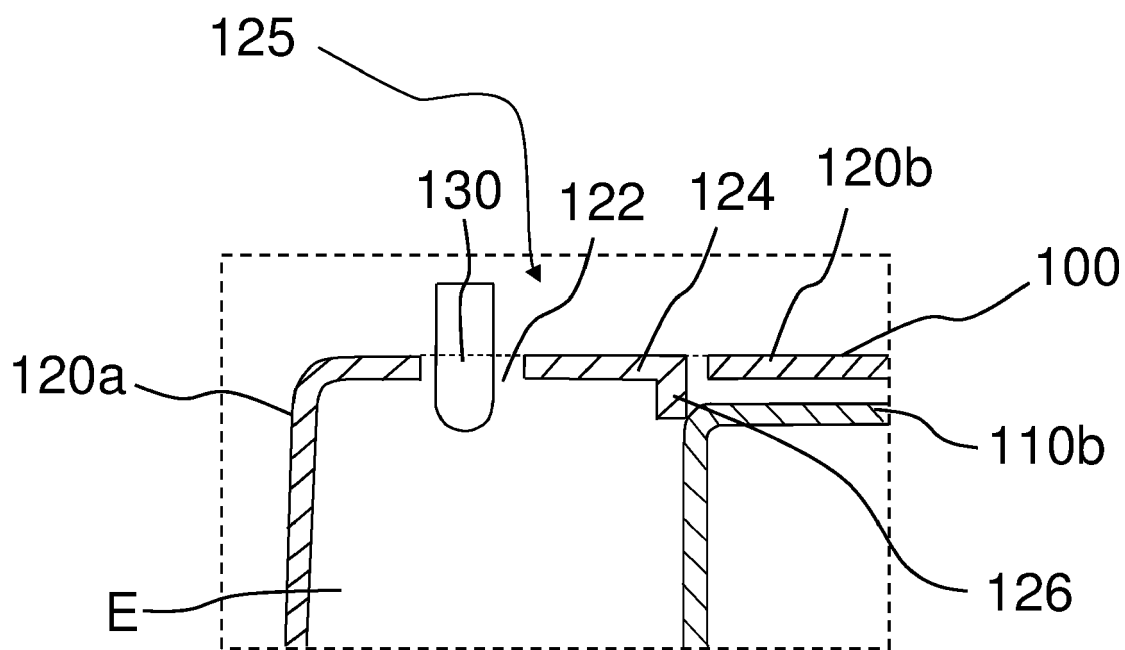


FIG. 4b

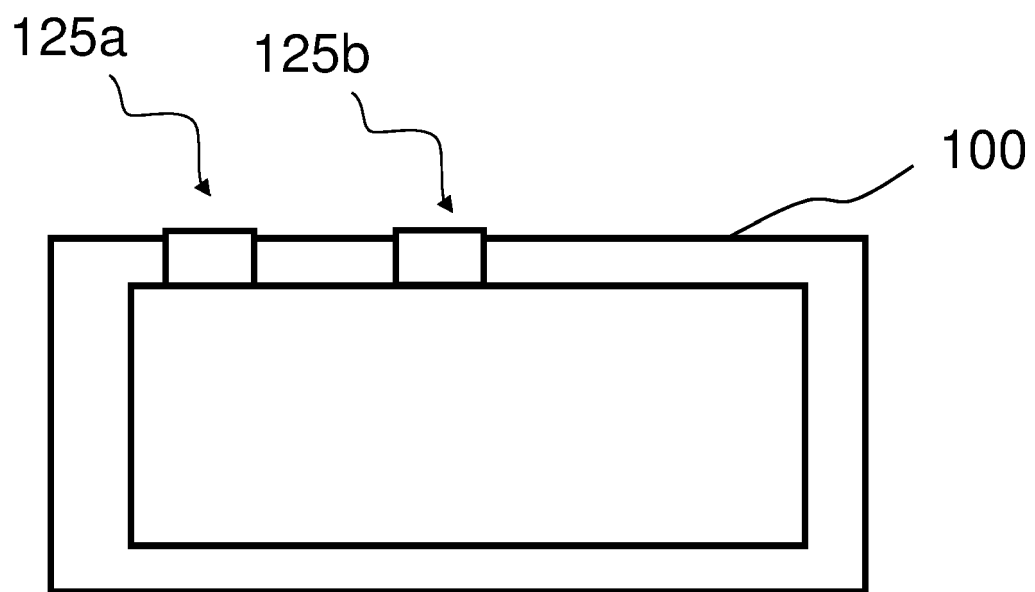


FIG. 5



EUROPEAN SEARCH REPORT

Application Number
EP 20 46 1563

5

10

15

20

25

30

35

40

45

50

55

2

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)
A	EP 3 444 544 A1 (VALEO AUTOSYSTEMY SP ZOO [PL]) 20 February 2019 (2019-02-20) * paragraph [0011] - paragraph [0034]; figure 1 *	1-13	INV. F25B43/00 B60H1/00
A	US 3 785 164 A (WRENN G) 15 January 1974 (1974-01-15) * column 2, line 31 - column 2, line 67; figure 1 *	1-13	
A	EP 3 193 105 A2 (BERGSTROM INC [US]) 19 July 2017 (2017-07-19) * paragraphs [0006], [0040] - paragraph [0051]; figures 2A-2F *	1-13	
			TECHNICAL FIELDS SEARCHED (IPC)
			F25B B60H B01D
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 25 February 2021	Examiner Gaspar, Ralf
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			

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

EP 20 46 1563

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.

25-02-2021

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 3444544 A1	20-02-2019	CN 111527355 A	11-08-2020
		EP 3444544 A1	20-02-2019
		US 2020224943 A1	16-07-2020
		WO 2019034647 A1	21-02-2019

US 3785164 A	15-01-1974	CA 1006445 A	08-03-1977
		DE 2324680 A1	06-12-1973
		FR 2359386 A1	17-02-1978
		US 3759062 A	18-09-1973
		US 3785164 A	15-01-1974

EP 3193105 A2	19-07-2017	CN 107042747 A	15-08-2017
		EP 3193105 A2	19-07-2017
		US 2017198953 A1	13-07-2017
		US 2018073789 A1	15-03-2018
