



(12)

EUROPEAN PATENT APPLICATION

- (43)

Date of publication:
29.12.2021 Bulletin 2021/52
- (51)

Int Cl.:
D06F 75/14 (2006.01)
D06F 75/38 (2006.01)
- (21)

Application number: 21180650.0
- (22)

Date of filing: 21.06.2021

(84) Designated Contracting States: AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR Designated Extension States: BA ME Designated Validation States: KH MA MD TN (30) Priority: 23.06.2020 CN 202021186095 U (71) Applicant: Tsann Kuen (Zhangzhou) Enterprise Co., Ltd. Fujian 363107 (CN)	(72) Inventors: • ZHENG, Zhenxing Zhangzhou, 363107 (CN) • CHEN, Ronghuang Zhangzhou, 363107 (CN) (74) Representative: Zimmermann, Tankred Klaus Schoppe, Zimmermann, Stöckeler Zinkler, Schenk & Partner mbB Patentanwälte Radtkoferstrasse 2 81373 München (DE)
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(54)

STEAM IRON

(57) A steam iron (1) includes a soleplate (3), a heating unit (4), and a soleplate cover (5). The soleplate (3) includes a soleplate base (31), and a steaming chamber wall (32) disposed upright on top of the soleplate base (31). The soleplate base (31) and the steaming chamber wall (32) cooperatively define a reservoir chamber (37) to store water. The heating unit (4) is disposed in the soleplate base (31). The soleplate cover (5) covers the reservoir chamber (37) opposite to the soleplate base (31). The soleplate cover (5) has a plurality of cover protrusions (53) protruding into the reservoir chamber (37) for separating water in the reservoir chamber (37) into fine water droplets.

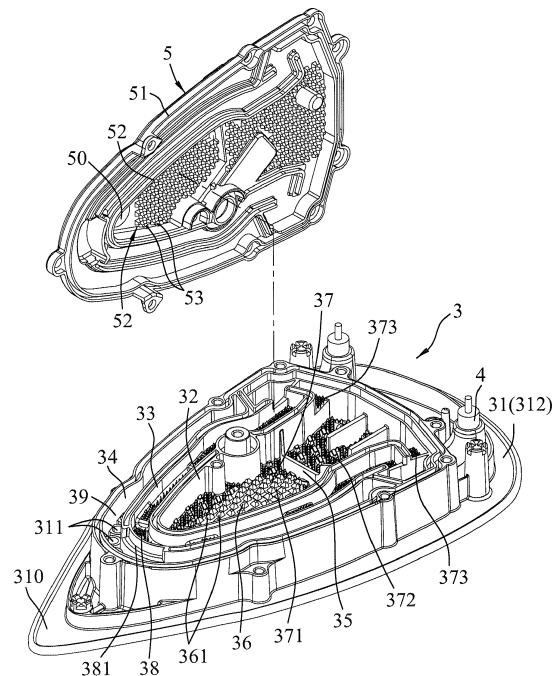


FIG.3

Description

[0001] The disclosure relates to a steam iron, and more particularly to a soleplate and a soleplate cover of the steam iron.

[0002] During ironing, a steam iron is often needed to be placed upright. This situation can cause entrainment of a large amount of unvaporized water in the steam sprayed out from the steam iron, thereby resulting in poor ironing effect. One way to solve the foregoing disadvantage is to increase power of an electric heating tube of the steam iron. However, because a heating area of the electric heating tube is limited, vaporization efficiency is restricted. The other way to solve the foregoing disadvantage is to place multiple barriers in a vaporizing chamber of the steam iron so that slits are formed by the barriers to only allow passage of steam therethrough. However, when hard water is used in the steam iron, hard water scale can easily accumulate in the slits and removal of the hard water scale is difficult. The service life of the steam iron can thus be shortened.

[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 art.

[0004] According to the disclosure, a steam iron includes a soleplate, a heating unit and a soleplate cover.

[0005] The soleplate includes a soleplate base, and a steaming chamber wall disposed upright on top of the soleplate base. The soleplate base and the steaming chamber wall cooperatively define a reservoir chamber to store water.

[0006] The heating unit is disposed in the soleplate.

[0007] The soleplate cover covers the reservoir chamber opposite to the soleplate base. The soleplate cover has a plurality of cover protrusions protruding into the reservoir chamber for separating water in the reservoir chamber into fine water droplets.

[0008] 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:

Figure 1 is a perspective view of an embodiment of the disclosure illustrating a steam iron;

Figure 2 is a perspective view of a soleplate, a heating unit, and a soleplate cover of the steam iron of the embodiment;

Figure 3 is an exploded perspective view of the embodiment illustrating the soleplate, the heating unit and the soleplate cover;

Figure 4 is a top view of the soleplate;

Figure 5 is a partly enlarged view of the soleplate;

Figure 6 is a perspective view of the soleplate cover; and

Figure 7 is a sectional view of the soleplate and the soleplate cover of the embodiment.

Figures 1 to 3 illustrates a steam iron 1 having an outer iron casing 2 covering a soleplate 3 and a sole-

plate cover 5.

[0009] The soleplate 3 is made of a metallic material and includes a soleplate base 31, a steaming chamber wall 32, a guiding wall 33, an outer surrounding wall 34, a barrier plate 35, and a convexed portion 36. The soleplate base 31 has a front tapered end 310 and a rear end 312 opposite to the front tapered end 310 in a front-rear direction of the soleplate base 31. The steaming chamber wall 32 is disposed upright on top of the soleplate base 31 and has a substantially V-shaped profile in the front-rear direction with an opening proximate to the rear end 312 of the soleplate base 31. The guiding wall 33 is substantially in a v-shape, disposed upright on top of the soleplate base 31 and around part of the steaming chamber wall 32, and has an opening proximate to the rear end 312 of the soleplate base 31. The outer surrounding wall 34 is disposed upright on top of the soleplate base 31 and surrounds the steaming chamber wall 32 and the guiding wall 33. The barrier plate 35 is disposed upright on top of the soleplate base 31 and spans the steaming chamber wall 32. The convexed portion 36 protrudes upwardly from the soleplate base 31 in front of the barrier plate 35.

[0010] The soleplate base 31 and the steaming chamber wall 32 cooperatively define a reservoir chamber 37 to store water. The soleplate base 31, the steaming chamber wall 32 and the guiding wall 33 cooperatively define a guiding channel 38 that is formed along front, left and right sides of the reservoir chamber 37. The soleplate base 31, the guiding wall 33 and the outer surrounding wall 34 cooperatively define a steam channel 39 that is formed along front, left and right sides of the guiding channel 38. The barrier plate 35 divides the reservoir chamber 37 into a first chamber portion 371 and a second chamber portion 372 disposed rearward of the first chamber portion 371. Two steam outlets 373 are respectively formed on left and right sides of the second chamber portion 372 to communicate with the guiding channel 38. A communication outlet 381 is formed at a front end of the guiding channel 38 and communicates with a front end of the steam channel 39.

[0011] The soleplate base 31 further has a plurality of steam delivery holes 311 extending therethrough in communication with the steam channel 39. The barrier plate 35 has two opposite connection end portions 352 connected to the steaming chamber wall 32, and an intermediate part 351 between the opposite connection end portions 352. A height of the intermediate part 351 from the soleplate base 31 is smaller than that of each of the connection end portions 352. Accordingly, an upper part of the first chamber portion 371 is in communication with an upper part of the second chamber portion 372 (see Figures 3 and 5). Further, the convexed portion 36 has a mid tapered part 360 that is tapered upwardly towards the soleplate cover 5 (further details of the soleplate cover 5 will be described hereinafter). The convexed portion 36 inclines downwardly and laterally from the mid tapered

part 360.

[0012] As shown in Figures 3 and 4, a heating unit 4 is disposed in the soleplate base 31 and situated below the guiding channel 38. In this embodiment, the heating unit 4 is an electric heating tube to heat the soleplate base 31 so that water and vapor in the reservoir chamber 37, the guiding channel 38 and the steam channel 39 can be heated through the heating unit 4.

[0013] The soleplate cover 5 is disposed on top of the steaming chamber wall 32, the guiding wall 33 and the outer surrounding wall 34, and covers the reservoir chamber 37, the guiding channel 38 and the steam channel 39 opposite to the soleplate base 31. The soleplate cover 5 has a cover body 51, a plurality of cover protrusions 53, and a water inlet 50. As shown in Figures 3 and 6, the cover protrusions 53 are uniformly distributed and protrude from the cover body 51 into the reservoir chamber 37. The water inlet 50 is formed in the cover body 51 and communicates with the first chamber portion 371 for supplying water into the first chamber portion 371.

[0014] In this embodiment, the cover protrusions 53 are arranged in multiple rows extending in the front-rear direction of the sole plate base 31. The cover protrusions 53 of two adjacent rows are staggered in a left-right direction intersecting the front-rear direction. The convexed portion 36 has a plurality of soleplate protrusions 361 protruding upwardly toward the cover protrusions 53.

[0015] The water inlet 50 may be designed to connect a water box (not shown) disposed inside the outer iron casing 2, or connect an external water resource (not shown) through a water conduit (not shown) to supply water from the external water resource into the first chamber portion 371 by a pump (not shown).

[0016] In use, the heating unit 4 is electrified to produces a high temperature heat that vaporizes the water in the first chamber portion 371, and the vaporized steam flows to the second chamber portion 372.

[0017] In this embodiment, the convexed portion 36 in the first chamber portion 371 is tapered upwardly towards the soleplate cover 5 and inclines downwardly and laterally from the mid tapered part 360 thereof to the steaming chamber wall 32. Therefore, the unvaporized water in the first chamber portion 371 flows to and is collected in left and right sides of the first chamber portion 371 proximate to the heating unit 4, thereby enhancing vaporization efficiency. By virtue of each connection end portion 352 higher than the intermediate part 351 of the barrier plate 35, the unvaporized water can remain in the first chamber portion 371, and the vaporized steam passes into the second chamber portion 372 through a gap formed between the soleplate cover 5 and the intermediate part 351.

[0018] In other embodiments, the convexed portion 36 may be designed with two inclined surfaces intersecting each other, as long as the inclined surfaces are able to guide the water inside the first chamber portion 371 to flow to the steaming chamber wall 32.

[0019] The vaporized steam in the second chamber

portion 372 is guided to the guiding channel 38 through the steam outlets 373. Because the guiding channel 38 is disposed above the heating unit 4, the vaporized steam in the guiding channel 38 is continuously heated to be guided to the steam channel 39 through the communication outlet 381. Finally, the vaporized steam in the steam channel 39 is sprayed outward through the steam delivery holes 311 to iron clothes (not shown).

[0020] Referring to Figure 7 in combination with Figures 1, 3 and 4, during ironing, the steam iron 1 can be placed upright temporally on a flat surface. In this situation, the water in the first chamber portion 371 will flow to the barrier plate 35, and part of the water will strike the cover protrusions 53 formed on the cover body 51. As the cover protrusions 53 can separate the water into fine water droplets to be vaporized, vaporization efficiency can be enhanced.

[0021] In this embodiment, the number of the soleplate protrusions 361 is equal to the number of the cover protrusions 53. The soleplate protrusions 361 can also separate the water into fine water droplets to enhance vaporization efficiency. While, in this embodiment, each soleplate protrusion 361 or each cover protrusion 53 has the shape of a truncated quadrangular pyramid, in other embodiments, each soleplate protrusion 361 and each cover protrusion 53 may have the shape of a truncated cone as long as it can separate water into fine water droplets. Further, the soleplate protrusions 361 and the cover protrusions 53 may be non-uniformly distributed.

[0022] To sum up, because the cover 5 has the cover protrusions 53, the water stored in the reservoir chamber 37 can be separated by the cover protrusions 53 into the fine water droplets for vaporization to enhance the vaporization efficiency. By virtue of cooperation between the barrier plate 35 and the convexed portion 36, the water in the first chamber portion 371 is enabled to flow to the steaming chamber wall 32 close to the heating unit 4, and the flow of water toward the second chamber portion 372 can be slowed down, thereby enhancing the vaporization efficiency.

Claims

1. A steam iron (1), comprising:

A soleplate (3) including a soleplate base (31), and a steaming chamber wall (32) disposed upright on top of said soleplate base (31), said soleplate base (31) and said steaming chamber wall (32) cooperatively defining a reservoir chamber (37) to store water;
a heating unit (4) disposed in said soleplate base (31); and
a soleplate cover (5) covering said reservoir chamber (37) opposite to said soleplate base (31), said soleplate cover (5) having a plurality of cover protrusions (53) protruding into said res-

ervoir chamber (37) for separating water in said reservoir chamber (37) into fine water droplets.

2. The steam iron (1) as claimed in Claim 1, wherein said cover protrusions (53) are uniformly distributed. 5
3. The steam iron (1) as claimed in Claim 2, wherein said cover protrusions (53) are arranged in multiple rows extending in a front-rear direction from a front tapered end (310) of said soleplate base (31) to a rear end (312) opposite to said front tapered end, said cover protrusions (53) of two adjacent ones of said rows being staggered in a left-right direction intersecting said front-rear direction. 10
4. The steam iron (1) as claimed in Claim 3, wherein each of said cover protrusions (53) has the shape of a truncated cone. 15
5. The steam iron (1) as claimed in Claim 4, wherein each of said cover protrusions (53) has the shape of a truncated quadrangular pyramid. 20
6. The steam iron (1) as claimed in Claim 5, wherein: 25

said reservoir chamber (37) is divided into a first chamber portion (371) and a second chamber portion (372); and

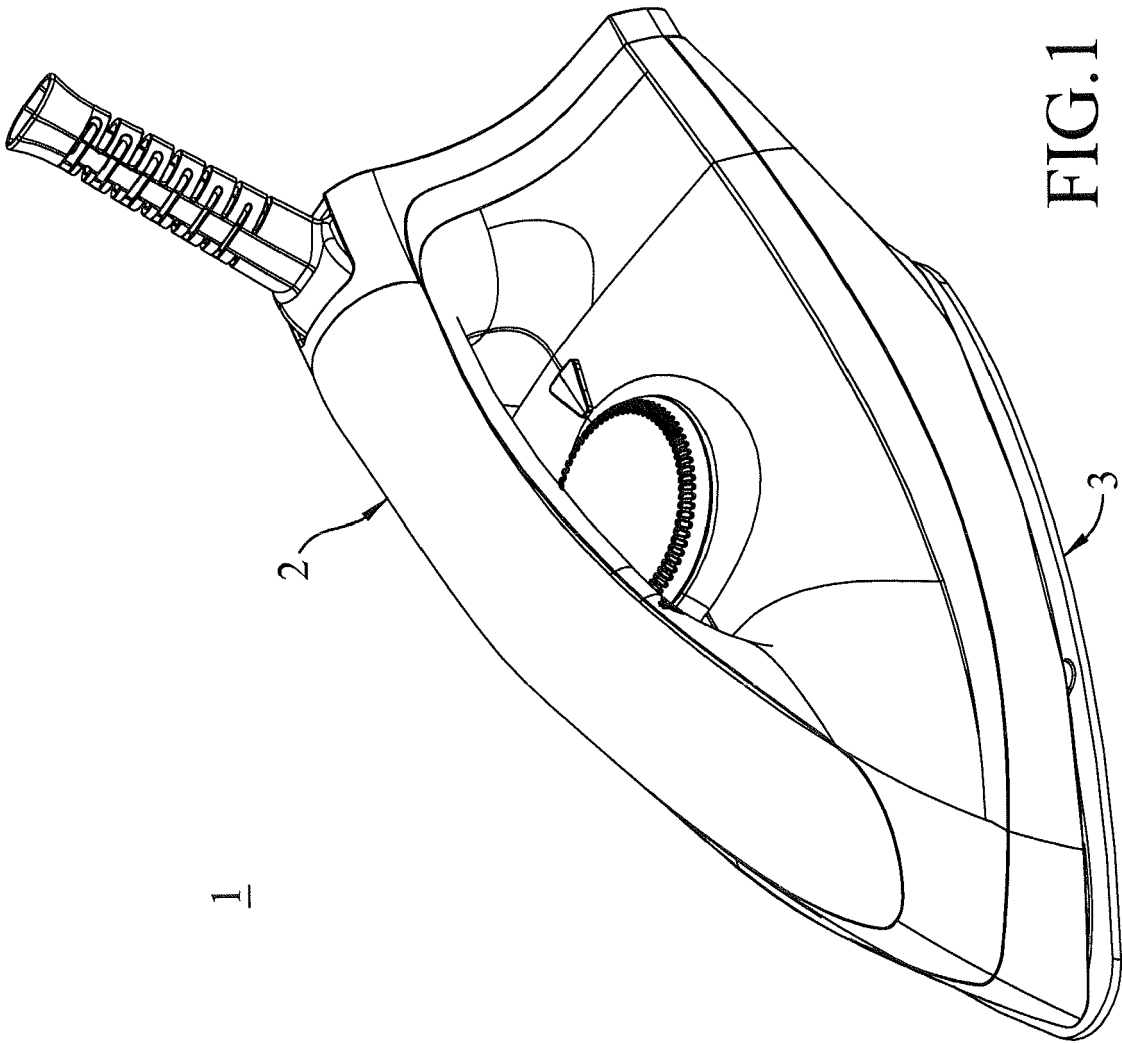
said soleplate cover (5) further has a water inlet (50) communicating with said first chamber portion (371). 30
7. The steam iron (1) as claimed in Claim 6, wherein said soleplate (3) further includes a barrier plate (35) disposed upright on top of said soleplate base (31) and spanning said steaming chamber wall (32), said barrier plate (35) having two opposite connection end portions (352) connected to said steaming chamber wall (32) and dividing said reservoir chamber (37) into said first and second chamber portions (371, 372). 35 40
8. The steam iron (1) as claimed in Claim 7, wherein:

said barrier plate (35) further has an intermediate part (351) between said opposite connection end portions (352) of said barrier plate (35); and

a height of said intermediate part (351) from said soleplate base (31) is smaller than that of each of said connection end portions (352). 45 50
9. The steam iron (1) as claimed in Claim 7, wherein said soleplate (3) includes a convexed portion (36) protruding upwardly from said soleplate base (31) in front of said barrier plate (35), said convexed portion (36) having a mid tapered part (360) that is tapered upwardly towards said soleplate cover (5), and inclining downwardly and laterally from said mid ta-

pered part (360).

10. The steam iron (1) as claimed in Claim 9, wherein said convexed portion (36) has a plurality of soleplate protrusions (361) protruding upwardly toward said cover protrusions (53).



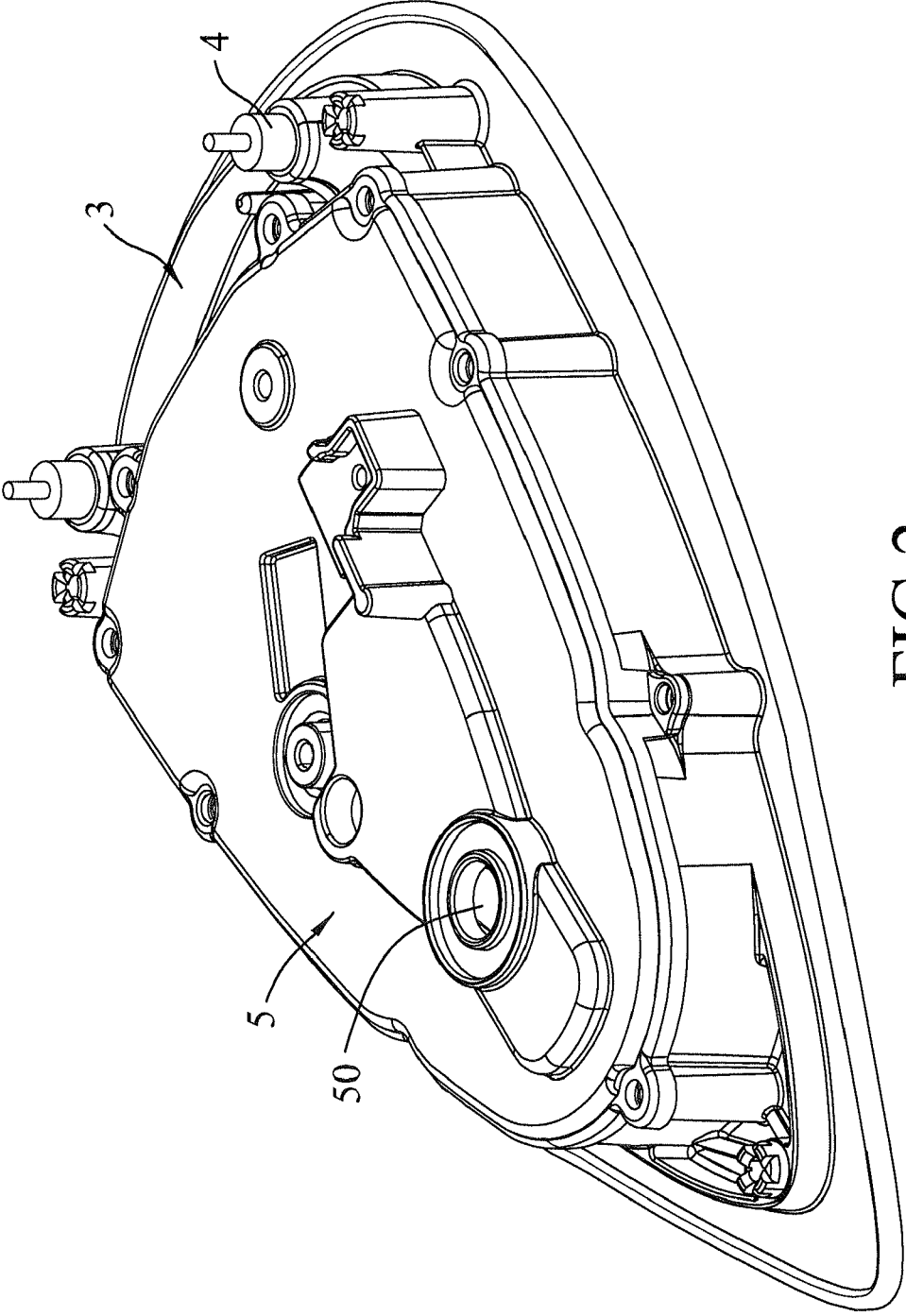


FIG.2

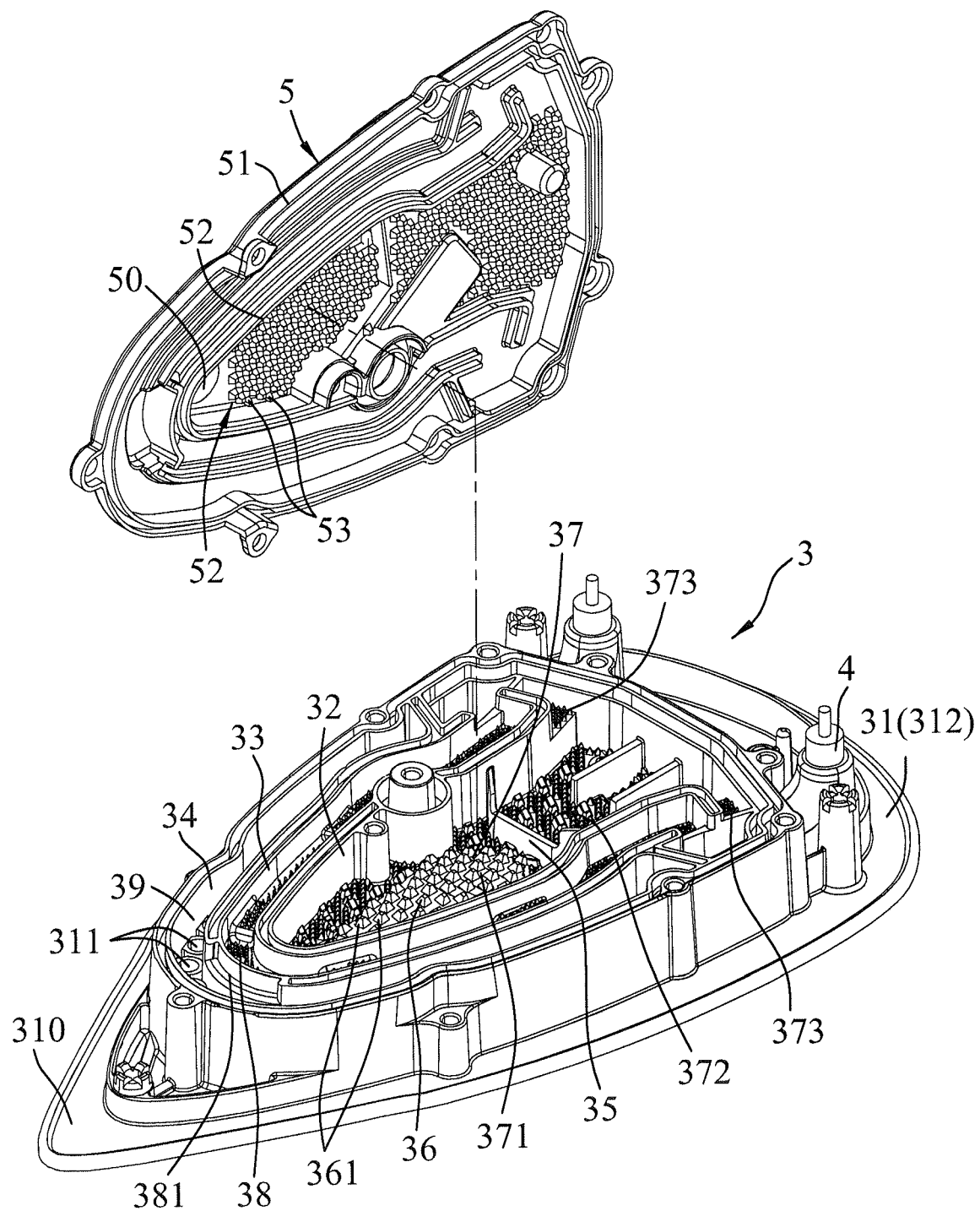


FIG.3

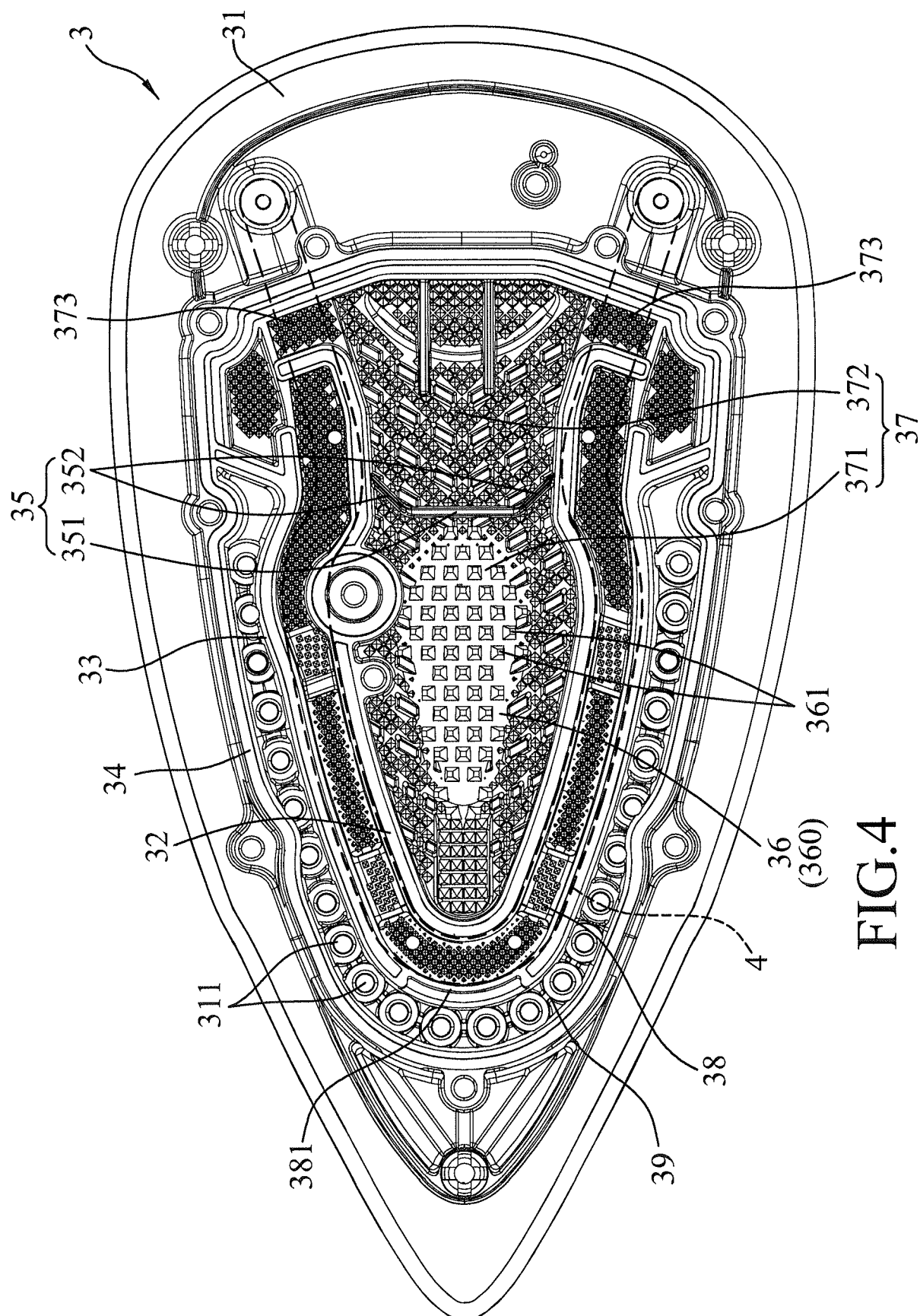
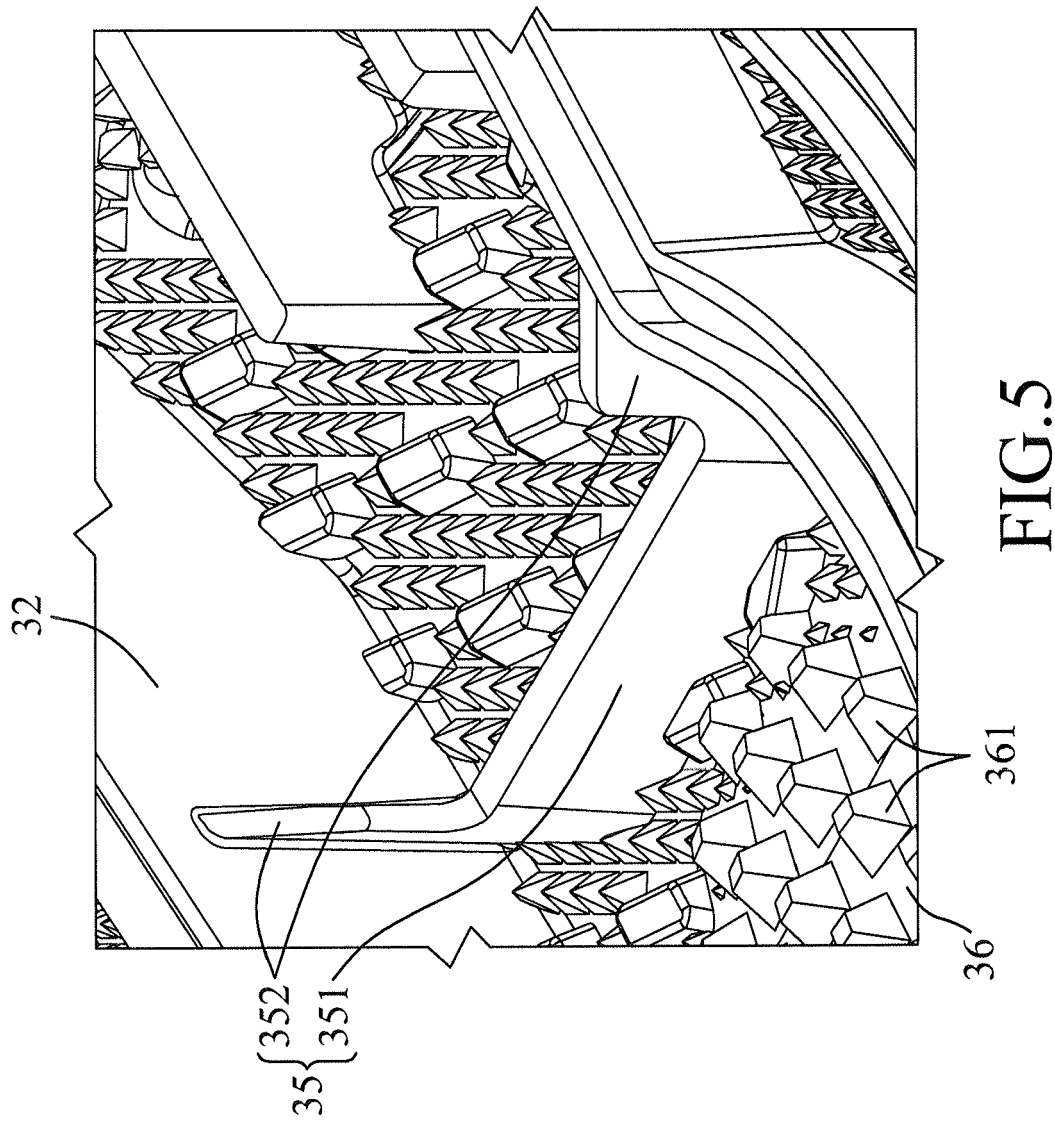


FIG. 4



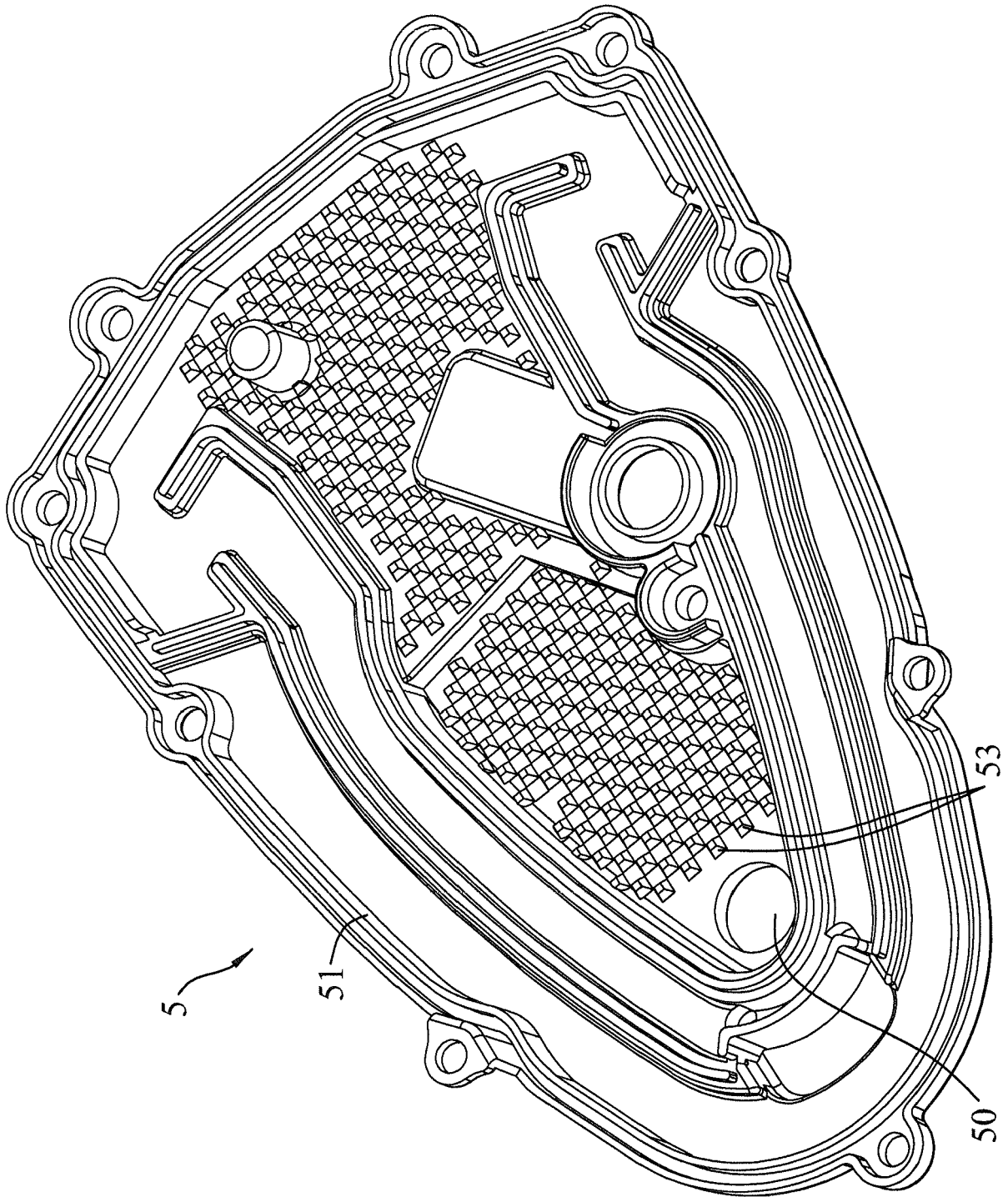


FIG.6

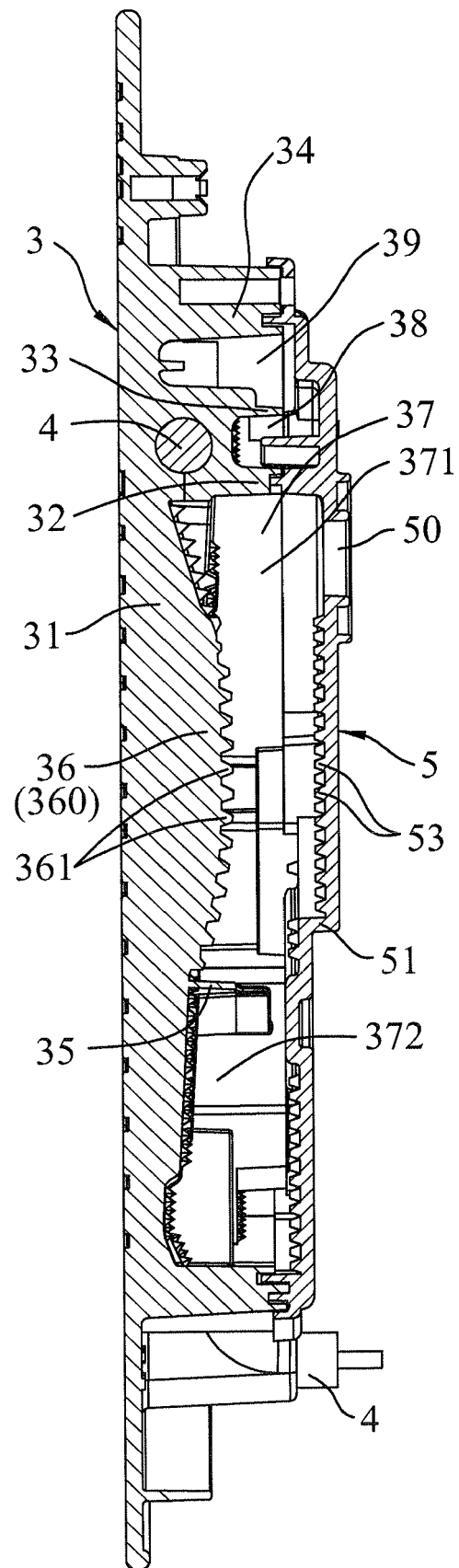


FIG. 7



EUROPEAN SEARCH REPORT

Application Number
EP 21 18 0650

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A	* paragraph [0034] - paragraph [0037] * * paragraph [0047] - paragraph [0055] * * figures 2-8 *	3,7-10	D06F75/18
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A	EP 3 572 578 A1 (SEB SA [FR]) 27 November 2019 (2019-11-27) * paragraph [0066] - paragraph [0073]; figures 3-6, 14, 15 *	1-10	

			TECHNICAL FIELDS SEARCHED (IPC)
			D06F
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 12 November 2021	Examiner Sabatucci, Arianna
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

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**ANNEX TO THE EUROPEAN SEARCH REPORT
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5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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