

(19)



(11)

EP 3 173 519 A1

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:
31.05.2017 Bulletin 2017/22

(51) Int Cl.:
D06F 75/10^(2006.01) D06F 75/12^(2006.01)

(21) Application number: **16201300.7**

(22) Date of filing: **30.11.2016**

(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:
MA MD

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(30) Priority: **30.11.2015 IT UB20155998**

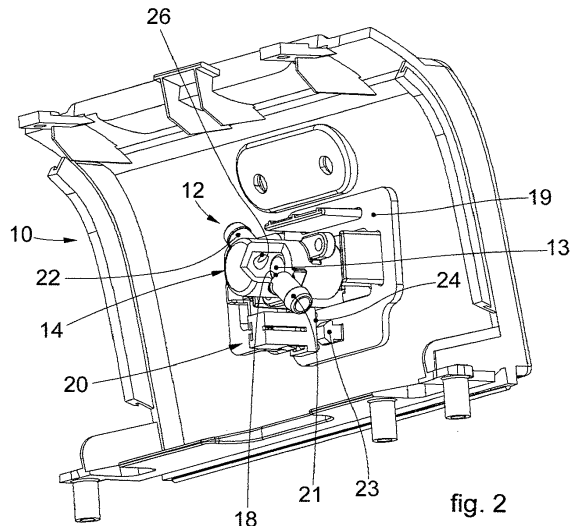
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(54) IRONING APPARATUS AND CORRESPONDING DEVICE TO REGULATE STEAM

(57) Ironing apparatus that comprises at least an ironing body, or iron (101), a tank (102) to generate, contain and deliver steam, and at least a regulation device (10) to regulate the quantity of steam delivered. The device (10) is associated with the iron (101) and/or the tank (102) to generate, contain and deliver steam. Said regulation device (10) comprises a button type member (12), in turn comprising an external actuation body (19), a hollow body (14) and a pin (13) sliding linearly inside the hollow body (14) and elastically contrasted by an elastic element (15), wherein on substantially opposite portions

of said hollow body (14) on one side a steam inlet pipe (21) is coupled, connected to said tank (102) to generate, contain and deliver steam, and on the other side a steam outlet pipe (22) is coupled, connected to the ironing body (101), and wherein said sliding pin (13), by driving said external actuation body (19), is able to assume at least a maximum steam delivery position, in which it does not interfere with the passage of steam between the steam inlet pipe (21) and the steam outlet pipe (22), and at least a partial steam delivery position in which it at least partly interferes with said passage of steam.



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Description

FIELD OF THE INVENTION

[0001] The present invention concerns an ironing apparatus, usable both in the home and the industrial field, which can be used on multiple types of finished textile products or fabrics in general.

[0002] The ironing apparatus to which the invention refers is the type with selective steam delivery, and therefore has an ironing body, or iron proper, and a tank to generate, contain and deliver steam.

[0003] The present invention also concerns a device to regulate the quantity of steam delivered by the ironing apparatus.

BACKGROUND OF THE INVENTION

[0004] Known ironing apparatuses, with selective steam delivery, generally comprise an ironing body, or iron, and a tank to generate, contain and deliver steam, understood as an autonomous body or integrated in the iron.

[0005] Most ironing apparatuses of this type provide means to regulate the quantity of steam delivered, which normally consist of selective choking means drivable by the user.

[0006] The choking means normally comprise a knob which, when rotated, allows to regulate an increase or reduction in the quantity of steam delivered.

[0007] Regulating the delivery of steam using the knob is neither immediate nor easy, nor does it allow the user to perceive the different delivery levels.

[0008] The use of the knob implies problems of bulk and constrains its installation in correspondence with the steam tank or boiler, if it is separate from the iron; it also makes installing it directly on the iron problematic and complex. For example, the solution of applying the knob in correspondence with the grip of the iron is not practical industrially, although this could be activated advantageously with the same hand that holds the iron.

[0009] Another disadvantage is that a rotary knob provides the user with general information about the apparatus which is typically analogic.

[0010] There is also the possibility that the position assumed by the knob can be unstable, with consequent uncontrolled variations in the delivery caused by the variations in steam delivery pressure.

[0011] Document DE 202005012165 U1 describes a device to regulate and direct steam, comprising a selector connected to a valve by means of which the steam can be selectively directed, in different quantities, to outlet holes present under the plate or to a nozzle located on the front part of the plate.

[0012] Documents CN 201770887 and CN 102 199 868 A describe other known devices to regulate the emission of steam from an iron.

[0013] One purpose of the present invention is to ob-

tain a device to regulate steam that is easy to install directly in an iron.

[0014] Another purpose of the present invention is to obtain a device to regulate steam that is easy to use for the user, and in particular that is intuitive and immediate to understand, in terms of delivery levels, even for the least expert.

[0015] Another purpose of the present invention is to obtain a device to regulate steam that allows regulation with a constant and immediate response and that can also be managed in relation to requirements that arise on each occasion.

[0016] Another purpose of the invention is to provide the user with a general perception of an ironing apparatus, with discrete and therefore precise control of the delivery levels, and stably maintaining the delivery coherent with the chosen position.

[0017] The Applicant has devised, tested and embodied the present invention to overcome the shortcomings of the state of the art and to obtain these and other purposes and advantages.

SUMMARY OF THE INVENTION

[0018] The present invention is set forth and characterized in the independent claims, while the dependent claims describe other characteristics of the invention or variants to the main inventive idea.

[0019] In accordance with the above purposes, an ironing apparatus according to the present invention comprises at least an ironing body cooperating directly or indirectly with a tank to generate, contain and deliver steam.

[0020] Furthermore, the ironing apparatus comprises at least a device to regulate the quantity of steam delivered, associated with the iron or, according to a variant, associated with an external source of steam.

[0021] The regulation device comprises a button type member, in turn comprising an external actuation body, a hollow body and a pin able to slide linearly inside the hollow body and elastically contrasted by an elastic element.

[0022] On substantially opposite portions of the hollow body on one side a steam inlet pipe is coupled, connected to the tank to generate, contain and deliver steam, and on the other side a steam outlet pipe is coupled, connected to the iron.

[0023] According to one aspect of the present invention, by driving the external actuation body, the sliding pin is able to assume at least a maximum steam delivery position, in which it does not interfere with the passage of steam between the steam inlet pipe and the steam outlet pipe, and at least a partial steam delivery position in which it at least partly interferes with the passage of steam. In this way, driving the button type member directly conditions the steam passage gap and hence the quantity of steam selectively delivered.

[0024] With this solution, therefore, a simple linear

movement generated by a pressure exerted on the button type member allows the user to select at least two steam delivery conditions, simply and with an immediate perception of said condition.

[0025] The present invention also concerns a regulation device installed in the ironing apparatus.

BRIEF DESCRIPTION OF THE DRAWINGS

[0026] These and other characteristics of the present invention will become apparent from the following description of some embodiments, given as a non-restrictive example with reference to the attached drawings wherein:

- fig. 1 is a front view of an ironing apparatus;
- fig. 2 is a perspective view of a regulation device in one embodiment and in a position to deliver a maximum quantity of steam;
- fig. 3 is a detailed view of the regulation device in fig. 2;
- fig. 4 is a sectioned view of the regulation device in fig. 2;
- fig. 5 is a perspective view of the regulation device in fig.2 in a position to deliver a partial quantity of steam;
- fig. 6 is a detailed view of the regulation device in fig. 5;
- fig. 7 is a perspective view of the regulation device in another embodiment in a position to deliver a partial quantity of steam;
- fig. 8 is a sectioned view of the regulation device in fig.7 ;
- fig. 9 is a sectioned view of the regulation device in another embodiment.

[0027] To facilitate comprehension, the same reference numbers have been used, where possible, to identify identical common elements in the drawings. It is understood that elements and characteristics of one embodiment can conveniently be incorporated into other embodiments without further clarifications.

DETAILED DESCRIPTION OF SOME EMBODIMENTS

[0028] According to the present description and with reference to the attached drawings, the invention concerns an ironing apparatus 100 comprising at least a device 10 to regulate the quantity of steam delivered.

[0029] The ironing apparatus 100 comprises at least an ironing body, or iron 101, and a tank 102 to generate, contain and deliver steam (see fig. 1).

[0030] In particular, the ironing apparatus 100 can be the type with a steam boiler which provides the tank 102 to generate, contain and deliver steam, or tank or simply boiler, independent from the iron 101.

[0031] Alternatively, the ironing apparatus 100 can be the type with the tank 102 to generate, contain and deliver

steam positioned inside the iron 101.

[0032] The apparatus 100 also provides an inlet pipe 21, configured to connect the tank 102 with a hollow body 14, which is part of the regulation device 10, as will be seen hereafter, and to allow the steam to transit inside it.

[0033] The apparatus 100 also provides an outlet pipe 22, configured to connect the hollow body 14 to the iron 101 and to allow the steam to transit inside it.

[0034] On one side the hollow body 14 has a steam inlet 18, connected to the inlet pipe 21, arriving from the tank to generate, contain and deliver steam 102.

[0035] Furthermore, the hollow body 14 has an outlet 26, connected to the outlet pipe 22, to cause the steam to exit from the hollow body 14 and to be conveyed where it is needed.

[0036] The inlet 18 and the outlet 26 are positioned laterally to the hollow body 14 and in a position substantially opposite each other.

[0037] In particular, as will be seen hereafter, the steam generated in the tank 102 is made to transit through the hollow body 14, in a direction substantially transverse to the longitudinal development of the hollow body 14, before being fed to the iron 101, to be possibly divided up, in the manner described hereafter.

[0038] The regulation device 10 is provided with a button type member, or button 12, having at least a maximum steam delivery position and at least a partial steam delivery position.

[0039] In fig. 1 the device 10 can be applied to the front part of a handle 210 of the iron 101, or to an external container 110 of the tank 102.

[0040] Hereafter we will show the case where the device 10 is applied to the external container 110 of the tank 102.

[0041] The button type member, or button 12, comprises an external actuation body 19 drivable with a finger by the user and configured to selectively assume, in the case shown here, a compression configuration or a release configuration.

[0042] The button type member 12 also comprises a pin 13 which can selectively slide linearly inside the hollow body 14 and is elastically contrasted in its sliding by an elastic element 15.

[0043] The pin 13 is connected to the external actuation body 19, which determines its selective sliding when driven by the user.

[0044] In a variant embodiment, the elastic element 15 can be a spring which partly surrounds the pin 13.

[0045] According to one embodiment, the hollow body 14 and the pin 13 have a cylindrical shape and the pin 13 is installed coaxially to the hollow body 14.

[0046] The position selectively assumed by the pin 13 inside the hollow body 14, and in particular its position with respect to the steam inlet pipe 21 and steam outlet pipe 22, determines the transit conditions of the steam through the hollow body 14 and hence the quantity of steam which is sent from the tank 102 to the iron 101.

[0047] As can be seen in detail in figs. 3 and 6, the pin

13 can assume a first retracted position inside the hollow body 14 (fig. 3), in which it does not interfere with the passage of the steam from the inlet pipe 21, connected to the tank 102 or boiler, to the outlet pipe 22, connected to the iron 101; and at least a second advanced position (fig. 6), in which it interferes with the passage of the steam from the inlet pipe 21 to the outlet pipe 22, in this way choking the steam delivery.

[0048] In particular, in the choked delivery condition, the passage gap between the inlet pipe 21 and the outlet pipe 22 is defined by the difference between the cross section of the pin 13 and the cross section of the hollow body 14, this difference allowing the steam to flow around the pin 13 and exit from the hollow body 14 to then be conveyed in the outlet pipe 22 and from here to the iron 101.

[0049] According to another embodiment, shown by way of example in figs. 7-9, the steam passage gap is defined by a groove 16 made in an intermediate position between two gaskets 17, longitudinally distanced with respect to each other and provided peripherally on the pin 13.

[0050] Therefore, the axial positioning of the pin 13 selectively actuated by a user pressing on the external actuation body 19, determines a specific partial delivery position, or partial delivery.

[0051] According to a variant, two or more grooves 16 can be provided, each with its own level of steam transit (fig. 9).

[0052] The elastic return exerted by the elastic element 15 on the pin 13 determines a maximum steam delivery position.

[0053] The device 10 also comprises at least an attachment element 20, with a blocking element 23 and at least a coordinated holding wing 24.

[0054] The blocking element 23 is solid with the external actuation body 19.

[0055] The blocking element 23 and the holding wing 24 are configured to be associated with each other through interference, in relation to the position selectively assumed by the pin 13.

[0056] The blocking element 23 and the holding wing 24 are distanced longitudinally with respect to each other as a function of the position of the pin 13.

[0057] The external actuation body 19, coupled with the attachment element 20, exerts an action of retaining the pin 13 in at least one partial delivery position (see figs. 7-9).

[0058] The attachment element 20 can be configured in various ways with respect to the holding wings 24 and the blocking element 23, and can provide rapid connection elements, attachment clips, attachment teeth or suchlike or comparable attachment means.

[0059] In a variant embodiment, shown by way of example in fig. 9, the button type member, or button 12, can provide at least two grooves 16 able to be positioned in a second partial delivery position. The other groove 16 is provided with gasket elements 17 able to define an-

other steam passage gap.

[0060] Furthermore, the passage gaps defined by the two pairs of grooves 16 have a different steam passage gap, thus determining a differentiated steam delivery exiting from the hollow body 14.

[0061] In this way, to determine the partial steam delivery position, by way of example the external actuation body 19 couples with a second attachment element 20.

[0062] In this case, the first holding wings 24a that are associated with the respective first blocking element 23a are configured or installed differently from the second holding wings 24b.

[0063] In a variant embodiment, combinable with the previous one, the first holding wings 24a are installed in a selectively mobile manner. In particular, as the pressure exerted on the external actuation body 19 gradually increases, the first holding wings 24a are mechanically released and slide to allow to associate the second holding wings 24b and the respective second blocking element 23b.

[0064] In another variant embodiment, the first holding wings 24a are configured so as to have a bigger travel with respect to the second holding wings 24b and thus to determine an attachment position of the respective first blocking element 23a and possibly to continue its travel due to greater pressure exerted on the external actuation body 19 to allow to associate the second holding wings 24b with the second blocking element 23b.

[0065] The button type member, or button 12, determines two steam delivery positions, the maximum steam delivery position (figs. 2, 3, 4) and at least a partial steam delivery position (figs. 5-9).

[0066] The association of the blocking element 23 with the holding wings 24 prevents the elastic return of the pin 13 to its maximum steam delivery position, defining the attachment condition of the attachment element 20.

[0067] The return to the maximum steam delivery position is determined by a further pressure exerted on the external actuation body 19 which removes the interference exerted by the holding wings 24 on the blocking element 23.

[0068] In particular, the external actuation body 19 and the pin 13 are distanced from the elastic element 15.

[0069] It is clear that modifications and/or additions of parts may be made to the ironing apparatus 100 and the device 10 as described heretofore, without departing from the field and scope of the present invention.

[0070] It is also clear that, although the present invention has been described with reference to some specific examples, a person of skill in the art shall certainly be able to achieve many other equivalent forms of ironing apparatus 100 and device 10, having the characteristics as set forth in the claims and hence all coming within the field of protection defined thereby.

Claims

1. Ironing apparatus comprising at least an ironing body (101), a tank (102) to generate, contain and deliver steam, and at least a regulation device (10) to regulate the quantity of steam delivered by the tank (102) to the ironing body (101), **characterized in that** said regulation device (10) comprises a button type member (12), in turn comprising an external actuation body (19), a hollow body (14) and a pin (13) sliding linearly inside the hollow body (14) and elastically contrasted by an elastic element (15), wherein on substantially opposite portions of said hollow body (14) on one side a steam inlet pipe (21) is coupled, connected to said tank (102) to generate, contain and deliver steam, and on the other side a steam outlet pipe (22) is coupled, connected to the ironing body (101), and wherein said sliding pin (13), by driving said external actuation body (19), is able to assume at least a maximum steam delivery position, in which it does not interfere with the passage of steam between the steam inlet pipe (21) and the steam outlet pipe (22), and at least a partial steam delivery position in which it at least partly interferes with said passage of steam.
2. Apparatus as in claim 1, **characterized in that** said hollow body (14) has a steam inlet (18), connected to the inlet pipe (21) arriving from the tank (102) to generate, contain and deliver steam, and a steam outlet (26), connected to the outlet pipe (22), to determine the exit of the steam from the hollow body (14), wherein said inlet (18) and said outlet (26) are positioned laterally to the hollow body (14) and in a substantially opposite position to each other.
3. Apparatus as in claim 1 or 2, **characterized in that** said hollow body (14) and said pin (13) have a cylindrical shape and said pin (13) is installed coaxially to said hollow body (14).
4. Apparatus as in any claim hereinbefore, **characterized in that** in the partial steam delivery condition, the steam passage gap between the inlet pipe (21) and the outlet pipe (22) is defined by the difference between the cross section of the pin (13) and the cross section of the hollow body (14), wherein said difference allows the steam to flow around the pin (13) and exit from the hollow body (14) to then be conveyed in the outlet pipe (22) and from here to the ironing body (102).
5. Apparatus as in any claim from 1 to 3, **characterized in that** in the partial steam delivery condition, the steam passage gap is defined by a groove (16) made in an intermediate position between two gaskets (17), longitudinally distanced from each other and provided peripherally on the pin (13).
6. Apparatus as in any claim from 1 to 3, **characterized in that** in the partial steam delivery condition, the steam passage gap is defined by a pair of grooves (16) made respectively in an intermediate position between two pairs of gaskets (17), longitudinally distanced from each other and provided peripherally on the pin (13), wherein said two grooves (16) have different steam passage gaps.
7. Apparatus as in any claim hereinbefore, **characterized in that** said regulation device (10) comprises at least an attachment element (20) including a blocking element (23), solid with said external actuation body (19) and mobile with it, and at least a coordinated holding wing (24), said blocking element (23) and said holding wing (24) being configured to be selectively associated by interference in relation to the position selectively assumed by said pin (13) along said hollow body (14) and to block said pin (13) in position in at least a partial steam delivery condition.
8. Apparatus as in claim 7, **characterized in that** it comprises two distinct blocking elements (23) suitable to cooperate with distinct holding wings (24) to block said pin (13) in two corresponding different positions inside said hollow body (14) in relation to two distinct delivery conditions of a partial quantity of steam.
9. Steam regulation device for an ironing apparatus, said device (10) being associated with an ironing body or iron (101), and/or with a tank (102) to generate, contain and deliver steam, said device comprising a button type member or button (12), in turn comprising an external actuation body (19), a hollow body (14) and a pin (13) sliding linearly inside the hollow body (14) and elastically contrasted by an elastic element (15), and wherein on substantially opposite portions of said hollow body (14) on one side a steam inlet pipe (21) is coupled, connected to said tank (102) to generate, contain and deliver steam, and on the other side a steam outlet pipe (22) is coupled, connected to the ironing body (101), **characterized in that** said sliding pin (13) is able to assume at least a maximum steam delivery position, in which it does not interfere with the passage of steam between the steam inlet pipe (21) and the steam outlet pipe (22), and at least a partial steam delivery position in which it at least partly interferes with said passage of steam.
10. Device as in claim 9, **characterized in that** said pin (13) has a cylindrical cross section smaller than the cylindrical cross section of said hollow body (14) to define the steam passage gap in the condition of interference of the pin (13) in the passage of steam through said hollow body (14).

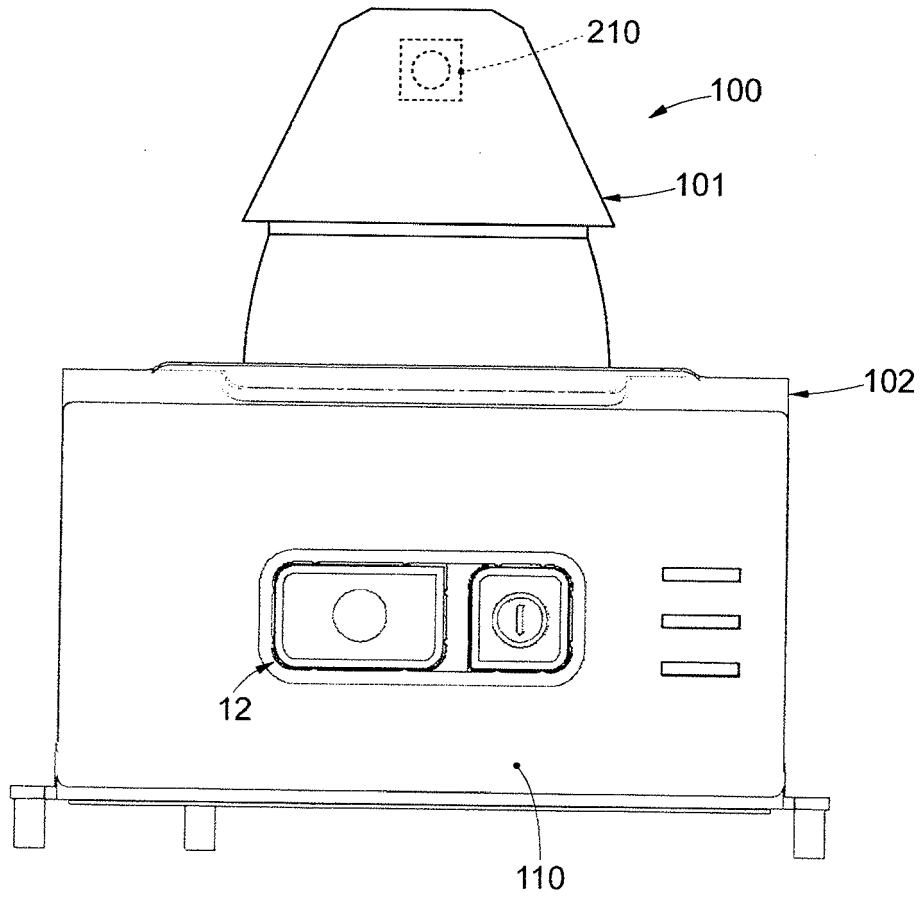


fig. 1

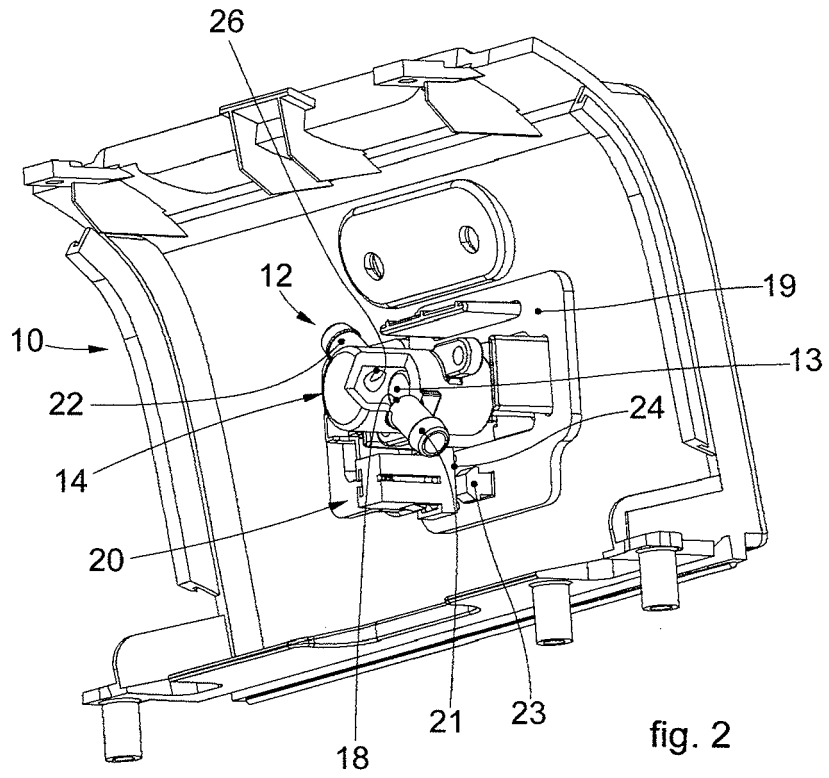


fig. 2

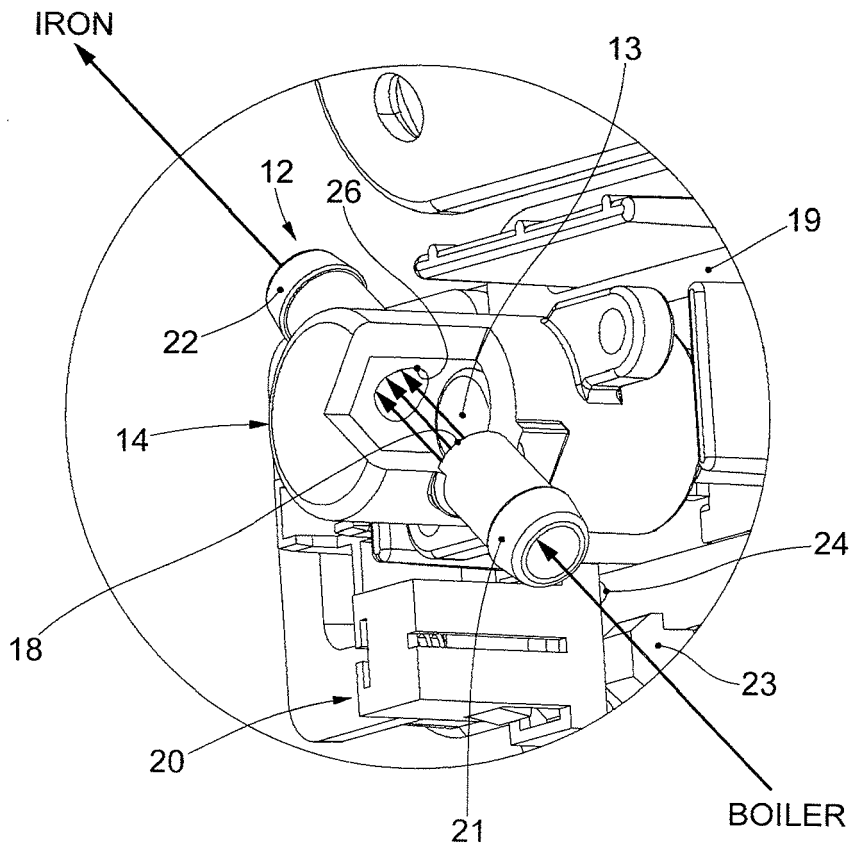


fig. 3

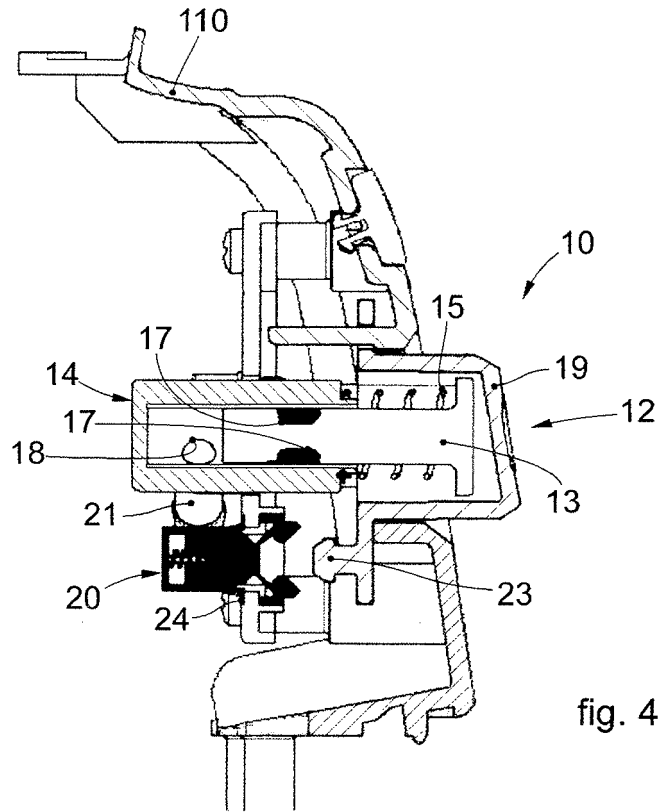


fig. 4

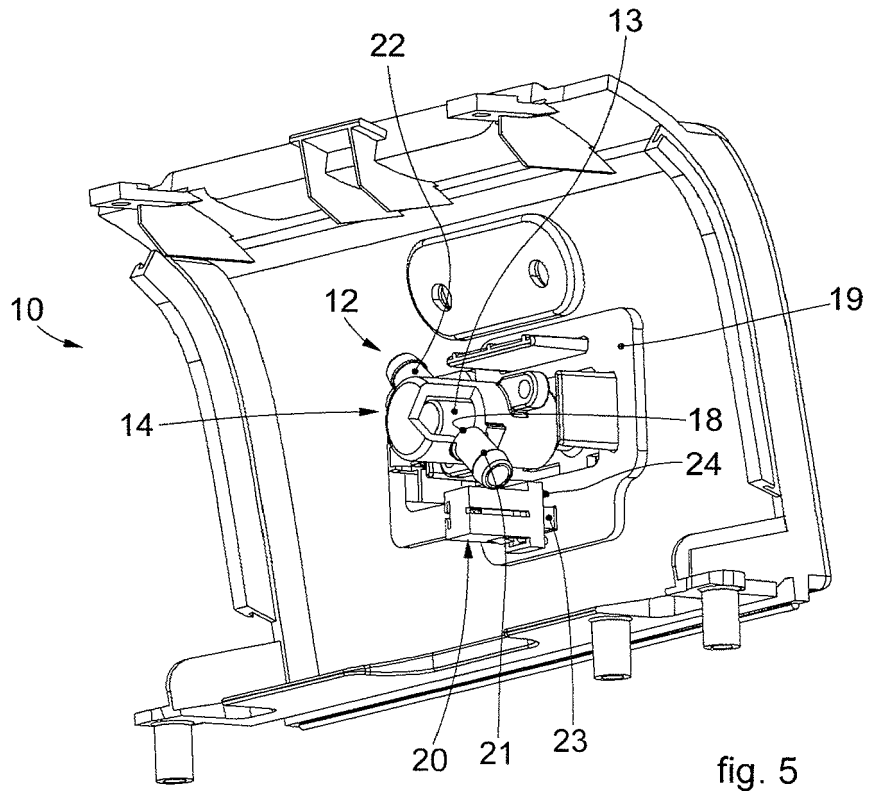
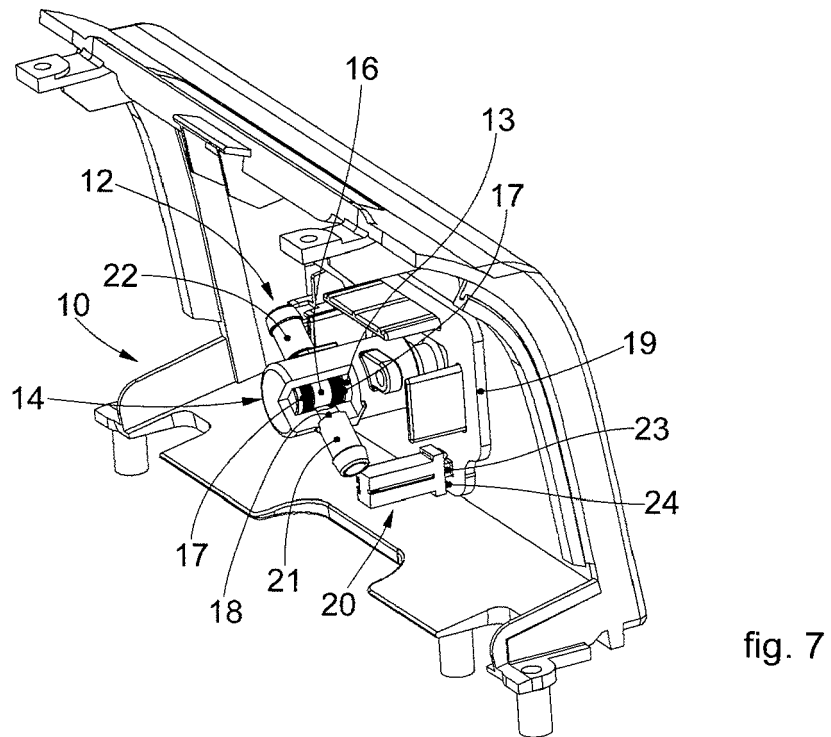
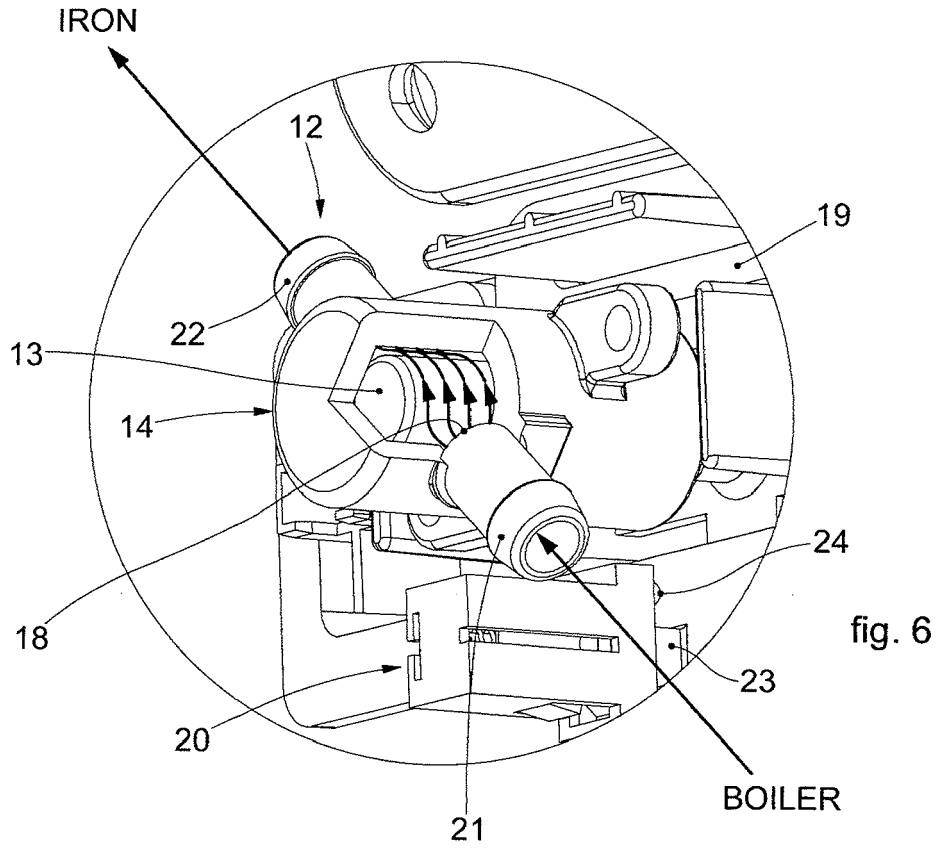
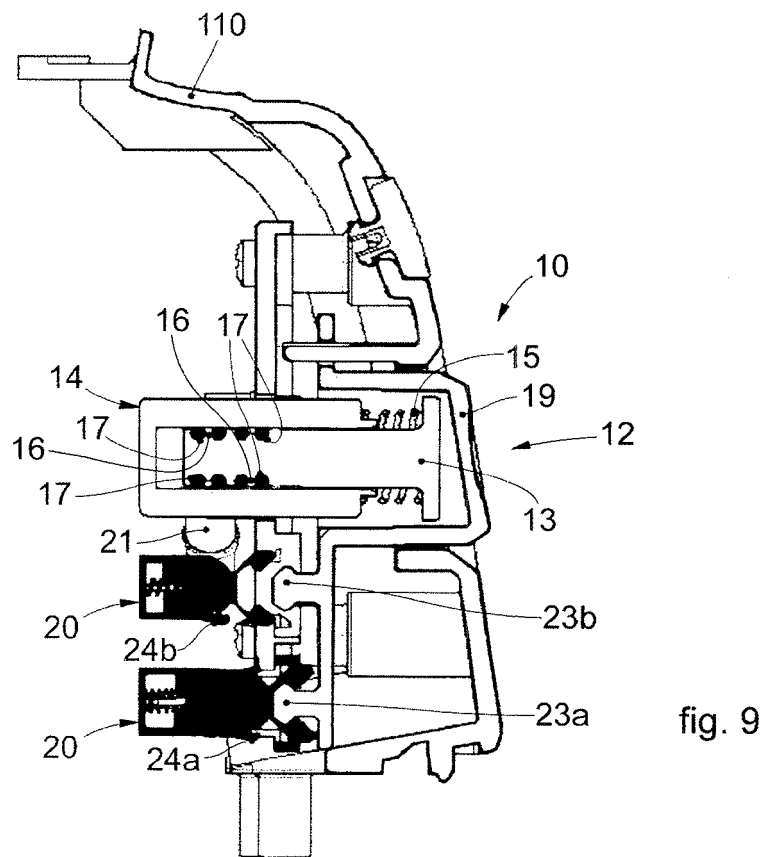
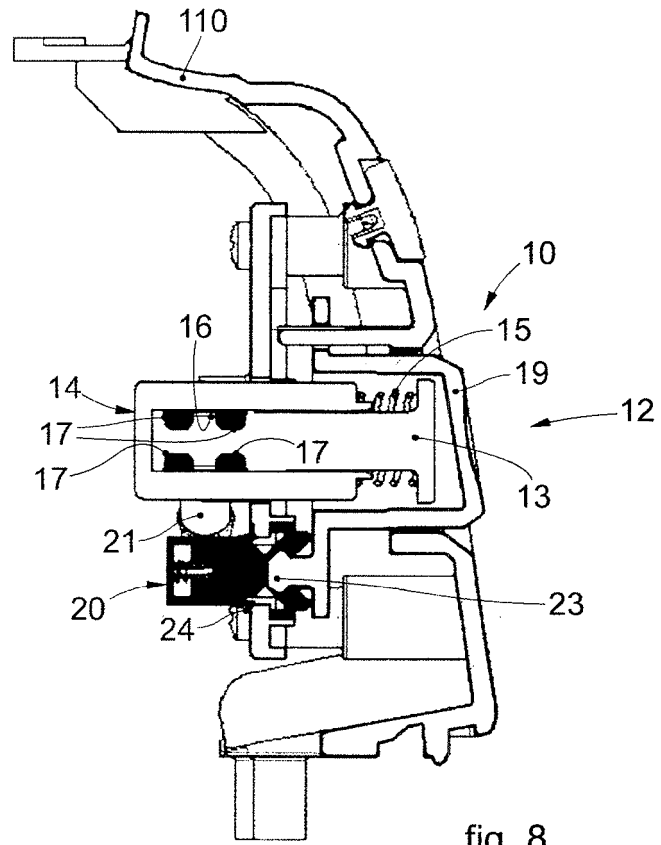


fig. 5







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