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(54) **CONNECTOR**

(57) A connector for a heating system filter, the connector comprising:
an inlet;
an outlet;
a flow gauge;
a plurality of connectors configured to be connected to a heating system filter or a liquid delivery means; and
a plurality of isolation valves configured, in a first configuration, to direct liquid from the inlet through the heating system filter to the outlet and configured, in a second configuration, to direct liquid from the inlet to the outlet and to isolate liquid to the heating system filter, to permit interchange of the heating system filter for the liquid delivery means, wherein the inlet, the outlet, the plurality of connectors, the flow gauge and the plurality of isolation valves are comprised in a unitary body, and wherein the flow gauge is located between the inlet and a first isolation valve, between the first isolation valve and a second isolation valve, or between the second isolation valve and the outlet.

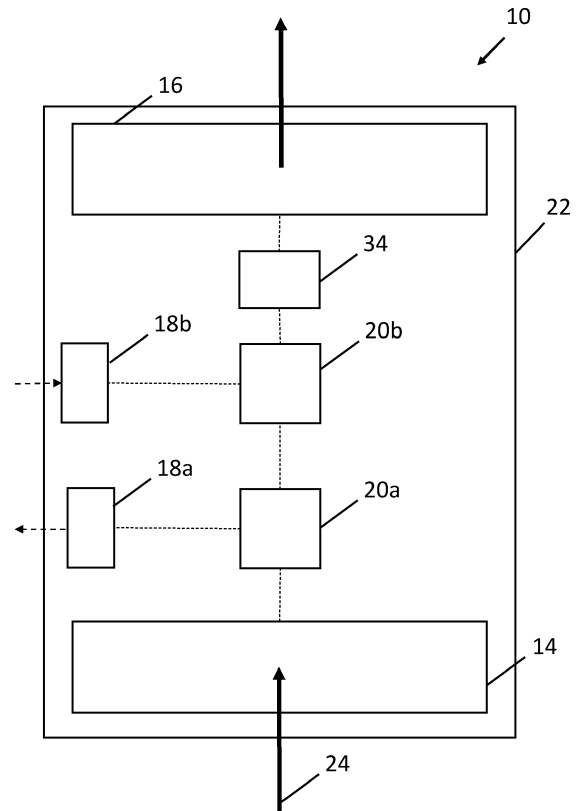


FIG. 1

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Description

TECHNOLOGICAL FIELD

[0001] Embodiments of the present disclosure relate to a connector for a heating system filter. Some relate to a connector for a heat pump system filter.

BACKGROUND

[0002] Filters can be connected to heating systems to remove contaminants, such as debris, from the liquid in the heating system.

[0003] It would be desirable to connect a filter to a heating system efficiently and effectively.

BRIEF SUMMARY

[0004] According to various, but not necessarily all, embodiments there is provided a connector for a heating system filter, the connector comprising:

an inlet;
 an outlet;
 a flow gauge;
 a plurality of connectors configured to be connected to a heating system filter or a liquid delivery means and
 a plurality of isolation valves configured, in a first configuration, to direct liquid from the inlet through the heating system filter to the outlet and configured, in a second configuration, to direct liquid from the inlet to the outlet and to isolate liquid to the heating system filter, to permit the interchange of the heating system filter for the liquid delivery means, wherein the inlet, the outlet, the plurality of connectors, the flow gauge and the plurality of isolation valves are comprised in a unitary body, and wherein the flow gauge is located between the inlet and a first isolation valve, between the first isolation valve and a second isolation valve, or between the second isolation valve and the outlet.

[0005] In some examples, at least one of the plurality of isolation valves is configured in a third configuration to control a rate of flow of liquid through the connector. At least one of the plurality of isolation valves may be considered a flow balancing valve.

[0006] In some examples, the flow gauge is configured to allow a liquid flow rate through the connector to be determined.

[0007] In some examples, the liquid delivery means may comprise a heating system filling system or a heating system flush system.

[0008] In some examples, the connector comprises a pressure gauge, wherein the pressure gauge is attached to the unitary body and is configured to measure a pressure of the liquid when the plurality of isolation valves are

in the first configuration or the second configuration.

[0009] According to various, but not necessarily all, embodiments there is provided a heating filter system comprising:

a connector as described herein; and
 a heating system filter connected to the plurality of connectors.

[0010] According to various, but not necessarily all embodiments, there is provided a heating system comprising a heater and a heating filter system as described herein.

[0011] According to various, but not necessarily all, embodiments there is provided examples as claimed in the appended claims.

[0012] The description of a function should additionally be considered to also disclose any means suitable for performing that function

BRIEF DESCRIPTION

[0013] Some examples will now be described with reference to the accompanying drawings in which:

FIG. 1 shows an example of the subject matter described herein; and

FIG. 2 shows another example of the subject matter described herein.

DETAILED DESCRIPTION

[0014] Examples of the disclosure relate to a connector for a heating system filter. A connector for a heating system filter can be considered a connector for connecting a heating system filter to a heating system.

[0015] The following description and FIGs describe various examples of a connector 10 for a heating system filter 12, the connector 10 comprising:

an inlet 14;
 an outlet 16
 a flow gauge 34;
 a plurality of connectors 18 configured to be connected to a heating system filter 12 or a liquid delivery means; and
 a plurality of isolation valves 20 configured, in a first configuration, to direct liquid 24 from the inlet 14 through the heating system filter 12 to the outlet 16 and configured, in a second configuration, to direct liquid from the inlet 14 to the outlet 16 and to isolate liquid 24 to the heating system filter 12 or the liquid delivery means to permit the interchange of the heating system filter for the liquid delivery means, wherein the inlet 14, the outlet 16, the plurality of connectors 18 and the plurality of isolation valves 20 are comprised in a unitary body 22, and wherein the flow gauge 34 is located between the inlet 14 and a first

isolation valve 20a, between the first isolation valve 20a and a second isolation valve 20b, or between the second isolation valve 20b and the outlet 16.

[0016] In examples, where a feature is described as 'for performing an action' it should also be considered to be configured to perform the action and vice versa.

[0017] FIG. 1 schematically illustrates an example of a connector 10 for a heating system filter 12. In examples, the connector 10 can be considered a unitary connector 10.

[0018] In examples, the connector 10 illustrated in the example of FIG. 1 can be considered a connector 10 for connecting a heating system filter 12 to a heating system 40.

[0019] In the example of FIG. 1, the connector 10 comprises an inlet 14, an outlet 16, a flow gauge 34 and a plurality of isolation valves 20 configured to control the flow of liquid 24 from the inlet 14, through the connector 10, to the outlet 16.

[0020] The connector 10 of FIG. 1 also comprises a plurality of connectors 18 configured to be connected to a heating system filter 12, for example any suitable filter for use with any suitable heating system, or a liquid delivery means such as a heating system filling system or a heating system flush system.

[0021] In examples, the plurality of connectors 18 can be considered a plurality of connection points.

[0022] The inlet 14, the outlet 16, the flow gauge 34, the plurality of isolation valves 20 and the plurality of connectors 18 are comprised in a unitary body 22.

[0023] In examples, the inlet 14, the outlet 16, the flow gauge 34, the plurality of isolation valves 20 and/or the plurality of connectors 18 can be considered to form part of the unitary body 22.

[0024] That is, the connector 10 can be formed from a unitary body 22 comprising the various features of the connector 10.

[0025] In examples, a unitary body 22 can be considered a body that is formed as a single unit and is not, therefore, formed by the various features of the connector 10 being individually connected together. In some examples, a plurality of sections can be combined together to form the unitary body 22 in which the inlet 14, the outlet 16, the flow gauge 34, the plurality of isolation valves 20 and the plurality of connectors 18 are comprised and/or form part of.

[0026] In examples, the plurality of isolation valves 20 have a plurality of configurations.

[0027] In some examples, the plurality of isolation valves 20 can be moved between a plurality of positions to put the isolation valves 20 into different configurations. For example, an operating member of the isolation valves 20 can be rotated between different positions, for example by 90 degrees. In examples, an operating member can comprise a handle, a slot for use with a tool and so on.

[0028] In examples any suitable isolation valves 20 can be used. For example, the isolation valve 20 can com-

prise two-way isolation valves.

[0029] In a first configuration, the plurality of isolation valves 20 are configured to direct liquid 24 from the inlet 14 through a heating system filter 12, to the outlet 10 when a heating system filter 12 is connected to the connector 10, or to direct liquid from a liquid delivery means through the heating system 40. Directing liquid from a liquid delivery means may comprise enabling the heating system 40 to be filled and / or flushed.

[0030] Any suitable inlet 14 to allow liquid 24 to enter the connector 10 can be used. For example, the inlet 14 can comprise a G1" british standard part (BSP).

[0031] Any suitable outlet 16 to allow liquid 24 to exit the connector 10 can be used. For example, the outlet 16 can comprise a G1" BSP.

[0032] In the example, of FIG. 1, in the first configuration, a first isolation valve 20a is configured to direct liquid 24 from the inlet 14 to a first connector 18a, to introduce the liquid to a heating system filter 12, or to connect the heating system to a liquid delivery means.

[0033] In the first configuration, a second connector 18b is configured to receive liquid 24 from a heating system filter 12, or to connect the heating system to a liquid delivery means and a second isolation valve 20b is configured to direct the liquid 24 to the outlet 16.

[0034] Any suitable connectors/connection points 18 to allow a heating system filter 12, or liquid delivery means to be connected to the connector 10 can be used. For example, connectors 18 comprising swivel nuts can be used.

[0035] In some examples, the plurality of connectors 18 are configured and/or arranged to be able to connect to the heating system filter 12, or liquid delivery means that the connector 10 is intended and/or designed to be used with.

[0036] Any suitable heating system filter 12 can be used. For example, any suitable filter for removing debris and/or magnetite from a heating system 40 such as a heat pump heating system or a boiler heating system can be used. See, for example, FIG. 2.

[0037] Any suitable heating system filling system may be used. For example, any suitable connection to a source of water, such as mains water pressure may be used.

[0038] Any suitable heating system flush system may be used. For example, the heating system flush system may comprise a heating system flush pump that is configured to generate flow through the heating system 40 to remove debris, rust and/or sludge that has accumulated in at least one portion of the heating system 40 that is different to the heating system filter 12.

[0039] In a second configuration, the plurality of isolation valves 20 are configured to direct liquid 24 from the inlet 14 to the outlet 16 and to isolate liquid 24 from the heating system filter 12 or liquid delivery means.

[0040] Isolating liquid 24 from the heating system filter 12 can be considered preventing liquid from the inlet 14 flowing through the heating system filter 12, or to and/or

from the liquid delivery means.

[0041] Isolation of liquid 24, when the plurality of isolation valves 20 are in the second configuration, permits the heating system filter 12 to be interchanged for the liquid delivery means such as the heating system filling system or heating system flush system, when maintenance is carried out on the heating system.

[0042] Maintenance may comprise the draining and subsequent re-filling of the heating system 40. Maintenance may comprise the flushing of the heating system 40. Flushing the heating system 40 may be advantageous as the efficiency of the heating system 40 may be improved by the removal of debris, rust and/or sludge that has accumulated within the heating system 40.

[0043] In the example of FIG. 1, in the second configuration, the isolation valves 20a, 20b are configured to allow liquid 24 from the inlet 14 to pass through the connector 10 to the outlet 16, without directing liquid towards the first connector 18a.

[0044] In the example of FIG. 1 liquid 24 is allowed to pass from the inlet 14 through the flow gauge 34 to the outlet 16 irrespective of the configuration of the isolation valves 20a, 20b.

[0045] Although the flow gauge 34 is illustrated in FIG. 1 as being between isolation valve 20b and outlet 16, it may be appreciated that flow gauge 34 may be located in an alternative portion of the connector 10.

[0046] For example, flow gauge 34 may be between inlet 14 and isolation valve 20a. Alternatively, flow gauge 34 may be between isolation valve 20a and isolation valve 20b.

[0047] Accordingly, FIG. 1 illustrates an example of a connector 10 for a heating system filter 12, the connector 10 comprising:

- an inlet 14;
- an outlet 16;
- a flow gauge 34;
- a plurality of connectors 18 configured to be connected to a heating system filter 12 or a liquid delivery means; and
- a plurality of isolation valves 20 configured, in a first configuration, to direct liquid 24 from the inlet 14 through the heating system filter 12 to the outlet 16 and configured, in a second configuration, to direct liquid from the inlet 14 to the outlet 16 and to isolate liquid 24 to the heating system filter 12 or the liquid delivery means, to permit the interchange of the heating system filter for the liquid delivery means, wherein the inlet 14, the outlet 16, the plurality of connectors 18 and the plurality of isolation valves 20 are comprised in a unitary body 22, and wherein the flow gauge is located between the inlet and a first isolation valve, between the first isolation valve and a second isolation valve, or between the second isolation valve and the outlet.

[0048] In some examples, at least one of the plurality

of isolation valves 20a, 20b may be configured to control a rate of flow of liquid through the connector 10. The flow gauge 34 may be configured to allow a liquid flow rate through the connector 10 to be determined.

[0049] Any suitable isolation valve configured to control a rate of flow through the connector 10 can be used.

[0050] Any suitable flow gauge can be used. For example, any flow gauge configured to allow a liquid flow rate through the connector 10 to be determined can be used.

[0051] In some examples, the connector 10 comprises a pressure gauge 38, wherein the pressure gauge 38 is attached to the unitary body 22 and is configured to measure a pressure of the liquid when the plurality of isolation valves 20 are in the first configuration or the second configuration. See, for example, FIG. 2.

[0052] In examples, the pressure gauge can be comprised in and/or form part of the unitary body.

[0053] Any suitable pressure gauge can be used. For example, any suitable pressure gauge 38 configured to measure the pressure of liquid when the plurality of isolation valves 20 are in the first configuration or second configuration can be used.

[0054] For example, any suitable pressure gauge 38 configured to measure the pressure of liquid passing through the connector 10 can be used.

[0055] The connector 10 can be made and/or formed in any suitable way using any suitable methods.

[0056] The connector 10 can comprise and suitable material or materials.

[0057] For example, the connector 10 can be formed from brass construction.

[0058] FIG. 2 illustrates a front view of an example of a connector 10 for a heating system filter 12.

[0059] The connector 10 illustrated in the example of FIG. 2 can be a connector 10 as described in relation to FIG. 1.

[0060] The connector 10 for a heating system filter 12 in the example of FIG. 2 comprises an inlet 14, an outlet 16, a flow gauge 34, a plurality of isolation valves 20 and a plurality of connectors/connection points 18 configured to be connected to a heating system filter 12 or liquid delivery means.

[0061] The inlet 14, outlet 16, flow gauge 34, isolation valves 20 and connectors 18 are comprised and/or form part of a unitary body 22.

[0062] In the example of FIG. 2, the connector 10 also comprises a pressure gauge 38.

[0063] In the example of FIG. 2, the inlet 14 comprises a G1" BSB, the outlet 16 comprises a G1" BSP, the connectors 18 comprise swivel nuts and the isolation valves 20 comprise two-way isolation valves.

[0064] In the example of FIG. 2, a heating system filter 12 is connected/attached to the connector 10 at the connectors/connection points 18.

[0065] In the example, of FIG. 2, the isolation valves 20 are in a first configuration such that liquid from the inlet 14 is directed through the heating system filter 12

and to the outlet 16.

[0066] However, in a second configuration, for example when the operating members of the isolation valves are rotated to a second position, liquid from the inlet 14 flows straight through the connector 10 and is isolated from the heating system filter 12 or liquid delivery means.

[0067] In the second configuration, the swivel nuts, for example, of the connectors 18 can be used to release the filter 12 to allow, for example, servicing of the filter 12 while a heating system 40 to which the connector 10 is connected remains live. When in the second configuration, the filter 12 may be interchanged for the liquid delivery means for flushing and/or filling of a heating system 40 when the connector 10 is connected to the heating system 40, or vice versa.

[0068] FIG. 2 therefore also illustrates a heating filter system 36 comprising a connector 10 as described herein and a heating system filter 12 connected to the plurality of connections/connection points 18 of the connector 10.

[0069] In examples, the heating filter system 36 is connected to a heating system 40.

[0070] FIG. 2 therefore also illustrates a heating system 40 comprising a heater (not illustrated) and a heating filter system 36 as described herein.

[0071] In examples, the heater comprises a heat pump and/or boiler and so on.

[0072] In some examples, at least one of the plurality of isolation valves is configured in a third configuration to control a rate of flow of liquid through the connector. At least one of the plurality of isolation valves may be considered a flow balancing valve.

[0073] Accordingly, in examples, the connector 10 is configured to allow a flow rate through a heating system 40 to be monitored and adjusted and/or controlled.

[0074] Examples of the disclosure are advantageous and/or provide technical benefits.

[0075] For example, the connector comprising a unitary body allows the connector to be installed easily and efficiently.

[0076] For example, in use, the connector allows a heating system to remain live while maintenance is performed on a heating system filter.

[0077] For example, in use, the connector allows a heating system to be flushed and/or filled.

[0078] For example, in use, the connector allows flow rate in a heating system to be monitored and controlled.

[0079] In examples, the various features described are operationally coupled/connected and any number of intervening elements can exist (including no intervening elements). Where a structural feature has been described, it may be replaced by means for performing one or more of the functions of the structural feature whether that function or those functions are explicitly or implicitly described.

[0080] The term 'comprise' is used in this document with an inclusive not an exclusive meaning. That is any reference to X comprising Y indicates that X may comprise only one Y or may comprise more than one Y. If it

is intended to use 'comprise' with an exclusive meaning then it will be made clear in the context by referring to "comprising only one.." or by using "consisting".

[0081] In this description, reference has been made to various examples. The description of features or functions in relation to an example indicates that those features or functions are present in that example. The use of the term 'example' or 'for example' or 'can' or 'may' in the text denotes, whether explicitly stated or not, that such features or functions are present in at least the described example, whether described as an example or not, and that they can be, but are not necessarily, present in some of or all other examples. Thus 'example', 'for example', 'can' or 'may' refers to a particular instance in a class of examples. A property of the instance can be a property of only that instance or a property of the class or a property of a sub-class of the class that includes some but not all of the instances in the class. It is therefore implicitly disclosed that a feature described with reference to one example but not with reference to another example, can where possible be used in that other example as part of a working combination but does not necessarily have to be used in that other example.

[0082] Although examples have been described in the preceding paragraphs with reference to various examples, it should be appreciated that modifications to the examples given can be made without departing from the scope of the claims.

[0083] Features described in the preceding description may be used in combinations other than the combinations explicitly described above.

[0084] Although functions have been described with reference to certain features, those functions may be performable by other features whether described or not.

[0085] Although features have been described with reference to certain examples, those features may also be present in other examples whether described or not.

[0086] The term 'a' or 'the' is used in this document with an inclusive not an exclusive meaning. That is any reference to X comprising a/the Y indicates that X may comprise only one Y or may comprise more than one Y unless the context clearly indicates the contrary. If it is intended to use 'a' or 'the' with an exclusive meaning then it will be made clear in the context. In some circumstances the use of 'at least one' or 'one or more' may be used to emphasize an inclusive meaning but the absence of these terms should not be taken to infer any exclusive meaning.

[0087] The presence of a feature (or combination of features) in a claim is a reference to that feature or (combination of features) itself and also to features that achieve substantially the same technical effect (equivalent features). The equivalent features include, for example, features that are variants and achieve substantially the same result in substantially the same way. The equivalent features include, for example, features that perform substantially the same function, in substantially the same way to achieve substantially the same result.

[0088] In this description, reference has been made to various examples using adjectives or adjectival phrases to describe characteristics of the examples. Such a description of a characteristic in relation to an example indicates that the characteristic is present in some examples exactly as described and is present in other examples substantially as described.

[0089] Whilst endeavoring in the foregoing specification to draw attention to those features believed to be of importance it should be understood that the Applicant may seek protection via the claims in respect of any patentable feature or combination of features hereinbefore referred to and/or shown in the drawings whether or not emphasis has been placed thereon.

Claims

1. A connector for a heating system filter, the connector comprising:

an inlet;

an outlet;

a flow gauge;

a plurality of connectors configured to be connected to a heating system filter or a liquid delivery means; and

a plurality of isolation valves configured, in a first configuration, to direct liquid from the inlet through the heating system filter to the outlet and configured, in a second configuration, to direct liquid from the inlet to the outlet and to isolate liquid to the heating system filter, to permit interchange of the heating system filter for the liquid delivery means, wherein the inlet, the outlet, the plurality of connectors, the flow gauge and the plurality of isolation valves are comprised in a unitary body, and wherein the flow gauge is located between the inlet and a first isolation valve, between the first isolation valve and a second isolation valve, or between the second isolation valve and the outlet.

2. A connector as claimed in claim 1 wherein at least one of the plurality of isolation valves is configured to control a rate of flow of liquid through the connector.

3. A connector as claimed in claim 1 or 2 wherein the flow gauge is configured to allow a liquid flow rate through the connector to be determined.

4. A connector as claimed in any of claims 1 to 3, wherein the connector comprises a pressure gauge, wherein the pressure gauge is attached to the unitary body and is configured to measure a pressure of the liquid when the plurality of isolation valves are in the first configuration or the second configuration.

5. A heating filter system comprising:

a connector as claimed in any of claims 1 to 4; and

a heating system filter connected to the plurality of connectors.

6. A heating system comprising a heater and a heating filter system as claimed in claim 5.

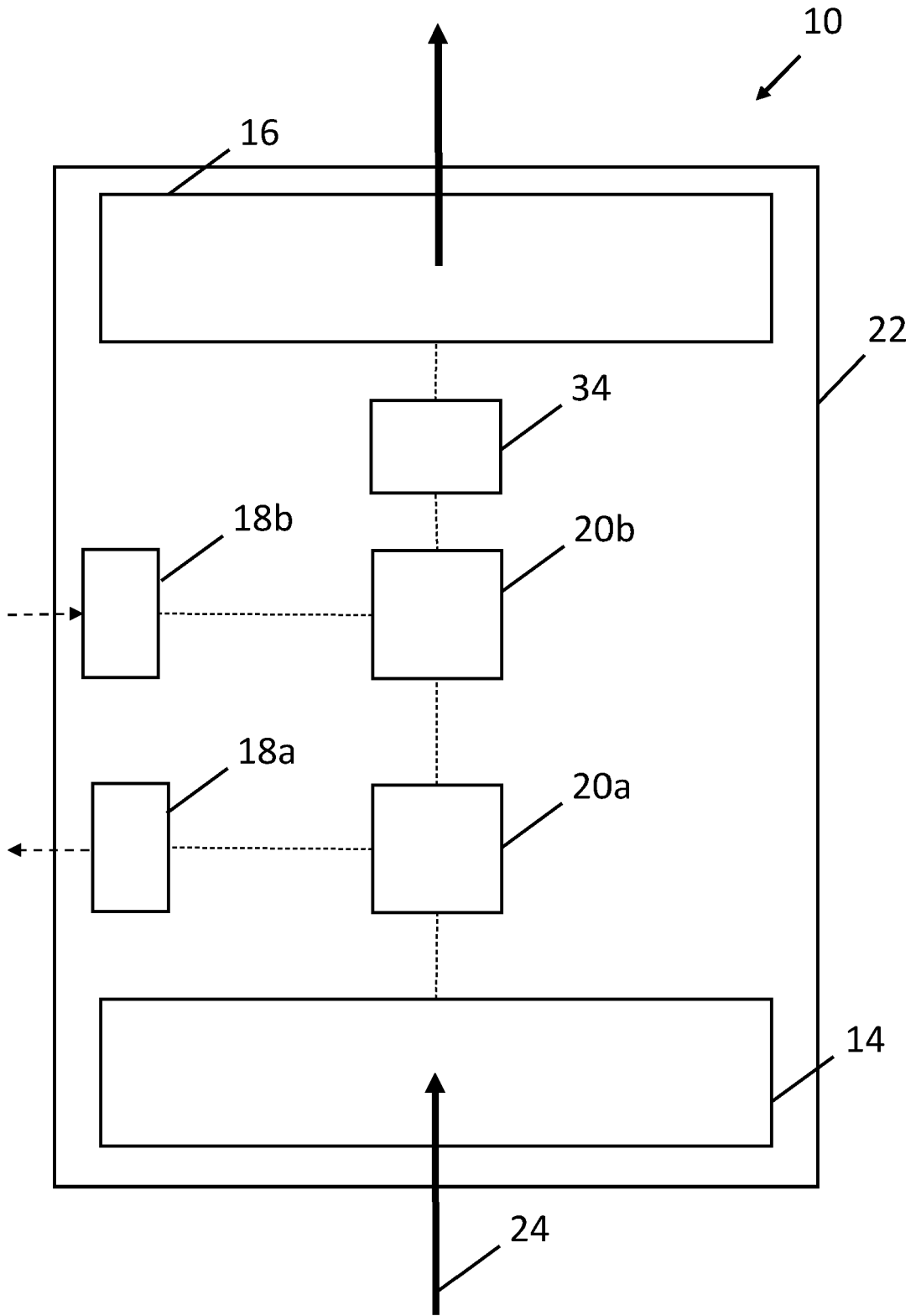


FIG. 1

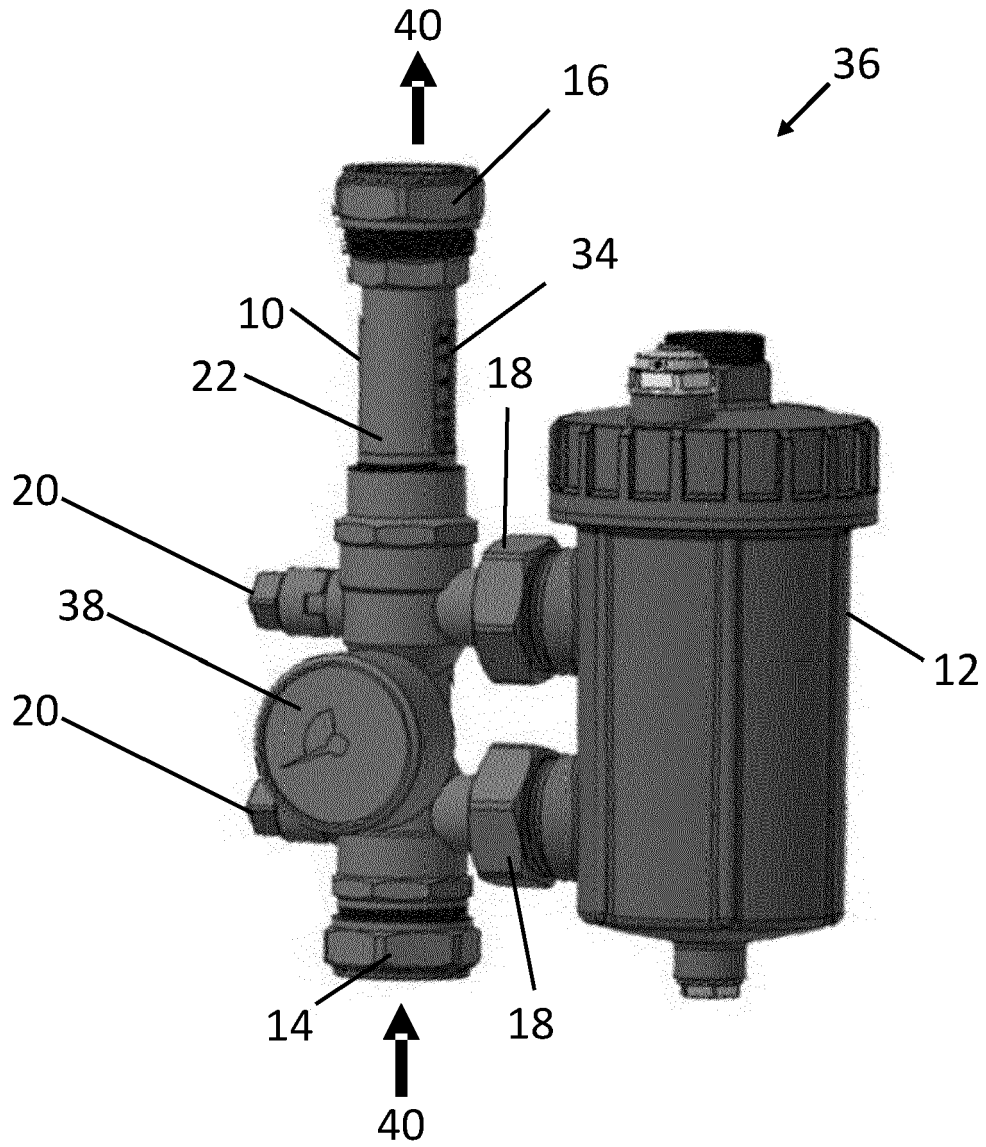


FIG. 2



EUROPEAN SEARCH REPORT

Application Number

EP 23 21 6443

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DOCUMENTS CONSIDERED TO BE RELEVANT

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15

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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The present search report has been drawn up for all claims

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Place of search Munich	Date of completion of the search 30 April 2024	Examiner Ast, Gabor
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EPO FORM 1503 03:82 (P04C01)

CATEGORY OF CITED DOCUMENTS
 X : particularly relevant if taken alone
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 E : earlier patent document, but published on, or after the filing date
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ANNEX TO THE EUROPEAN SEARCH REPORT
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5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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