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(54) **Regulation device to regulate the delivery of steam in a steam cleaning apparatus**

Vorrichtung zum Regeln der Dampfzufuhr in einem Dampfreinigungsgerät

Dispositif pour la régulation du débit de vapeur dans un appareil de nettoyage à vapeur

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Description

FIELD OF THE INVENTION

[0001] The present invention concerns a regulation device to regulate the delivery of steam in a steam cleaning apparatus, such as for example a vacuum cleaner, an electric brush or similar, wherein a steam generator sends the steam generated, through a pipe, to a functional accessory for cleaning objects and/or surfaces.

[0002] To be more exact, the invention concerns a gripper element of the pipe, wherein both activation means to activate the generator and also regulation means to regulate the quantity of steam emerging from the functional accessory are positioned.

BACKGROUND OF THE INVENTION

[0003] It is known that in steam cleaning apparatuses, such as vacuum cleaners, electric brushes or suchlike, there is a steam generator unit to which a functional accessory is connected by means of a connection pipe, normally articulated. Such accessory, such as a brush, a window washer or suchlike, delivers the steam and comprises a gripper element to move the connection pipe easily.

[0004] Such known apparatuses have the disadvantage however that they have the regulation mechanism to regulate the delivery of steam arranged in proximity with the generator unit, which normally is not near at hand for the user, so that, if he needs to vary the quantity of steam delivered, he is obliged to momentarily interrupt the cleaning operations in order to act on the regulation mechanism.

[0005] Such operation causes not only an increase in the times required to do the cleaning, but also a physical effort on the part of the user, who is obliged to bend over to reach the generator unit, with consequent fatigue, which should be avoided, instead, especially in the case of elderly people.

[0006] This disadvantage has been partly resolved in the state of the art by arranging on the gripper element a regulation device to regulate the delivery of steam, which acts directly on a flexible and deformable segment of the pipe through which the steam passes, occluding the section. This known device not only does not guarantee a perfect regulation of the steam delivered, but it is also easily subject to the risk of breakage in its flexible segment, due to the continuous stress to which this is subjected.

[0007] DE A1 4443795 discloses a steam cleaning apparatus in which a toothed wheel can be rotated in order to linearly move a slide which comprises mating teeth on its rear end; the front end of the slide can penetrate more or less within an aperture in the passage of the flow of the steam so as to regulate the delivery of the steam from the apparatus.

[0008] US-A-5.937.475 discloses a water extraction

cleaning machine comprising means for regulating the mixture ratio between the water and detergent. The regulating means comprises a knob able to be rotated in order to rotate a disk. The disk comprises a plurality of apertures which are differently sized and are able to be selectively aligned to a wall aperture, in order to regulate the amount of detergent which is delivered in the mixture.

[0009] The Applicant has devised and embodied the present invention to overcome such shortcomings of the state of the art and to obtain other advantages.

SUMMARY OF THE INVENTION

[0010] The present invention is set forth and characterized in the main claim, while the dependent claims describe other innovative characteristics of the invention.

[0011] One purpose of the present invention is to achieve a regulation device to regulate the delivery of steam which does not oblige the user to momentarily interrupt the cleaning operations in order to act on the regulation means to regulate the delivery, and thus allows to reduce the times required to perform the cleaning operations, and avoids physical effort on the part of the user.

[0012] Another purpose of the present invention is to achieve a regulation device that regulates the quantity of steam delivered without the pipe through which the steam passes being occluded.

[0013] The present invention is applied advantageously, though not exclusively, to a steam cleaning apparatus comprising at least a steam generator unit and a connection pipe that connects the generator unit to a functional accessory for delivering steam.

[0014] The apparatus also comprises a gripper element that allows the user to maneuver the pipe and the functional accessory. Regulation means to regulate the delivery of steam are provided on such gripper element.

[0015] In accordance with the above purposes, the regulation means comprise a first part solid with the gripper element, and a second part able to be associated with said pipe. The first and second part are mounted reciprocally rotatable axially with respect to each other.

[0016] The first part comprises a female element provided with an outlet aperture, while the second part comprises a male element inserted into the female element and provided with at least a inlet aperture for the steam.

[0017] The reciprocal rotation of the second part with respect to the first part is able to determine an angular positioning of the inlet aperture with respect to the outlet aperture so as to define a plurality of reciprocal angular positions of the first part and the second part, to which different deliveries of steam through the outlet aperture correspond.

[0018] In a first form of embodiment of the present invention, the inlet aperture comprises an axial hole, a radial through hole communicating with the axial hole, and a circumferential seating made on a segment of an outer surface of the male element, and able to connect the radial through hole with the outlet aperture of the female

element. The outlet aperture is made radially with respect to the axial hole of the male element, so that the reciprocal rotation of the two parts defines a first angular position for a minimum delivery of steam, wherein only the circumferential seating cooperates with the outlet aperture, a second angular position for a medium delivery of steam, wherein a part of the circumferential seating and a part of the radial hole cooperate with the outlet aperture, and a third angular position for maximum delivery, wherein only the radial hole cooperates completely with the outlet aperture.

[0019] In a second form of embodiment, the inlet aperture comprises three through holes, of which a first hole is arranged coaxial to the male element, and two other holes are arranged on opposite sides with respect to the first hole. The outlet aperture comprises an eyelet large enough to coincide always with the first hole and selectively with the two other holes.

[0020] In both these forms of embodiment, it is provided that the first part comprises an elastic stop element that cooperates with respective positioning seatings made on the second part. Each positioning seating defines a precise angular position of the second part with respect to the first part, so that the various regulations of the steam are pre-determined and easily repeatable.

[0021] With the present invention it is therefore possible for the user to activate and regulate the delivery of steam directly from the gripper element, thus avoiding the need to interrupt the cleaning operations in order to move in proximity with the steam generator unit, and thus avoiding physical effort and consequent fatigue.

[0022] Moreover, with the device according to the present invention it is possible to regulate the quantity of steam delivered without occluding the pipe through which the steam passes, which can therefore be made of strong material, thus limiting risks of breakages and malfunctions.

BRIEF DESCRIPTION OF THE DRAWINGS

[0023] These and other characteristics of the present invention will become apparent from the following description of some preferential forms of embodiment, given as a non-restrictive example, with reference to the attached drawings wherein:

- fig. 1 is a three-dimensional view of a steam cleaning apparatus provided with the regulation device to regulate the delivery of steam according to the present invention;
- fig. 2 is an enlarged three-dimensional view of a first form of embodiment of the regulation device in fig. 1;
- fig. 3 is a longitudinal section of the regulation device in fig. 2;
- fig. 4 shows an enlarged detail of fig. 3;
- fig. 5 shows a section from V to V of the regulation device in fig. 3, in a first operating condition;
- fig. 6 shows a section from VI to VI of the regulation

device in fig. 3, in a second operating condition;

- fig. 7 shows a section from VII to VII of the regulation device in fig. 3, in a third operating condition;
- fig. 8 shows an enlarged detail of fig. 5;
- fig. 9 shows a cross section from IX to IX of fig. 3;
- fig. 10 is an enlarged three-dimensional view of a second form of embodiment of the regulation device in fig. 1;
- fig. 11 shows a longitudinal section of the regulation device in fig. 10;
- fig. 12 is a schematic view of a first operating condition of a detail of the regulation device in fig. 10;
- fig. 13 is a schematic view of a second operating condition of the detail in fig. 12;
- fig. 14 is a schematic view of a third operating condition of the detail in fig. 12.

DESCRIPTION OF SOME PREFERENTIAL FORMS OF EMBODIMENT

[0024] With reference to fig. 1, a regulation device 10 to regulate the delivery of steam according to the present invention is applied to a steam vacuum cleaner 11 of the type comprising a steam generator 12, a connection pipe 13, connected at one end to the generator 12, and a functional accessory, such as for example a brush 14, connected to the free end of the pipe 13, in order to direct the delivery of steam with precision and subsequently suck in the dirt.

[0025] The regulation device 10 comprises a gripper element 15, interposed between the pipe 13 and the brush 14 to allow a user to maneuver the pipe 13 and the brush 14 with extreme ease. Both a command button 16 to drive the generator 12 and also a regulation mechanism 17 to regulate the delivery of steam are associated with the gripper element 15 (figs. 3 and 9).

[0026] In accordance with a first, preferential form of embodiment, shown in figs. 2 to 8, the mechanism 17 comprises a first part 20 and a second part 21 mounted coaxially with each other and free to rotate one with respect to the other.

[0027] The first part 20 is substantially tubular in shape, is attached to the brush 14 and supports the command button 16, while the second part 21 is also substantially tubular in shape and is connected to the pipe 13.

[0028] The command button 16 is able to be taken selectively into contact with a switch 18 arranged inside the first part 20 and electrically connected to the generator 12.

[0029] The mechanism 17 also comprises a male element 22 and a female element 23, associated rotatably with each other. To be more exact, the female element 23 is mounted on the first part 20 and is provided with an outlet aperture 24 (figs. 3 to 8), which is cylindrical in shape and is arranged substantially vertical, so as to allow the steam to exit.

[0030] The male element 22 is substantially cylindrical in shape, is mounted on the second part 21 and is pro-

vided with an inlet aperture 25.

[0031] To be more exact, the inlet aperture 25 comprises a first cylindrical hole 25a made axially on the male element 22, a second through cylindrical hole 25b, with a cross section equivalent to that of the outlet aperture 24, made radially on the male element 22 and communicating with the first cylindrical hole 25a, and a circumferential seating 25c made on an arc of the outer circular surface of the male element 22, and able to put the second cylindrical hole 25b in communication with the outlet aperture 24.

[0032] The circumferential seating 25c (figs. 4 and 8) has a substantially rectangular cross section and a height "h" of some tenths of a millimeter. Such height "h" gradually reduces, until it becomes zero, as the distance from the radial through hole 25b increases angularly, so that the circumferential seating 25c has a variable profile section.

[0033] In this way, by reciprocally rotating the second part 21 with respect to the first part 20, an angular displacement is determined (figs. 5, 6 and 7) of the second cylindrical hole 25b and the circumferential seating 25c with respect to the outlet aperture 24, thus entailing a progressive increase in the delivery of steam exiting from the latter.

[0034] The second part 21 also comprises, in correspondence with one front end 21a, an elastic stop element 26 (fig. 9), substantially consisting of a pair of balls 27 thrust from opposite sides by a spring 28, and able to cooperate with respective positioning seatings 30 made on an inner surface of the first part 20. Each of these positioning seatings 30 defines a precise angular position of the second part 21 with respect to the first part 20.

[0035] On the outer surface of the second part 21 there are reference notches 31 which cooperate with a fixed indicator 33 made on the first part 20, which are able to signal visually to a user the reciprocal position of the cylindrical hole 25b and the circumferential seating 25c, with respect to the outlet aperture 24, and hence the quantity of steam able to be delivered.

[0036] To guarantee an airtight seal of the whole regulation device 10, there are washers 32 provided, of a known type and not described in detail, arranged in proximity with the zones of connection between the first part 20 and the second part 21, and between the female element 23 and the male element 22.

[0037] The regulation device 10 as described heretofore functions as follows.

[0038] First of all the generator 12 is activated by means of the command button 16. Such action on the button 16 and all the other regulation actions which will be described hereafter are performed without ever interrupting the cleaning operations and with a simple manual action on the gripper element 15.

[0039] After the generator 12 has been switched on, it is possible to rotate the second part 21 with respect to the first part 20, so as to determine the angular position of the cylindrical hole 25b and the circumferential seating

25c with respect to the outlet aperture 24.

[0040] As shown in figs. 5 to 7, it can be seen how in a first angular position of the second part 21 with respect to the first part 20, only the circumferential seating 25c cooperates with the outlet aperture 24, thus allowing the passage of a minimum quantity of steam.

[0041] By rotating in this case the second part 21 by an angle α (fig. 6), defined by the angular position of the positioning seatings 30, apart from the circumferential seating 25c, part of the second cylindrical hole 25b is also taken into cooperation with the outlet aperture 24, thus increasing the steam passage area, and hence allowing an intermediate delivery of steam.

[0042] By rotating further the second part 21 by an angle α (fig. 7), the cylindrical hole 25b is taken to an angular position of substantial coincidence with the outlet aperture 24, so as to allow maximum delivery of steam through the brush 14.

[0043] According to the variant shown in figs. 10 to 14, where elements equivalent to the first form of embodiment are indicated with the same numbers, the mechanism 17 comprises a first part 120 and a second part 121 mounted coaxially with each other and free to rotate one with respect to the other.

[0044] The first part 120 is substantially tubular in shape, is attached to the brush 14 and supports the command button 16, while the second part 121 is also substantially tubular in shape and is connected to the pipe 13.

[0045] The mechanism 17 also comprises a male element 122 and a female element 123, associated rotatably with each other. To be more exact, the female element 123 is mounted on the first part 120 and is provided with an outlet aperture 124 (figs. 12-14) for the delivery of steam.

[0046] The male element 122 is mounted on the second part 121 and is provided with three through holes 125, respectively a central hole 125b and two diametrically opposite lateral holes 125a, 125c, arranged so as to selectively cooperate with the outlet aperture 124.

[0047] The outlet aperture 124 has an elongated form and is shaped so that, in a determinate angular position of the three holes 125a, 125b and 125c, it will coincide with them.

[0048] In this way, by rotating the second part 121 with respect to the first part 120, the maximum, intermediate or minimum overlap of the holes 125 with the outlet aperture 124 is determined, and it is thus possible to regulate the area of passage of the steam and hence the quantity delivered.

[0049] The first part 120 also comprises (fig. 11), in correspondence with a front surface 120a of the end that cooperates with the second part 121, an elastic stop element 126, substantially consisting of a ball 127 thrust by a spring 128 and able to cooperate with respective positioning seatings 130 made on a front surface 121a of the second part 121. Each of these positioning seatings 130 defines a precise angular position of the second part 121 with respect to the first part 120.

[0050] This second form of embodiment of the regulation device 10 according to the invention functions as follows.

[0051] After the generator 12 has been switched on, it is possible to rotate the second part 121 with respect to the first part 120, so as to determine the angular position of the holes 125 with respect to the outlet aperture 124.

[0052] As shown in figs. 12 to 14, it can be seen how in a first angular position of the second part 121 with respect to the first part 120, only the central hole 125b of the through holes 125 cooperates with the outlet aperture 124, thus allowing the passage of a minimum quantity of steam.

[0053] By rotating the second part 121 by an angle α (fig. 13), apart from the central hole 125b, part of the lateral holes 125a and 125c is also taken into cooperation with the outlet aperture 124, thus increasing the steam passage area, and hence allowing an intermediate delivery of steam.

[0054] By rotating further the second part 121 by an angle α (fig. 14), the through holes 125 are taken to an angular position of perfect coincidence with the outlet aperture 124, so as to allow maximum delivery of steam through the brush 14.

[0055] It is clear, however, that modifications and/or additions of parts may be made to the regulation device 10 as described heretofore, without departing from the field and scope of the present invention.

[0056] For example, according to a variant, the angle of rotation of the second part 21 or 121 with respect to the first part 20 or 120 is not constrained by any positioning seating 30 or 130, thus allowing a user a wider range of positionings and hence of regulations of the delivery of steam.

[0057] According to another variant, between the gripper element 15 and the brush 14 a rigid extension of a known type, not shown in the drawings, may be provided.

[0058] It is also clear that, although the present invention has been described with reference to specific examples, a person of skill in the art shall certainly be able to achieve many other equivalent forms of the regulation device to regulate the delivery of steam in a steam cleaning apparatus, all of which shall come within the field and scope of the present invention.

Claims

1. Device to regulate the delivery of steam in a steam cleaning apparatus (11) comprising at least a steam generator unit (12), a connection pipe (13) able to connect said generator unit (12) to a functional accessory (14) to deliver steam, a gripper element (15) able to allow a user to maneuver said pipe (13) and said functional accessory (14), and regulation means (17) to regulate the delivery of steam associated with said gripper element (15), **characterized in that** said regulation means (17) comprise a first

tubular part (20, 120) solid with said gripper element (15), and a second tubular part (21, 121) mounted coaxially and free to rotate with respect to said first part (20, 120), said second part (21) being connected with said pipe (13), **in that** said first tubular part (20, 120) comprises a female element (23, 123) provided with an outlet aperture (24, 124), **in that** said second tubular part (21, 121) comprises a male element (22, 122) inserted into said female element (23, 123) and provided with at least an inlet aperture (25, 125) for said steam, and **in that** the reciprocal rotation of said second tubular part (21, 121) with respect to said first tubular part (20, 120) is able to determine an angular positioning of said at least one inlet aperture (25, 125) with respect to said outlet aperture (24, 124) in order to define a plurality of reciprocal angular positions of said first tubular part (20, 120) and said second tubular part (21, 121), to which different deliveries of said steam through said outlet aperture (24, 124) correspond.

2. Device as in claim 1, **characterized in that** said inlet aperture (25) comprises an axial hole (25a), a radial through hole (25b) communicating with said axial hole (25a), and a circumferential seating (25c) made on a segment of an outer surface of said male element (22) and able to connect said radial through hole (25b) with said outlet aperture (24) of said female element (23), and **in that** said outlet aperture (24) is made radially with respect to said axial hole (25a) of said male element (22).

3. Device as in claim 2, **characterized in that** said circumferential seating (25c) has a determinate height (h) in correspondence with said radial through hole (25b) and **in that** said height reduces gradually, until it becomes zero, as the distance from said radial through hole (25b) increases angularly, so that said circumferential seating 25c has a variable profile section.

4. Device as in claim 2, **characterized in that**, in a first angular position, with a minimum delivery of said steam, said male element (22) is angularly positioned with respect to said female element (23) so that only said circumferential seating (25c) cooperates with said outlet aperture (24), **in that** in a second angular position, with a medium delivery of said steam, said male element (22) is angularly positioned with respect to said female element (23) so that a part of said circumferential seating (25c) and a part of said radial hole (25b) cooperate with said outlet aperture (24), and **in that** in a third angular position, with maximum delivery of said steam, said male element (22) is angularly positioned with respect to said female element (23) so that only said radial hole (25b) cooperates with said outlet aperture (24).

5. Device as in claim 4, **characterized in that** the cross section of said radial hole (25b) is substantially equal to that of said outlet aperture (24).
6. Device as in claim 1, **characterized in that** said at least one inlet aperture (125) comprises three through holes (125a, 125b, 125c) made in said male element (122), of which a first hole (125b) is arranged in a central position and coaxial to said male element (122), and two further holes (125a, 125c) are arranged on diametrically opposite sides with respect to said first hole (125b), and **in that** said outlet aperture (124) comprises an eyelet large enough to always coincide with said first hole and, selectively, also with said two further holes (1125a, 125c).
7. Device as in claim 6, **characterized in that** said three through holes (125a, 125b, 125c) are able to be positioned angularly, by means of the reciprocal rotation of said male element (122) with respect to said female element (123) in a first position of minimum opening wherein only said first hole (125b) coincides with said outlet aperture (124), in a second position of intermediate opening wherein apart from said first hole (125b), said two further holes (125a, 125c) also coincide, although only partly, with said outlet aperture (124), and a third position of maximum opening wherein both said first hole (125b) and also said two further holes (125a, 125c) completely coincide with said outlet aperture (124).
8. Device as in any claim hereinbefore, **characterized in that** said first part (20, 120) comprises an elastic stop element (26, 126) able to cooperate with respective positioning seatings (30, 130) made on said second part (21, 121), each of said positioning seatings (30, 130) defining a precise angular position of said second part (21, 121) with respect to said first part (20, 120).
9. Device as in claim 8, **characterized in that** said elastic stop element (26, 126) comprises at least a ball (27, 127) cooperating with a spring (28, 128).
10. Device as in any claim hereinbefore, **characterized in that** on the outer surface of said second part (21, 121) there are reference notches (31) cooperating with a respective fixed indicator (33) made on said first part (20, 120), and able to signal visually to a user the reciprocal position of said outlet aperture (24, 124) with respect to said inlet aperture (25, 125).
11. Device as in any claim hereinbefore, wherein said gripper element (15) is provided with activation means (16) for said generator unit (12), **characterized in that** said activation means comprise a command button (16) able to selectively command an electric switch (18) connected with said generator

unit (12) in order to determine the activation thereof.

12. Device as in any claim hereinbefore, **characterized in that** it also comprises washers (32) arranged in proximity with the zones of connection between said first part (20, 120) and said second part (21, 121), and between said female element (23, 123) and said male element (22, 122), in order to guarantee an airtight seal of the reciprocally rotatable parts.

Patentansprüche

1. Vorrichtung zum Regeln der Dampfzufuhr in einem Dampfreinigungsgerät (11) mit mindestens einer Dampferzeugereinheit (12), einem Verbindungsrohr (13), das dazu ausgelegt ist, die Erzeugereinheit (12) mit einem funktionellen Anschlussstück (14) zu verbinden, um Dampf zuzuführen, einem Griffelement (15), das dazu ausgelegt ist, einem Benutzer das Bewegen des Rohrs (13) und des funktionellen Anschlussstücks (14) zu erlauben, und einer mit dem Griffelement (15) verbundenen Regeleinrichtung (17) zum Regeln der Dampfzufuhr, **dadurch gekennzeichnet, dass** die Regeleinrichtung (17) ein mit dem Griffelement (15) festes erstes Rohrteil (20, 120) und ein bezüglich des ersten Rohrteils (20, 120) koaxial befestigtes und frei drehbares zweites Rohrteil (21, 121) aufweist, wobei das zweite Rohrteil (21) mit dem Rohr (13) verbunden ist, das erste Rohrteil (20, 120) ein mit einer Auslassöffnung (24, 124) versehenes weibliches Element (23, 123) aufweist, das zweite Rohrteil (21, 121) ein in das weibliche Element (23, 123) gestecktes und mit mindestens einer Einlassöffnung (25, 125) für den Dampf versehenes männliches Element (22, 122) aufweist, und das Drehen des zweiten Rohrteils (21, 121) relativ zu dem ersten Rohrteil (20, 120) dazu geeignet ist, eine Winkelpositionierung der mindestens einen Einlassöffnung (25, 125) bezüglich der Auslassöffnung (24, 124) zu bestimmen, um eine Vielzahl von Relativwinkelpositionen des ersten Rohrteils (20, 120) und des zweiten Rohrteils (21, 121) zu definieren, denen verschiedene Dampfzufuhrmengen durch die Auslassöffnung (24, 124) entsprechen.
2. Vorrichtung nach Anspruch 1, **dadurch gekennzeichnet, dass** die Einlassöffnung (25) ein axiales Loch (25a), ein mit dem axialen Loch (25a) kommunizierendes radiales Durchgangsloch (25b) und eine auf einem Abschnitt einer Außenfläche des männlichen Elements (22) angebrachte Umfangsbefestigungsfläche (25c) aufweist, die dazu ausgelegt ist, das radiale Durchgangsloch (25b) mit der Auslassöffnung (24) des weiblichen Elements (23) zu verbinden, und

die Auslassöffnung (24) radial bezüglich des axialen Lochs (25a) des männlichen Elements (22) hergestellt ist.

3. Vorrichtung nach Anspruch 2, **dadurch gekennzeichnet, dass** die Umfangsbefestigungsfläche (25c) eine in Übereinstimmung mit dem radialen Durchgangsloch (25b) genau festgelegte Höhe (h) hat, und die Höhe sich graduell reduziert, bis sie Null wird, wenn der Abstand vom radialen Durchgangsloch (25b) winklig ansteigt, so dass die Umfangsbefestigungsfläche (25c) einen variablen Profilabschnitt aufweist. 5
4. Vorrichtung nach Anspruch 2, **dadurch gekennzeichnet, dass** in einer ersten Winkelposition, bei minimaler Dampfzufuhr, das männliche Element (22) bezüglich des weiblichen Elements (23) so winkelpositioniert ist, dass nur die Umfangsbefestigungsfläche (25c) mit der Auslassöffnung (24) zusammenwirkt, in einer zweiten Winkelposition, bei mittlerer Dampfzufuhr, das männliche Element (22) bezüglich des weiblichen Elements (23) so winkelpositioniert ist, dass ein Teil der Umfangsbefestigungsfläche (25c) und ein Teil des radialen Lochs (25b) mit der Auslassöffnung (24) zusammenwirken, und in einer dritten Winkelposition, bei maximaler Dampfzufuhr, das männliche Element (22) bezüglich des weiblichen Elements (23) so winkelpositioniert ist, dass nur das radiale Loch (25b) mit der Auslassöffnung (24) zusammenwirkt. 10
5. Vorrichtung nach Anspruch 4, **dadurch gekennzeichnet, dass** der Querschnitt des radialen Lochs (25b) im Wesentlichen gleich dem der Auslassöffnung (24) ist. 20
6. Vorrichtung nach Anspruch 1, **dadurch gekennzeichnet, dass** die mindestens eine Einlassöffnung (125) drei in das männliche Element (122) gemachte Durchgangslöcher (125a, 125b, 125c) aufweist, von denen ein erstes Loch (125b) in einer mittigen Position und koaxial zum männlichen Element (122) angeordnet ist und zwei weitere Löcher (125a, 125c) an diametral entgegengesetzten Seiten bezüglich des ersten Lochs (125b) angeordnet sind, und die Auslassöffnung (124) eine Öse aufweist, die groß genug ist, um immer mit dem ersten Loch und wahlweise auch mit den zwei weiteren Löchern (125a, 125c) übereinzustimmen. 25
7. Vorrichtung nach Anspruch 6, **dadurch gekennzeichnet, dass** die drei Durchgangslöcher (125a, 125b, 125c) dazu ausgelegt sind, dass sie durch das Drehen des männlichen Elements (122) relativ zu 30

dem weiblichen Element (123) in eine erste Position minimaler Öffnung, in der nur das erste Loch (125b) mit der Auslassöffnung (124) übereinstimmt, in eine zweite Position mittlerer Öffnung, in der abgesehen vom ersten Loch (125b) die zwei weiteren Löcher (125a, 125c), wenngleich nur teilweise, auch mit der Auslassöffnung (124) übereinstimmen, und in eine dritte Position maximaler Öffnung, in der sowohl das erste Loch (125b) als auch die zwei weiteren Löcher (125a, 125c) vollständig mit der Auslassöffnung (124) übereinstimmen, winkelpositionierbar sind.

8. Vorrichtung nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** das erste Rohrteil (20, 120) ein elastisches Anschlagelement (26, 126) aufweist, das dazu ausgelegt ist, mit den zugehörigen an dem zweiten Rohrteil (21, 121) gebildeten Positionieraufnahmen (30, 130) zusammenzuwirken, wobei jede der Positionieraufnahmen (30, 130) eine präzise Winkelposition des zweiten Rohrteils (21, 121) bezüglich des ersten Rohrteils (20, 120) definiert. 35
9. Vorrichtung nach Anspruch 8, **dadurch gekennzeichnet, dass** das elastische Anschlagelement (26, 126) mindestens eine mit einer Feder (28, 128) zusammenwirkende Kugel (27, 127) aufweist. 40
10. Vorrichtung nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** an der Außenfläche des zweiten Rohrteils (21, 121) Referenzkerben (31) sind, die mit einer am ersten Rohrteil (20, 120) angebrachten, zugehörigen festen Markierung (33) zusammenwirken und dazu ausgelegt sind, einem Benutzer die Position der Auslassöffnung (24, 124) relativ zu der Einlassöffnung (25, 125) visuell zu signalisieren. 45
11. Vorrichtung nach einem der vorhergehenden Ansprüche, wobei das Griffelement (15) mit einer Aktivierungseinrichtung (16) für die Erzeugereinheit (12) versehen ist, **dadurch gekennzeichnet, dass** die Aktivierungseinrichtung einen Steuerknopf (16) aufweist, der einen mit der Erzeugereinheit (12) verbundenen elektrischen Schalter (18) wahlweise steuern kann, um dessen Aktivierung zu bestimmen. 50
12. Vorrichtung nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** ferner in der Nähe der Verbindungszonen zwischen dem ersten Rohrteil (20, 120) und dem zweiten Rohrteil (21, 121) und zwischen dem weiblichen Element (23, 123) und dem männlichen Element (22, 122) Dichtungsringe (32) angeordnet sind, um eine luftdichte Abdichtung der relativ zueinander drehbaren Rohrteile zu gewährleisten. 55

Revendications

1. Dispositif pour réguler la distribution de vapeur dans un appareil de nettoyage à vapeur (11) comprenant au moins une unité génératrice de vapeur (12), un tuyau de raccordement (13) capable de raccorder ladite unité génératrice (12) à un accessoire fonctionnel (14) pour distribuer de la vapeur, un élément de préhension (15) capable de permettre à un utilisateur de manoeuvrer ledit tuyau (13) et ledit accessoire fonctionnel (14), et des moyens de régulation (17), pour réguler la distribution de vapeur, associés audit élément de préhension (15), **caractérisé en ce que** lesdits moyens de régulation (17) comprennent une première partie tubulaire (20, 120) solide avec ledit élément de préhension (15), et une seconde partie tubulaire (21, 121) montée de façon coaxiale et libre de tourner par rapport à ladite première partie (20, 120), ladite seconde partie (21) étant raccordée audit tuyau (13), **en ce que** ladite première partie tubulaire (20, 120) comprend un élément femelle (23, 123) pourvu d'une ouverture de sortie (24, 124), **en ce que** ladite seconde partie tubulaire (21, 121) comprend un élément mâle (22, 122) inséré dans ledit élément femelle (23, 123) et pourvu d'au moins une ouverture d'entrée (25, 125) pour ladite vapeur, et **en ce que** la rotation réciproque de ladite seconde partie tubulaire (21, 121) par rapport à ladite première partie tubulaire (20, 120) est capable de déterminer un positionnement angulaire de ladite au moins une ouverture d'entrée (25, 125) par rapport à ladite ouverture de sortie (24, 124) afin de définir une pluralité de positions angulaires réciproques de ladite première partie tubulaire (20, 120) et ladite seconde partie tubulaire (21, 121), auxquelles différentes distributions de ladite vapeur à travers ladite ouverture de sortie (24, 124) correspondent.
2. Dispositif selon la revendication 1, **caractérisé en ce que** ladite ouverture d'entrée (25) comprend un orifice axial (25a), un orifice de passage radial (25b) communiquant avec ledit orifice axial (25a), et un siège circonférentiel (25c) réalisé sur un segment d'une surface extérieure dudit élément mâle (22) et capable de raccorder ledit orifice de passage radial (25b) à ladite ouverture de sortie (24) dudit élément femelle (23), et **en ce que** ladite ouverture de sortie (24) est réalisée de façon radiale par rapport audit orifice axial (25a) dudit élément mâle (22).
3. Dispositif selon la revendication 2, **caractérisé en ce que** ledit siège circonférentiel (25c) possède une hauteur déterminée (h) en correspondance avec ledit orifice de passage radial (25b) et **en ce que** ladite hauteur diminue progressivement, jusqu'à ce qu'elle soit nulle, au fur et à mesure que la distance à partir dudit orifice de passage radial (25b) augmente de façon angulaire, de sorte que ledit siège circonfé-
4. Dispositif selon la revendication 2, **caractérisé en ce que**, dans une première position angulaire, avec une distribution minimum de ladite vapeur, ledit élément mâle (22) est positionné angulairement par rapport audit élément femelle (23) de sorte que seulement ledit siège circonférentiel (25c) coopère avec ladite ouverture de sortie (24), **en ce que** dans une deuxième position angulaire, avec une distribution moyenne de ladite vapeur, ledit élément mâle (22) est positionné angulairement par rapport audit élément femelle (23) de sorte qu'une partie dudit siège circonférentiel (25c) et une partie dudit orifice radial (25b) coopèrent avec ladite ouverture de sortie (24), et **en ce que** dans une troisième position angulaire, avec une distribution maximum de ladite vapeur, ledit élément mâle (22) est positionné angulairement par rapport audit élément femelle (23) de sorte que seulement ledit orifice radial (25b) coopère avec ladite ouverture de sortie (24).
5. Dispositif selon la revendication 4, **caractérisé en ce que** la section transversale dudit orifice radial (25b) est sensiblement égale à celle de ladite ouverture de sortie (24).
6. Dispositif selon la revendication 1, **caractérisé en ce que** ladite au moins une ouverture d'entrée (125) comprend trois orifices de passage (125a, 125b, 125c) réalisés dans ledit élément mâle (122), dont un premier orifice (125b) est agencé dans une position centrale et coaxiale par rapport audit élément mâle (122), et deux autres orifices (125a, 125c) sont agencés sur des côtés diamétralement opposés par rapport audit premier orifice (125b), et **en ce que** ladite ouverture de sortie (124) comprend un oeillet suffisamment grand pour toujours coïncider avec ledit premier orifice et, sélectivement, également avec lesdits deux autres orifices (125a, 125c).
7. Dispositif selon la revendication 6, **caractérisé en ce que** lesdits trois orifices de passage (125a, 125b, 125c) sont capables d'être positionnés angulairement, au moyen de la rotation réciproque dudit élément mâle (122) par rapport audit élément femelle (123) dans une première position d'ouverture minimum dans laquelle seulement ledit premier orifice (125b) coïncide avec ladite ouverture de sortie (124), dans une deuxième position d'ouverture intermédiaire dans laquelle, à part ledit premier orifice (125b), lesdits deux autres orifices (125a, 125c) coïncident également, bien que seulement partiellement, avec ladite ouverture de sortie (124), et une troisième position d'ouverture maximum dans laquelle ledit premier orifice (125b) et également lesdits deux autres orifices (125a, 125c) coïncident complètement avec ladite ouverture de sortie (124).

8. Dispositif selon une quelconque revendication précédente, **caractérisé en ce que** ladite première partie (20, 120) comprend un élément d'arrêt élastique (26, 126) capable de coopérer avec des sièges de positionnement respectifs (30, 130) réalisés sur ladite seconde partie (21, 121), chacun desdits sièges de positionnement (30, 130) définissant une position angulaire précise de ladite seconde partie (21, 121) par rapport à ladite première partie (20, 120). 5
9. Dispositif selon la revendication 8, **caractérisé en ce que** ledit élément d'arrêt élastique (26, 126) comprend au moins une bille (27, 127) coopérant avec un ressort (28, 128). 10
10. Dispositif selon une quelconque revendication précédente, **caractérisé en ce que**, sur la surface extérieure de ladite seconde partie (21, 121), se trouvent des encoches de référence (31) coopérant avec un indicateur fixe respectif (33) réalisé sur ladite première partie (20, 120), et capables de signaler visuellement à un utilisateur la position réciproque de ladite ouverture de sortie (24, 124) par rapport à ladite ouverture d'entrée (25, 125). 15
11. Dispositif selon une quelconque revendication précédente, dans lequel ledit élément de préhension (15) est pourvu de moyens d'activation (16) pour ladite unité génératrice (12), **caractérisé en ce que** lesdits moyens d'activation comprennent un bouton de commande (16) capable de commander sélectivement un commutateur électrique (18) connecté à ladite unité génératrice (12) afin d'en déterminer l'activation. 20
12. Dispositif selon une quelconque revendication précédente, **caractérisé en ce qu'il** comprend également des rondelles (32) agencées à proximité des zones de raccordement entre ladite première partie (20, 120) et ladite seconde partie (21, 121), et entre ledit élément femelle (23, 123) et ledit élément mâle (22, 122), afin de garantir un joint étanche à l'air des parties réciproquement rotatives. 25

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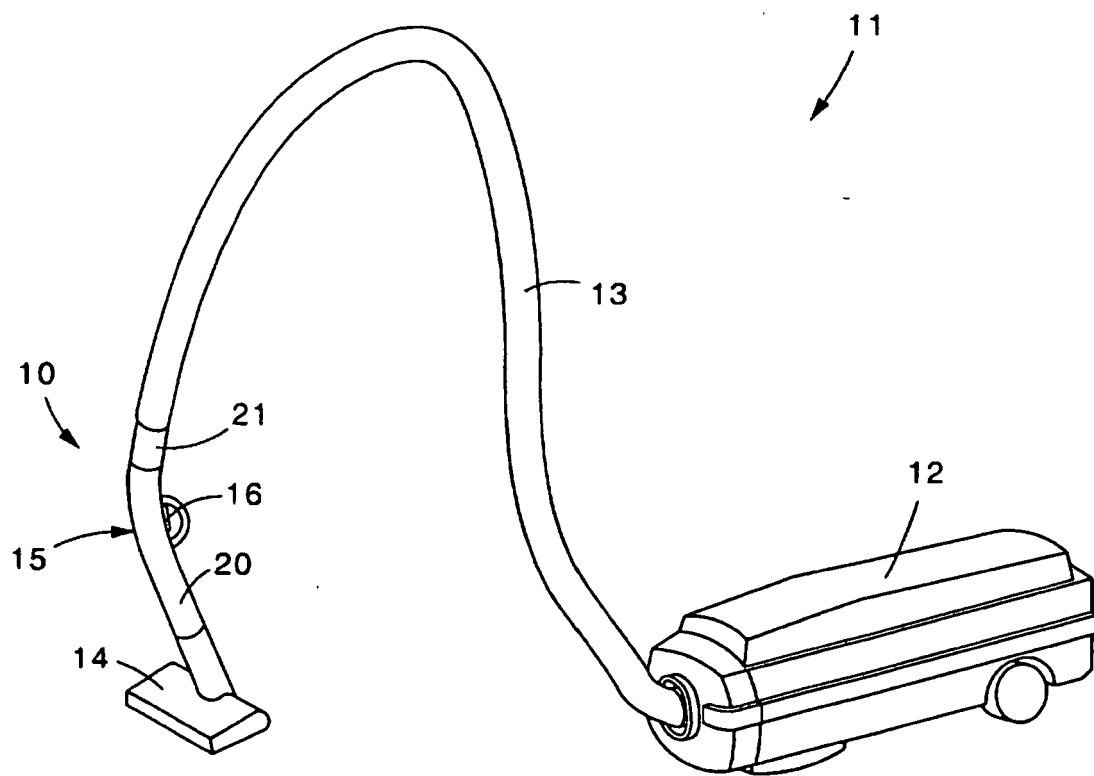


fig. 1

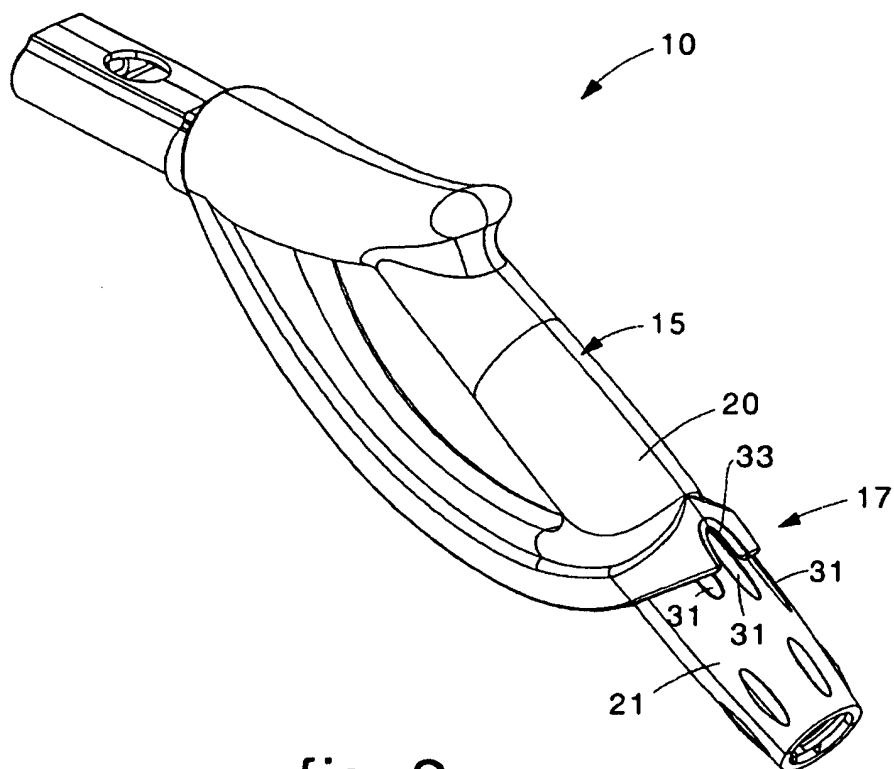


fig. 2

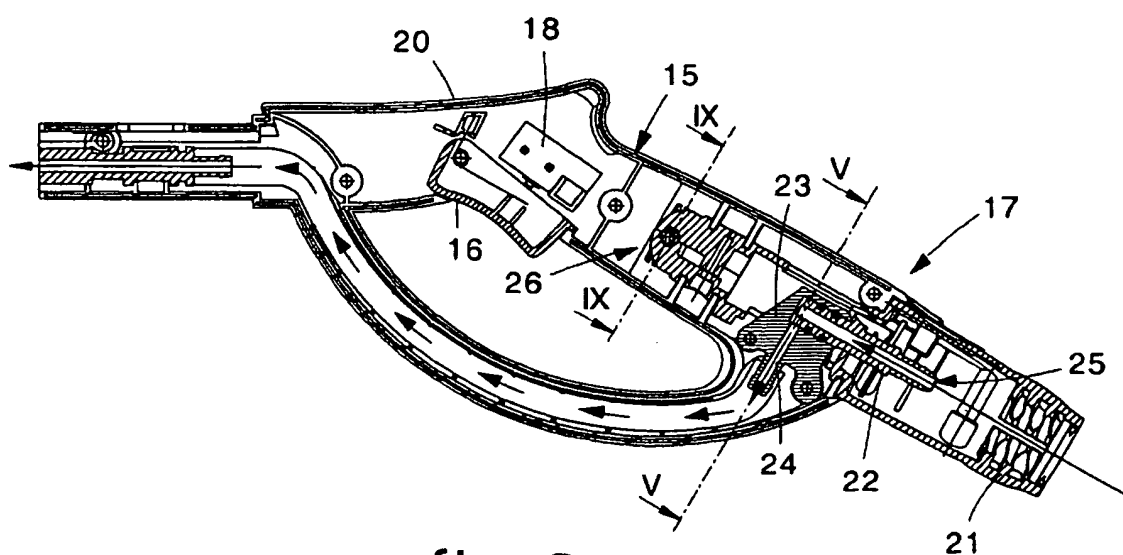


fig. 3

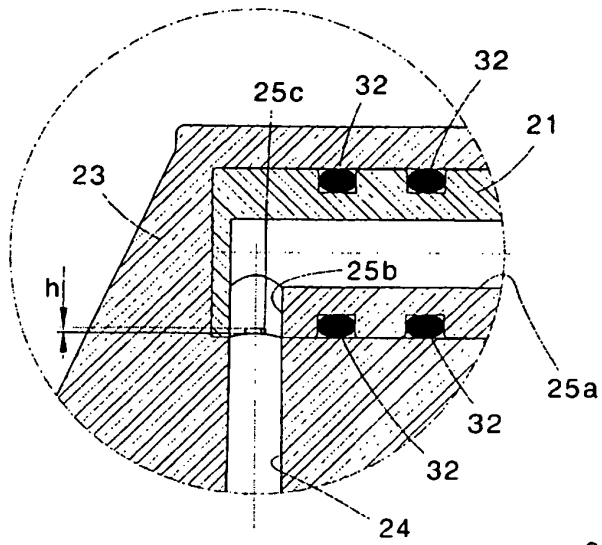


fig. 4

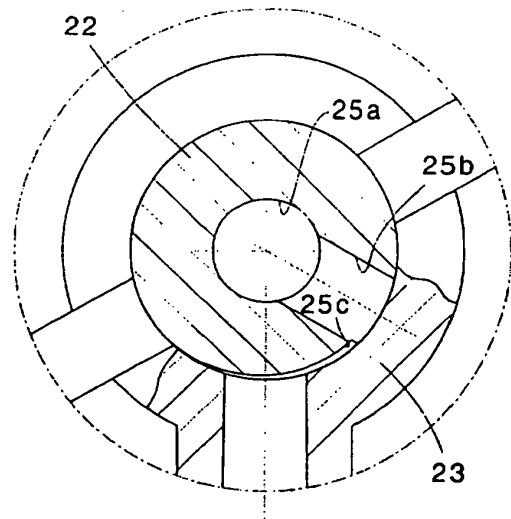


fig. 8

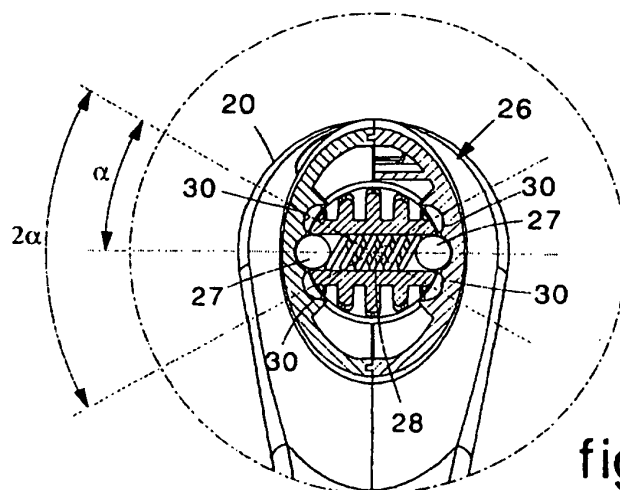


fig. 9

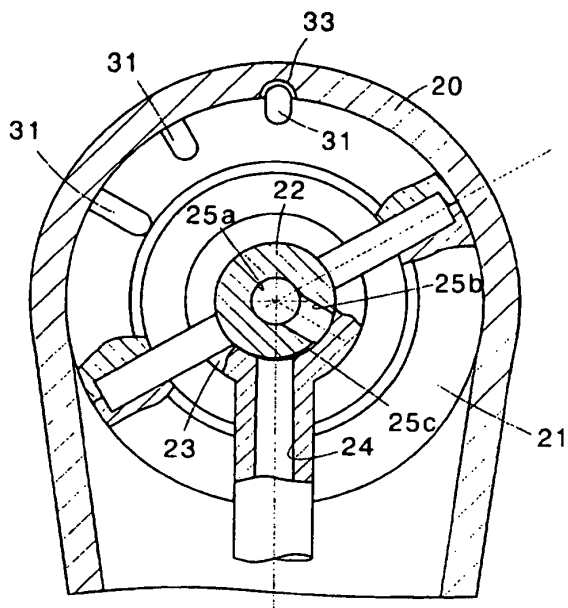


fig. 5

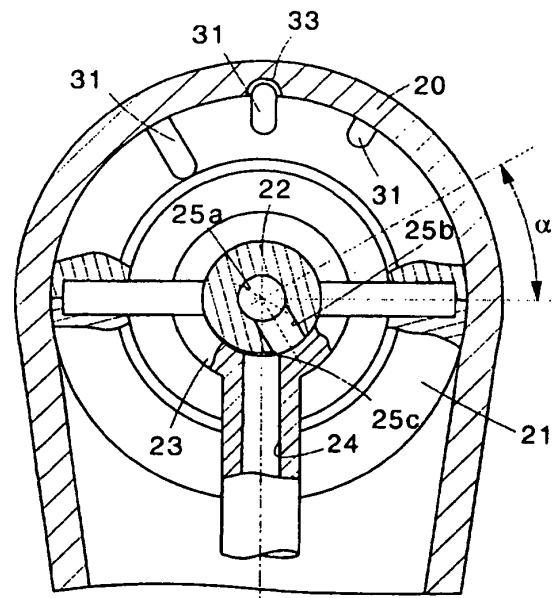


fig. 6

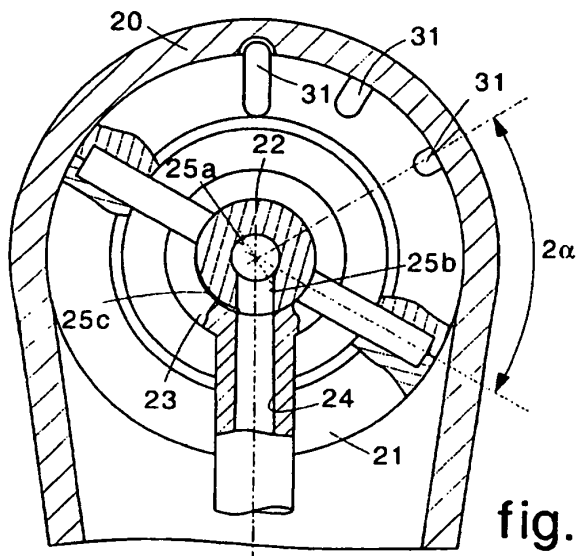
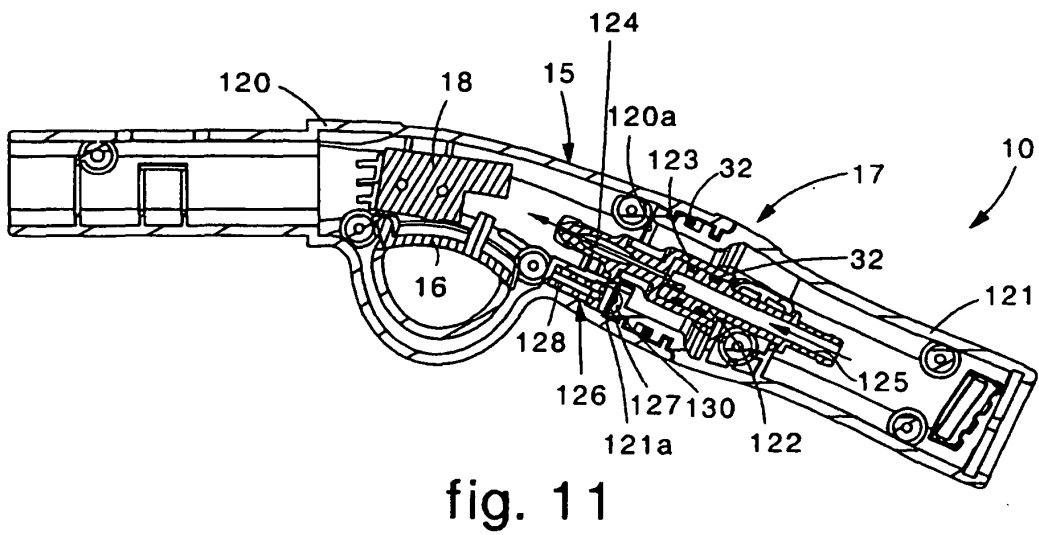
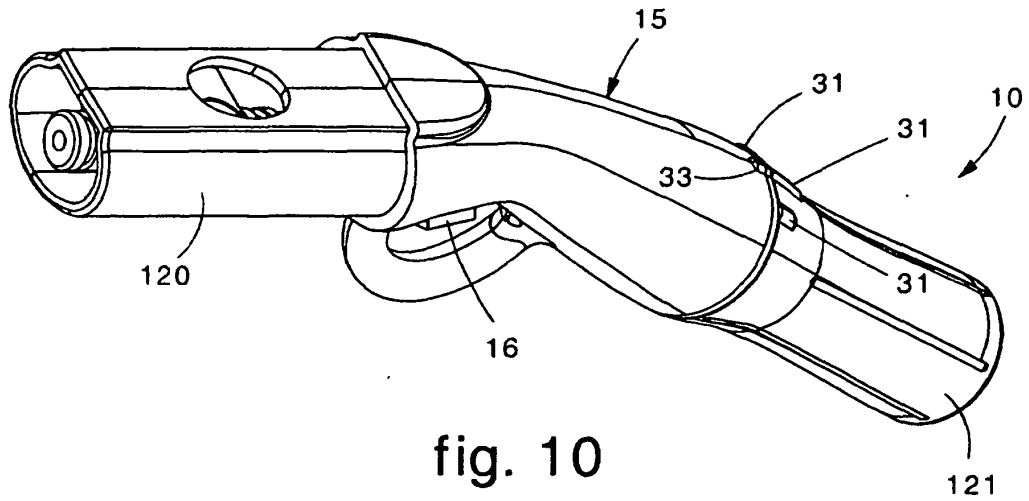


fig. 7



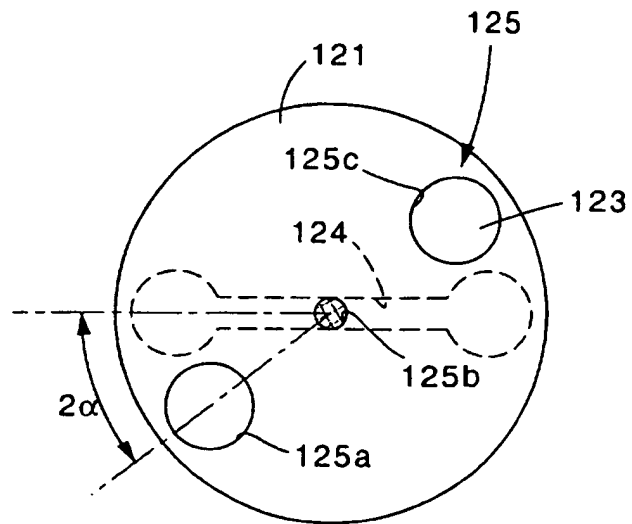


fig. 12

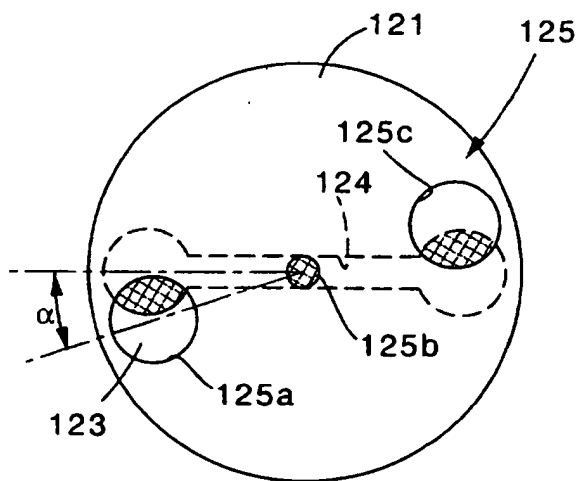


fig.13

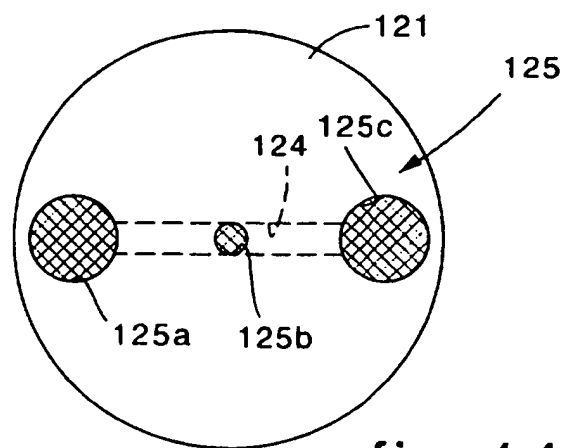


fig. 14

REFERENCES CITED IN THE DESCRIPTION

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