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(71) Applicant: **Tsann Kuen (Zhangzhou) Enterprise Co., Ltd.**
Fujian 363107 (CN)

(72) Inventors:
- **Cai, Ruifeng**
  363107 Zhangzhou, Fujian (CN)
- **Zheng, Zhenxing**
  363107 Zhangzhou, Fujian (CN)

(74) Representative: **DREISS Patentanwälte PartG mbB**
Friedrichstrasse 6
70174 Stuttgart (DE)

(54) STEAM IRON

(57) A steam iron includes an ironing unit (4). The ironing unit (4) includes an ironing board member (41), and a heating tube (45) mounted fixedly in the ironing board member (41) and having left and right heating tube sections (451). The ironing board member (41) is formed with a pre-heating channel (42) that is formed between the left and right heating tube sections (451), two heating channels (43) that are in fluid communication with and that flank the pre-heating channel (42), and that extend forward and are disposed respectively and substantially over the left and right heating tube sections (451) for heating water from the pre-heating channel (42) into steam, a steam channel (44) that is in fluid communication with front ends of said heating channels (43), and a plurality of spaced-apart steam vents (412) that are in spatial communication with and arranged along the steam channel (44).

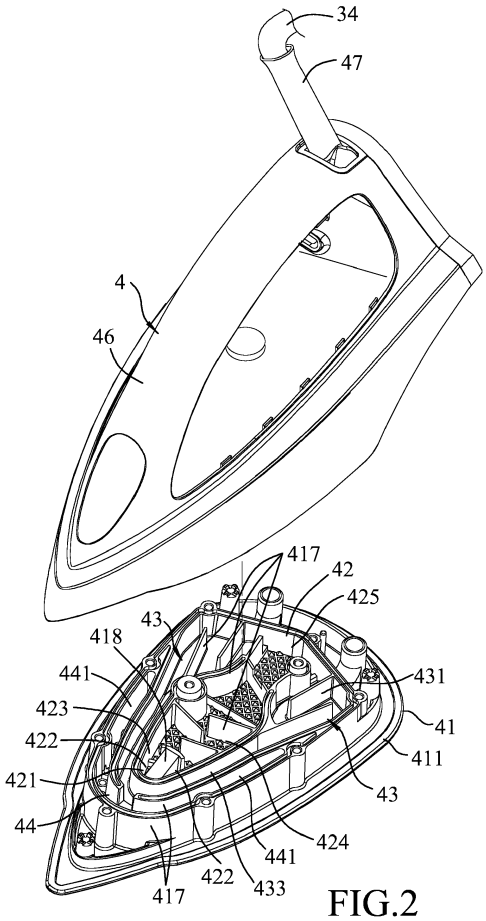

FIG.2

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Description

[0001] The disclosure relates to an iron, and more particularly to a steam iron.

[0002] Conventional steam irons tend to have low heating efficiency where a relatively small, inconsistent amount of steam is generated per unit time. Such is insufficient to remove creases on clothes. To improve the heating process and increase the amount of steam output, a conventional steam iron is designed to utilize a two-stage heating process. First, water is initially pre-heated outside of the conventional steam iron to a certain temperature. Then, the pre-heated water is poured into the conventional steam iron to be further heated by an electric heating tube mounted therein. However, such heating process is relatively insufficient and energy-consuming.

[0003] Therefore, an object of the disclosure is to provide a steam iron that can alleviate at least one of the drawbacks of the prior arts.

[0004] According to the disclosure, the steam iron includes an ironing unit. The ironing unit includes an ironing board member, a heating tube which is mounted fixedly in the ironing board member and which has left and right heating tube sections, and a housing which is mounted on top of the ironing board member. The steam iron is characterized in that the ironing board member is formed with a pre-heating channel, two heating channels, a steam channel and a plurality of spaced-apart steam vents.

[0005] The pre-heating channel is formed between the left and right heating tube sections of the heating tube. The heating channels are in fluid communication with a rear end of the pre-heating channel, flank the pre-heating channel, extend forward and are disposed respectively and substantially over the left and right heating tube sections for heating the water coming from the pre-heating channel into steam. The steam channel is in fluid communication with front ends of the heating channels, and has two divisional sections flanking and being respectively adjacent to the heating channels, and extending rearward for spreading out the steam advanced from the heating channels. The steam vents are in spatial communication with and arranged along the divisional sections of the steam channel.

[0006] Other features and advantages of the disclosure will become apparent in the following detailed description of the embodiment with reference to the accompanying drawings, of which:

Fig. 1 is a perspective view of an embodiment of a steam iron according to the disclosure;

Fig. 2 is a partly exploded perspective view of an ironing unit of the embodiment;

Fig. 3 is a partly sectional view of the embodiment;

Fig. 4 is a top view of an ironing board member of the embodiment; and

Fig. 5 is a bottom view of the ironing board member of the embodiment.

[0007] Before the disclosure is described in greater detail, it should be noted that like elements are denoted by the same reference numerals throughout the disclosure.

[0008] Referring to Figs. 1 and 3, an embodiment of a steam iron according to the disclosure includes a water tank unit 3 and an ironing unit 4.

[0009] The water tank unit 3 includes a water tank 31, a water pump 32, a controller 33, a connecting pipe 34 and a handle 35. The water tank 31 defines a water reservoir 310, and is capable of supporting the ironing unit 4 thereon. The water pump 32 is mounted to the water tank 31 and is disposed in spatial communication with the water reservoir 310. The controller 33 controls operation of the water pump 32. The connecting pipe 34 is connected to the water pump 32. The handle 35 is connected pivotably to the water tank 31 so that a user can hold the handle 35 to transport the entire steam iron.

[0010] Referring to Figs. 2, 3 and 4, the ironing unit 4 includes an ironing board member 41 made of a metal material, a heating tube 45 mounted fixedly in the ironing board member 41 and having left and right heating tube sections 451, a housing 46 mounted on top of the ironing board member 41, and a linking tube 47 connected to the housing 46. The connecting pipe 34 of the water tank unit 3 interconnects the water pump 32 and the linking tube 47. Each of the left and right heating tube sections 451 has a front end. The front ends of the left and right heating tube sections 451 are connected to each other.

[0011] The water tank unit 3 is connected to the linking tube 47, and is operable to pump water stored in the water reservoir 310 into the linking tube 47 by means of the water pump 32.

[0012] Referring to Figs. 2, 4 and 5, the ironing board member 41 has an iron plate portion 411, a plurality of partitioning portions 417 and a plurality of protruding portions 418.

[0013] The partitioning portions 417 extend upwardly from the iron plate portion 411, and cooperate with the iron plate portion 411 to define a pre-heating channel 42, two heating channels 43 and a steam channel 44.

[0014] The pre-heating channel 42 is formed between the left and right heating tube sections 451 of the heating tube 45 (i.e., the pre-heating channel 42 is surrounded by the heating tube 45) for guiding water introduced therein from the linking tube 47 to be pre-heated by the left and right heating tube sections 451.

[0015] The heating channels 43 are in fluid communication with a rear end of the pre-heating channel 42, flank the pre-heating channel 42, extend forward and are disposed respectively and substantially over the left and right heating tube sections 451 for heating the water coming from the pre-heating channel 42, thereby converting the water into steam. Each of the heating channels 43 has an S-shaped first heating section 431 that is connected to the rear end of the pre-heating channel 42, and a second heating section 432 that extends forward from

the first heating section 431. Front ends of the second heating sections 432 of the heating channels 43 are connected to each other. Specifically, a portion of the first heating section 431 and a major part of the second heating section 432 are disposed above the left and right heating tube sections 451 for facilitating the abovementioned water-to-steam conversion. Since the pre-heating channel 42 is disposed at an inner side of the heating channels 43, the high-temperature steam in the heating channels 43 also facilitates the pre-heating process in the pre-heating channel 42.

[0016] The protruding portions 418 are spaced apart from each other, protrude upward from the iron plate portion 411 into the heating channels 43, and are symmetrically arranged. Each of the protruding portions 418 has a height smaller than that of the partitioning portions 417. In this embodiment, each of the heating channels 43 is provided with three of the protruding portions 418. One of the protruding portions 418 in each heating channel 43 is disposed in the middle of the first heating section 431, and the remaining two of the protruding portions 418 are disposed in the second heating section 432. Due to the abovementioned structural design, the heating channels 43 are divided into a plurality of compartments 430 that are in fluid communication with each other. As such, flow of the water therein is slowed to allow the water to be sufficiently heated into steam.

[0017] The steam channel 44 is in fluid communication with the front ends of the second heating sections 432 of the heating channels 43, and has two divisional sections 441 flanking and being respectively adjacent to the heating channels 43 and extending rearward for spreading out the steam coming from the heating channels 43. The iron plate portion 411 is formed with a plurality of steam vents 412 that extend therethrough, and that are in spatial communication with and arranged along the divisional sections 441 of the steam channel 44. Specifically, the divisional sections 441 are disposed respectively on outer sides of the left and right heating tube sections 451, and are proximate to outer sides of the second heating sections 432.

[0018] The heating tube 45 is fixed in the iron plate portion 411 below the pre-heating channel 42, the heating channels 43 and the steam channel 44, and may be powered to generate heat for heating the ironing board member 41 and thus, heat the water within the pre-heating channel 42, the heating channels 43 and the steam channel 44.

[0019] The iron plate portion 411 is further formed with a plurality of first steam recesses 413 (see Fig. 5) at a bottom surface thereof, a plurality of spaced-apart second steam recesses 414 and a retention groove 415. The first steam recesses 413 are formed in the bottom side of the iron plate portion 411 and are respectively in spatial communication with the steam vents 412. The second steam recesses 414 are formed in the bottom side of the iron plate portion 411 and are not in spatial communication with the steam vents 412. Each of the steam vents 412, the first steam recesses 413 and the second steam recesses 414 retains a portion of the steam therein when the steam iron is in use with the iron plate portion 411 sliding on the clothes, to facilitate distribution of the steam to the clothes and to increase the ironing efficiency. Moreover, the structural design of the first steam recesses 413 and the second steam recesses 414 prevents deformation of the iron plate portion 411. The retention groove 415 is in fluid communication with the pre-heating channel 42 to receive the water from the housing 46. Front ends of the heating tube sections 451 are disposed proximate to a front end of the retention groove 415 so that water retained in the retention groove 415 before reaching the pre-heating channel 42 may be warmed up, thereby increasing heating efficiency.

[0020] Referring to Figs. 2 and 3, the housing 46 covers a top side of the pre-heating channel 42, is fixed on the ironing board member 41, and has a connecting tube portion 461 connected to the linking tube 47 for introducing water from the linking tube 47 into the front end of the pre-heating channel 42. An open end of the connecting tube portion 461 is disposed above the retention groove 415, so that water advanced from the housing 46 will be momentarily retained in the retention groove 415.

[0021] When the steam iron is in use, the ironing board member 41 is heated by the heating tube 45 to a certain/specific temperature. The water pump 32 is operated to pump water stored in the water reservoir 310 of the water tank 31 into the ironing unit 4 through the connecting pipe 34. Since the novelty of this disclosure does not reside in the heating process, further details will be omitted for the sake of brevity.

[0022] The water then enters the retention groove 415 and flows rearward through the pre-heating channel 42 to reach the heating channels 43. Since the retention groove 415 is proximate to the heating tube 45, water retained therein is warmed up prior to flowing through the pre-heating channel 42. Since a lower portion of the pre-heating channel 42 is surrounded by the heating tube 45 and the heating channels 43 are surrounded by the heat of the heating tube 45, the warm water flowing rearward through the pre-heating channel 42 is rapidly pre-heated to a certain temperature. Since the heating channels 43 are divided into the compartments 430 and are disposed above the heating tube 45, when the pre-heated water subsequently flows into the heating channels 43, the flow of the pre-heated water is slowed within the compartments 430 by the protruding portions 418 to allow enough time for the pre-heated water to be boiled and vaporized into high-temperature steam. Such steam is pressured into the steam channel 44, and escapes from the ironing unit 4 through the steam vents 412 for ironing clothes.

[0023] The water pump 32 may be designed such that the amount of water pumped into the ironing unit 4 may be controlled at different times of the entire ironing process. For instance, the water pump 32 may pump a larger amount of water as the initial pump, and once the water

begins to vaporize, periodic pumps of smaller amounts of water are provided to prevent the clothes from being soaked due to overabundance of steam. Actual practice is not limited to what is disclosed herein.

[0024] In sum, due to well designed contours of the pre-heating channel 42, the heating channels 43 and the steam channel 44, water in the pre-heating channel 42 can be effectively pre-heated before entering the heating channels 43, and can be quickly boiled into steam in the heating channels 43, such that a large amount of steam can be quickly generated. Thus, a separate heating device outside of the steam iron of this invention is not required, thereby reducing manufacturing costs.

Claims

1. A steam iron including an ironing unit (4) that includes an ironing board member (41), a heating tube (45) which is mounted fixedly in said ironing board member (41) and which has left and right heating tube sections (451), and a housing (46) which is mounted on top of said ironing board member (41), said steam iron being **characterized in that** said ironing board member (41) is formed with:

   a pre-heating channel (42) that is formed between said left and right heating tube sections (451) of said heating tube (45);
   two heating channels (43) that are in fluid communication with a rear end of said pre-heating channel (42), that flank said pre-heating channel (42), and that extend forward and are disposed respectively and substantially over said left and right heating tube sections (451) for heating the water coming from the pre-heating channel (42) into steam;
   a steam channel (44) that is in fluid communication with front ends of said heating channels (43), and that has two divisional sections (441) flanking and being respectively adjacent to said heating channels (43) and extending rearward for spreading out the steam advanced from said heating channels (43); and
   a plurality of spaced-apart steam vents (412) that are in spatial communication with and arranged along said divisional sections (441) of said steam channel (44).

2. The steam iron as claimed in Claim 1, further **characterized in that** said ironing board member (41) has an iron plate portion (411) that is formed with said steam vents (412) extending therethrough, and a plurality of partitioning portions (417) that extend upwardly from said iron plate portion (411), and that cooperate with said iron plate portion (411) to define said pre-heating channel (42), said heating channels (43) and said steam channel (44).

3. The steam iron as claimed in Claim 2, further **characterized in that** said ironing board member (41) further has a plurality of protruding portions (418) that are spaced apart from each other and that protrude upward from said iron plate portion (411) into said heating channels (43) for dividing said heating channels (43) into a plurality of compartments (430).

4. The steam iron as claimed in any one of Claims 1, 2 and 3, further **characterized in that** front ends of said heating channels (43) are in fluid communication with each other.

5. The steam iron as claimed in any one of Claims 1, 2 and 3, further **characterized in that** said iron plate portion (411) has a plurality of first steam recesses (413) that are formed in a bottom side thereof, and that are respectively in spatial communication with said steam vents (412).

6. The steam iron as claimed in Claim 5, further **characterized in that** said iron plate portion (411) further has a plurality of second steam recesses (414) that are formed in the bottom side thereof, and that are not in spatial communication with said steam vents (412).

7. The steam iron as claimed in any one of Claims 1, 2 and 3, further **characterized in that** said ironing unit (4) further includes a linking tube (47) connected to said housing (46), said housing (46) having a connecting tube portion (461) that is connected to said linking tube (47) for introducing water from said linking tube (47) into front end portion of said pre-heating channel (42), said steam iron further including a water tank unit (3) that is connected to said linking tube (47) and that is operable to pump water stored therein into said linking tube (47).

8. The steam iron as claimed in Claim 7, further **characterized in that** said water tank unit (3) includes
   a water tank (31) that defines a water reservoir (310) and that is capable of supporting said ironing unit (4) thereon,
   a water pump (32) that is mounted to said water tank (31) and that is disposed in spatial communication with said water reservoir (310),
   a controller (33) that is for controlling operation of said water pump (32), and
   a connecting pipe (34) that interconnects said water pump (32) and said linking tube (47).

9. The steam iron as claimed in Claim 8, further **characterized in that** said water tank unit (3) further includes a handle (35) that is connected pivotably to said water tank (31).

10. The steam iron as claimed in Claim 7, further **char-**

acterized in that said iron plate portion (411) is further formed with a retention groove (415) that is in fluid communication with said pre-heating channel (42) and that is disposed under said connecting tube portion (461) for receiving water flowing from said linking tube (47) to said pre-heating channel (42).

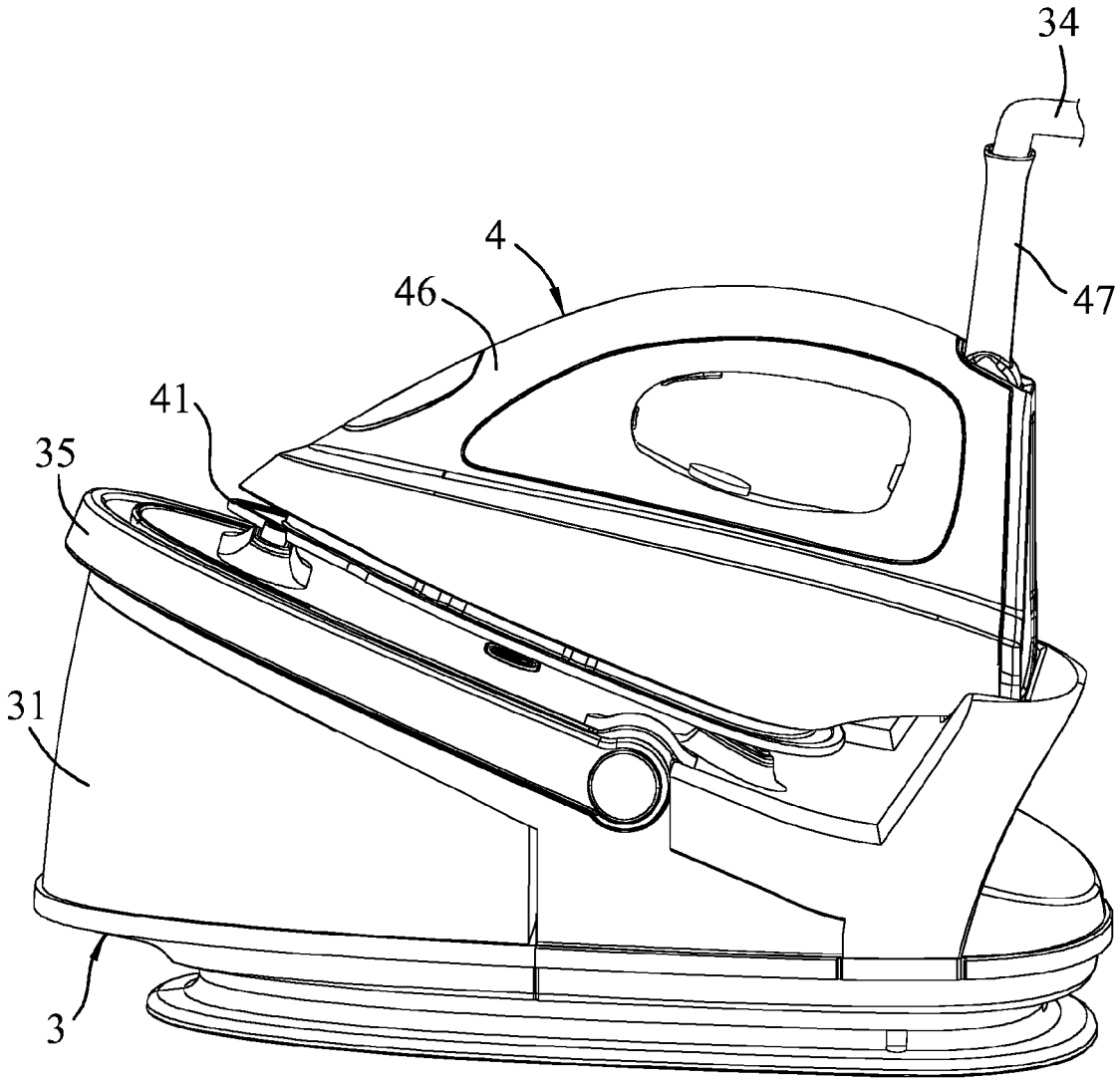

FIG.1

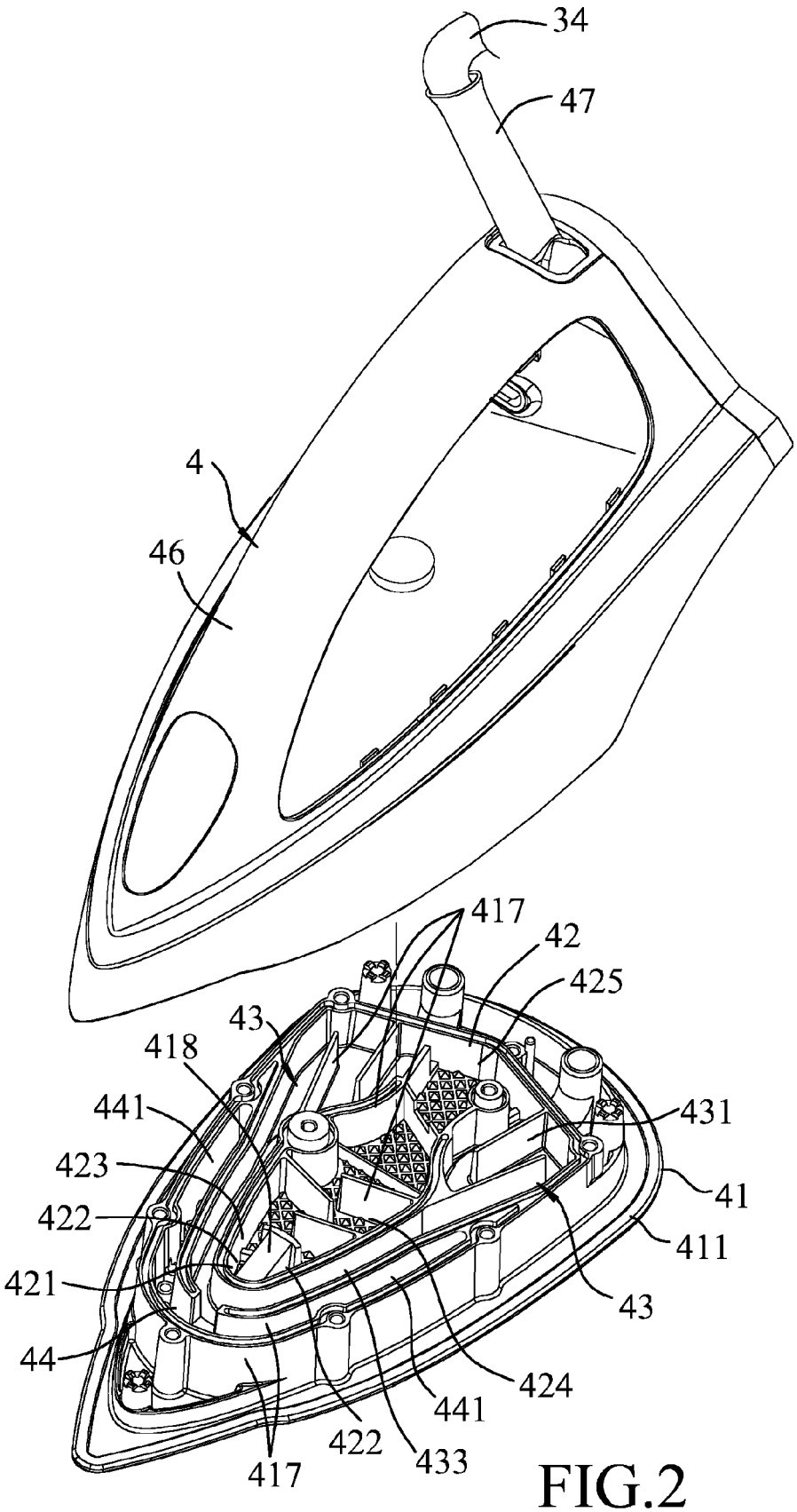
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FIG.2

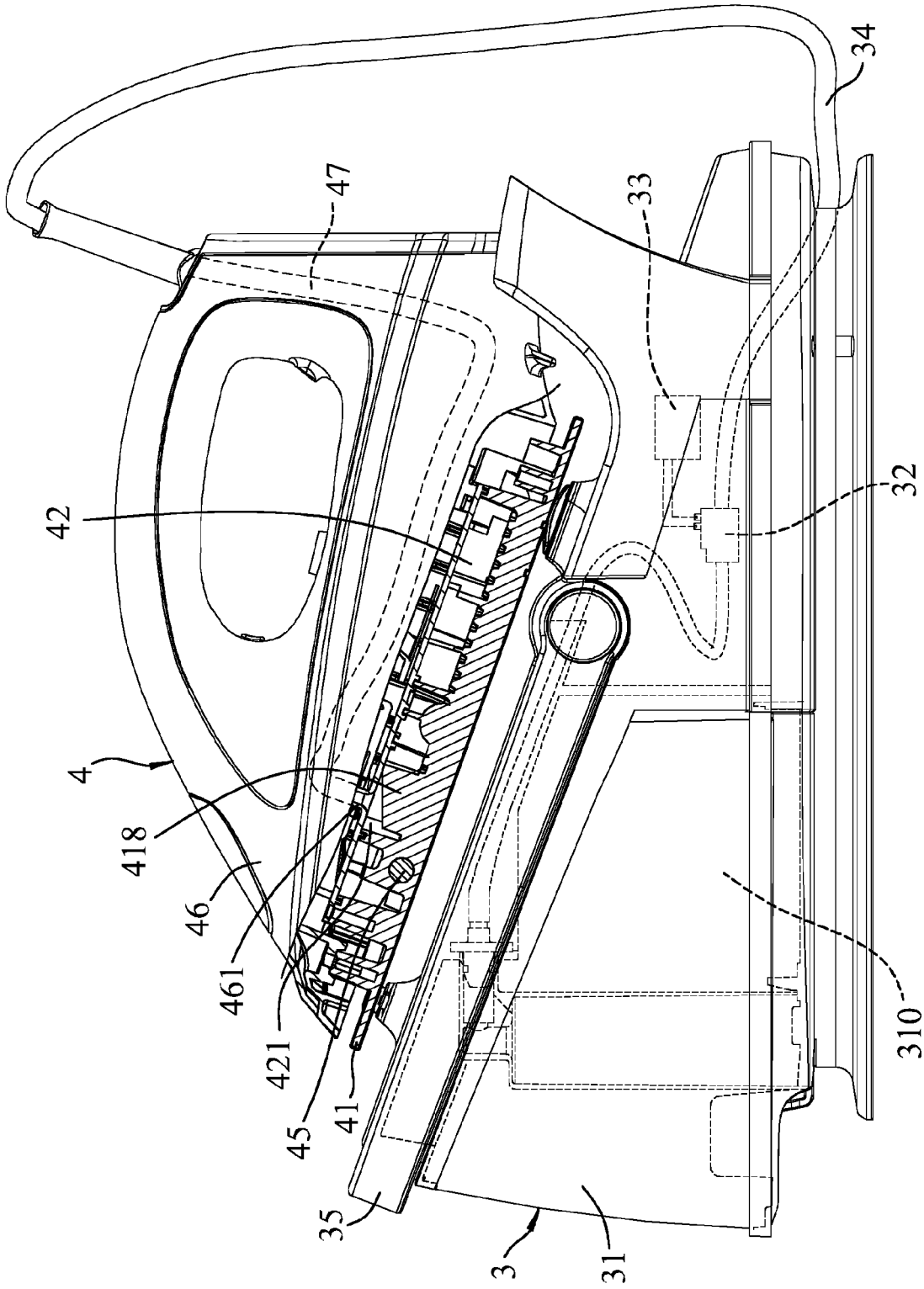

FIG.3

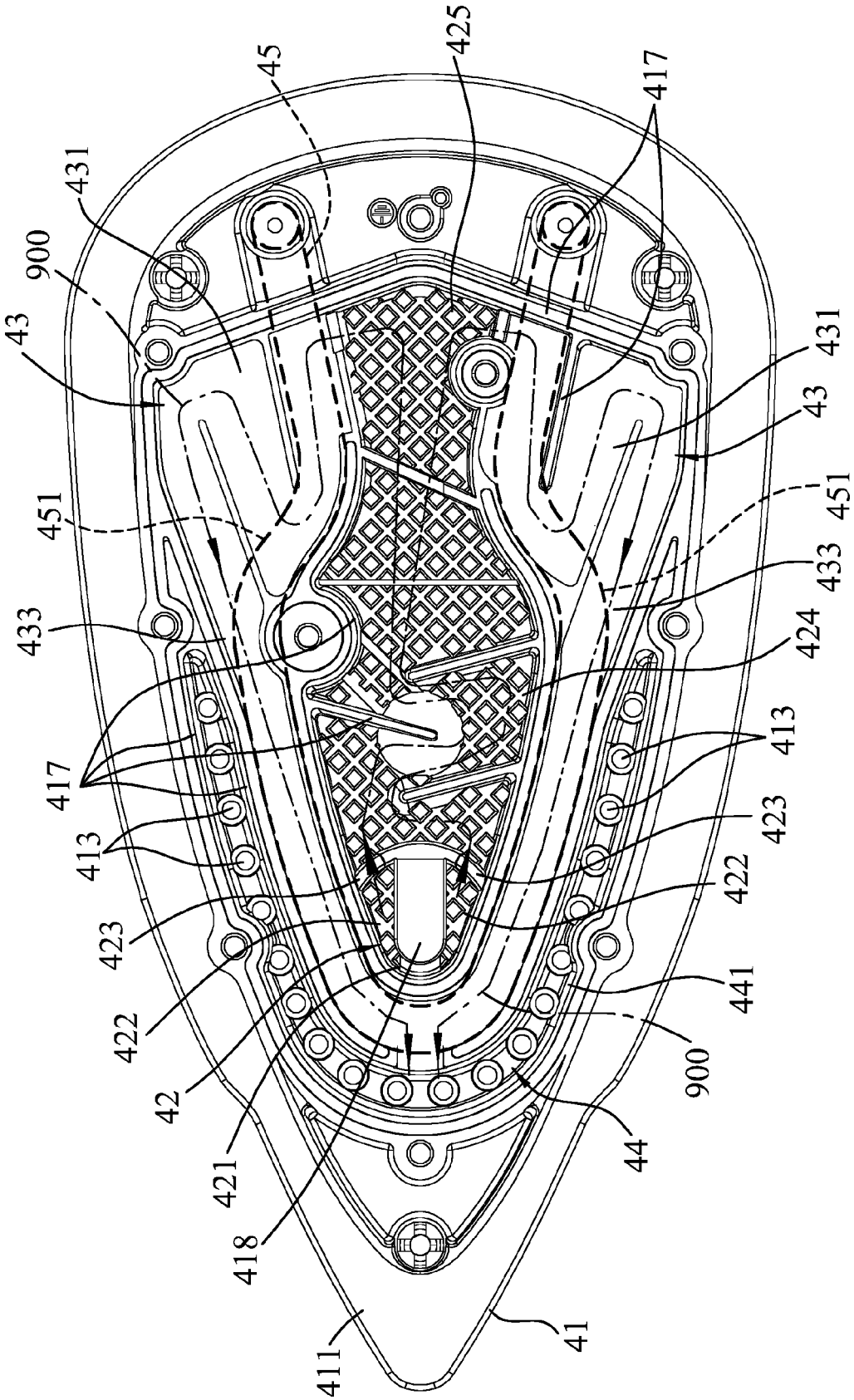
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FIG.4

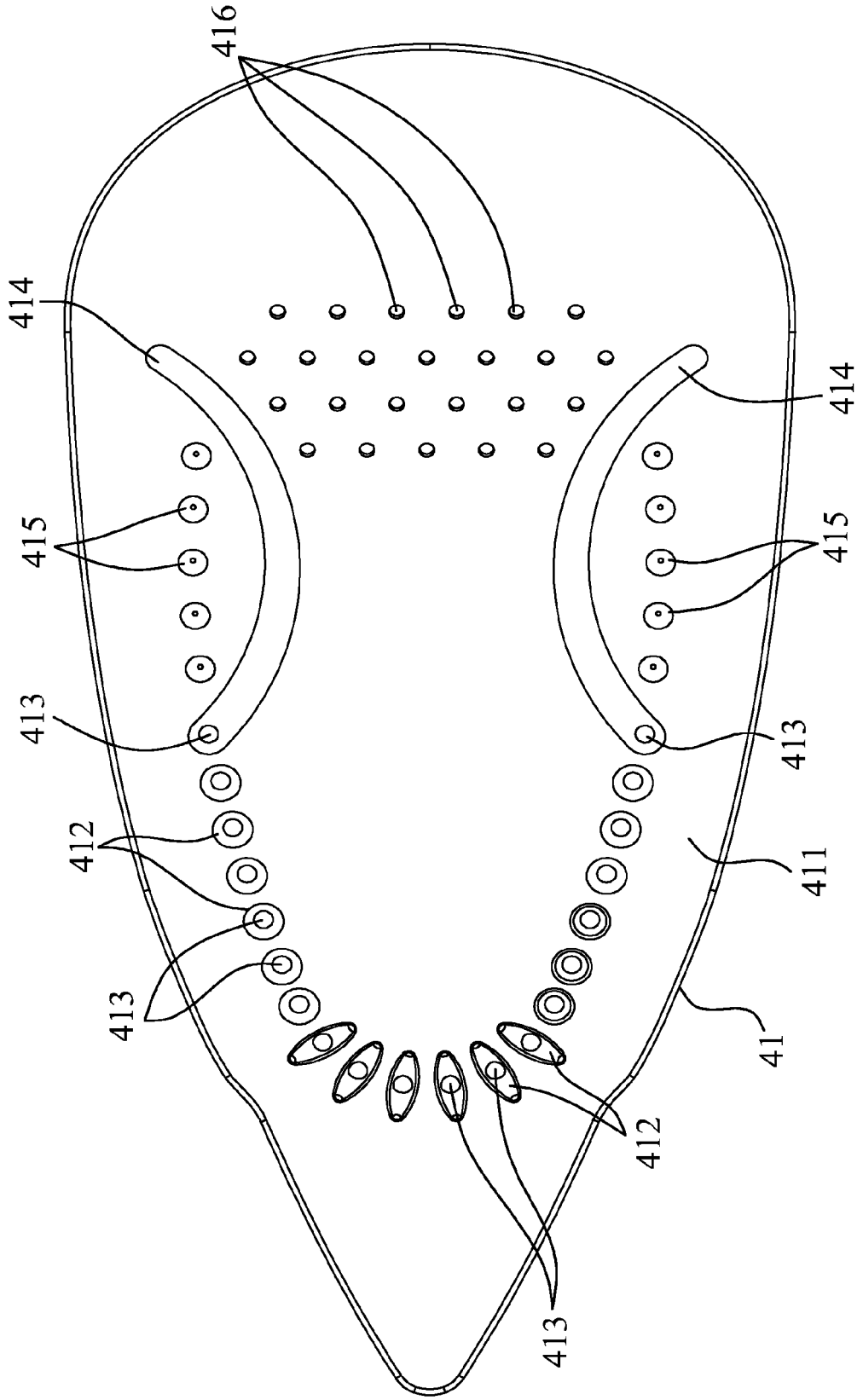

FIG.5

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EUROPEAN SEARCH REPORT

Application Number
EP 15 16 6859

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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TECHNICAL FIELDS SEARCHED (IPC)
D06F

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	16 September 2015	Diaz y Diaz-Caneja

CATEGORY OF CITED DOCUMENTS

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