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(54) Ironing system

Bügelsystem

Système à repasser

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Description

[0001] The present invention has as its object an ironing system. Particularly, the present invention has as its object an ironing system intended for a household application (see GB-A-819577).

[0002] Ironing systems are known, comprising a boiler necessary for the production of water vapour and, in some cases, a tank for water containment.

[0003] The vapour produced by the boiler is conveyed to a dispensing plate which comprises a special chamber to collect and dispense the same vapour. The known ironing systems further comprise a resistor associated to the plate in order to heat it according to a predetermined temperature.

[0004] The dispensing of vapour occurs through a plurality of through-holes obtained through a bottom wall of the plate. In detail, the holes have a vapour inlet section facing said chamber, and an outlet section obtained on a outer surface of the bottom wall. Such outer surface defines an ironing surface.

[0005] The thus-dispensed vapour is characterized by a high rate and a high temperature, since, before escaping, it is exposed to the high temperatures induced by the resistor.

[0006] In detail, the expansion chamber causes the vapour being introduced in the plate to follow a long path such as to allow the vapour to lick the plate hot walls for a time required to overheat the vapour, thereby increasing the pressure and rate thereof, in addition to temperature (Fig. 4).

[0007] The plate is further provided with a thermally insulated handle to allow a user to manoeuvre the same plate during the ironing operations. Suitable control members are associated to the plate to allow the user to select, for example, the plate temperature and/or the dispensed amount of vapour.

[0008] By way of example, the control members comprise a thermostat for the adjustment of the plate temperature, and a tap arranged upstream said chamber to adjust the vapour flow.

[0009] In the known systems, boiler and tank are distinct from the plate, and are fixed. Systems are further known, in which tank and boiler are integrated to the plate.

[0010] Disadvantageously, when particularly strong fabrics are to be ironed, such as for example jeans, cotton fabrics or the like, the known ironing systems do not ensure that the suitable conditions are reached for these fabrics.

[0011] In fact, independently of how much the vapour flow can be maximised, the dispensed vapour is characterized by high temperature, but low humidity. This characteristic reduces the energy being transferred from the plate to the fabric and the ironing effectiveness is also reduced.

[0012] In fact, when the fabric is particularly thick, it requires to be suitably moistened such that the heat can be effectively transferred to the fabric in order to easily stretch the fibers thereof.

[0013] An example of a prior art iron is disclosed e.g. in GB819.577.

[0014] In this context, the technical task of the present invention is to propose an ironing system which is free from the cited drawback.

[0015] Particularly, it is the object of the present invention to propose an ironing system which allows ironing also particularly strong fabrics in an effective manner.

[0016] In accordance with the present invention, the technical task and the object described herein are achieved by an ironing system according to claim 1.

[0017] Further characteristics and the advantages of the present invention will be more clearly understood from the indicative, and therefore non-limitative, description of a preferred but not exclusive embodiment of an ironing system, as illustrated in the annexed drawings, in which:

- Fig. 1 illustrates a perspective view of an ironing system in accordance with the present invention with some details removed in order to better highlight other ones;
- Fin. 2 illustrates an exploded view of the ironing system of Fig. 1,
- Fig. 3 illustrates a first component of the ironing system of Fig. 1 in a first plan view;
- Fig. 4 illustrates the first component of Fig. 3 in a second plan view;
- Fig. 5 illustrates a sectional side view of a second component of the ironing system in Fig. 1;
- Fig. 6 illustrates a perspective view of a third component of the ironing system in Fig. 1;
- Fig. 7 illustrates a perspective view of a detail of the first component of Figs. 3 and 4; and
- Fig. 8 illustrates a sectional view of a detail in Fig. 7.

[0018] With reference to the annexed Figures, an ironing system according to the present invention has been generally indicated with 1.

[0019] The ironing system 1 comprises a boiler 2, necessary to produce water vapour, which withdraws the necessary water from a tank (not shown) integrated in the boiler 2 and accessible through a plug 3.

[0020] The ironing system 1 further comprises an ironing plate 4 connected to the boiler 2 to dispense the produced vapour.

[0021] In the described embodiment, the boiler 2 and the plate 4 are detached and distinct. A special hose 5 connects the boiler 2 to the plate 4 to bring the produced vapour to the latter.

[0022] However, it shall be noted that the present invention finds advantageous application also in relation to those ironing systems in which the boiler 2 is integrated to the plate 4

[0023] The plate 4 comprises a main body 6 which is manufactured, by way of example, by melting, and a lid

7 that can be placed over the main body 6.

[0024] The plate 4 further comprises a bottom wall 8 having an outer surface 8a which defines an ironing surface 9 of the plate 4.

[0025] The plate 4 bottom wall 8 has a plan essentially isoscele triangular shape with major sides which are rounded and confluent in a vertex 10 arranged at a front portion 4a of the plate 4.

[0026] A minor side is opposed relative to the cited vertex 10 and is arranged at a rear portion 4b of the plate 4.

[0027] Furthermore, the plate 4 comprises two side walls 11 connected to the bottom wall 8 and further convergent at the vertex 10 of the bottom wall 8. A rear wall 12 is connected to the side walls 11 and to the bottom wall 8 at the plate 4 rear portion 4b.

[0028] The bottom wall 8, the side walls 11, and the rear wall 12 are formed in the plate 4 main body 6.

[0029] The plate 4 further comprises a resistor 13 arranged inside the plate 4. Particularly, the resistor 13 is symmetrically arranged on the bottom wall 8 relative to a middle plane "P" of the plate 4. Still more precisely, in the described embodiment, the resistor 13 extends on the plate 4 bottom wall 8 along an essentially "U"-shaped path.

[0030] Suitable electrical connectors 14 allow the electrical supply of the resistor 13. In greater detail, the cited electrical connectors 14 are arranged at the resistor 13 free ends in the rear plate 4 portion 4b.

[0031] The supply is brought to the plate 4 thanks to an electric cable 15 associated to the hose 5.

[0032] The resistor 13 heats the plate 4 in accordance with a predetermined temperature as selected by the user.

[0033] Suitable control means allow selecting and keeping said predetermined temperature. By way of example, the control means comprise a thermostat (not shown).

[0034] In the described embodiment, the plate 4 is provided with a handle 16 to allow a user to manoeuvre the plate 4, thus allowing the ironing operation.

[0035] The handle 16 is supported to the plate 4 by a bracket 17 rigidly connected to the same plate 4. A cover 18 made in thermo-insulating material wraps the handle 16 so as to avoid burns to the user and to increment the safety conditions of the ironing system 1.

[0036] Furthermore, the plate 4 comprises a covering guard which is not illustrated in the annexed Figures.

[0037] The ironing system comprises an overheating chamber 19 connected to the boiler 2 to increase the temperature of the vapour to be dispensed (Fig. 4).

[0038] More precisely, the overheating chamber 19 is obtained in the plate 4. In still more detail, the overheating chamber 19 is obtained in the plate 4 main body 6 and is defined in cooperation with the lid 7.

[0039] The overheating chamber 19 comprises an inlet connector 20 which allows the connection to a supply duct 21 which introduces the vapour coming from the boiler 2 in the same overheating chamber 19. In detail, the inlet connector 20 is obtained on the plate 4 lid 7.

[0040] The overheating chamber 19 comprises a plurality of partition walls 22 which define a labyrinth-shaped path inside the same overheating chamber 19. In this manner, the vapour introduced in the overheating chamber 19 travels a long path 25 before being dispensed.

[0041] The overheating chamber 19 is obtained in the proximity of the resistor 13. In this manner, during the functioning, the plate 4 bottom wall 8 and the overheating chamber 19 partition walls 22 are heated, and the vapour, by licking very hot surfaces, increases its own temperature, as well as its own pressure and rate, getting overheated. Typically, in these conditions, the vapour is at a temperature ranging between 200°C and 220 °C.

[0042] Advantageously, the labyrinth path imposed to the vapour by the overheating chamber 19 makes such overheating process quick and efficient.

[0043] The overheating chamber 19 comprises a dispensing end portion 19a. Such end portion 19a is arranged in the proximity of the plate 4 front portion 4a.

[0044] A plurality of dispensing nozzles 23 are obtained through the plate 4 bottom wall 8 to allow the ejection of the overheated vapour. The dispensing nozzles 23 are in fluidic communication with the overheating chamber 19. In more detail, the nozzles 23 are in fluidic communication with the overheating chamber 19 end portion 19a.

[0045] The cited dispensing nozzles 23 have a diameter which is constant and ranging between 1,5 and 3 mm. Preferably, the nozzles 23 diameter ranges between 2 and 2,5 mm.

[0046] The dispensing nozzles 23 are arranged on the plate 4 in a "V"-configuration with the vertex facing the plate 4 front portion 4. Correspondently, the overheating chamber 19 end portion 19a is as well essentially "V"-shaped.

[0047] In alternative embodiments, the dispensing nozzles 23 are arranged according to different configurations, such as, for example, arched configurations.

[0048] The nozzles 23 have respective development axes which are mutually parallel and orthogonal to the ironing surface 9.

[0049] Alternatively, the dispensing nozzles 23 development axes have such a slope as to define an acute angle with the ironing surface 9. In other words, in this embodiment, the nozzles 23 development axis is oriented so that the overheated vapour escapes being directed towards the plate 4 vertex 10. Advantageously, in this configuration, the escaped vapour interacts with a major, surface of the fabric to be ironed, making the ironing operation more efficient.

[0050] The ironing system 1 further comprises an expansion chamber connected to the boiler 2, which is adapted to reduce at least the vapour temperature and pressure before it is dispensed.

[0051] The expansion chamber 24 is arranged in fluidic communication with a dispensing chamber 25 to allow

the passage and the dispensing of the cooled vapour in the expansion chamber 24.

[0052] To such aim, a plurality of through-holes 26 are formed in the plate 4 and arranged in direct fluidic communication with the dispensing chamber 25 to allow the escape of the cooled vapour. In greater detail, the holes 26 are obtained in the plate 4 bottom wall 8.

[0053] The holes 26 have an increasing section from the dispensing chamber 25 towards the ironing surface 9. Such holes 26 have an average diameter ranging between 2 and 3,5 mm, preferably between 2,5 and 3 mm.

[0054] It shall be noticed that the expansion chamber 24 and the dispensing chamber 25 are distinct from the described overheating chamber 19. Similarly, the holes 26 are distinct from the dispensing nozzles 23.

[0055] The dispensing chamber 25 is integrally obtained in the plate 4. More precisely, the dispensing chamber 25 is defined by its own defining walls 27 obtained in the plate 4 main body 6 and by the cited lid 7.

[0056] On the contrary, the expansion chamber 24 is arranged outside the plate 4. In greater detail, the expansion chamber 24 is arranged above the plate 4. In still greater detail, the expansion chamber 24 is rested to the plate 4 lid 7 by a plurality of feet 28 adapted to keep the expansion chamber 24 lifted from the lid 7 (Fig. 5 and 6).

[0057] Advantageously, the expansion chamber 24 being arranged outside the plate 4, the temperature thereof is below that of the rest of the plate 4. On the other hand, the feet 28 keep the expansion chamber 24 divided from the plate 4 lid 7, concurring to limit the expansion chamber 24 heating.

[0058] Advantageously, the expansion chamber 24 is overlaid to the dispensing chamber 25 so as to allow a quick transfer from the expansion chamber 24 to the dispensing chamber 25 without the occurrence of significant changes in the characteristics of the cooled vapour. To this aim, the expansion chamber 24 is directly connected to the dispensing chamber 25 by a passage port 29.

[0059] In greater detail, the expansion chamber 24 comprises two mutually coupled shells 30.

[0060] The ironing system 1 further comprises a pre-chamber 31 obtained inside the plate 4. Such pre-chamber 31 is connected to the boiler 2 to receive the vapour from the latter, and is in fluidic communication with the expansion chamber 24 in order to introduce the vapour in the latter.

[0061] As it shall be more clearly understood below, the cited pre-chamber 31 advantageously prevents that water in liquid state is introduced into the expansion chamber 24.

[0062] The pre-chamber 31 is obtained at the plate 4 rear portion 4b. Particularly, the pre-chamber 31 is defined by the side walls 11 and the rear wall 12 of the plate 4, as well as by a dividing diaphragm 32 developing essentially parallel to the plate 4 rear wall 12.

[0063] Therefore, the pre-chamber 31 is arranged in the vicinity of the resistor 13, but is not arranged in direct contact with the latter. In other words, the pre-chamber 31 temperature is lower, relative to that of the zone which directly contacts the resistor 13.

[0064] The pre-chamber 31 comprises an inlet coupling 33 to connect a supply tube 34 of the vapour coming from the boiler 2 and an outlet coupling 35 to connect the same pre-chamber 31 to the expansion chamber 24 via a suitable connection tube 36.

[0065] In use, the vapour coming from the boiler 2 is introduced in the pre-chamber 31. The latter, being heated at least in part by the resistor 13, allows the vapour to keep a minimum temperature in order to avoid undesired condensations during the transfer of the same vapour from the pre-chamber 31 to the expansion chamber 24.

[0066] Furthermore, the pre-chamber 31 allows intercepting optional water fractions---in liquid state coming from the boiler 2 Such water fractions, remaining inside the pre-chamber 31, can evaporate before being brought into the expansion chamber 24.

[0067] When the vapour enters the expansion chamber 24, the volume which can be taken up by the same increases, consequently the vapour undergoes an expansion. Furthermore, the expansion chamber 24 being at a relatively low temperature, the vapour is also cooled. This lowers the vapour temperature and pressure. The vapour is then proximate to the condensation condition, due to the high humidity thereof. Typically, the second vapour is at a temperature ranging between 100°C and 110°C.

[0068] The expanded vapour is then transferred to the dispensing chamber 25 through the passage port 29. In order to improve the expansion, in the described embodiment, a filter 37 occludes the passage port 29 so as to induce a further diffusion of the vapour. A gasket 38 is arranged at the filter 37 between the expansion chamber 24 and the dispensing chamber 25.

[0069] Therefore, the vapour expanded and cooled is ejected from the dispensing chamber 25 through the holes 26.

[0070] Advantageously, since the holes 26 have an increasing section, the vapour is further expanded during the dispensing thereof.

[0071] The ironing system 1 further comprises first and second pluralities of dispensing ducts 39 arranged along two distinct rows on each side wall 11 of the plate 4 (Fig. 4 and 7).

[0072] In greater detail, the dispensing ducts 39 are arranged in the proximity of the plate 4 front portion 4a.

[0073] The dispensing ducts 39 have an outlet section 39a arranged at a higher height than the ironing surface 9.

[0074] Furthermore, in the described embodiment, the dispensing ducts 39 have respective development axes "A" which are inclined towards the ironing surface 9, so as to dispense the vapour towards the latter (Fig. 8). In such a manner, the vapour dispensed by the dispensing ducts 39 licks the surface of a fabric to be ironed without passing through it.

[0075] Each development axis "A" results to be inclined

relative to the ironing surface 9. Such slope can advantageously be of an angle ranging between 25° and 55°, preferably between 35° and 45°. Furthermore, the dispensing ducts 39 development axes "A" are arranged preferably mutually parallel. Particularly, the development axes "A" are parallel to a middle plane "P" of the plate 4.

[0076] In this manner, the vapour flow dispensed by the dispensing ducts 39 is always directed to the direction of the plate 4 vertex 10, avoiding that the vapour flow may hit the user during the ironing operation.

[0077] In the described embodiment, the plate 4 has recesses 40 respectively obtained on the side walls 11 of the same plate 4 (Fig. 7). The dispensing ducts 39 are obtained at said recesses 40. In greater detail, the dispensing ducts 39 outlet sections 39a are arranged at the recesses 40.

[0078] In still greater detail, each recess 40 has a surface portion 40a, for example, planar or suitably shaped, which the dispensing ducts 39 are facing.

[0079] With particular reference to the described embodiment, the surface portions 40a of each recess 40 are arranged essentially parallel to the ironing surface 9, but they could also be arranged inclined.

[0080] The ironing system 1 further comprise a pair of side vapour chambers 41 to collect the vapour produced by the boiler 2 and to dispense it through the described dispensing ducts 39.

[0081] The side vapour chambers 41 are obtained in the plate 4 in the proximity of the side walls 11. The side vapour chambers 41 are defined by a respective parting sheet 42 obtained in the plate 4 main body 6.

[0082] Each side vapour chamber 41 comprises a collection portion 41 a in which the vapour coming from the boiler 2 enters, and a dispensing portion 41 b connected to the collection portion 41 a and directly in fluidic communication with the dispensing ducts 39.

[0083] Particularly, the collection portion 41a can be, for example, an individual one for the two side vapour chambers 41 and arranged at the tip plate, or can be double, and arranged on the plate sides, as in the illustrated example.

[0084] A septum 43 is arranged between each collection portion 41a and the respective dispensing portion 41 b to partially divide the said portions.

[0085] In greater detail, the septum 43 is obtained in the plate 4 main body 6 starting from the bottom wall 8. However, the septum 43 does not reach the plate 4 lid 7, in this manner leaving a passage port that allows the vapour passage from the collection portion 41a to the dispensing portion 41b, while preventing the passage of an optional fraction of liquid water. In fact, it remains entrapped by gravity in the collection portion 41a, until evaporation.

[0086] It shall be noticed that in the described embodiment, each side vapour chamber 41 has an essentially linear inner shaping. However, in an alternative (and not shown) embodiment, the side vapour chambers 41 are so shaped as to define therein a labyrinth-shaped path to exert a overheating process on the vapour contained therein which is similar to that described in relation to the overheating chamber 19.

[0087] Each side vapour chamber 41 is connected to the boiler through a connection duct 44 connected to respective connectors 45 of the same side vapour chambers 41.

[0088] The ironing system 1 further comprises a deflector adapted to selectively direct the produced vapour coming from the boiler 2 at least to the dispensing ducts 39 and/or to the expansion chamber 24.

[0089] In the preferred embodiment, the deflector 46 is adapted to selectively direct the vapour to the dispensing ducts 39 and/or to the expansion chamber 24 and/or to the overheating chamber 19.

[0090] In detail, the deflector 46 is associated to the plate 4 at the above-described bracket 17.

[0091] The deflector 46 comprises an inlet duct 47 to which the cited hose 5, coming from the boiler 2 and carrying therewith the vapour produced, is connected.

[0092] The deflector 46 further comprises a first outlet duct 48 to which the supply duct 21 is connected in order to bring vapour to the overheating chamber 19, a second outlet duct 49 to which the supply tube 34 is connected in order to bring the vapour to the pre-chamber 31 and, successively, to the expansion chamber 24, and a third outlet duct 50 to which the connection duct 44 is connected in order to bring the vapour to the side vapour chamber 41.

[0093] The deflector 46 also comprises a control handle 51 to select the vapour dispensing mode.

[0094] The invention achieves the intended object and accomplishes important advantages.

[0095] Due to the expansion chamber 24, the vapour produced from the boiler 2 is expanded and cooled. Thereby, the vapour thus obtained and dispensed through the dispensing chamber 25 has a low outlet rate and a markedly higher humidity. In fact, in these conditions, the vapour is proximate to the condition of condensation.

[0096] Thereby, the vapour being dispensed from the holes 26 is capable of transferring heat to the fabric to be ironed in a much more effective manner.

[0097] This characteristic is particularly applied when fabrics are ironed which are particularly strong and/or difficult to iron.

[0098] Again, in the ironing system 1 according to the present invention it is possible to select different dispensing vapour modes. This makes the present ironing system 1 particularly flexible.

Claims

1. An ironing system comprising a boiler (2) for the production of vapour, a plate (4) connected to said boiler (2) to dispense said vapour; said plate (4) comprising

a bottom wall (8) defining an ironing surface (9) and a resistor (13) arranged inside the plate (4); said ironing system further comprises a dispensing chamber (25) arranged in said plate (4) and a plurality of holes (26) formed in said plate (4) and in fluidic communication with said dispensing chamber (25) to dispense said vapour; said ironing system further comprises an expansion chamber (24) connected to said boiler (2) and in fluidic communication with said dispensing chamber (25), **characterized in that** said expansion chamber (24) is arranged outside said plate (4) to reduce the temperature and pressure of the dispensed vapour.

2. The ironing system according to claim 1, **characterized in that** said expansion chamber (24) is placed above said plate (4).

3. The ironing system according to claim 2, **characterized in that** the expansion chamber (24) rests on a lid (7) of the plate (4) by a plurality of feet (28) adapted to keep the expansion chamber (24) lifted from the lid(7).

4. The ironing system according to claim 2 or 3, **characterized in that** said expansion chamber (24) is placed above said dispensing chamber (25).

5. The ironing system according to any preceding claim, **characterized in that** said expansion chamber (24) is directly connected to said dispensing chamber (25) through a passage port (29).

6. The ironing system according to any preceding claim, **characterized in that** it further comprises a pre-chamber (31) arranged inside said plate (4), said pre-chamber (31) being connected to said boiler (2) and being in fluidic communication with said expansion chamber (24) to prevent the inlet of a water portion in said expansion chamber (24).

7. The ironing system according to claim 6, **characterized in that** said pre-chamber (31) is obtained at a rear portion (4b) of said plate (4).

8. The ironing system according to claim 6 or 7, **characterized in that** said pre-chamber (31) is directly connected to said expansion chamber (24) through a connection tube (36).

9. The ironing system according to any preceding claim, **characterized in that** said holes (26) have a diameter ranging between 2 and 3,5 mm, preferably between 2,5 and 3 mm.

10. The ironing system according any preceding claim, **characterized in that** it further comprises at least one first plurality of vapour dispensing ducts (39) arranged at at least one side wall (11) of said plate.

11. The ironing system according to the preceding claim, **characterized in that** it further comprises at least one second plurality of vapour dispensing ducts (39), said first and said second pluralities of dispensing ducts being arranged along two distinct rows obtained at each side wall (11) of said plate (4).

12. The ironing system according to the preceding claim, **characterized in that** said dispensing ducts (39) have respective development axes (A) inclined relative to said ironing surface (9); said development axes (A) being inclined relative to said ironing surface (9) of an angle ranging between 25° and 55°, preferably between 35° and 45°.

13. The ironing system according to any claim 10 to 12, **characterized in that** said dispensing ducts (39) have respective development axes (A) arranged mutually parallel; said development axes (A) being parallel to a middle plane (P) which is orthogonal to said plate (4).

14. The ironing system according to any claim 10 to 13, **characterized in that** said dispensing ducts (39) have respective development axes (A) so inclined as to dispense the vapour towards the plate front part.

15. The ironing system according to any claim 10 to 14, **characterized in that** said dispensing ducts (39) have respective outlet sections (39a) arranged at a lifted level relative to said ironing surface (9).

16. The ironing system according to any claim 10 to 12, **characterized in that** said plate (4) has recesses (40) obtained at said respective side walls (11); said dispensing ducts (39) being obtained at said recesses (40).

17. The ironing system according to the preceding claim, **characterized in that** each recess (40) has a surface portion (40a); said dispensing ducts (39) having respective outlet sections (39a) laying on said surface portion (40a)

18. The ironing system according to the preceding claim, **characterized in that** each surface portion (40a) is essentially parallel to said ironing surface (9).

19. The ironing system according to any claim 10 to 18, **characterized in that** it comprises at least one side vapour chamber (41) for the collection and dispensing of said vapour, obtained in said plate (4); said side vapour chamber (41) comprising a collection portion (41a), and a dispensing portion (41 b) connected to said collection portion (41 a) and directly

in fluidic communication with said dispensing ducts (39).

20. The system according to the preceding claim, **characterized in that** it comprises a pair of said side vapour chambers (41), each arranged in the proximity of said side walls (11).

21. The system according to claim 19 or 20, **characterized in that** each side vapour chamber (41) comprises a septum (43) to partially divide said collection portion (41a) from said dispensing portion (41b); said septum (43) developing from said bottom wall (8) to reduce the passage of liquid water from said collection portion (41 a) to said dispensing portion (41b).

22. The ironing system according to any claim 19 to 21, **characterized in that** said side vapour chambers (41) are in fluidic communication with said boiler (2) through a connection duct (44).

23. The ironing system according to any preceding claim, **characterized in that** it further comprises a overheating chamber (19) connected to said boiler (2) to increase the temperature of the vapour which is produced and to dispense said first vapour.

24. The ironing system according to the preceding claim, **characterized in that** said overheating chamber (19) is obtained in said plate (4); said overheating chamber (19) comprising a plurality of partition walls (22) to define a labyrinth-shaped path to said vapour.

25. The ironing system according to claim 21 or 24, **characterized in that** it further comprises a resistor (13) to heat said plate (4); said overheating chamber (19) being obtained at said resistor (13).

26. The ironing system according to any claim 23 to 25, **characterized in that** it comprises a plurality of dispensing nozzles (23) obtained through said bottom wall (8); said nozzles (23) being in fluidic communication with said overheating chamber (19).

27. The ironing system according to the preceding claim, **characterized in that** said overheating chamber (19) comprises a dispensing end portion (19a) directly connected to said nozzles (23).

28. The ironing system according to claim 26 or 27, **characterized in that** said nozzles (23) have a diameter ranging between 1,5 and 3 mm, preferably between 2 and 2,5 mm.

29. The ironing system according to any claim 10 to 28, **characterized in that** it further comprises a deflector (46) to selectively direct said vapour into said dispensing ducts (39) and/or into said expansion chamber (24).

30. The ironing system according to claim 23 and 29, **characterized in that** said deflector (46) is adapted to direct said vapour into said dispensing ducts (39) and/or into said expansion chamber (24) and/or into said overheating chamber (19)

Patentansprüche

1. Bügelsystem umfassend einen Boiler (2) zur Erzeugung von Dampf, eine Platte (4), welche mit dem Boiler (2) verbunden ist, um den Dampf zu dispensieren; wobei die Platte (4) eine Bodenwand (8), die eine Bügelfläche (9) definiert, und einen Widerstandskörper (13) umfasst, der innerhalb der Platte (4) angeordnet ist; wobei das Bügelsystem ferner eine Dispensierkammer (25), die in der Platte (4) angeordnet ist, und eine Mehrzahl von Löchern (26), die in der Platte (4) gebildet sind, umfasst und in Fluidverbindung mit der Dispensierkammer (25) ist, um den Dampf zu dispensieren; wobei das Bügelsystem ferner eine Expansionskammer (24) umfasst, die mit dem Boiler (2) verbunden ist und in Fluidverbindung mit der Dispensierkammer (25) ist, **dadurch gekennzeichnet, dass** die Expansionskammer (24) außerhalb der Platte (4) angeordnet ist, um die Temperatur und den Druck des dispensierten Dampfes zu verringern.

2. Bügelsystem nach Anspruch 1, **dadurch gekennzeichnet, dass** die Expansionskammer (24) über der Platte (4) platziert ist.

3. Bügelsystem nach Anspruch 2, **dadurch gekennzeichnet, dass** die Expansionskammer (24) auf einem Deckel (7) der Platte (4) durch eine Mehrzahl von Füßen (28) aufliegt, die dazu eingerichtet sind, um die Expansionskammer (24) angehoben von dem Deckel (7) zu halten.

4. Bügelsystem nach Anspruch 2 oder 3, **dadurch gekennzeichnet, dass** die Expansionskammer (24) über der Dispensierkammer (25) platziert ist.

5. Bügelsystem nach irgendeinem vorhergehenden Anspruch, **dadurch gekennzeichnet, dass** die Expansionskammer (24) direkt mit der Dispensierkammer (25) durch einen Durchgangsanschluss (29) verbunden ist.

6. Bügelsystem nach irgendeinem vorhergehenden Anspruch, **dadurch gekennzeichnet, dass** es ferner eine Vorkammer (31), angeordnet in der Platte (4), umfasst, wobei die Vorkammer (31) mit dem Boiler (2) verbunden ist und in Fluidverbindung mit der Expansionskammer (24) ist, um den Einlass eines

Wasseranteils in die Expansionskammer (24) zu verhindern.

7. Bügelsystem nach Anspruch 6, **dadurch gekennzeichnet, dass** die Vorkammer (31) an einem hinteren Teilbereich (4b) der Platte (4) erhalten ist.

8. Bügelsystem nach Anspruch 6 oder 7, **dadurch gekennzeichnet, dass** die Vorkammer (31) direkt mit der Expansionskammer (24) durch ein Verbindungsrohr (36) verbunden ist.

9. Bügelsystem nach irgendeinem vorhergehenden Anspruch, **dadurch gekennzeichnet, dass** die Löcher (26) einen Durchmesser aufweisen, der sich zwischen 2 und 3,5 mm, vorzugsweise zwischen 2,5 und 3 mm, bewegt.

10. Bügelsystem nach irgendeinem vorhergehenden Anspruch, **dadurch gekennzeichnet, dass** es ferner wenigstens eine Mehrzahl von Dampf dispensierenden Durchgängen (39), angeordnet an wenigstens einer Seitenwand (11) der Platte, umfasst.

11. Bügelsystem nach dem vorhergehenden Anspruch, **dadurch gekennzeichnet, dass** es ferner wenigstens eine zweite Mehrzahl von Dampf dispensierenden Durchgängen (39) umfasst, wobei die erste und zweite Mehrzahl von Dampf dispensierenden Durchgängen entlang zwei verschiedenen Reihen, erhalten an jeder Seitenwand (11) der Platte (4), angeordnet ist.

12. Bügelsystem nach dem vorhergehenden Anspruch, **dadurch gekennzeichnet, dass** die Dispensierdurchgänge (39) jeweils Entwicklungsachsen (A) aufweisen, die relativ zu der Bügelfläche (9) geneigt sind; wobei die Entwicklungsachsen (A) relativ zu der Bügelfläche (9) mit einem Winkel geneigt sind, der sich zwischen 25° und 55°, vorzugsweise zwischen 35° und 45°, bewegt.

13. Bügelsystem nach irgendeinem der Ansprüche 10 bis 12, **dadurch gekennzeichnet, dass** die Dispensierdurchgänge (39) jeweilige Entwicklungsachsen (A) aufweisen, die zueinander parallel angeordnet sind; wobei die Entwicklungsachsen (A) parallel zu einer Mittelebene (P) sind, die senkrecht zu der Platte (4) ist.

14. Bügelsystem nach irgendeinem der Ansprüche 10 bis 13, **dadurch gekennzeichnet, dass** die Dispensierdurchgänge (39) jeweilige Entwicklungsachsen (A) aufweisen, derart geneigt, um den Dampf in Richtung des vorderen Teils der Platte zu dispensieren.

15. Bügelsystem nach irgendeinem der Ansprüche 10 bis 14, **dadurch gekennzeichnet, dass** die die Dispensierdurchgänge (39) jeweilige Auslassabschnitte (39a) aufweisen, die an einem angehobenen Niveau relativ zu der Bügelfläche (9) angeordnet sind.

16. Bügelsystem nach irgendeinem der Ansprüche 10 bis 12, **dadurch gekennzeichnet, dass** die Platte (4) Vertiefungen (40) aufweist, die an den jeweiligen Seitenwänden (11) erhalten sind; wobei die Dispensierdurchgänge (39) an den Vertiefungen (40) erhalten sind.

17. Bügelsystem nach dem vorhergehenden Anspruch, **dadurch gekennzeichnet, dass** jede Vertiefung (40) einen Flächenteil (40a) aufweist; wobei die Dispensierdurchgänge (39) jeweilige Auslassabschnitte (39a), die auf dem Flächenteil (40a) liegen, aufweisen.

18. Bügelsystem nach dem vorhergehenden Anspruch, **dadurch gekennzeichnet, dass** jeder Flächenteil (40a) im Wesentlichen parallel zu der Bügelfläche (9) ist.

19. Bügelsystem nach irgendeinem der Ansprüche 10 bis 18, **dadurch gekennzeichnet, dass** es wenigstens eine Seitendampfkammer (41) für die Sammlung und Dispensierung von dem Dampf umfasst, die in der Platte (4) erhalten ist; wobei die Seitendampfkammer (41) einen Sammlungsteilbereich (41 a) und einen Dispensierteilbereich (41 b) umfasst, der mit dem Sammlungsteilbereich (41 a) verbunden ist und in direkter Fluidverbindung mit den Dispensierdurchgängen (39) ist.

20. System nach dem vorhergehenden Anspruch, **dadurch gekennzeichnet, dass** es ein Paar von den Seitendampfkammern (41) umfasst, wobei jede in der Nähe von den Seitenwänden (11) angeordnet ist.

21. System nach Anspruch 19 oder 20, **dadurch gekennzeichnet, dass** jede Seitendampfkammer (41) eine Mittelwand (43) umfasst, um teilweise den Sammlungsteilbereich (41 a) von dem Dispensierteilbereich (41 b) abzutrennen; wobei sich die Mittelwand (43) aus der Bodenwand (8) herausbildet, um den Durchgang von flüssigem Wasser von dem Sammlungsteilbereich (41 a) zu dem Dispensierteilbereich (41 b) zu verringern.

22. Bügelsystem nach irgendeinem Anspruch 19 bis 21, **dadurch gekennzeichnet, dass** die Seitendampfkammern (41) in Fluidverbindung mit dem Boiler (2) durch einen Verbindungsdurchgang (44) sind.

23. Bügelsystem nach irgendeinem vorhergehenden Anspruch, **dadurch gekennzeichnet, dass** es ferner eine Überhitzungskammer (19) umfasst, die mit dem Boiler (2) verbunden ist, um die Temperatur des

Dampfs zu erhöhen, der erzeugt wird und den ersten Dampf abzugeben.

24. Bügelsystem nach dem vorhergehenden Anspruch, **dadurch gekennzeichnet, dass** die Überhitzungskammer (19) in der Platte (4) erhalten ist; wobei die Überhitzungskammer (19) eine Mehrzahl von Teilungswänden (22) umfasst, um einen labyrinthgeformten Weg für den Dampf zu definieren.

25. Bügelsystem nach Anspruch 21 oder 24, **dadurch gekennzeichnet, dass** es ferner einen Widerstandskörper (13) umfasst, um die Platte (4) zu wärmen; wobei die Überhitzungskammer (19) an dem Widerstandskörper (13) erhalten ist.

26. Bügelsystem nach irgendeinem der Ansprüche 23 bis 25, **dadurch gekennzeichnet, dass** es ferner eine Mehrzahl von Dispensierdüsen (23) umfasst, die durch die Bodenwand (8) erhalten sind; wobei die Düsen (23) in Fluidverbindung mit der Überhitzungskammer (19) sind.

27. Bügelsystem nach dem vorhergehenden Anspruch, **dadurch gekennzeichnet, dass** die Überhitzungskammer (19) einen Dispensierendteil (19a) umfasst, der direkt mit den Düsen (23) verbunden ist.

28. Bügelsystem nach Anspruch 26 oder 27, **dadurch gekennzeichnet, dass** die Düsen (23) einen Durchmesser aufweisen, der sich zwischen 1,5 und 3 mm, vorzugsweise zwischen 2 und 2,5 mm, bewegt.

29. Bügelsystem nach irgendeinem der Ansprüche 10 bis 28, **dadurch gekennzeichnet, dass** es ferner einen Ablenker (46) umfasst, um wahlweise den Dampf in die Dispensierdurchgänge (39) und/ oder in die Expansionskammer (24) zu lenken.

30. Bügelsystem nach Anspruch 23 und 29, **dadurch gekennzeichnet, dass** der Ablenker (46) dazu eingerichtet ist, den Dampf in die Dispensierdurchgänge (39) und/ oder in die Expansionskammer (24) und/ oder in die Überhitzungskammer (19) zu lenken.

Revendications

1. Système à repasser comprenant une bouilloire (2) pour la production de vapeur, une plaque (4) reliée à ladite bouilloire (2) pour distribuer ladite vapeur; ladite plaque (4) comprenant une paroi inférieure (8) définissant une surface de repassage (9) et une résistance (13) agencée à l'intérieur de la plaque (4) ; ledit système de repassage comprend en outre une chambre de distribution (25) agencée dans ladite plaque (4) et une pluralité de trous (26) formés dans ladite plaque (4) et en communication fluidique avec ladite chambre de distribution (25) pour distribuer ladite vapeur; ledit système de repassage comprend en outre une chambre d'expansion (24) reliée à ladite bouilloire (2) et en communication fluidique avec ladite chambre de distribution (25), **caractérisé en ce que** ladite chambre d'expansion (24) est agencée en dehors de ladite plaque (4) pour réduire la température et la pression de la vapeur distribuée.

2. Système de repassage selon la revendication 1, **caractérisé en ce que** ladite chambre d'expansion (24) est placée au-dessus de ladite plaque (4).

3. Système de repassage selon la revendication 2, **caractérisé en ce que** la chambre d'expansion (24) repose contre un couvercle (7) de la plaque (4) par une pluralité de pieds (28) adaptés pour maintenir la chambre d'expansion (24) levée du couvercle (7).

4. Système de repassage selon la revendication 2 ou 3, **caractérisé en ce que** ladite chambre d'expansion (24) est placée au-dessus de ladite chambre de distribution (25).

5. Système de repassage selon l'une quelconque revendication précédente, **caractérisé en ce que** ladite chambre d'expansion (24) est directement reliée à ladite chambre de distribution (25) par un orifice de passage (29).

6. Système de repassage selon l'une quelconque revendication précédente, **caractérisé en ce qu'**il comprend en outre une préchambre (31) agencée dans ladite plaque (4), ladite préchambre (31) étant reliée à ladite bouilloire (2) et étant en communication fluidique avec ladite chambre d'expansion (24) pour empêcher l'entrée d'une partie d'eau dans ladite chambre d'expansion (24).

7. Système de repassage selon la revendication 6, **caractérisé en ce que** ladite préchambre (31) est obtenue sur une partie arrière (4b) de ladite plaque (4).

8. Système de repassage selon la revendication 6 ou 7, **caractérisé en ce que** ladite préchambre (31) est directement reliée à ladite chambre d'expansion (24) par un tube de liaison (36).

9. Système de repassage selon l'une quelconque revendication précédente, **caractérisé en ce que** lesdits trous (26) ont un diamètre variant entre 2 et 3,5 mm, de préférence entre 2,5 et 3 mm.

10. Système de repassage selon l'une quelconque revendication précédente, **caractérisé en ce qu'**il comprend en outre au moins une première pluralité de conduits de distribution de vapeur (39) agencés

sur au moins une paroi latérale (11) de ladite plaque.

11. Système de repassage selon la revendication précédente, **caractérisé en ce qu'**il comprend en outre au moins une seconde pluralité de conduits de distribution de vapeur (39), lesdites première et lesdites secondes pluralités de conduits de distribution étant agencées le long de deux rangées distinctes obtenues sur chaque paroi latérale (11) de ladite plaque (4).

12. Système de repassage selon la revendication précédente, **caractérisé en ce que** lesdits conduits de distribution (39) ont des axes de développement respectifs (A) inclinés par rapport à ladite surface de repassage (9) ; lesdits axes de développement (A) étant inclinés par rapport à ladite surface de repassage (9) d'un angle variant entre 25 et 55°, de préférence entre 35 et 45°.

13. Système de repassage selon l'une quelconque revendication 10 à 12, **caractérisé en ce que** lesdits conduits de distribution (39) ont des axes de développement respectifs (A) agencés mutuellement parallèlement ; lesdits axes de développement (A) étant parallèles à un plan médian (P) qui est orthogonal à ladite plaque (4).

14. Système de repassage selon l'une quelconque revendication 10 à 13, **caractérisé en ce que** lesdits conduits de distribution (39) ont des axes de développement respectifs (A) inclinés de sorte à distribuer la vapeur vers la partie avant de plaque.

15. Système de repassage selon l'une quelconque revendication 10 à 14, **caractérisé en ce que** lesdits conduits de distribution (39) ont des sections de sortie respectives (39a) agencées sur un niveau levé par rapport à ladite surface de repassage (9).

16. Système de repassage selon l'une quelconque revendication 10 à 12, **caractérisé en ce que** ladite plaque (4) possède des évidements (40) obtenus sur lesdites parois latérales respectives (11) ; lesdits conduits de distribution (39) étant obtenus sur lesdits évidements (40).

17. Système de repassage selon la revendication précédente, **caractérisé en ce que** chaque évidement (40) a une partie de surface (40a) ; lesdits conduits de distribution (39) présentant des sections de sortie respectives (39a) reposant sur ladite partie de surface (40a).

18. Système de repassage selon la revendication précédente, **caractérisé en ce que** chaque partie de surface (40a) est essentiellement parallèle à ladite surface de repassage (9).

19. Système de repassage selon l'une quelconque revendication 10 à 18, **caractérisé en ce qu'**il comprend au moins une chambre de vapeur latérale (41) pour la collecte et la distribution de ladite vapeur, obtenue dans ladite plaque (4) ; ladite chambre de vapeur latérale (41) comprenant une partie de collecte (41a), et une partie de distribution (41b) reliée à ladite partie de collecte (41a) et directement en communication fluidique avec lesdits conduits de distribution (39).

20. Système de repassage selon la revendication précédente, **caractérisé en ce qu'**il comprend une paire de dites chambres de vapeur latérales (41), chacune agencée à proximité desdites parois latérales (11).

21. Système de repassage selon la revendication 19 ou 20, **caractérisé en ce que** chaque chambre de vapeur latérale (41) comprend un septum (43) pour diviser en partie ladite partie de collecte (41a) de ladite partie de distribution (41b) ; ledit septum (43) se développant de ladite paroi inférieure (8) pour réduire le passage d'eau liquide de ladite partie de collecte (41a) à ladite partie de distribution (41b).

22. Système de repassage selon l'une quelconque revendication 19 à 21, **caractérisé en ce que** lesdites chambres de vapeur latérales (41) sont en communication fluidique avec ladite bouilloire (2) par un conduit de liaison (44).

23. Système de repassage selon l'une quelconque revendication précédente, **caractérisé en ce qu'**il comprend en outre une chambre de surchauffe (19) reliée à ladite bouilloire (2) pour augmenter la température de la vapeur qui est produite et pour distribuer ladite première vapeur.

24. Système de repassage selon la revendication précédente, **caractérisé en ce que** ladite chambre de surchauffe (19) est obtenue dans ladite plaque (4) ; ladite chambre de surchauffe (19) comprenant une pluralité de parois de séparation (22) pour définir une voie en forme de labyrinthe pour ladite vapeur.

25. Système de repassage selon la revendication 21 ou 24, **caractérisé en ce qu'**il comprend en outre une résistance (13) pour chauffer ladite plaque (4) ; ladite chambre de surchauffe (19) étant obtenue sur ladite résistance (13).

26. Système de repassage selon l'une quelconque revendication 23 à 25, **caractérisé en ce qu'**il comprend une pluralité de buses de distribution (23) obtenues par ladite paroi inférieure (8) ; lesdites buses (23) étant en communication fluidique avec ladite chambre de surchauffe (19).

27. Système de repassage selon la revendication précédente, **caractérisé en ce que** ladite chambre de préchauffe (19) comprend une partie d'extrémité de distribution (19a) reliée directement auxdites buses (23).

28. Système de repassage selon la revendication 26 ou 27, **caractérisé en ce que** lesdites buses (23) ont un diamètre variant entre 1,5 et 3 mm, de préférence entre 2 et 2,5 mm.

29. Système de repassage selon l'une quelconque revendication 10 à 28, **caractérisé en ce qu'**il comprend en outre un déflecteur (46) pour diriger sélectivement ladite vapeur dans lesdits conduits de distribution (39) et/ou dans ladite chambre d'expansion (24).

30. Système de repassage selon les revendications 23 et 29, **caractérisé en ce que** ledit déflecteur (46) est adapté pour diriger ladite vapeur dans lesdits conduits de distribution (39) et/ou dans ladite chambre d'expansion (24) et/ou dans ladite chambre de surchauffe (19).

Fig. 1

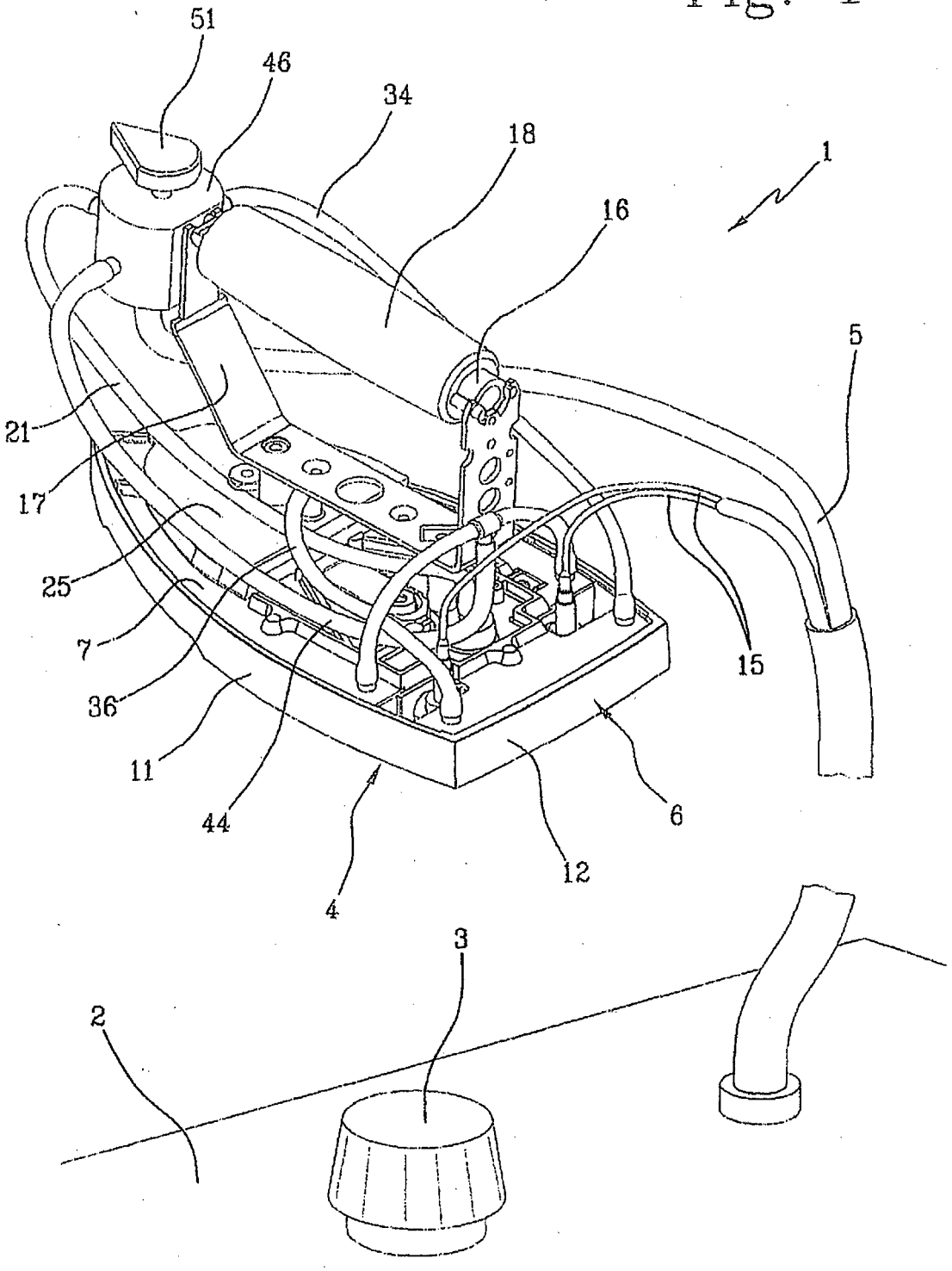
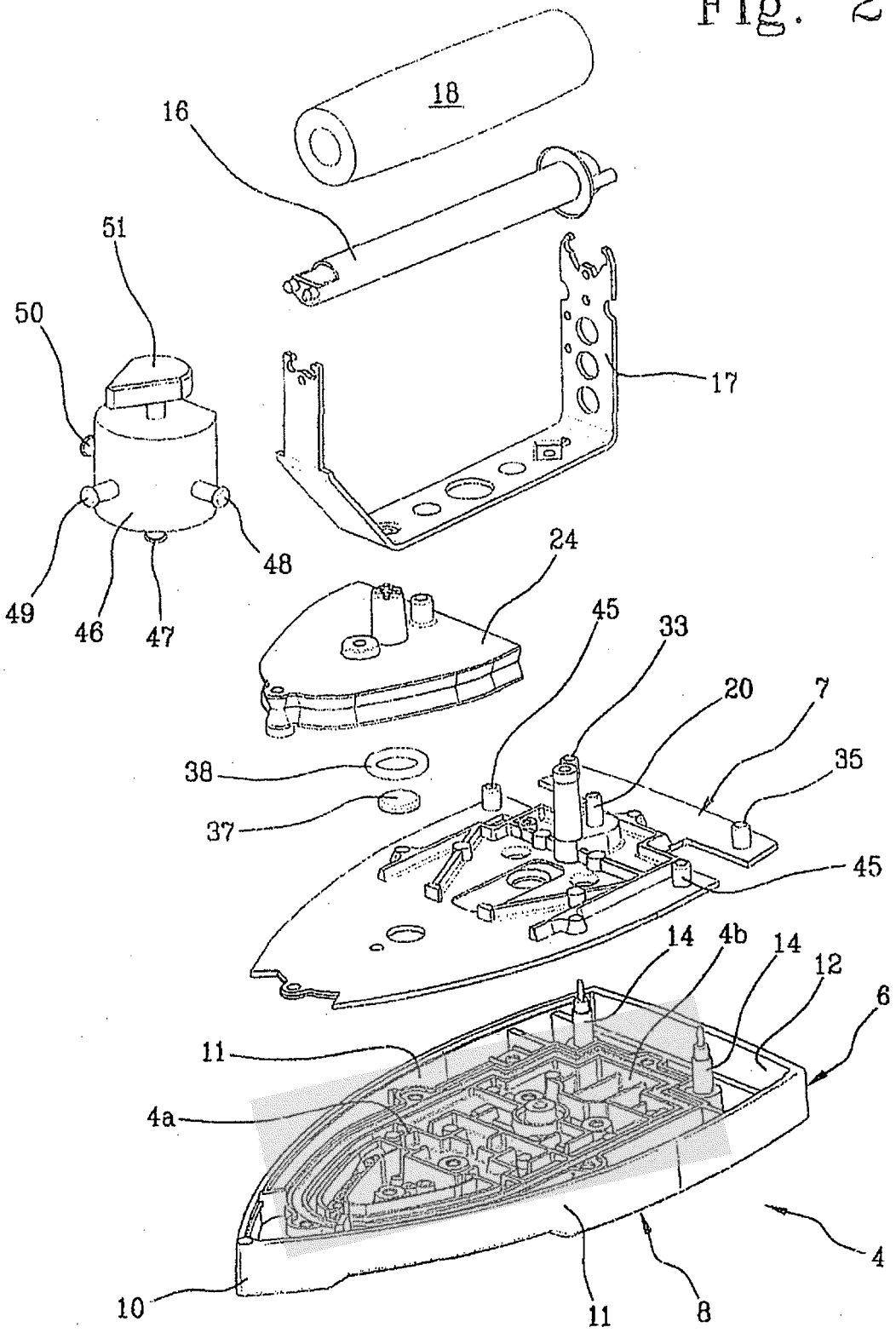


Fig. 2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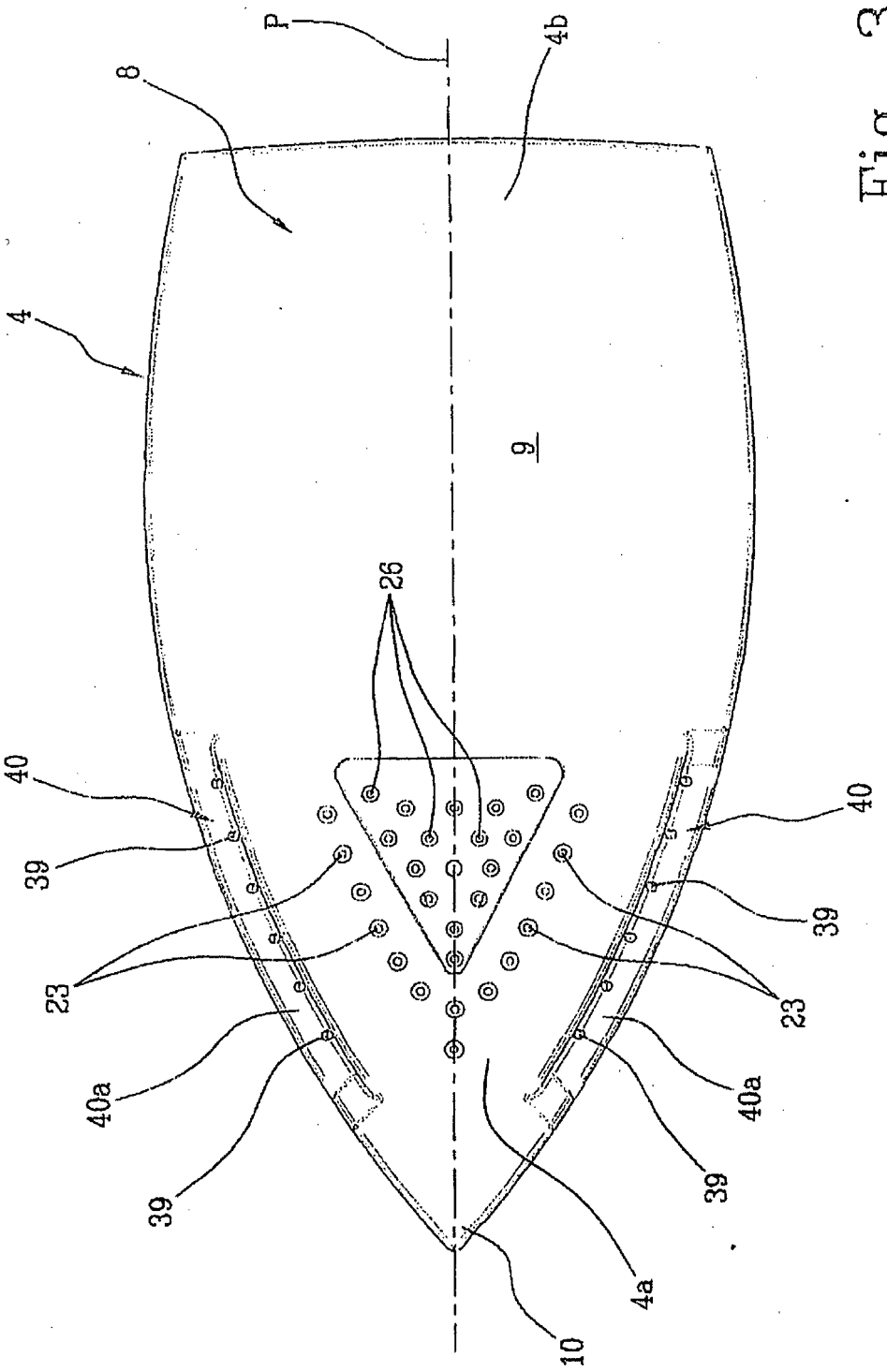

Fig. 3

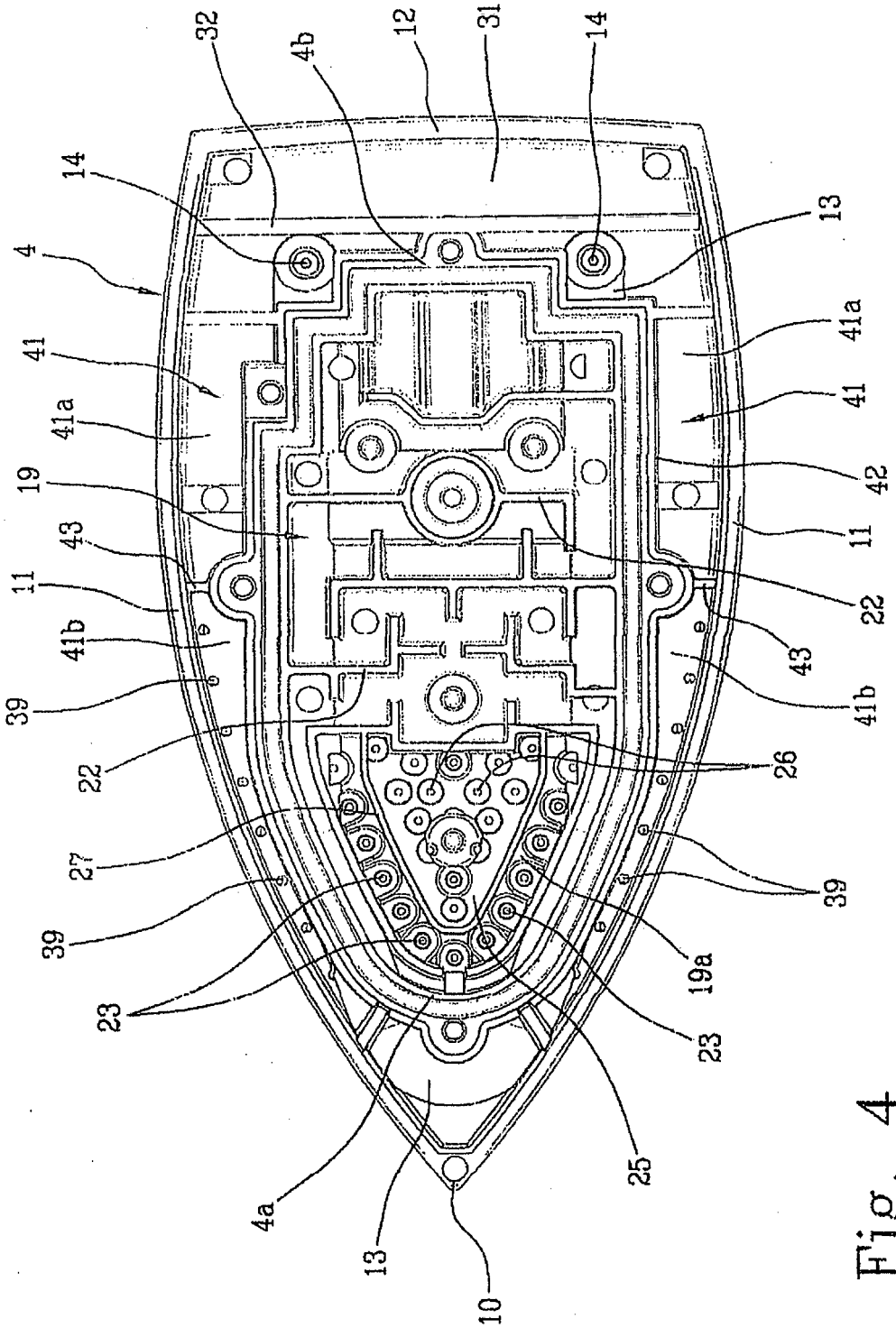
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Fig. 4

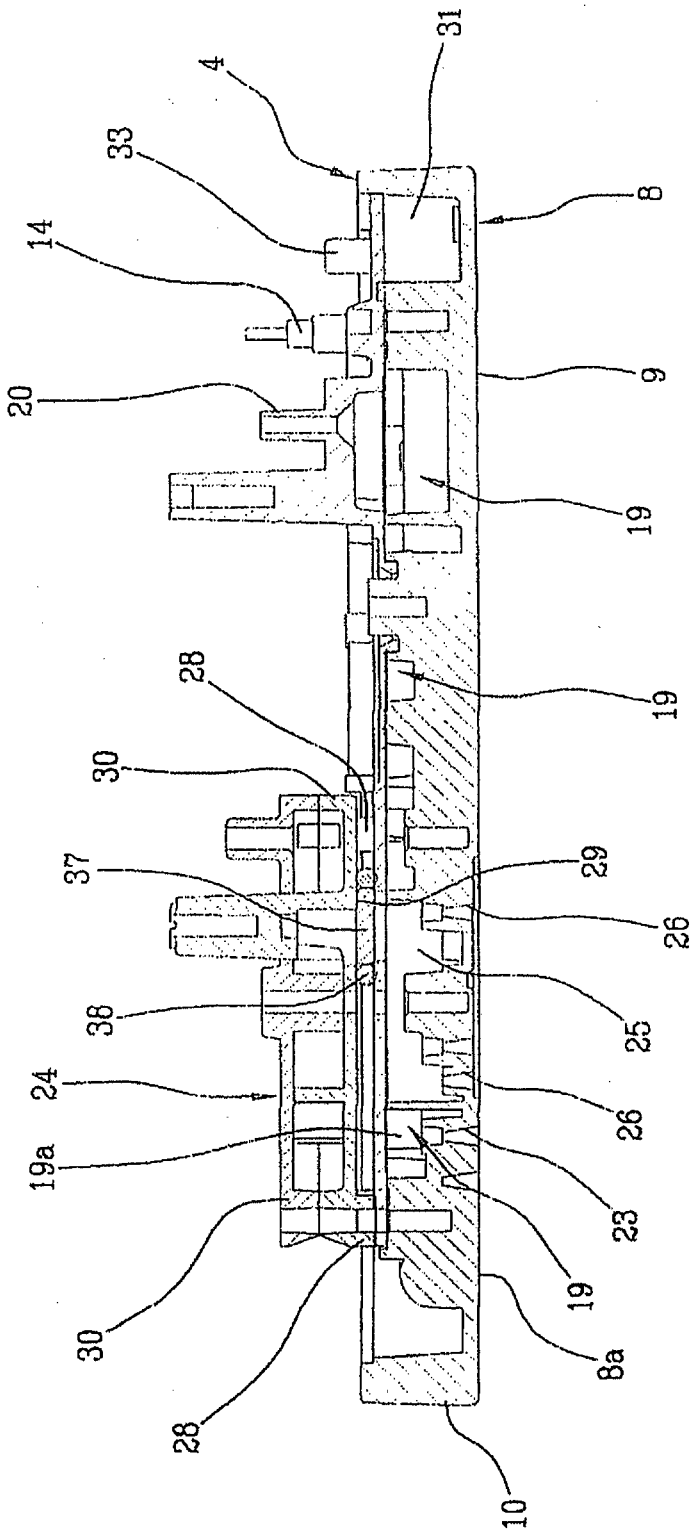


Fig. 5

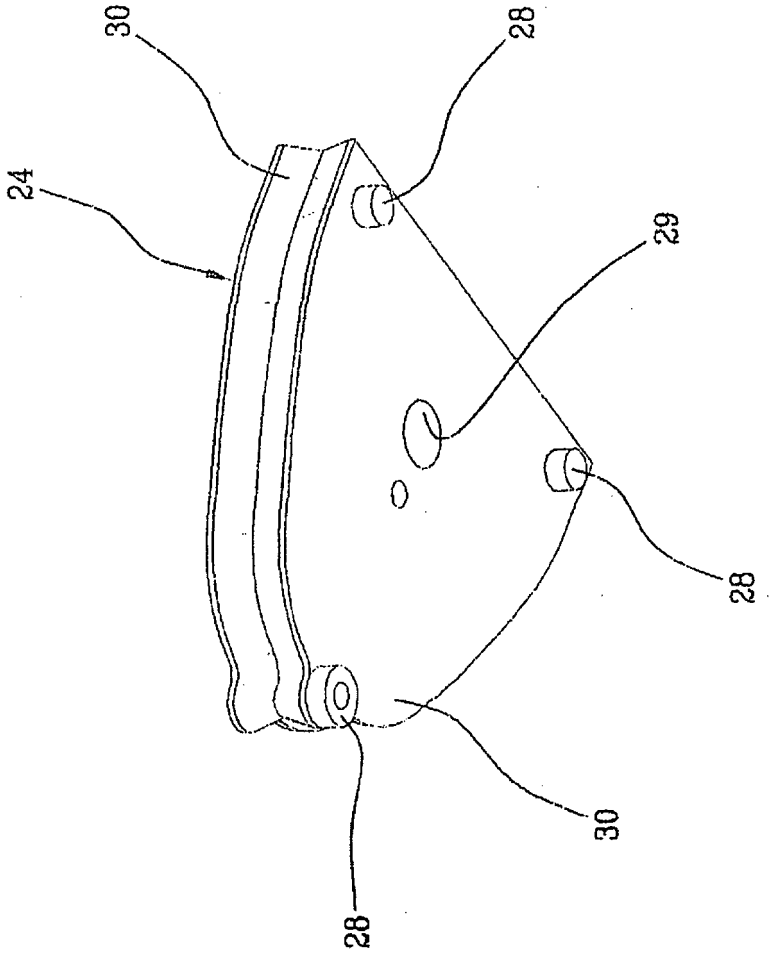


Fig. 6

Fig. 7

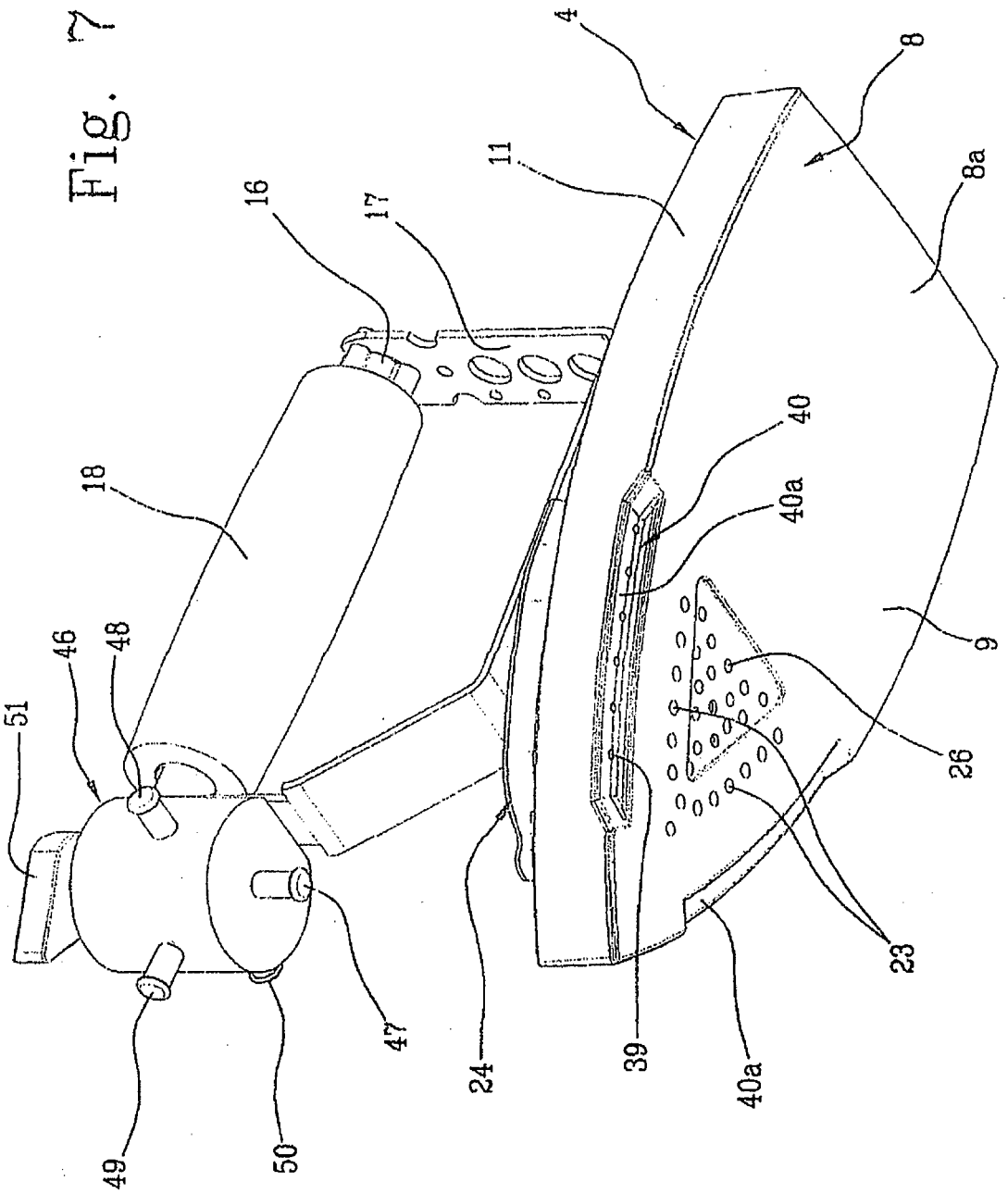
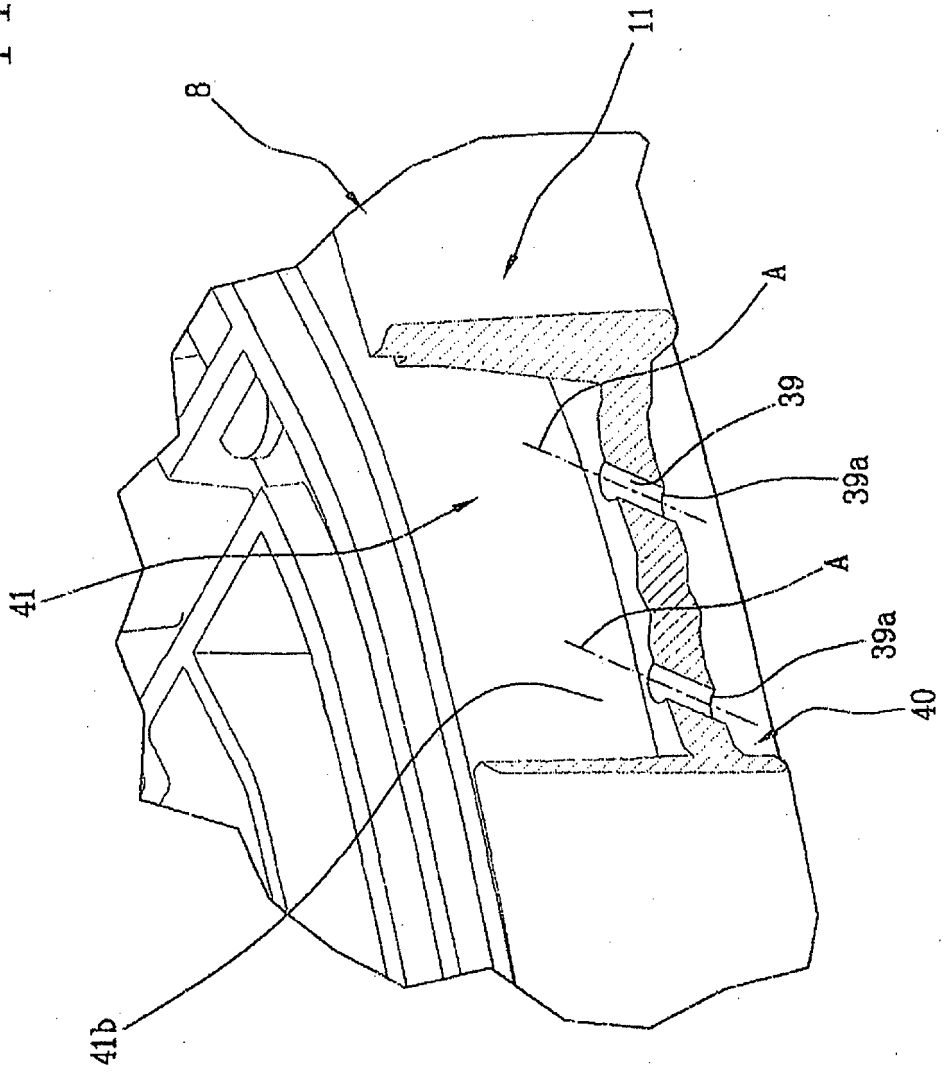


Fig. 8



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