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- (71) **Anmelder (für alle Bestimmungsstaaten mit Ausnahme von US):** STEINER AG WEGGIS [CH/CH]; Röhrlistrasse 22, CH-6353 Weggis (CH).
- (72) **Erfinder; und**
- (75) **Erfinder/Anmelder (nur für US):** STEINER, Adrian [CH/CH]; Remisstrasse 12, CH-6353 Weggis (CH).
- (74) **Anwalt:** LUCHS, Willi; c/o Luchs & Partner AG, Patentanwälte, Schulhausstrasse 12, CH-8002 Zürich (CH).
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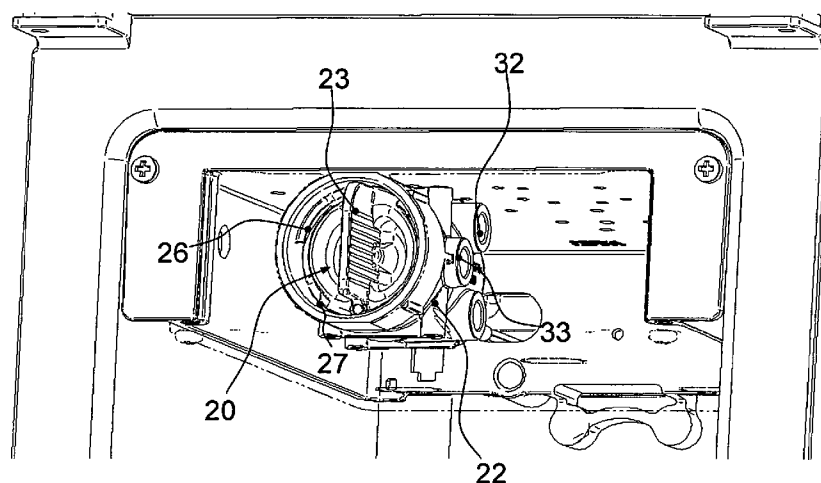
— mit internationalem Recherchenbericht (Artikel 21 Absatz 3)

[Fortsetzung auf der nächsten Seite]

(54) **Title:** CLEANING SYSTEM FOR A COFFEE MACHINE OR A SIMILAR DEVICE

(54) **Bezeichnung :** REINIGUNGSSYSTEM FÜR EINE KAFFEEMASCHINE ODER EINE ÄHNLICHE EINRICHTUNG

Fig. 5



(57) **Abstract:** The invention relates to a cleaning system for coffee machines and similar devices, in the cleaning circuit (1) of which a cleaning key (20) having a storage chamber (24) is installed for receiving appropriately configured cleaning tablets (25). The cleaning key (20) can be turned in a sleeve-like housing (22) into two operating positions at defined angles of rotation, wherein in one operating position the storage chamber (24) is fixed in the housing (22), whilst in the other operating position the storage chamber is released and can be removed from the housing (22) to be filled or refilled with suitably packaged cleaning tablets.

(57) **Zusammenfassung:**

[Fortsetzung auf der nächsten Seite]



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— vor Ablauf der für Änderungen der Ansprüche geltenden Frist; Veröffentlichung wird wiederholt, falls Änderungen eingehen (Regel 48 Absatz 2 Buchstabe h)

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Die Erfindung betrifft ein Reinigungssystem für Kaffeemaschinen und ähnliche Einrichtungen, in dessen Reinigungskreislauf (1) ein Reinigungsschlüssel (20) mit einer Vorratskammer (24) zur Aufnahme von entsprechend konfigurierten Reinigungstabletten (25) eingebaut ist. Der Reinigungsschlüssel (20) kann in einem hülsenförmigen Gehäuse (22) in zwei drehwinkelbestimmten Betriebsstellungen gedreht werden, wobei die Vorratskammer (24) in der einen Betriebsstellung im Gehäuse (22) fixiert ist, während sie in der anderen Betriebsstellung gelöst ist und aus dem Gehäuse (22) zum Auf- oder Nachfüllen derselben mit passend konfektionierten Reinigungstabletten ausziehbar ist.

T1-P19-PCI

Cleaning System for a Coffee Machine or a Similar Device

The invention relates to a cleaning system for a coffee machine or a similar device, comprising a cleaning circuit in which a preferably soluble cleaning agent is delivered to the cleaning liquid.

Devices of this type must guarantee a high degree of cleanliness of the products produced. For this purpose thorough cleaning of the respective units is carried out periodically in such a way that the latter are flushed with a cleaning liquid enriched with cleaning agents from time to time. Here the cleaning agent is delivered by means of a metering screw with a complex

structure and control system which interacts with an equally complex metering cabinet.

The object underlying the invention is to bring about the delivery of the cleaning agent with the simplest possible apparatus which works reliably and is easy to handle.

This object is achieved according to the invention in that there is installed in the cleaning circuit a cleaning key that can be switched into two operating positions and comprises a storage chamber for the cleaning agent, the storage chamber being blocked in the one operating position, while in the other operating position it is unblocked and can be moved into a freely accessible position as required. In this position it can easily be filled with the respectively provided cleaning agent. With the aid of the cleaning key it can also be guaranteed, for example, that the operation is only carried out by authorised staff members.

Within the context of a structurally simple and reliable construction provision is made according to the invention such that the cleaning key can be inserted into a sleeve-shaped housing and in the latter can be turned from one operating position to the other, the storage chamber in the one operating position being fixed in the housing, while in the other operating position it is released and can be removed with the cleaning key from the housing. In order to clear the storage chamber it is only necessary to bring the cleaning key into the latterly mentioned operating position and then to withdraw it from the housing. The storage chamber is then therefore freely accessible and can easily be filled or refilled with the suitable cleaning agent. In order to fix the storage chamber in the other operating position it is advantageous to provide the cleaning key with holding means which in this operating position can be engaged in a circumferential groove of the housing.

Furthermore, the invention makes provision such that the storage chamber is hollow cylindrical in form and is provided with a side window for introduction of

the cleaning agent. In this way the latter can be introduced easily, preferably in tablet form, into the storage chamber.

Provision is also made according to the invention such that the housing of the cleaning key is provided with inlet and outlet connections, arranged on the side, for delivering and discharging the cleaning liquid to and from the storage chamber of the cleaning key, the latter having appropriately arranged flushing openings which, with the storage chamber blocked, are flush with the corresponding inlet and outlet connections of the housing.

In this way it is guaranteed that the storage chamber can only be flushed by the cleaning liquid in this operating position. During the flushing of the chamber the cleaning tablets located here are dissolved in the cleaning liquid and thus give it the respectively desired properties.

The invention further relates to a cleaning tablet for the cleaning key proposed above, which is characterised in that its configuration is matched to the geometry of the storage chamber of the cleaning key. In this way it is guaranteed that only suitably packaged tablets can be used, the properties of which as regards the desired cleaning effect are optimal.

Within the context of simple production and handling of the tablets it is advantageous if the latter are shaped like discs and their outer diameter has dimensions such that they can preferably be inserted upright and to a large extent without any play in the hollow cylindrical storage chamber of the cleaning key.

With regard to the correct positioning of the tablets it is advantageous to form them annularly and to provide them with a central bore hole into which a centring pin of the housing can be inserted to a large extent without any play. This measure also contributes to the fact that only suitably packaged tablets can be inserted in the cleaning key.

It is advantageous for optimisation of the cleaning effect for the tablet thickness to have dimensions according to the invention such that a number of tablets, optionally made differently, can be stacked in the storage chamber of the cleaning key. Depending on the amount and properties of the individual tablets used, the cleaning effect can be adjusted within broad limits.

In the following the invention is described in more detail by means of an exemplary embodiment with reference to the drawings. These show as follows:

- Fig. 1 a cleaning circuit with a cleaning key according to the invention for the milk unit of a coffee machine, shown diagrammatically,
- Fig. 2 the cleaning circuit according to Fig. 1, shown in the filling phase of the cleaning process,
- Fig. 3 the cleaning circuit according to Fig. 1, in the emptying phase of the cleaning process,
- Fig. 4 the cleaning circuit according to Fig. 1 in the flushing phase of the product process,
- Fig. 5 the cleaning key according to the invention, shown in the installed state and perspectively,
- Fig. 6a a section through the cleaning key from Fig. 5, shown in the blocked operating position,
- Fig. 6b the cleaning key according to Fig. 5 in the blocked operating position, shown perspectively,
- Fig. 7a a section through the cleaning key from Fig. 5, shown in the unblocked operating position,
- Fig. 7b the cleaning key from Fig. 5 in the unblocked operating position, shown perspectively,
- Fig. 8 the cleaning key from Fig. 6 and Fig. 7 with an empty storage chamber, shown in simplified form and perspectively,
- Fig. 9 the cleaning key from Fig. 8 with a filled storage chamber, likewise in simplified form and perspectively, and
- Fig. 10 an annular cleaning tablet for the cleaning key according to Figs.

5 to 9.

The cleaning circuit 1 according to Fig. 1 to Fig. 4 is used to periodically clean a milk unit 2 for producing heated milk, milk froth or drinks containing milk. The unit 2 is equipped with a milk tank 3, a suction lance 4, a milk pump 5, a milk heating device 6, a milk outlet valve 7 and a milk removal point 8. The cleaning circuit 1 also includes a water network connection 9 and a water pump 10 with directional valves 11 and 12 and two water outflow points 13 and 14, in front of and behind the milk unit 2, upstream of which a check valve 15 and directional valves 16 and 17 are connected. Furthermore, additional check valves 18 are disposed between the directional valves 11 and 12 and in a branch line 19.

Also installed in the cleaning circuit 1 according to the invention is a cleaning key 20 with which a cleaning agent, preferably in tablet form, can be delivered to the cleaning liquid. A strainer or filter 21 is connected upstream of the cleaning key 20.

The mode of operation of the cleaning circuit 1 can be deduced from Fig. 1 to Fig. 4. Since this is prior art, it is also unnecessary to discuss its mode of operation in any more detail.

The cleaning key 20 according to the invention is inserted into a sleeve-like housing 22 which, on its part, is fastened at an easily accessible point of the machine, for example in the milk refrigerator.

The cleaning key 20 has a wing head 23 with which it can be turned within the housing 22 between two operating positions at defined angles of rotation. The cleaning key 20 further comprises a storage chamber 24 for receiving cleaning tablets 25 which can dissolve in the cleaning liquid during the cleaning process. The cleaning key 20 is then located in the operating position according to Fig. 6a and Fig. 6b in which the storage chamber 24 is fixed in the housing 22 with a holding means 27 engaging in its circumferential groove 26. In the operating position according to Fig. 7a and Fig. 7b the

storage chamber 24 is released, however, and can be removed from the housing 22 by removing the cleaning key 20. A sensor device 28 is applied to the rear side of the housing 22. This is a component part of the control system of the machine.

As can be seen in particular from Fig. 8 and Fig. 9, the storage chamber 24 of the cleaning key 20 is hollow cylindrical in form and has a side window 29 through which the cleaning tablets 25 can be inserted in the storage chamber 24 as required. In order to facilitate this operation the window is slightly widened on the rear side. The cleaning tablets 25 are shaped like discs and their circumference is matched to the geometry of the storage chamber 24. They can therefore be inserted upright and to a large extent without any play in the hollow cylindrical storage chamber 24.

In addition, the cleaning tablets 25 are annular in form and have a central bore hole 30 into which a centring pin 31 of the housing 22 can be inserted, to a large extent without any play. Their tablet thickness is determined such that a number of tablets, optionally made differently, can be stacked in the storage chamber 24.

This type of tablet arrangement is illustrated in Fig. 9. The centring pin 31 serves to secure the tablets, centred, in the storage chamber 24. The cleaning effect of the tablets is dependent upon the number and properties of the tablets used.

Needless to say it is also possible within the framework of the invention to use differently configured cleaning tablets provided their configuration is matched to the geometry of the storage chamber of the cleaning key.

Inlet and outlet connectors 32, 33 to which the feeds and sections of the cleaning circuit 1 can be connected are applied to the housing 22 of the key. The storage chamber 24 on its part is provided with correspondingly arranged flushing openings 34 which, with the storage chamber blocked, are flush with the corresponding inlet and outlet connectors 32, 33 of the housing. In this

way the interior of the chamber is then flushed so that the cleaning tablets located here can dissolve in the cleaning liquid.

The cleaning key 20 according to the invention can easily be switched over by turning the key head 23. In the one switching position it guarantees reliable operation while the milk unit is flushed, and in the other switching position it makes it possible for the storage chamber 24 to be cleared so that the latter becomes accessible for the filling or refilling of the latter with the cleaning tablets 25. After this the cleaning key 20 is inserted in the housing 22 again and is switched into the original switching position by the key head 23.

The sensor device 28 signals on the one hand the respectively active operating position and on the other hand the filling level of the storage chamber 24. Both signals are important for controlling the function of the system. By encoding the key appropriately it can also be guaranteed by the device that the key is only actuated by authorised staff members.

The invention is sufficiently demonstrated by the exemplary embodiment described. However, it could also be illustrated by further variations. Thus, for example, the housing of the cleaning key could have inlet and outlet connections for delivering and discharging the cleaning liquid which are arranged at the top and the bottom or on the face side or somewhere else instead of these inlet and outlet connections arranged on the side.

T1-P19-PCT

CLAIMS

1. A cleaning system for a coffee machine or a similar device, comprising a housing (22) into which a preferably soluble cleaning agent (25) can be delivered for a cleaning process of a cleaning liquid, characterised in that a cleaning key (20) is provided with a storage chamber (24) for the cleaning agent (25) and can be inserted in the housing (22).

2. The cleaning system according to Claim 1, characterised in that the cleaning key (20) can be inserted into a sleeve-shaped housing (22) and in the latter can be turned from one operating position to the other, the storage chamber (24) in the one operating position being fixed in the housing (22), while in the other operating position it is released and can be removed with the cleaning key (20) from the housing (22).

3. The cleaning system according to Claim 2, characterised in that the cleaning key (20) is provided with holding means (27) which in the one operating position can be engaged in a circumferential groove (26) of the housing (22).

4. The cleaning system according to any of Claims 1 to 3, characterised in that the storage chamber (24) is hollow cylindrical in form and is provided with a side window (29) for introduction of the cleaning agent (25).

5. The cleaning system according to any of Claims 2 to 4, characterised in that the housing (22) of the cleaning key is provided with inlet and outlet connections (32, 33), arranged on the side, for delivering and discharging the cleaning liquid to and from the storage chamber (24), the latter having appropriately arranged flushing openings (34) which, with the storage chamber blocked, are flush with the corresponding inlet and outlet connections of the housing (22).

6. The cleaning system according to any of Claims 1 to 5, characterised in that a sensor device (28) integrated into the system control is applied to the rear side of the housing (22).

7. The cleaning system according to any of Claims 1 to 6, characterised in that the cleaning means (25) can be inserted in the storage chamber (24) in tablet form.

8. The cleaning tablet for a cleaning system according to any of Claims 1 to 7, characterised in that the configuration of the cleaning tablet (25) is matched to the geometry of the storage chamber (24) of the cleaning key (20).

9. The cleaning tablet according to Claim 8 for a cleaning system according to any of Claims 4 to 7, characterised in that it is shaped like a disc and its outer diameter is determined such that it can preferably be inserted upright and to a large extent without any play in the hollow cylindrical storage chamber (24) of the cleaning key (20).

10. The cleaning tablet according to Claim 9, characterised in that it is annular in form and is provided with a central bore hole (30) into which a centring pin (28) of the housing (22) can be inserted, to a large extent without any play.

11. The cleaning tablet according to any of Claims 8 to 10, characterised in that the tablet thickness is determined such that a number of tablets (25), optionally made differently, can be stacked in the storage chamber (24) of the cleaning key (20).

Fig. 1

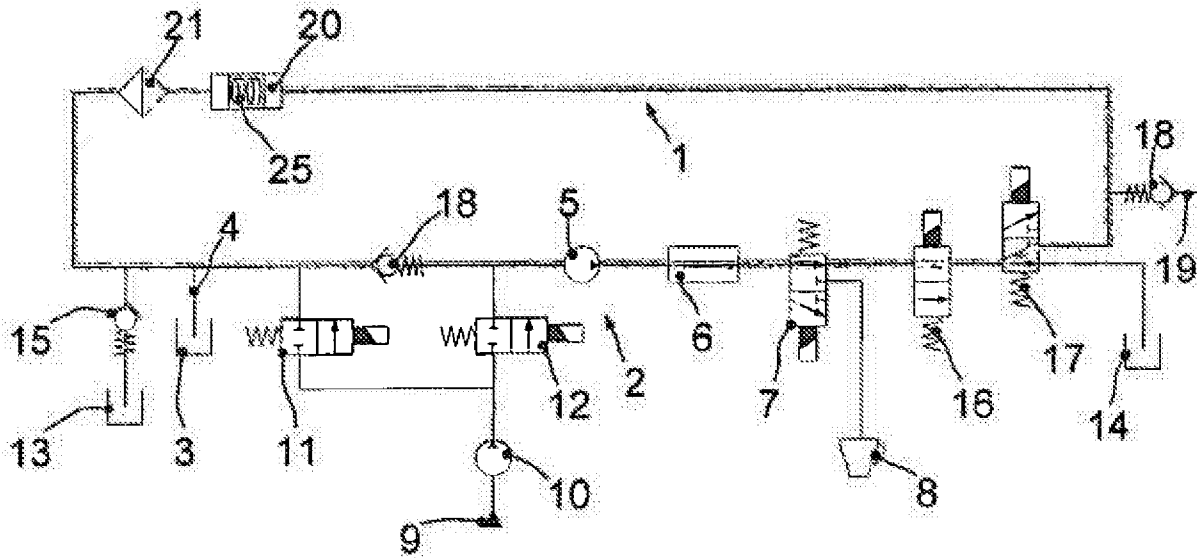


Fig. 2

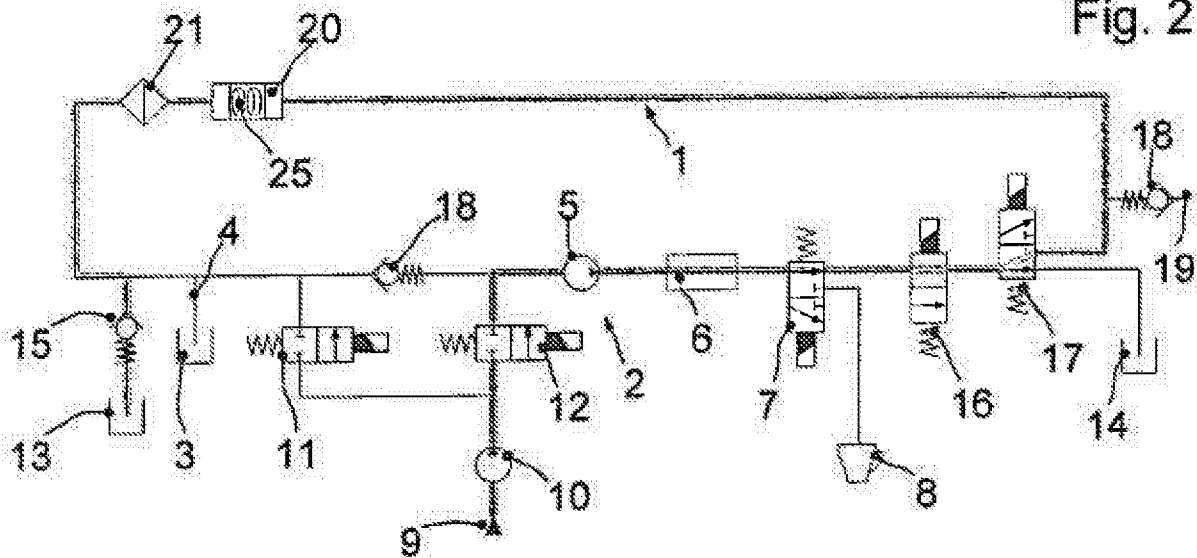


Fig. 3

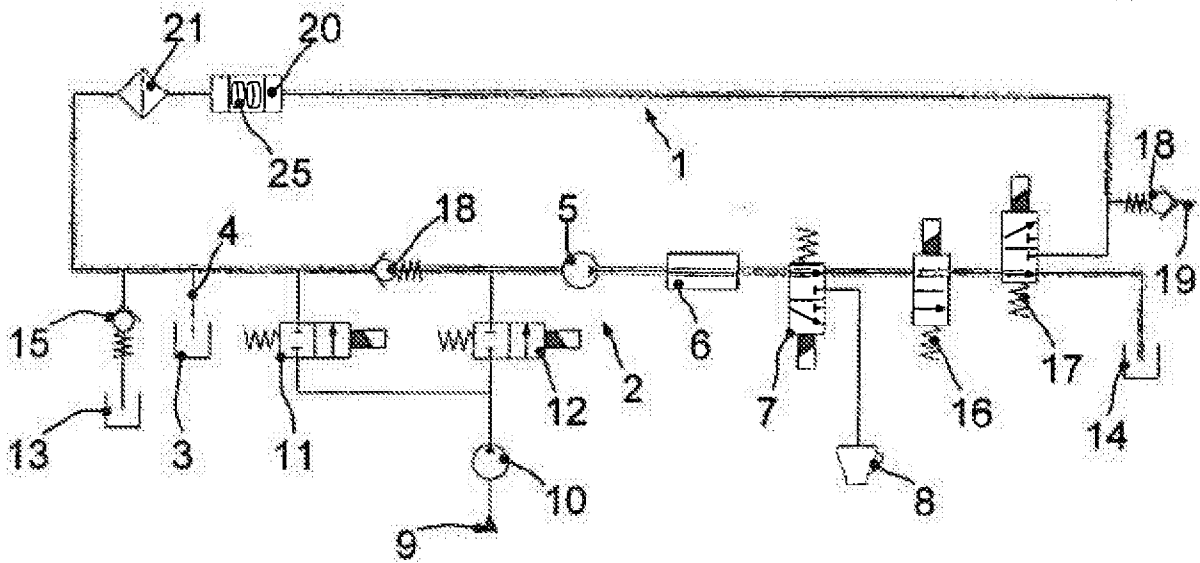


Fig. 4

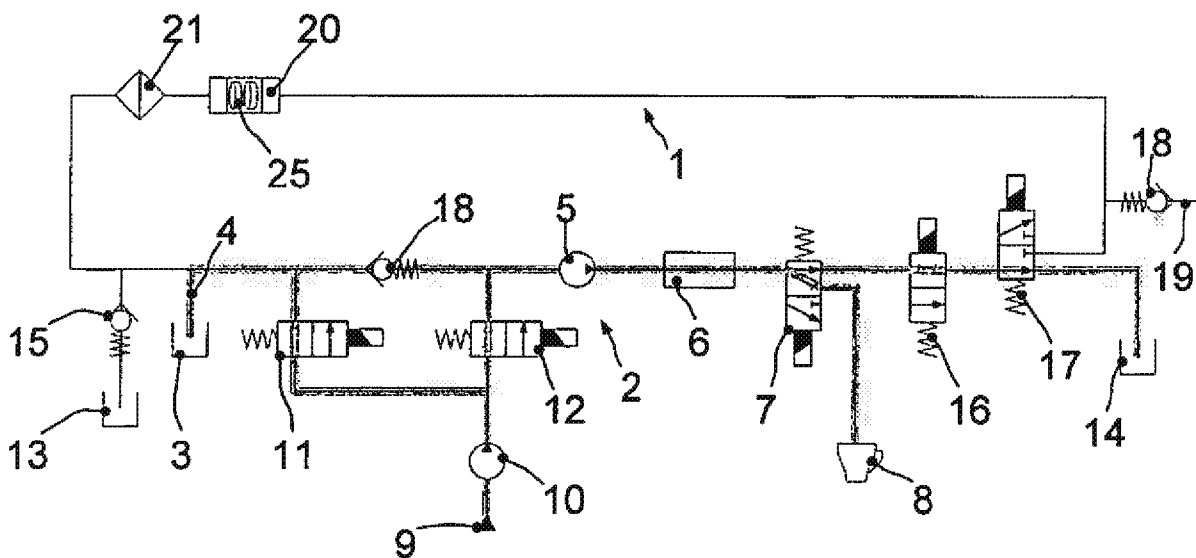


Fig. 5

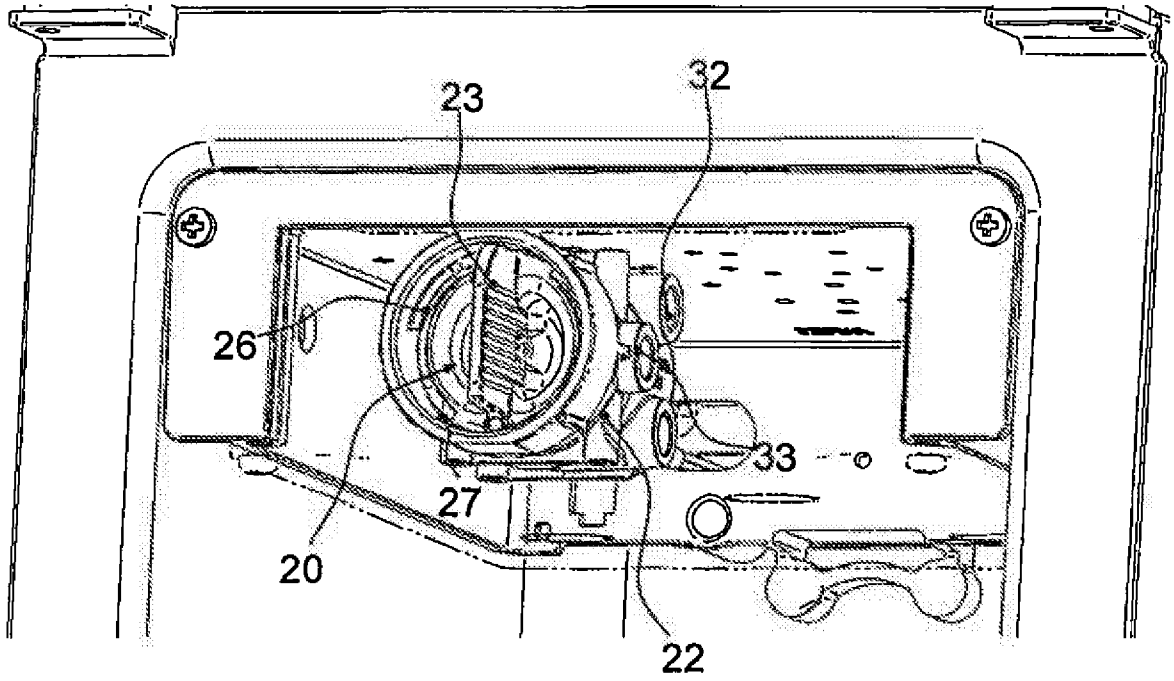


Fig. 6a

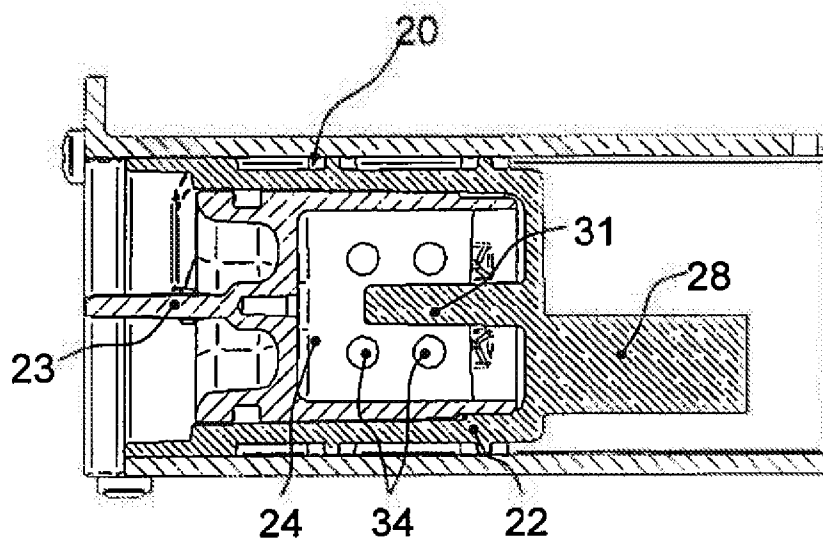


Fig. 6b

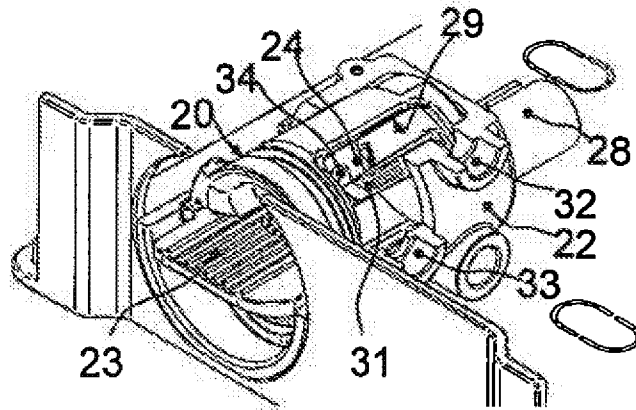


Fig. 7a

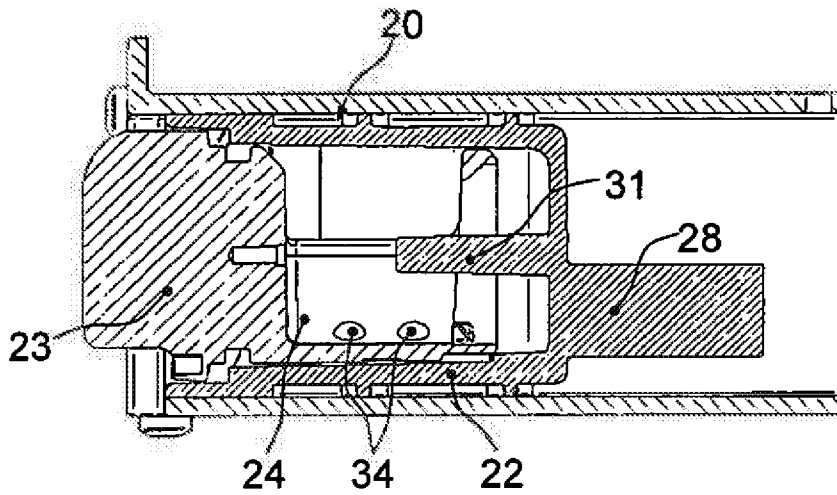


Fig. 7b

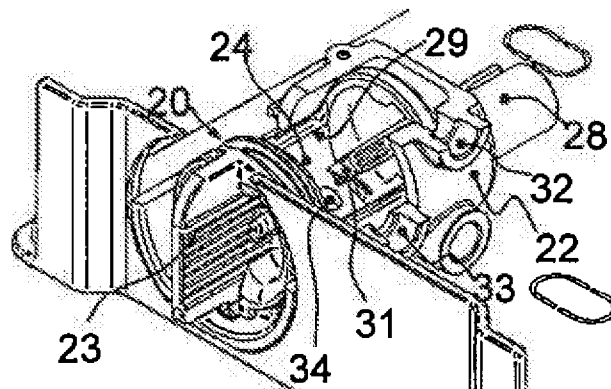


Fig. 8

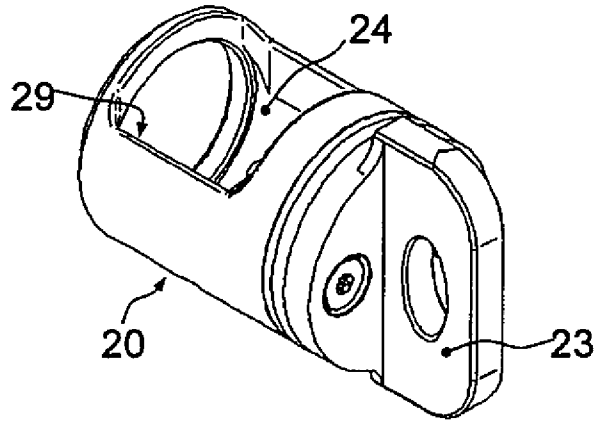


Fig. 9

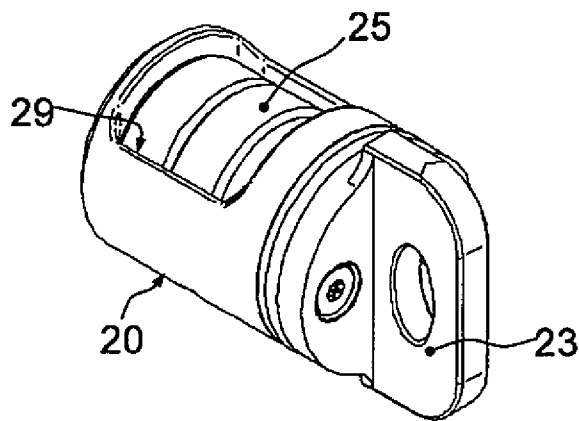


Fig. 10

