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(71) Applicant: **Tsann Kuen (Zhangzhou) Enterprise Co., Ltd.**
Fujian 363000 (CN)

(72) Inventors:
- **PAN, Chienchih**
  Tainan City
  Taiwan (CN)
- **ZHANG, Jincan**
  Zhangzhou
  Fujian 363000 (CN)

(74) Representative: **Lermer, Christoph et al**
LangRaible GbR
Patent- und Rechtsanwälte
Rosenheimer Straße 139
DE-81671 München (DE)

(54) **STEAM ELECTRIC IRON**

(57) The present invention is provided with a steam iron, the steam pipe of which is connected between the steam boiler and the steam inlet of the three way valve in the housing of the iron. The space between the baffle of the housing and the heating pan is divided into a high pressure steam room and a homogeneous steam room. The first steam outlet of the three way valve is connected to the high pressure steam room, the second steam outlet is connected to the homogeneous steam room; at least a small hole is disposed on the heating pan at the bottom of the high pressure steam room, several big holes are disposed on the heating pan at the bottom of the homogeneous steam room; the valve rod of the three way valve is connected to the control button, which is extended from the outside into the housing of the iron; when the valve rod and the control button are situated in the first position, the steam inlet of the three-way valve is connected to the first steam outlet only; when in the second position, the steam inlet of the three-way valve is connected to the second steam outlet only. The present invention solves the problem to take into count both wetting the cloth with high pressure concentration steam and ironing the cloth with large area homogeneous steam.

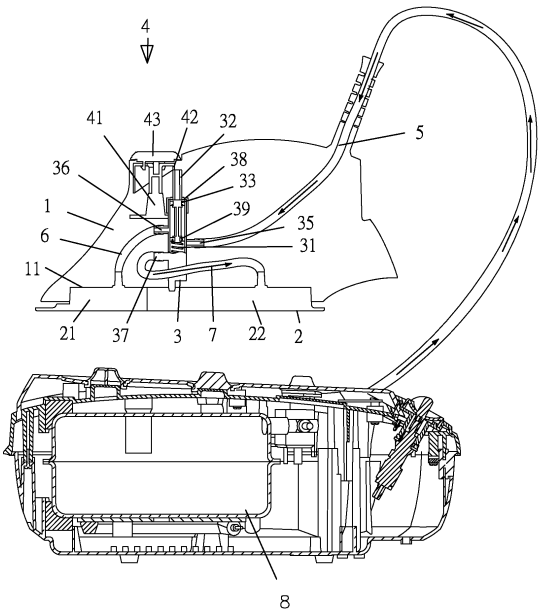


FIG. 1

EP 2 436 834 A1

Description

Field of the invention

[0001] The present invention relates to an electric iron with the steam provided from the boiler.

Background of the invention

[0002] The traditional steam iron is provided with a steam pipe to connect the steam boiler. The steam pipe is connected to the steam inlet of the cut-off valve disposed inside the housing of the iron, and the steam outlet is connected to the cavity between the housing and the heating pan. The bottom of the heating pan is disposed with exhaust hole to exhaust the steam in the cavity out. The valve rod of the cut-off valve is connected to the control button, which is extending from the outside to the housing of the iron. When the control button is pressed, the steam inlet of the cut-off valve is connected to the steam outlet, and the steam from the steam pipe is heated by the heating pan when entering into the cavity. Then the steam is exhausted out from the steam holes of the heating pan. When the control button is released, the steam inlet of the cut-off valve is no longer connected to the steam outlet. So the steam from the steam pipe is cut off by the cut-off valve, it won't enter into the cavity or exhaust out from the steam holes. But there are disadvantages: the steam exhausting type is single, which can't take into count both wetting the cloth with high pressure concentration steam and ironing the cloth with large area homogeneous steam.

Summary of the invention

[0003] The object of the present invention is to provide a steam iron, which solves the problem to take into count both wetting the cloth with high pressure concentration steam and ironing the cloth with large area homogeneous steam.

[0004] The technical proposal of the present invention is:

A steam iron is provided, the steam pipe is connected between the steam boiler and the steam inlet of the three-way valve, which is disposed inside the housing of the iron; the space between the baffle and the heating pan inside the iron housing is divided into a high pressure steam room and a homogeneous steam room; the first steam outlet of the three-way valve is connected to the high pressure steam room, and the second steam outlet is connected to the homogeneous steam room; at least a small hole is disposed on the heating pan at the bottom of the high pressure steam room, several big holes are disposed on the heating pan at the bottom of the homogeneous steam room; The valve rod of the three-way valve is connected to the control button, which is extending from the outside into the housing; when the valve rod and the control button are situated in the first position, the steam inlet of the three-way valve is connected to the first steam outlet only; when in the second position, the steam inlet of the three-way valve is connected to the second steam outlet only. The steam from the steam pipe is heated by the heating pan when entered into the homogenous steam room and exhausted out through the big holes on the heating pan to iron the cloth.

[0005] Furthermore: when the valve rod and the control button are situated in the third position, the steam inlet of the three-way valve is connected to the two steam inlet at the same time. The steam from the steam pipe is entered into the high pressure steam room and the homogeneous steam room at the same time and heated by the heating pan. When the steam is exhausted out from the small holes on the heating pan to wet the cloth, the steam is also exhausted out through the big holes on the heating pan to iron the cloth.

[0006] In another embodiment: the three-way valve is a slide valve, the steam inlet of the three-way valve is situated in the central section of the valve body, the first steam outlet is situated above the steam inlet, and the second steam outlet is situated below the steam inlet; the portion the valve rod extended into the valve is disposed with two pistons, the distance between the two pistons is slightly larger than the distance between the first steam outlet and the second steam outlet.

[0007] In another embodiment: the three way valve is angle valve, the wall of the valve body is disposed with a first steam outlet, a steam inlet and a second steam outlet in order; the portion the valve rod extended into the valve body is connected to the rotary piston of triangle.

[0008] In another preferred embodiment: the high pressure steam room is bean sprout shaped, the curved portion in the front portion of the U shaped heating pipe of the heating pan is covered by the bean shaped portion, the front portion of the first side straightsection of the U-shaped heating pipe of the heating pan is covered with the stem portion; the homogeneous steam roomis situated in the posteromedial portion of the heating pan, covering the rear portion of the first side straightsection of the U shaped heating pipe and the second side straightseciton. The steam from the steam pipe is full heated by the curved portion in the front portion of the U shaped heating pipe and the front portion of the first side straightsection of the U-shaped heating pipe when entered into the high pressure steam room. So the temperature of the steam is raised fast. The steam from the steam pipe is heated by the rear portion of the first side straightsection of the U shaped heating pipe and the second side straightseciton when entered into the homogeneous steam room. As the larger covering area of the homogeneous steam room, the temperature of the steam exhausted from the homogeneous steam room is lower

than that of the high pressure steam room.

[0009] Furthermore: the high temperature steam room and the homogeneous steam room are separately divided into several disjunctive cavities which are connected one after another by the remaining wall, the steam inlet of the high pressure steam room and the homogeneous steam room are separately disposed in the innermost of the disjunctive cavities, the small holes1 of the high pressure steam room and the big holes of the homogeneous steam room are separately disposed on the outermost of the outlet of the disjunctive cavities. As the disjunctive cavities disposed in the high pressure steam room and the homogeneous steam room, the distance the steam passing through the steam pipe is lengthened so with the heating period. So the steam is full heated. Specially: the small holes are situated in the front portion of the high pressure steam room; the big holes are separately situated in the right and the left sides of the homogeneous steam room. With the small holes disposed, the high pressure steam is propitious to be centralized. With the big holes disposed, the homogeneous steam is propitious to be exhausted homogeneously.

[0010] The present invention of a steam iron is disposed with a high pressure steam room and a homogeneous steam room on the heating pan. The three way valve is applied to choose the steam from the high pressure steam room or the homogeneous steam room through the steam pipe to be heated secondary on the heating pan, then the steam will be exhausted from the corresponding holes. The high pressure steam is centralized in a central region on the heating pan to wet the cloth faster and more effective. The large scale of homogeneous steam is exhausted in another region on the hating pan to iron the large scale of cloth. The steam is exhausted in the two regions, which can iron with large steam. The free change of the three iron states is achieved, which satisfies the customers' different needs. In the preferred embodiment, the steam from the boiler is passed through the steam pipe and exhausted out from the front of the heating pan with high temperature and centralized. The high temperature makes the iron without wrinkle faster; the centralization makes the steam passing through thick cloth easier. The steam from the boiler is passed through the rear portion of the heating pan and exhausted out from the right side and the left side of the heating pan as dry steam, which can iron the cloth with large scale. The present invention of a steam iron is provided more convenient for the users.

Brief description of the drawings

[0011]

Fig.1 illustrates the structure of the first embodiment of the present invention of a steam iron;

Fig.2 illustrates the structure of the heating pan in the first embodiment;

Fig.3 illustrates the structure of the steam iron with high temperature steam in the first embodiment;

Fig.4 illustrates the structure of the steam iron with high temperature steam and the homogeneous steam at the same time in the first embodiment;

Fin.5 illustrates the structure of the three way valve when the steam iron is provided with high pressure steam in the second embodiment;

Fig.6 illustrates the structure of the three way valve when the steam iron is provided with homogeneous steam in the second embodiment;

Fig.7 illustrates the structure of the three way valve when the steam iron is provided with high pressure steam and homogeneous steam at the same time in the second embodiment.

Detailed description of the preferred embodiment

[0012] The structure of the steam iron of the present invention in the first preferred embodiment is figures as the fig.1. The steam iron includes a steam boiler 800 and a steam body 100. A heating pan 2 is disposed at the bottom of the housing 1 of the iron body 100. A baffle 11 is disposed inside the housing 1. The space between the baffle 11 and the heating pan 2 is divided into a high pressure steam room 21 and a homogeneous steam room 22. A three way valve 3 is disposed inside the housing 1. The valve rod 32 of the three way valve 3 is connected to the control button 4, which is extended from the outside into the housing 1. A steam pipe 5 is connected between the steam boiler 8 and the steam inlet 35 of the three way valve 3. The first steam outlet 36 of the three way valve 3 is connected to the high pressure steam room 21 through the first steam pipe 6. The second steam outlet 37 of the three way valve 3 is connected to the homogeneous steam room 22 through the second steam pipe 7.

[0013] The structure of the heating pan 2 is figured as the fig.2. There is a raised wall 23 of warhead shaped disposed on the upper surface of the heating pan 2. a retaining wall 24 of raised upward along the upper surface of the heating pan 2 is disposed inside the raised wall 23. The space the raised wall surrounded is divided into a high pressure steam room 21 and a homogeneous steam room 22 by the retaining wall 24. The high pressure steam room 21 and the homogeneous steam room 22 are separately disposed with several disjunctive cavities connected one after another. The body of the retaining wall 24 is about parallel to the raised wall 23 and situated outside the U shaped heating pipe 25 inside the heating pan 2. The poles 26 of the U shaped heating pipe 25 are disposed in the rear portion of the heating pan 2 and outside the raised wall 23.

[0014] The high pressure steam room 21 is bean sprout shaped (a semiellipse extended with a curved bar). the curved portion in the front portion of the U shaped heating pipe of the heating pan 2 is covered by the bean shaped portion(the semiellipse), the front portion of the first side straightsection of the U-shaped heat-

ing pipe of the heating pan 2 is covered with the stem portion(the curved bar); the steam inlet 212 of the high pressure steam room 21 is situated in the disjunctive cavity in the innermost of the high pressure steam room, that is the free end of the stem portion. Several small holes 211 are opened at the bottom of the high pressure steam room 21 on the heating pan. These small holes 211 are disposed at the opening of the disjunctive cavity situated at the external of the high pressure steam room 21, that is the front portion of the high pressure steam room 21.

[0015] The homogeneous steam room 22 is situated in the posteromedial portion of the heating pan 2, covering the rear portion of the first side straightsection of the U shaped heating pipe o25 and the second side straightseciton. Several big holes 221 is opened at the bottom of the homogeneous steam room 22 on the heating pan 2.

[0016] The steam inlet 222 of the homogeneous steam room is situated in the disjunctive cavity in the innermost of the homogeneous steam room 22. These big holes 211 are disposed at the right and the left opening of the disjunctive cavity situated at the external of the homogeneous steam room 22, that is the passageway between the retaining wall 24 and the raised wall 23 at the right side and the left side of the homogeneous steam room 22.

[0017] Refer to the fig.1, the three way valve 3 in this embodiment is a slide valve with the piston moving in a straight line. The bottom portion of the valve body is disposed with a spring 31 to withstand the valve rod 32 upward. The steam inlet 35 of the three way valve 3 is situated in the central of the valve body. The first steam outlet 36 is situated above the steam inlet 35, and the second steam outlet 37 is situated below the steam inlet 35. The portion the valve rod 32 extending into the valve body is disposed with an upper piston 38 and a lower piston 39. The distance between the two pistons 38 and 39 is slightly larger than that of the first steam outlet 36 and the second steam outlet 37. A bonnet 33 is disposed at the upper end of the valve body to allow the valve rod 32 moving up and down but prevent the upper piston 38 passing by.

[0018] The control button 4 is consisted of a permanent seat 41, a revolving drum 42 and a turnplate 43. The permanent seat 41and the revolving drum 42 are disposed inside the housing 1, while the turnplate 43 is disposed outside the housing 1. The revolving drum 42 is sleeved in the axis of the upper portion of the permanent seat 41. The opening of the revolving drum 42 is inclined. The axis of the turnplate 43 is extended into the housing 1 and inserted into the centre hole of the revolving drum 42. The jack catch on the lower surface of the turnplate 43 is extended into the housing 1 and locked to the catch hole on the end face of the revolving drum 42 to make the revolving drum 42 revolving around the axis of the permanent seat 41 with the turnplate 43.

[0019] The situation of the valve rod 32 and the control button is figured as the fig.1, where the lowest point of the mouth rim of the revolving drum 42 withstands the valve rod 32. The valve rod 32 is situated in the highest position. The upper piston 38 on the valve rod 32 is situated in the upper surface of the bonnet 33, and the lower piston 39 is situated above the steam inlet 35, cutting off the passage of the steam inlet 35 and the first steam outlet 36. The steam inlet 35 is just connected to the second steam outlet 37. The steam from the steam pipe 5 is heated by the U shaped heating pipe 25 of the heating pan 2 when entered into the homogenous steam room 22, then exhausted out homogeneously from the big holes 221 of the both sides at the rear portion of the heating pan 2 to be applied for ironing the cloth with large scale. Revolve the turnplate 43 to make the valve rod 32 and the control button 4 situated in the position as figured in the fig.3. The central point of the mouth rim of the revolving drum 42 withstands the valve rod 32. When the valve rod 32 is situated in the central position, the upper piston 38 on the valve rod 32 is situated above the first steam outlet 36 and the lower piston 39 is below the steam inlet 35, the passage between the steam inlet 35 and the second steam outlet 37 is cut off. The steam inlet 35 of the three way valve 3 is connected to the first steam outlet 36 only. The steam from the steam pipe 5 is heated by the U shaped heating pipe 25 of the heating pan 2 when entered into the high pressure steam room 21, then exhausted out centrally from the small holes 211 of the at the front portion of the heating pan 2 to wet the thick cloth and be applied for ironing the wrinkle fast.

[0020] Keep on revolving the turnplate 43 to make the valve rod 32 and the control button 4 situated in the position as figured in the fig.4. The highest point of the mouth rim of the revolving drum 42 withstands the valve rod 32. When the valve rod 32 is situated in the lowest position, the upper piston 38 on the valve rod 32 is situated above the first steam outlet 36 and the lower piston 39 is below the second steam outlet 37, the steam inlet 35 is connected separately to both of the steam outlet 36 and 37 at the same time. The steam from the steam pipe 5 is heated by the U shaped heating pipe 25 of the heating pan 2 when entered into the high pressure steam room 21 and the homogeneous steam room 22, then exhausted out centrally from the small holes 211 of the at the front portion of the heating pan 2 to wet the thick cloth while exhausted out homogeneously from the big holes 221 of the both sides at the rear portion of the heating pan 2 to be applied for ironing the cloth with large scale.

[0021] If keeping on revolving the turnplate 43, the highest point of the mouth rim of the revolving drum 42 withstanding the valve rod 32 is changed to be the lowest point withstanding the valve rod 32. The spring 31 inside the valve body withstands upward to push the valve rod 32 to make the valve rod 32 and the control button 4 situated in the position as figured in the fig.1, etc.

[0022] If reversely revolving the turnplate 43, the highest point of the mouth rim of the revolving drum 42 withstanding the valve rod 32 is changed to be the central point withstanding the valve rod 32. The spring 31 inside the valve body withstands upward to push the valve rod 32 to make the valve rod 32 and the control button 4

situated in the position as figured in the fig.3, etc.

[0023] In other embodiments, the three way valve can be applied with angle valve of rotary piston.

[0024] Please refer to the fig.5, fig.6 and fig.7, the three way valve is an angel valve 30, the circumference wall of the valve body is disposed with a first steam outlet 306, a steam inlet 305 and a second steam outlet 307 in order. The portion the valve rod 302 extending into the valve body is connected to the rotary piston 308 of triangle. The valve rod 302 of the three way valve 30 is connected to the control button, which is extending from the outside into the housing. The steam boiler is connected to the steam inlet 305 of the three way valve 30 through the steam pipe. The first steam outlet 306 of the three way valve 30 is connected to the high pressure steam room through the first steam pipe, while the second steam outlet 307 of the three way valve 30 is connected to the homogeneous steam room through the second steam pipe. Refer to the fig.5, when the valve rod 302 and the control button are situated in the first position, the passage between the steam inlet 305 of the valve body and the second steam outlet 307 is cut off by the apex angle of the piston 308. The inner wall outside the first steam outlet 306 in the valve body is cut off by the first base angle of the piston 308. The steam inlet 305 is connected to the first steam outlet 306 only. The steam from the steam pipe is heated by the heating pan when entered into the high pressure steam room, and exhausted centrally out from the small holes on the heating pan to be applied for ironing the wrinkle fast.

[0025] Revolve the control button to make the valve rod 302 and the control button situated in the second position, refer to the fig.6. The passage between the steam inlet 305 of the valve body and the first steam outlet 306 is cut off by the apex angle of the piston 308. The inner wall outside the second steam outlet 307 in the valve body is cut off by the second base angle of the piston 308. The steam inlet 305 is connected to the second steam outlet 307 only. The steam from the steam pipe is heated by the heating pan when entered into the homogeneous steam room, and exhausted homogeneously out from the small holes on the heating pan to be applied for ironing the cloth with large scale.

[0026] Keep on revolving the control button to make the valve rod 32 and the control button 4 situated in the third position. The inner wall outside the first steam outlet 306 in the valve body is cut off by the second base angle of the piston 308, while the inner wall outside the second steam outlet 307 in the valve body is cut off by the first base angle of the piston 308. The steam inlet 305 is connected separately to the first steam outlet 306 and the second steam outlet 307. The steam from the steam pipe is heated by the heating pan when entered into the high pressure steam room and the homogeneous steam room at the same time, and exhausted centrally out from the small holes on the heating pan to be applied for ironing the wrinkle fast and exhausted homogeneously out from the big holes on the heating pan to be applied for ironing the cloth with large scale.

[0027] Although the present invention has been described with reference to the preferred embodiments thereof for carrying out the invention, it is apparent to those skilled in the art that a variety of modifications and changes may be made without departing from the scope of the present invention which is intended to be defined by the appended claims.

Industrial applicability

[0028] The present invention is provided with a steam iron, in which the steam pipe is connected between the steam boiler and the steam inlet of the three way valve in the iron housing. The high pressure steam room and the homogeneous steam room are divided between the baffle in the housing and the heating pan. The high pressure steam, the homogeneous steam or the combination of both can be exhausted out as required, which solves the problem to take into count both wetting the cloth with high pressure concentration steam and ironing the cloth with large area homogeneous steam.

Claims

1. The steam iron includes a iron body 100 and a steam boiler 800, wherein the steam pipe 5 is connected between the steam boiler 800 and the steam inlet 35 of the three-way valve 3, which is disposed inside the housing 1 of the iron; the space between the baffle 11 and the heating pan 2 inside the iron housing 1 is divided into a high pressure steam room 21 and a homogeneous steam room 22; the first steam outlet 36 of the three-way valve 3 is connected to the high pressure steam room 21, and the second steam outlet 37 is connected to the homogeneous steam room 22; at least a small hole is disposed on the heating pan at the bottom of the high pressure steam room 21, several big holes 221 are disposed on the heating pan at the bottom of the homogeneous steam room 22;
   The valve rod 32 of the three-way valve 3 is connected to the control button 4; when the valve rod 32 and the control button 4 are situated in the first position, the steam inlet 35 of the three-way valve 3 is connected to the first steam outlet 36 only; when in the second position, the steam inlet 35 of the three-way valve 3 is connected to the second steam outlet 37 only.

2. The steam iron according to the claim 1, wherein when the valve rod 32 and the control button are situated in the third position, the steam inlet 35 of the three-way valve 3 is connected to the two steam inlet 36, 37 at the same time.

3. The steam iron according to the claim 1 or claim 2,

wherein the three-way valve 3 is a slide valve, the steam inlet 35 of the three-way valve is situated in the central section of the valve body, the first steam outlet 36 is situated above the steam inlet 35, and the second steam outlet 37 is situated below the steam inlet 35; the portion the valve rod 32 extended into the valve is disposed with two pistons 38, 39, the distance between the two pistons is slightly larger than the distance between the first steam outlet 36 and the second steam outlet 37.

4. The steam iron according to the claim 1 or claim 2, wherein the three way 3 valve is angle valve 30, the wall of the valve body is disposed with a first steam outlet 306, a steam inlet 305 and a second steam outlet 307 in order; the portion the valve rod 302 extended into the valve body is connected to the rotary piston 308 of triangle.

5. The steam iron according to the claim 1 or the claim 2, wherein the high pressure steam room is bean sprout shaped, the curved portion in the front portion of the U shaped heating pipe 25 of the heating pan 2 is covered by the bean shaped portion, the front portion of the first side straightsection of the U-shaped heating pipe 25 of the heating pan 2 is covered with the stem portion; the homogeneous steam room 22 is situated in the posteromedial portion of the heating pan 2, covering the rear portion of the first side straightsection of the U shaped heating pipe 25 and the second side straightseciton.

6. The steam iron according to the claim 5, wherein the high temperature steam room 21 and the homogeneous steam room 22 are separately divided into several disjunctive cavities which are connected one after another by the remaining wall 24, the steam inlet 212 and 222 of the high pressure steam room 21 and the homogeneous steam room 22 are separately disposed in the innermost of the disjunctive cavities, the small holes 211 of the high pressure steam room 21 and the big holes 221 of the homogeneous steam room 22 are separately disposed on the outermost of the outlet of the disjunctive cavities.

7. the steam iron according to the claim 6, wherein the small holes 211 are situated in the front portion of the high pressure steam room 21, the big holes are separately situated in the right and the left sides of the homogeneous steam room 22.

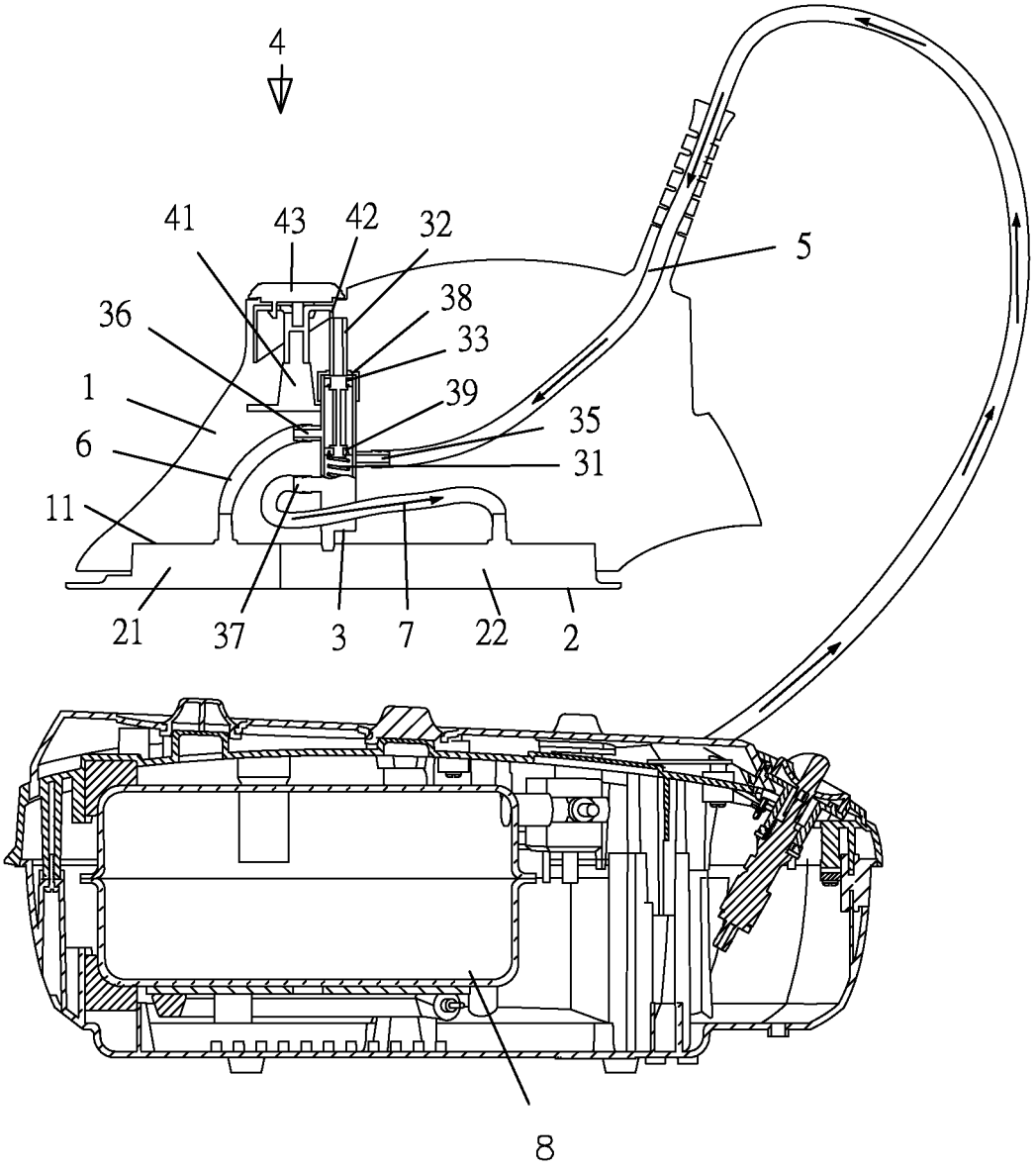


FIG. 1

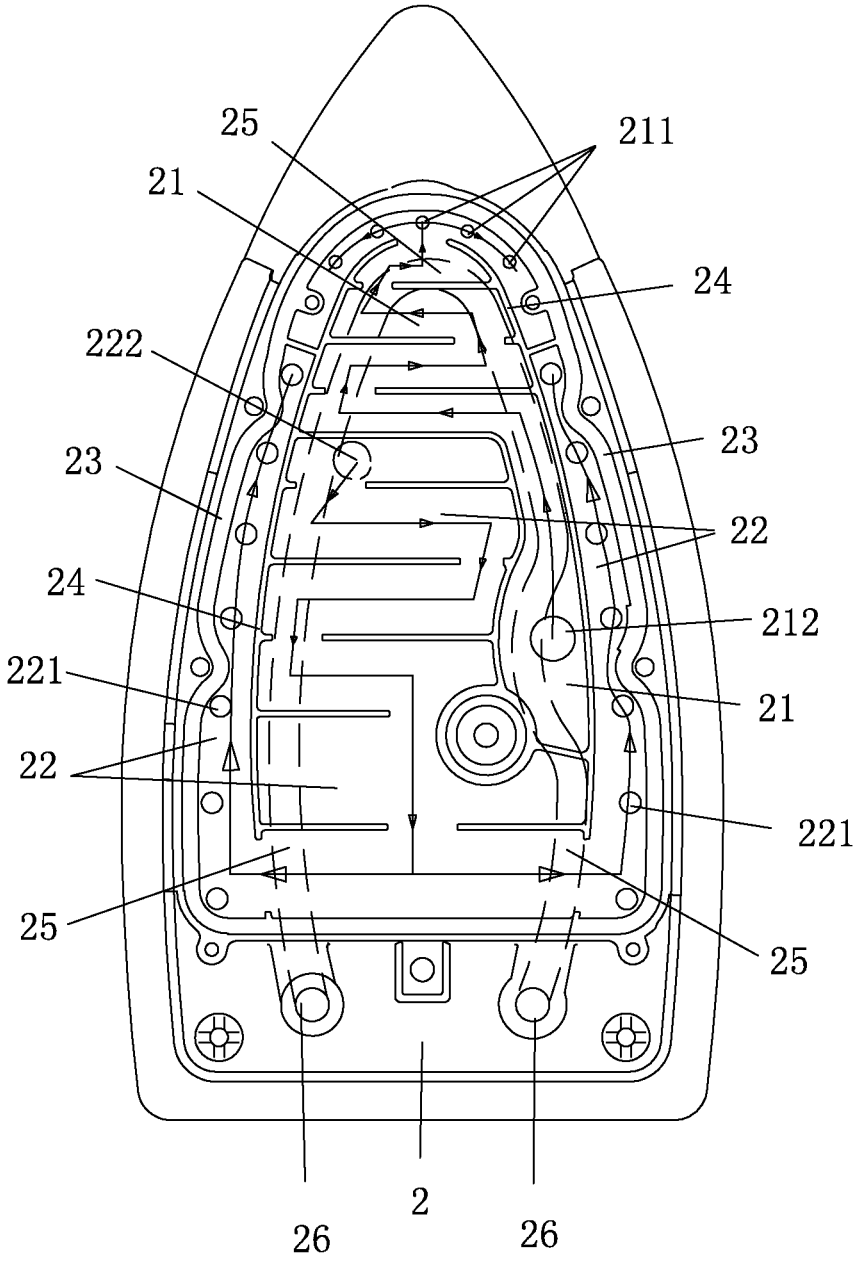


FIG. 2

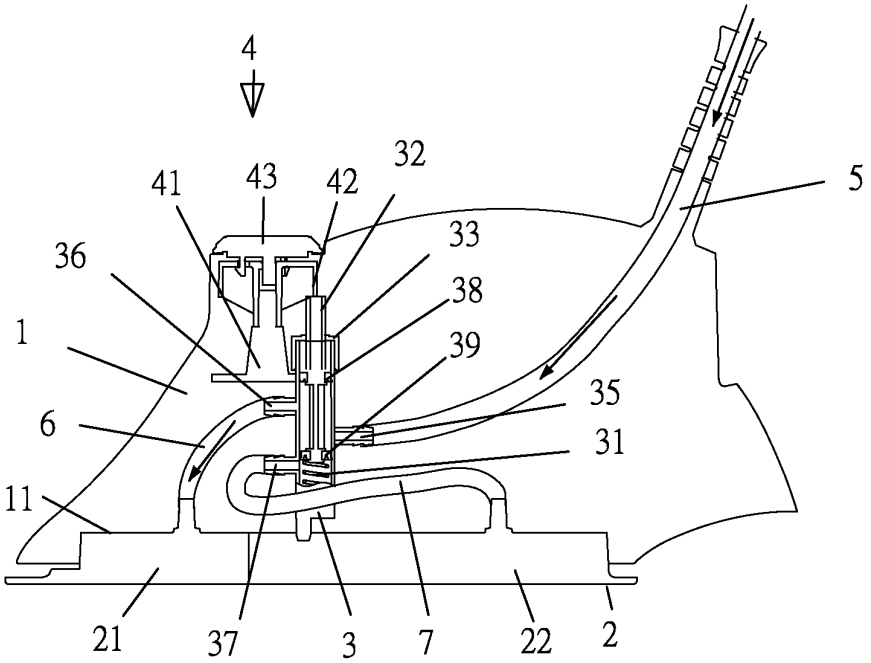

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FIG. 3

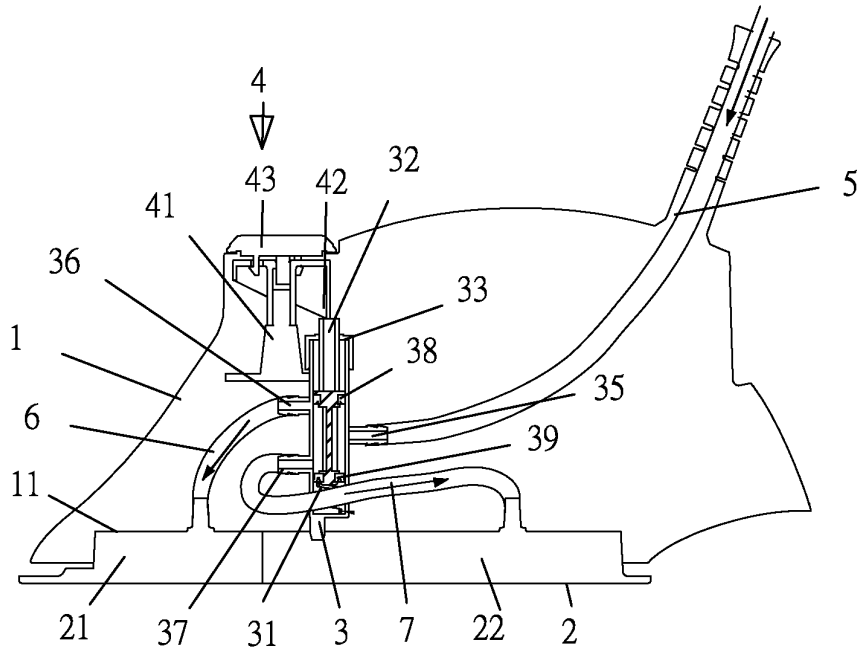

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FIG. 4

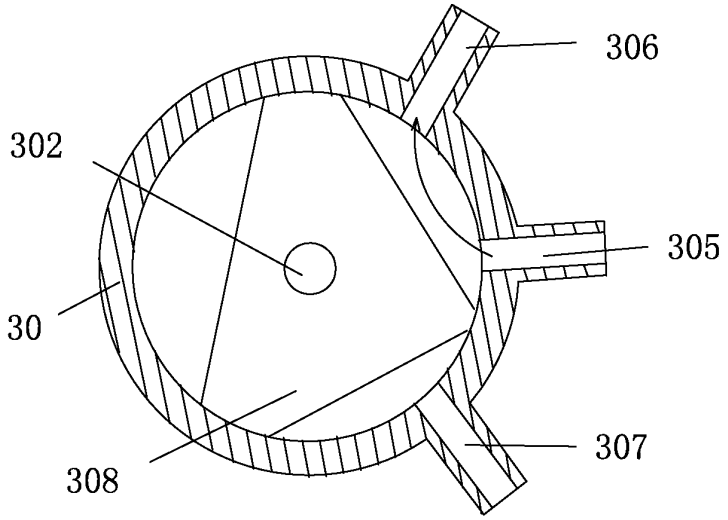


FIG. 5

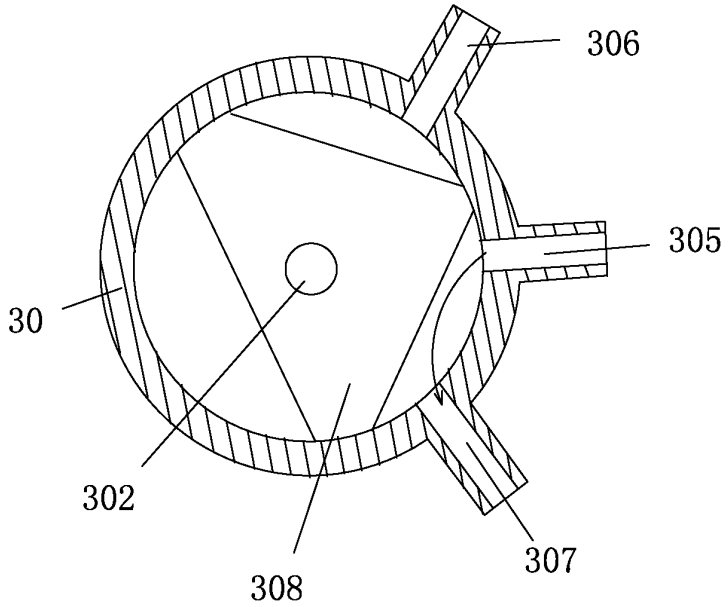


FIG. 6

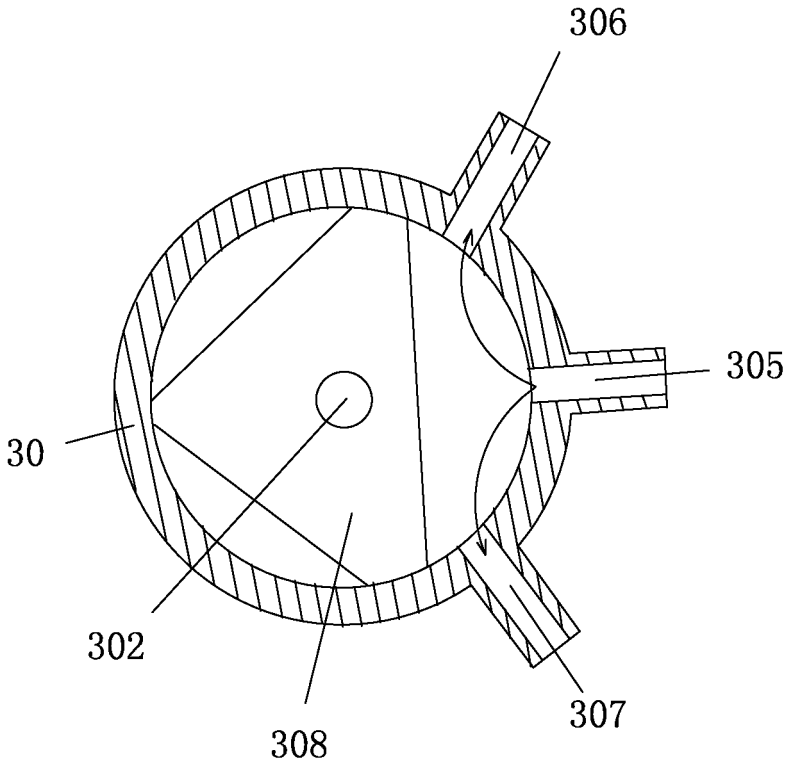


FIG. 7

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2010/073054

A. CLASSIFICATION OF SUBJECT MATTER

D06F75/12(2006.01)i

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC: D06F75/-, D06F79/-,D06F73/-,D06F87/-

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

WPI,EPODOC,CNPAT: VALVE , OPENING, THREE WAY

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
PX	CN201473800U(ZHANGZHOU TSANN KUEN IND CO LTD), 19 May 2010（19.05.2010）, claims 1-7	1-7
Y	CN201224843Y(XIAMEN CANKUN IND CO LTD), 22 Apr. 2009（22.04.2009）, the description page 1 paragraph 2, page 5 paragraph 2 to page 9 paragraph 2, figures 1, 3, 4, 5	1-7
Y	CN201121279Y(XIAMEN CANKUN IND CO LTD), 24 Sep. 2008（24.09.2008）, the description page 3 paragraph 1to page 4 paragraph 2, figure 1	1-7

☒ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

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"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&"document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
04 Aug. 2010(04.08.2010)	**02 Sep. 2010 (02.09.2010)**
Name and mailing address of the ISA/CN The State Intellectual Property Office, the P.R.China 6 Xitucheng Rd., Jimen Bridge, Haidian District, Beijing, China 100088 Facsimile No. 86-10-62019451	Authorized officer XU,Yan Telephone No. (86-10)62084564

Form PCT/ISA /210 (second sheet) (July 2009)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2010/073054

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	CN1791716A(KONINK PHILIPS ELECTRONICS NV), 21 Jun. 2006（21.06.2006）, the whole document	1-7
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