(19) Europäisches Patentamt
European Patent Office
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(11) **EP 3 613 895 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
26.02.2020 Bulletin 2020/09

(51) Int Cl.:
D06F 75/38 *(2006.01)* *D06F 75/24* *(2006.01)*

(21) Application number: **18190633.0**

(22) Date of filing: **24.08.2018**

(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

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(54) IRONING SHOE WITH HEAT CONDUCTIVE PROTRUDING STRUCTURE

(57) The invention relates to an ironing shoe (100) adapted to be removably attached to a soleplate (101) of a garment care device (102). The ironing shoe (100) comprises a plate (103). The plate (103) comprises an outside face (104) intended to come into contact with garments to be treated. The plate (103) comprises an inside face (105) intended to face the soleplate when the ironing shoe (100) is attached to the garment care device. The inside face (105) comprises a heat insulating layer (106), a heat insulating protruding structure (107) to create an air gap (AG) between the heat insulating layer (106) and the soleplate when the ironing shoe (100) is attached to the garment care device, and a heat conductive protruding structure (108) to conduct heat from the soleplate to the plate (103) when the ironing shoe (100) is attached to the garment care device.
This ironing shoe improves the problem of steam condensation when the ironing shoe is attached to the soleplate.

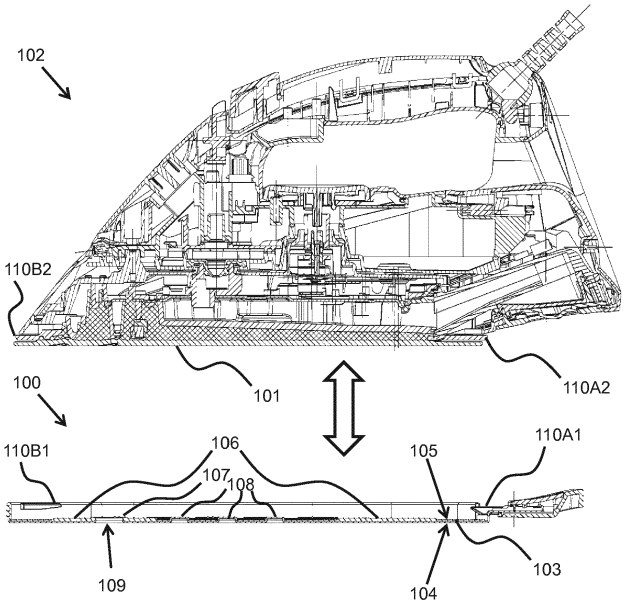

FIG.1A

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Description

FIELD OF THE INVENTION

[0001] The invention relates to an ironing shoe for garment care device.

[0002] The invention has some applications in the field of garment care.

BACKGROUND OF THE INVENTION

[0003] Ironing shoe (sometimes also called "fabric protector") is a known accessory intended to cooperate with a garment care device having a soleplate, such as a steam iron.

[0004] The goal of an ironing shoe is to reduce the heat transfer between the soleplate and the garment being treated (e.g. ironed). The treatment of the garment is thus done by the ironing shoe with a temperature much lower than the temperature of the soleplate.

[0005] Has a result, it becomes possible to iron garments made of delicate fabrics (e.g. silk) without damaging the garment, even if the soleplate temperature is relatively high (e.g. 160 to 235 degrees).

[0006] Known ironing shoes comprise a plate, for example made of aluminium, in which steam holes are arranged, the plate having an outside face intended to come into contact with garments to be treated by the garment care device, and an inside face covered by silicone rubber which faces the soleplate when the ironing shoe is attached to the garment care device. The silicone rubber reduces the heat transfer.

[0007] However, with known ironing shoes, it can be observed that some wet spots often appear on the garment being treated if the user starts steam-ironing after the ironing shoe has been attached to the soleplate.

SUMMARY OF THE INVENTION

[0008] It is an object of the invention to propose an improved ironing shoe that avoids or mitigates above-mentioned problems.

[0009] The invention is defined by the independent claims. The dependent claims define advantageous embodiments.

[0010] To this end, it is proposed an ironing shoe adapted to be removably attached to a soleplate of a garment care device, the ironing shoe comprising a plate, the plate comprising an outside face intended to come into contact with garments to be treated and an inside face intended to face the soleplate when the ironing shoe is attached to the garment care device, the inside face comprising:

- a heat insulating layer,
- a heat insulating protruding structure to create an air gap between the heat insulating layer and the soleplate when the ironing shoe is attached to the garment care device,
- a heat conductive protruding structure to conduct heat from the soleplate to the plate when the ironing shoe is attached to the garment care device.

[0011] The heat insulating layer allows reducing the heat transfer between the soleplate and the plate of the ironing shoe. The air gap created between the heat insulating layer and the soleplate when the ironing shoe is attached to the garment care device further reduces the heat transfer between the soleplate and the plate of the ironing shoe. With those features, the ironing shoe according to the invention allows an important decrease of the heat transfer between the soleplate and the plate of the ironing shoe, so that garments made of delicate fabric can be treated without damage by the ironing shoe attached to the soleplate, even if the soleplate has a high temperature.

[0012] The heat conductive protruding structure allows conducting locally a limited amount of heat from the soleplate to the plate of the ironing shoe. As a consequence, when the ironing shoe is attached to the soleplate, the plate of the ironing shoe is able to increase in temperature much faster. In this situation, after the ironing shoe has been attached to the soleplate, if the user starts steam-ironing, the condensation of steam on the ironing shoe will be greatly reduced. In other words, the heat conductive protruding structure solves the problem known as "spitting".

[0013] Preferably, the heat conductive protruding structure has a top part defining a contact area with the soleplate. The ratio between the surface of said contact area and the surface of the inside face is in the range [0.5; 30.0] %.

[0014] Such a range allows conducting locally and quickly a limited amount of heat from the soleplate to the plate of the ironing shoe, which is helpful to initially increase the temperature of the ironing shoe (which is initially at room-temperature) after the ironing shoe is attached to the soleplate. Because the contact area has a limited surface, the heat transfer will not substantially contribute to further increase the temperature of the ironing shoe after the ironing shoe has reached a balanced temperature.

[0015] Preferably, the heat conductive protruding structure is made of metal material.

[0016] Using conductive protruding structure made of metal material allows an easy and cost-effective way of conducting locally and quickly a limited amount of heat from the soleplate to the plate of the ironing shoe.

[0017] Preferably, the heat conductive protruding structure is cylindrical or oval shaped.

[0018] Forming the heat conductive protruding structure with those shapes allows an easy manufacturing.

[0019] Preferably, the heat conductive protruding structure comprises at least one bump.

[0020] Forming the conductive protruding structure as bump(s) allows an easy manufacturing of the heat conductive protruding structure in the plate.

[0021] Preferably, the at least one bump corresponds to a stamped portion in the plate.

[0022] Using stamping for forming the bump(s) allows an easy and cost-effecting manufacturing.

[0023] Preferably, the heat conductive protruding structure is arranged in a central part of the ironing shoe and/or extends along a longitudinal axis of the ironing shoe.

[0024] Having the conductive protruding structure arranged in a central part of the ironing shoe allows an even distribution of heat from the soleplate to the ironing shoe after the ironing shoe has been attached to the soleplate. This helps that the condensation of steam will be further limited over a larger area of the ironing shoe.

[0025] Because an ironing shoe always have a symmetrical shape, having the conductive protruding structure extending along a longitudinal axis of the ironing shoe also contributes to an even distribution of heat from the soleplate to the ironing shoe.

[0026] Preferably, the heat insulating protruding structure and the heat conductive protruding structure have a same height.

[0027] Having the heat insulating protruding structure and the heat conductive protruding structure with same height allows stabilizing the ironing shoe on the soleplate, because the ironing shoe has an increased number of contact points with the soleplate.

[0028] Preferably, the plate comprises at least one steam hole, the heat insulating protruding structure being formed on said inside face by a rim extending around the periphery of said at least one steam hole.

[0029] Having the heat insulating protruding structure formed as a rim extending around the periphery of the steam hole(s) allows an easy manufacturing. Moreover, the relatively long length of the heat insulating protruding structure around each steam hole also contributes to have a stable contact of the ironing shoe with the soleplate.

[0030] Preferably, the rim has a height in the range [0.1; 1.5] mm.

[0031] This range of value allows creating an air gap being a compromise between:

- a too thin air gap that would not heat insulate sufficiently the plate of the ironing shoe and would result in having the plate of the ironing shoe overall too hot (which could damage garments), and
- a too thick air gap that would not allow a sufficient heat transfer between the soleplate and the plate of the ironing shoe and would affect the efficiency of the garment treatment.

[0032] Preferably, the heat insulating layer comprises portions having different thickness.

[0033] Having insulating layer comprising portions having different thickness avoids that some part(s) of the ironing shoe would receive too much heat form the soleplate. This thus helps the ironing shoe to receive heat evenly from the soleplate.

[0034] Preferably, a first portion of the heat insulating layer has a thickness in the range [0.5; 1] mm, and a second portion of the heat insulating layer has a thickness in the range [1; 2] mm.

[0035] This aspect of the invention results in cost benefit for the first portion, and increased structural strength for supporting rubber rim(s) in the second portion.

[0036] Preferably, the air gap has a value in the range [0.1; 3] mm, preferably in the range [0.2; 1.5] mm.

[0037] This range of value for the air gap allows an optimal heat transfer from the soleplate to the plate of the ironing shoe, so that the external face of the ironing shoe is kept within an optimal and relatively low range of temperature compared to the soleplate temperature.

[0038] Preferably, the ironing shoe comprises first attaching means for removably attaching the ironing shoe to the soleplate.

[0039] The invention also relates to a garment care device comprising a soleplate for treating garments, and second attaching means for attaching an ironing shoe as described above via the first attaching means.

[0040] Detailed explanations and other aspects of the invention will be given below.

BRIEF DESCRIPTION OF THE DRAWINGS

[0041] Particular aspects of the invention will now be explained with reference to the embodiments described hereinafter and considered in connection with the accompanying drawings, in which identical parts or sub-steps are designated in the same manner :

Fig. 1A depicts an ironing shoe according to the invention when being detached from the soleplate of a steam iron,

Fig. 1B depicts the ironing shoe of Fig. 1A when being attached to the soleplate of the steam iron,

Fig. 2A depicts the inside face of an ironing shoe according to the invention,

Fig. 2B depicts the outside face of an ironing shoe according to the invention,

Fig. 3A depicts a cross-section of an ironing shoe according to the invention when attached to the soleplate of a steam iron,

Fig. 3B depicts a zoomed-in view of Fig. 3A,

Fig. 4A depicts a longitudinal cross-section of an ironing shoe according to the invention,

Fig. 4B depicts a zoomed-in view of Fig. 4A showing heat conductive protruding structure,

Fig. 4C depicts a zoomed-in view of Fig. 4A showing heat insulating layer and heat insulating protruding structure,

Fig. 4D depicts a zoomed-in view of Fig. 4C,

Fig. 5 depicts a zoomed-in view of a heat insulating protruding structure implemented in an ironing shoe according to the invention.

DETAILED DESCRIPTION OF THE EMBODIMENTS

[0042] Fig. 1A depicts an ironing shoe 100 according to the invention when being detached from the soleplate 101 of a garment care device 102, such as a steam iron, as illustrated.

[0043] The ironing shoe 100 comprises a plate 103 comprising an outside face 104 intended to come into contact with garments to be treated, and an inside face 105 intended to face the soleplate when the ironing shoe 100 is attached to the garment care device.

[0044] The plate 103 is preferably made of metal, such as aluminium or stainless steel.

[0045] Preferably, the plate 103 has a thickness in the range [0.6; 1.5] mm, preferably 0.8 mm.

[0046] The outside face 104 and the inside face 105 of the plate 103 are preferably flat, so that they extend parallel to the surface of the soleplate 101 when the ironing shoe is attached to the garment care device 102.

[0047] Fig. 1B depicts the ironing shoe of Fig. 1A when being attached to the soleplate of the steam iron.

[0048] The inside face 105 comprises:

- a heat insulating layer 106,
- a heat insulating protruding structure 107 to create an air gap AG between the heat insulating layer 106 and the soleplate when the ironing shoe 100 is attached to the garment care device,
- a heat conductive protruding structure 108 to conduct heat from the soleplate to the plate 103 when the ironing shoe 100 is attached to the garment care device.

[0049] The heat insulating layer 106 is for example made of a silicone rubber layer(s) coated on the inside face 105.

[0050] The heat insulating protruding structure 107 is a structure protruding from the inside face 105.

[0051] The heat insulating protruding structure 107 is intended to come into contact with the soleplate 101 when the ironing shoe is attached to the garment care device 102.

[0052] Because the heat insulating protruding structure 107 has a height larger than any other elements in the inside face 105, in particular larger than the height of the heat insulating layer 106, this helps creating an air gap AG between the heat insulating layer 106 and the soleplate when the ironing shoe 100 is attached to the garment care device.

[0053] The heat insulating layer 106 and the air gap act as insulation layers which ensures that the temperature of the plate 103 will remain in a range of temperature [100; 150] degrees when the temperature of the soleplate 101 is in a range of temperature [160; 235] degrees.

[0054] The air gap AG is illustrated on Fig. 3A, Fig. 3B.

[0055] The heat conductive protruding structure 108 is a structure protruding from the inside face 105.

[0056] The heat conductive protruding structure 108 is intended to come into close contact with the soleplate 101 when the ironing shoe is attached to the garment care device 102.

[0057] Preferably, the heat insulating protruding structure 107 and the heat conductive protruding structure 108 have a same height (h).

[0058] In that case, both the heat insulating protruding structure 107 and the heat conductive protruding structure 108 come into direct contact with the soleplate 101 when the ironing shoe is attached to the garment care device 102.

[0059] The height (h), calculated from the bottom of the inside face 105, is illustrated on Fig. 4B, Fig. 4D.

[0060] Preferably, the heat conductive protruding structure 108 has a top part defining a contact area with the soleplate.

[0061] For example, if the heat conductive protruding structure 108 is made of separate elements, such as three separate bumps having circular top part as illustrated in Fig. 2A, the contact area of the heat conductive protruding structure 108 with the soleplate corresponds to the sum of the separate top part surfaces, such as the sum of the surface of the three top part circles in the example of in Fig. 2A.

[0062] The ratio between the surface of said contact area and the surface of the inside face 105 is in the range [0.5; 30.0] %.

[0063] For example, the surface of the inside face 105 of an ironing shoe 100 adapted to be removably attached to a garment care device 102 corresponding to a steam iron is in the range [18000; 24000] mm2.

[0064] It is noted that the surface of the inside face 105 is (nearly) same as the surface of the soleplate 101.

[0065] With such a range for the surface of the inside face 105, and the range of percentage mentioned above, this results in a surface of the contact area of the heat conductive protruding structure 108 in the range [90; 7200] mm2.

[0066] As a specific example, illustrated in Fig. 2A, the surface of the inside face 105 is 22000 mm2.

[0067] The heat conductive protruding structure 108 is made of three separate bumps having circular top parts with diameter 10mm.

[0068] The top part surface of each bump is about 78.5 mm2.

[0069] This means that the contact area of the heat conductive protruding structure 108 is 78.5*3=235.5 mm2.

[0070] The ratio between the surface of said contact area and the surface of the inside face 105 is thus about 1%.

[0071] Preferably, the heat conductive protruding structure 108 is made of metal material, such as aluminium or stainless steel.

[0072] Preferably, the heat conductive protruding structure 108 is cylindrical (as illustrated in Fig. 2A), or oval shaped.

[0073] Preferably, the heat conductive protruding

structure 108 comprises at least one bump, such as bumps B1, B2, B3, as illustrated in Fig. 2A.

[0074] Preferably, the at least one bump B1, B2, B3 corresponds to a stamped portion in the plate 103 as illustrated in Fig. 4B.

[0075] Preferably, the heat conductive protruding structure 108 is arranged in a central part of the ironing shoe 100, as illustrated in Fig. 2A.

[0076] Preferably, the heat conductive protruding structure 108 extends along a longitudinal axis (A1) of the ironing shoe, as illustrated in Fig. 2A, Fig. 4A. Preferably, the longitudinal axis (A1) corresponds to a symmetry axis of the plate 103.

[0077] Preferably, the plate 103 comprises at least one steam hole 109, as illustrated in Fig. 1A, Fig. 2A, Fig. 2B, Fig. 3A, Fig. 3B, Fig. 5.

[0078] The heat insulating protruding structure 107 is formed on the inside face 105 by a rim R extending around the periphery of the at least one steam hole 109.

[0079] The rim R sits on the heat insulating layer 106.

[0080] Preferably, the rim R is molded together with the heat insulating layer 106.

[0081] Preferably, the rim R has a height h1 in the range [0.2; 1.5] mm, as illustrated in Fig. 4D.

[0082] The rim R can be round at its top (as illustrated in Fig. 4C, Fig. 4D, Fig. 5), but could also have a flat top part.

[0083] Preferably, the heat insulating layer 106 comprises portions (PI, P2) having different thickness (e1, e2), respectively, as illustrated in Fig. 4C.

[0084] For example, a first portion P1 of the heat insulating layer 106 has a thickness e1 in the range [0.5; 1] mm, and a second portion P2 of the heat insulating layer 106 has a thickness e2 in the range [1; 2] mm.

[0085] The thickness e1 and e2 are calculated compared to the bottom of plate 103.

[0086] Preferably, the air gap (AG) has a value in the range [0.1; 3] mm, preferably in the range [0.2; 1.5] mm.

[0087] The thickness of the air gap (AG) is calculated compared to the portion of the heat insulating layer 106 , as illustrated in Fig. 4D.

[0088] This means that in case the heat insulating layer 106 comprises various portions (PI, P2) having different thickness (e1, e2), there are areas where the air gap (AG) has different values:

- value AG1 = (h-e1) above the first portion PI,
- value AG2 = (h-e2) above the second portion P2.

[0089] Preferably, as illustrated in Fig. 4D, the value AG2 above the second portion P2 equals the height h1 of the rim R.

[0090] Preferably, the ironing shoe 100 comprises first attaching means 110A1, 110B1 for removably attaching the ironing shoe 100 to the soleplate 101 of the garment care device 102.

[0091] Preferably, the garment care device 102 comprises second attaching means 110A2, 110B2 for attaching an ironing shoe as described above, via first attaching means 110A1, 110B1.

[0092] In other words, in order to attach the ironing shoe to the soleplate of the garment care device, the first attaching means 110A1, 110B1 of the ironing shoe are adapted to cooperate with the second attaching means 110A2, 110B2 of the garment care device:

- attaching means 110A1 may for example correspond to a snap fit mechanism (as illustrated in Fig. 1A, Fig. 2A), adapted to cooperate with attaching means 110A2 that may correspond to a protruding part of the soleplate 101 (as illustrated in Fig. 1A).
- attaching means 110B1 may for example correspond to ribs protruding from an edge of the ironing shoe (as illustrated in Fig. 1A, Fig. 2A, Fig. 3B), adapted to cooperate with attaching means 110B2 that may correspond to the protruding tip of the soleplate 101 (as illustrated in Fig. 3A).

[0093] The above embodiments as described are only illustrative, and not intended to limit the technique approaches of the present invention. Although the present invention is described in details referring to the preferable embodiments, those skilled in the art will understand that the technique approaches of the present invention can be modified or equally displaced without departing from the protective scope of the claims of the present invention.

[0094] In particular, although the invention has been described based on a garment care device corresponding to a steam iron, the same invention can be applied to any other garment care device comprising a heated soleplate for treating garments, such as a garment steamer.

[0095] In the claims, the word "comprising" does not exclude other elements or steps, and the indefinite article "a" or "an" does not exclude a plurality. Any reference signs in the claims should not be construed as limiting the scope.

Claims

1. An ironing shoe (100) adapted to be removably attached to a soleplate (101) of a garment care device (102), the ironing shoe (100) comprising a plate (103), the plate (103) comprising an outside face (104) intended to come into contact with garments to be treated and an inside face (105) intended to face the soleplate when the ironing shoe (100) is attached to the garment care device, the inside face (105) comprising:

    - a heat insulating layer (106),
    - a heat insulating protruding structure (107) to create an air gap (AG) between the heat insulating layer (106) and the soleplate when the

ironing shoe (100) is attached to the garment care device,
- a heat conductive protruding structure (108) to conduct heat from the soleplate to the plate (103) when the ironing shoe (100) is attached to the garment care device.

2. Ironing shoe as claimed in claim 1, wherein the heat conductive protruding structure (108) has a top part defining a contact area with the soleplate, the ratio between the surface of said contact area and the surface of the inside face (105) being in the range [0.5; 30.0] %.

3. Ironing shoe as claimed in any one of the preceding claims, wherein the heat conductive protruding structure (108) is made of metal material.

4. Ironing shoe as claimed in any one of the preceding claims, wherein the heat conductive protruding structure (108) is cylindrical or oval shaped.

5. Ironing shoe as claimed in any one of the preceding claims, wherein the heat conductive protruding structure (108) comprises at least one bump (B1, B2, B3).

6. Ironing shoe as claimed in claim 5, wherein the at least one bump (B1, B2, B3) corresponds to a stamped portion in the plate (103).

7. Ironing shoe as claimed in any one of the preceding claims, wherein the heat conductive protruding structure (108) is arranged in a central part of the ironing shoe and/or extends along a longitudinal axis (A1) of the ironing shoe.

8. Ironing shoe as claimed in any one of the preceding claims, wherein the heat insulating protruding structure (107) and the heat conductive protruding structure (108) have a same height (h).

9. Ironing shoe as claimed in any one of the preceding claims, wherein the plate (103) comprises at least one steam hole (109), the heat insulating protruding structure (107) being formed on said inside face (105) by a rim (R) extending around the periphery of said at least one steam hole (109).

10. Ironing shoe as claimed in claim 9, wherein the rim (R) has a height (h1) in the range [0.1; 1.5] mm.

11. Ironing shoe as claimed in any one of the preceding claims, wherein the heat insulating layer (106) comprises portions (PI, P2) having different thickness (e1, e2).

12. Ironing shoe as claimed in claim 11, wherein a first portion (P1) of the heat insulating layer (106) has a thickness (e1) in the range [0.5; 1] mm, and a second portion (P2) of the heat insulating layer (106) has a thickness (e2) in the range [1; 2] mm.

13. Ironing shoe as claimed in any one of the preceding claims, wherein said air gap (AG) has a value in the range [0.1; 3] mm, preferably in the range [0.2; 1.5] mm.

14. Ironing shoe as claimed in any one of the preceding claims, comprising first attaching means (110A1, 110B1) for removably attaching the ironing shoe (100) to the soleplate (101).

15. Garment care device (102) comprising a soleplate (101) for treating garments, and second attaching means (110A2, 110B2) for attaching an ironing shoe as claimed in claim 14 via said first attaching means (110A1, 110B1).

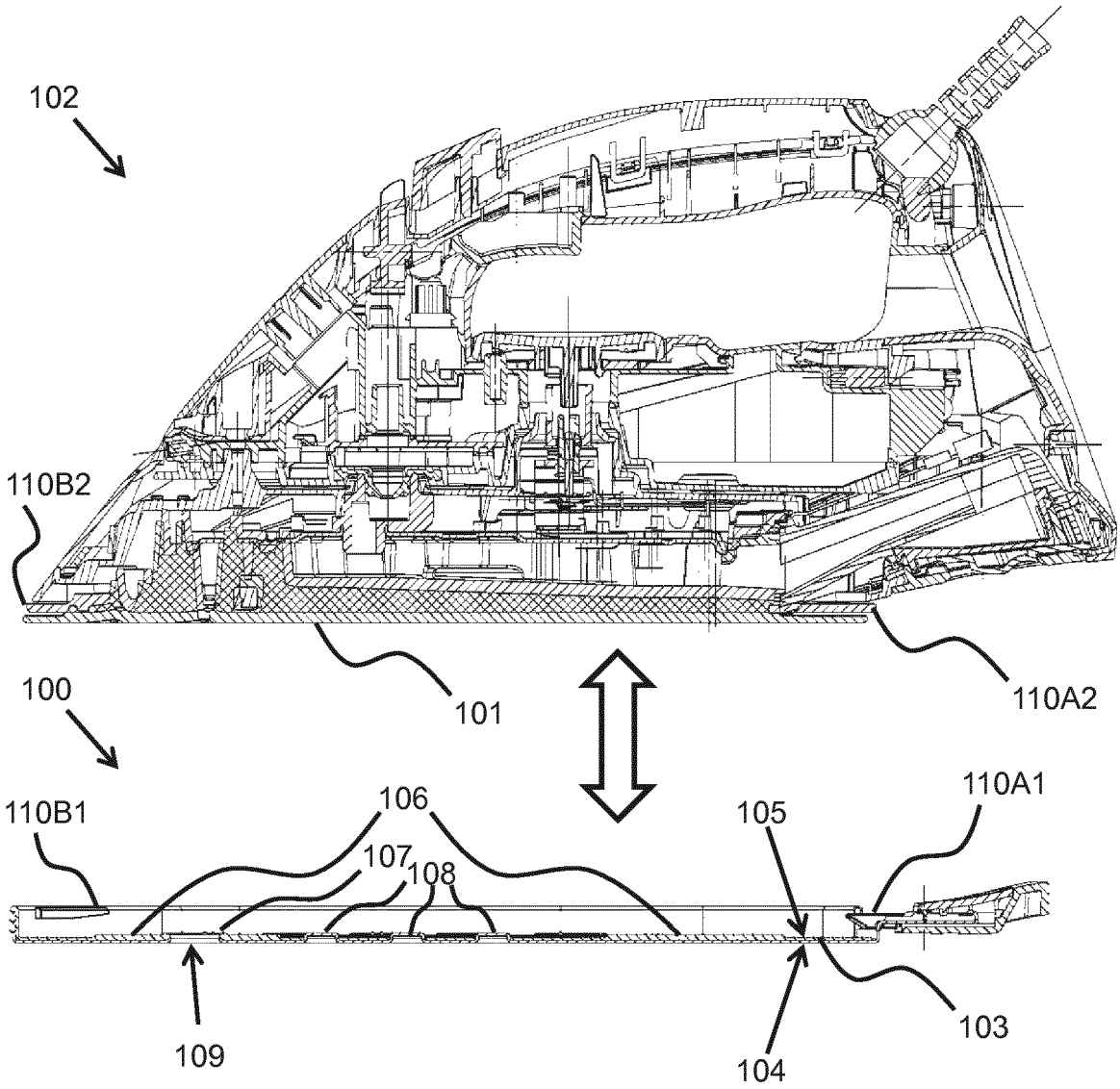
102
110B2
101
110A2
100
110B1
106
107
108
105
110A1
109
104
103

FIG.1A

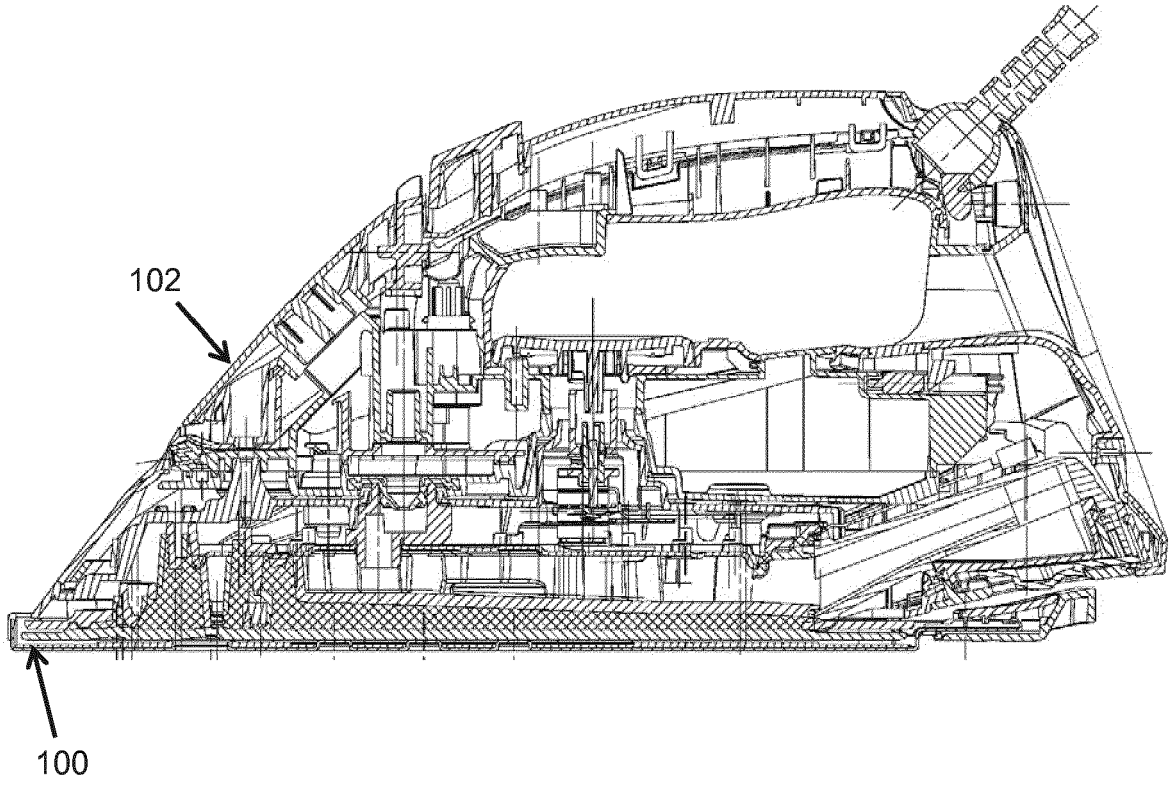

FIG.1B

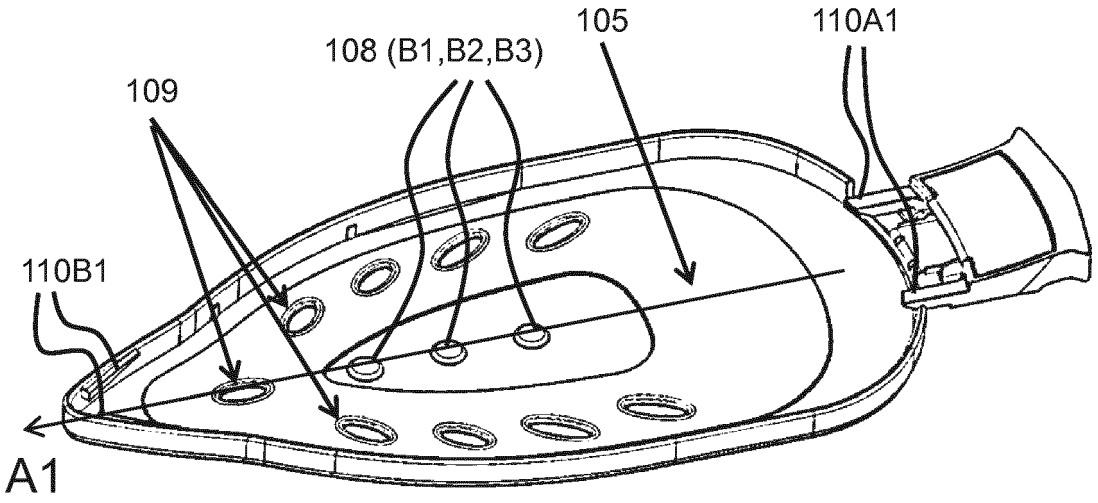

FIG.2A

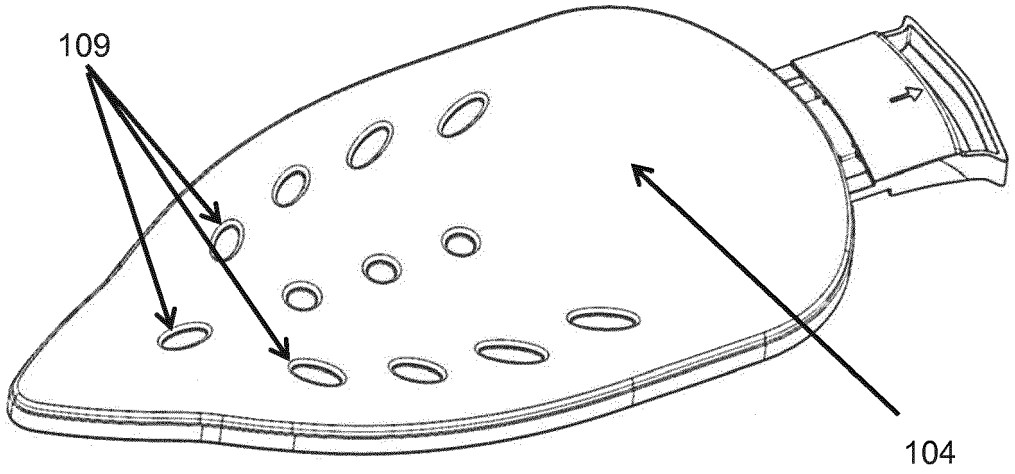

FIG.2B

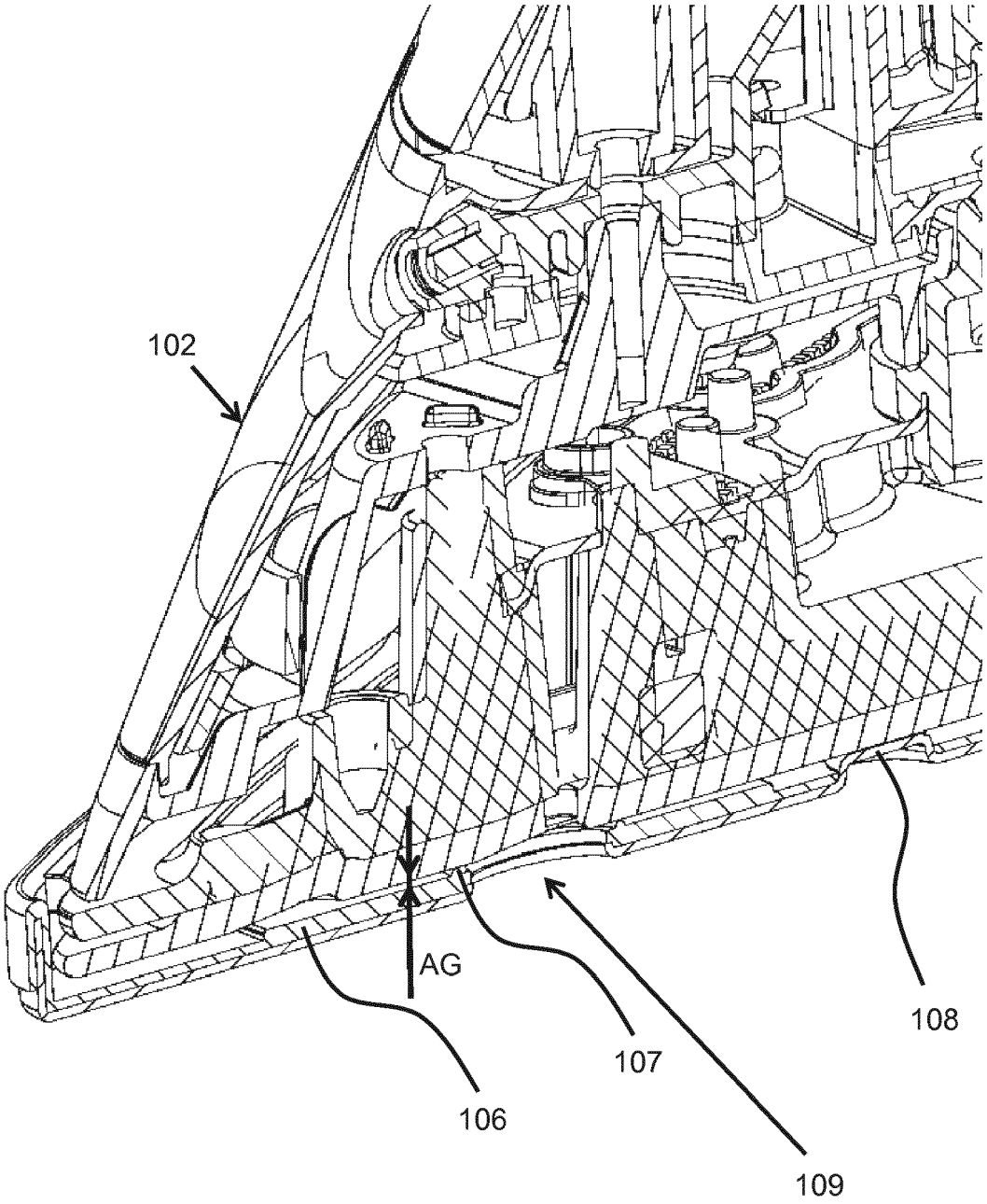

FIG.3A

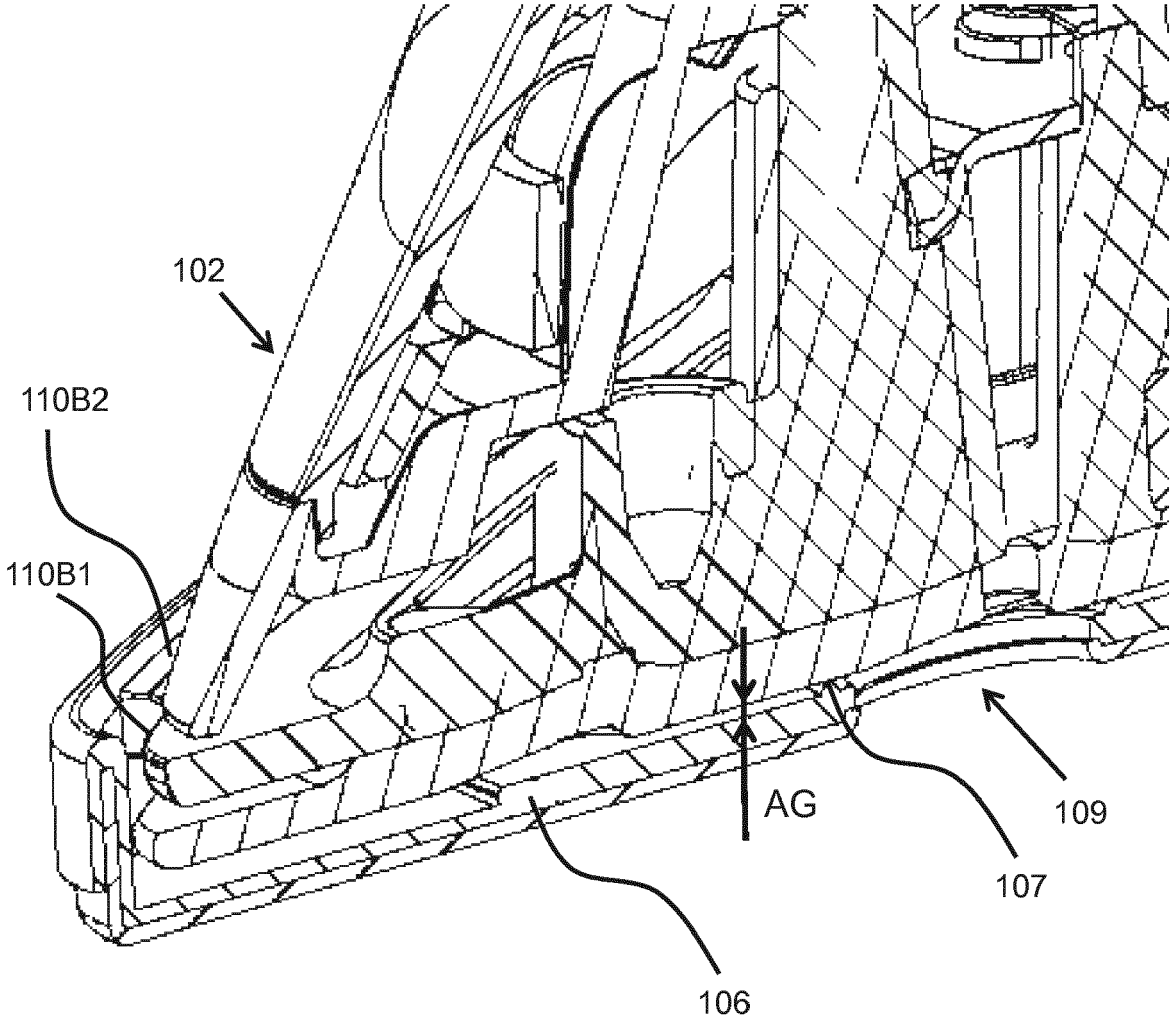

FIG.3B

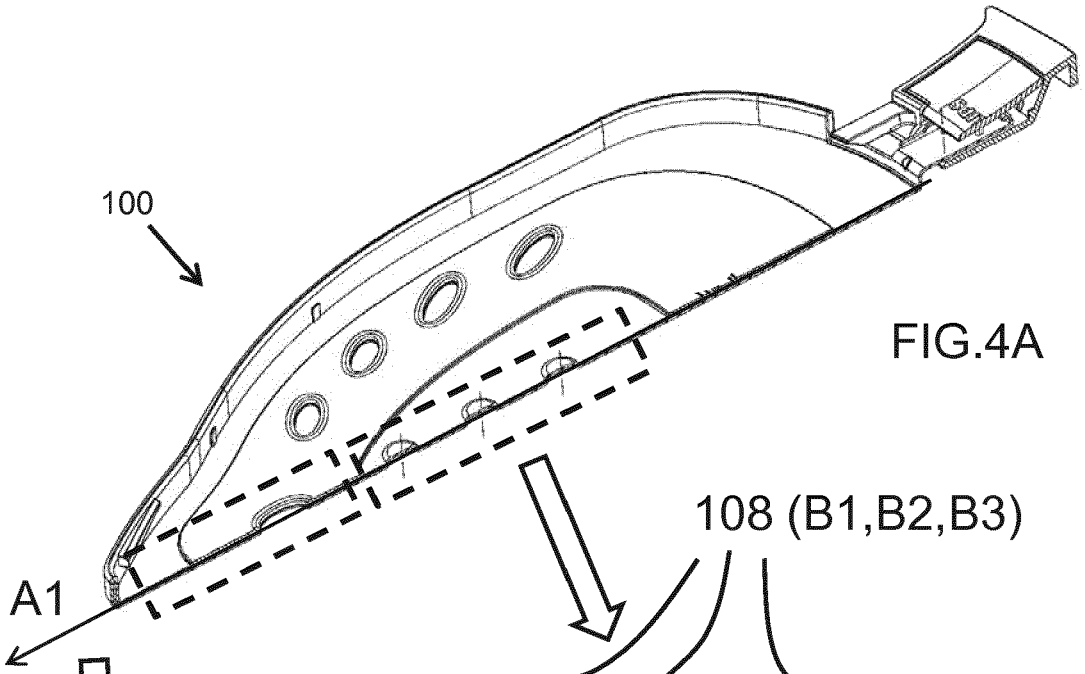

FIG.4A

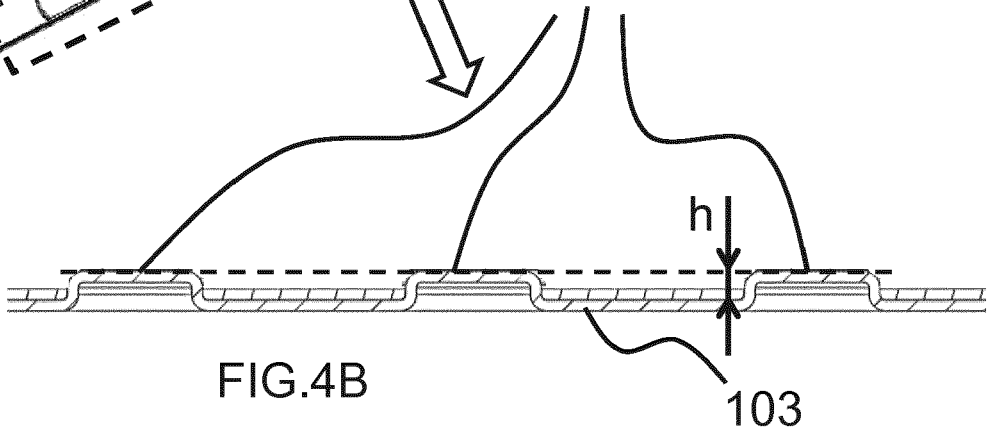

FIG.4B

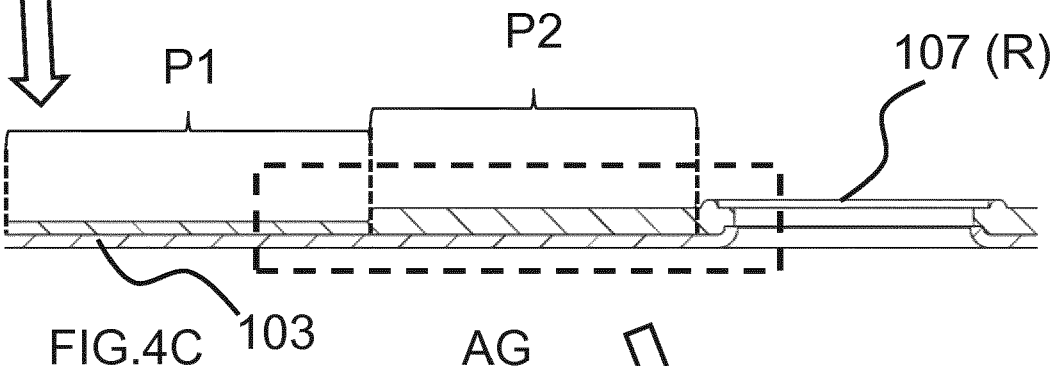

FIG.4C

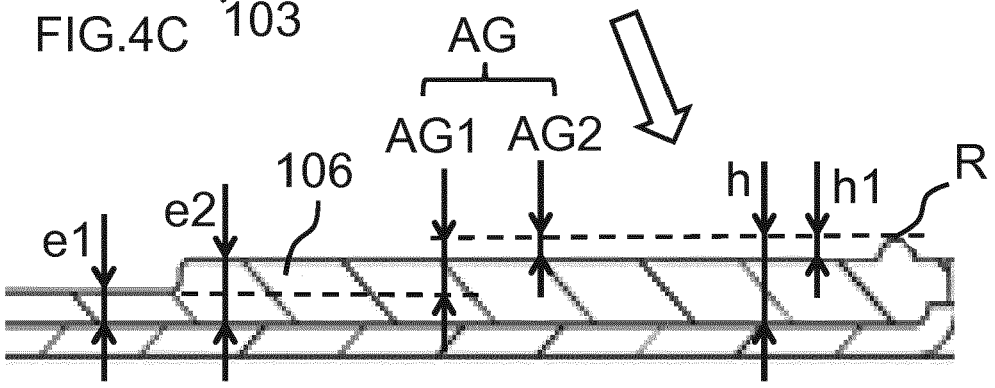

FIG.4D

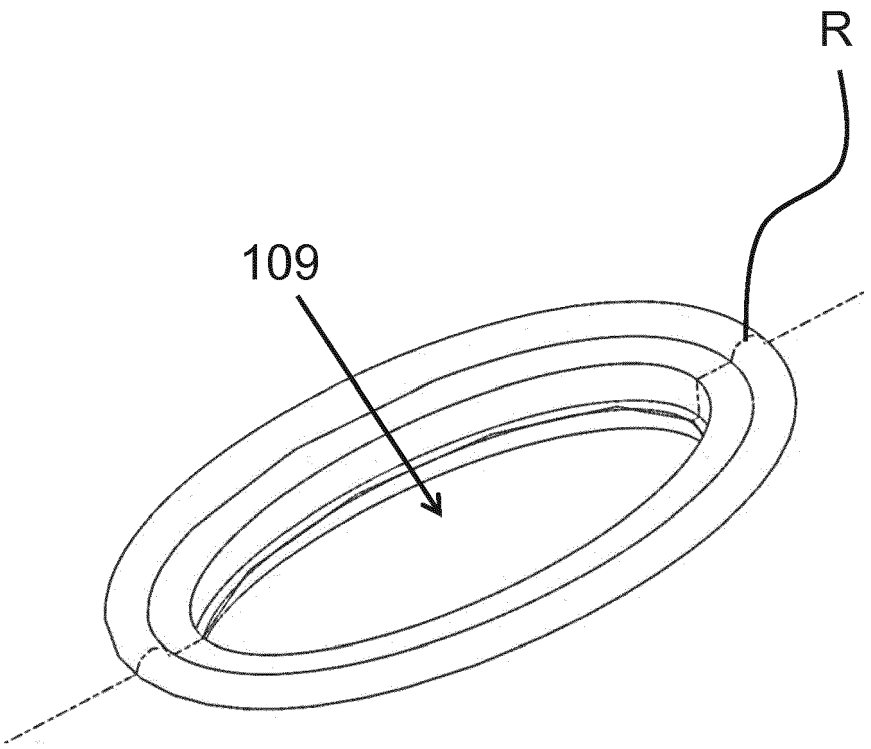

FIG.5

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EUROPEAN SEARCH REPORT

Application Number
EP 18 19 0633

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	DE 102 11 879 A1 (VORWERK CO INTERHOLDING [DE]) 10 October 2002 (2002-10-10) * paragraph [0005] * * paragraph [0026] - paragraph [0032] * * figures 1-9 *	1-15	INV. D06F75/38 ADD. D06F75/24
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D06F

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	25 January 2019	Bermejo, Marco

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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E : earlier patent document, but published on, or after the filing date
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