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(54) **GROUNDING METHOD FOR A COOKTOP PLATE AND A COOKING DEVICE HAVING SUCH A COOKTOP PLATE**

(57) The invention relates to a cooking device (1) comprising a cooktop plate (10) made of metal material and having an insulation layer (40); an electrical heating unit (12) fixed to the cooktop plate (10) by means of a retaining element (7); and at least one metal connection element (2) providing fixation of the retaining element (7) to a frame (11) of the cooktop plate (10) through a con-

nection opening (110). In order to provide grounding of the electrical heating unit (12), the cooktop plate (10) of the cooking device (1) is characterized by comprising at least one embossed form (111) defined at the periphery of the connection opening (110) so as to correspond to at least one cutting edge (201) of the connection element (2).

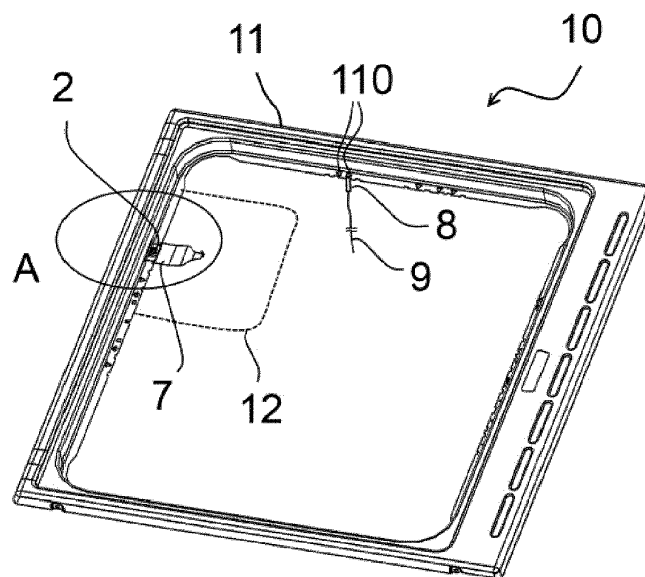


Figure 1

Description

[0001] The present invention relates to formation of a grounding line between a cooktop plate having insulation coating thereon and an electrical unit having no insulation layer thereon, during assembly of the cooktop plate.

[0002] A radiant or a non-radiant electrical heater group shall be grounded from a section thereof connected to a cooktop plate. For the grounding process, a mechanical and electrical connection is needed between the two pieces. During the assembly, a connection element having conductive structure like a bolt, and additional connection elements are utilized. However, if there is an insulation coating on one of the pieces, said insulation layer shall be stripped slightly.

[0003] In the present art, a device, where electrical grounding elements are utilized, can be seen in the patent publication GB2154079A. In said embodiment, a grounding connection is described which is provided between an electrical element and a cable termination. A screw threaded cable termination deforms a grounding plate.

[0004] In the patent publication DE102005010044, a grounding embodiment provided on a cooking device can be seen. A grounding embodiment is presented for an electrical device, particularly for a cooking device. The cooking device has a metal outer layer and within this, it has a thicker metal insert that has a threaded hole. The outer layer is electrically grounded and good contact with the inner region is provided by a screw that has a serrated surface.

[0005] The object of the present invention is to provide grounding of the electricity, provided on an electrical heating unit of the cooktop plate of the cooking device, through the cooktop plate, and realizing said grounding process in the shortest time possible and with the minimum number of process steps.

[0006] In order to realize said object and the objects which are to be deduced from the detailed description below, the present invention is a cooking device comprising a cooktop plate made of metal material and having an insulation layer; an electrical heating unit fixed to the cooktop plate by means of a retaining element; and at least one metal connection element providing fixation of the retaining element to a frame of the cooktop plate through a connection opening. In order to provide grounding of the electrical heating unit, the cooktop plate comprises at least one embossed form defined at the periphery of the connection opening so as to correspond to at least one cutting edge of the connection element. Thus, the electricity, provided on the electrical heating unit, is grounded through the cooktop plate, and this can be realized in the shortest time possible and with the minimum number of process steps. For an effective exposure process, three embossed forms are created.

[0007] In a probable embodiment of the present invention, the embossed form is in the form of an elevation formed by a metal layer forming the frame and by an insulation layer which covers at least one side of the metal

layer. Thus, as will be described in the method step given below, as the embossed form is stripped, the metal layer is accessed.

[0008] In a probable embodiment of the present invention, the embossed form comprises a retaining surface so as to correspond to the cutting edge of the connection element, and a stripping surface which at least partially encircles the retaining surface. Thus, first of all, the retaining surface of the embossed form contacts the cutting edge, and the retaining surface retains the cutting edge, and it begins to become exposed. Afterwards, the stripping surface is exposed and the metal layer is accessed.

[0009] In a probable embodiment of the present invention, the connection element is positioned so as to contact the retaining element made of metal material and the metal layer of the frame. Thus, the electrical transmission, which is needed for grounding, is provided through the connection element.

[0010] In a probable embodiment of the present invention, the connection element is a screw. Thus, an element, which is metal and conductive and which provides fixation, is used. The screw is easy to assemble and fix since it comprises threads thereon.

[0011] In a probable embodiment of the present invention, the retaining element comprises a retaining section which is bendable so as to absorb the forces applied on the electrical heating unit. Thus, the electrical heating unit is not damaged during vibrations.

[0012] In a probable embodiment of the present invention, the retaining element comprises a threaded housing through which the connection element passes and where to the connection element is fixed. Thus, the connection element, which is in screw form, is fixed so as not to be accidentally removed back.

[0013] In a probable embodiment of the present invention, the threaded housing of the retaining element is formed on the fixation section so as to be angled with respect to the fixation section. Thus, the accidental removal of the connection element is prevented.

[0014] The present invention relates to a method for formation of a grounding line between an electrical heating unit and a cooktop plate made of metal material and having an insulation layer thereon and having a retaining element fixing said electrical heating unit to a frame of the cooktop plate, during assembly of the cooktop plate. The subject matter method comprises the method steps of fixing the retaining element to a connection opening of the frame by means of a metal connection element; and bringing the connection element into contact with a conductive layer by means of stripping an insulation layer, provided on an embossed form of the cooktop plate, by a cutting edge of the connection element during the assembly of the connection element in order to provide an electrical transmission line realizing grounding. Thus, during the assembly of the cooktop plate, a grounding line is provided on the cooktop plate of an electrical heating unit fixed to the cooktop plate during assembly of the cooktop plate.

- Figure 1 is a top perspective view of a frame of a cooktop plate of a cooking device.
- Figure 2 is a frontal perspective view of a cooking device.
- Detail A is taken from Figure 1, and it is a zoomed view of the section to which a retaining element is connected.
- Detail B is taken from Detail A, and it is a zoomed view of a subject matter connection opening.
- Figure 3 is the view of the layers forming the frame of the cooktop plate.
- Figure 4 is the view of the assembled form of the retaining element and of the connection element to the cooktop plate when the cooktop plate is frontally viewed.
- Figure 5 is the view of the assembled form of the retaining element and of the connection element to the cooktop plate in a reversed position of the cooktop plate.
- Figure 6 is the view of a metal layer forming the cooktop plate or the frame thereof and a mold and a punching unit forming the subject matter connection openings provided on said metal layer.
- Figure 7a is a lateral perspective view of the retaining element.
- Figure 7b is a lateral two dimensional view of the retaining element.
- Figure 7c is a top two dimensional view of the retaining element.
- Figure 8a is the lateral view of the connection element.
- Figure 8b is the view where a cutting edge of the connection element can be seen when the connection element is viewed from the bottom.
- Figure 9a is the bottom view of a washer.
- Figure 9b is a lateral two dimensional view of a washer.

[0015] The present invention relates to grounding method of a cooktop plate (10) having an electrical heating unit (12), and relates to a cooking device (1) having said cooktop plate (10).

[0016] Figure 1 is a top perspective view of a frame (11) of a cooktop plate (10) of the cooking device (1). The frame (11) of the cooktop plate (10) is made of a metal material. The electrical heating unit (12) is fixed to the frame (11) by means of connection elements (2) and the frame (11) carries the electrical heating unit (12). A grounding terminal (8) is assembled to a connection opening (110) provided on the frame (11), and a grounding cable (9) is connected to the grounding terminal (8). A ceramic glass panel (not illustrated in the figure) is fixed onto the frame (11) of the cooktop plate (10). Foodstuffs are cooked in pans placed on the ceramic glass panel. The cooktop plate (10) or the frame (11) made of metal material are covered with insulation material.

[0017] Figure 2 is a frontal perspective view of a cooking device (1). The cooking device (1) is preferably formed by a cooktop and a cooking chamber (13). In an alternative embodiment of the present invention, the cooking device (1) may only be a cooktop. The cooktop may be a gas cooktop or an electrical cooktop. In case the cooktop is a gas cooktop, there is one or more than one burners (15) on the cooktop plate (10). The electronic or thermal control of the cooktop is realized through pluralities of buttons (14) positioned on the cooking device (1).

[0018] Detail A is taken from Figure 1, and it is a zoomed view of the section to which a retaining element (7) is connected. The retaining element (7) is fixed to the frame (11) with the help of a connection element (2), and it carries the electrical heating unit (12). Pluralities of retaining elements (7) are fixed through the frame (11). The retaining elements (7) bend as a result of any force acting on the cooktop plate (10), and they absorb the force, and they prevent damaging of the electrical heating unit or units (12). The bending movement is provided by means of the form of a retaining section (70) of the retaining element (7), which is defined at a specific slope with respect to a fixation section (71).

[0019] Detail B is taken from Detail A, and it is a zoomed view of a subject matter connection opening (110). Pluralities of connection openings (110) are formed on the cooktop plate (10) or on the frame (11) of the cooktop plate (10). During formation of the connection opening (110), on the cooktop plate (10) or on the frame (11) of the cooktop plate (10), one or more than one embossed form (111) is formed on a periphery of the connection opening (110). Preferably three embossed forms (111) are positioned side by side at a specific angle with respect to each other. The embossed form (111) comprises a planar retaining surface (1111), and a stripping surface (1112) which makes a slope from the retaining surface (1111) and which partially encircles the periphery of the retaining surface (1111). The embossed form(s) (111) is/are formed on a metal layer (4) by means of female and male molds (5) or a female mold (5) and by means of a male punching unit (6) corresponding thereto (Figure 6). Said metal layer (4) will form the cooktop plate (10) or the frame (11).

[0020] Figure 3 is the view of the layers forming the cooktop plate (11) or the frame (11) of the cooktop plate (11). During production steps, since the metal layer (4) is covered by an insulation paint or an insulation material, an insulation layer (41) is observed in the middle section and an insulation layer (40) is observed in the upper and/or lower section thereof.

[0021] Figure 4 is the view of the assembled form of the retaining element (7) and of the connection element (2) to the cooktop plate (10) when the cooktop plate (10) is frontally viewed. Figure 5 is the view where the retaining element (7) and the connection element (2) are assembled to the cooktop plate (10) in a reversed position of the cooktop plate (10).

[0022] Figure 6 is the view of a metal layer (4) forming the cooktop plate (10) or the frame (11) thereof and a mold (5) and a punching unit (6) forming the subject matter connection openings (110) provided on said metal layer (4). When a pressure force is applied in the direction of the arrows given in the figure, the punching tips (61) of the punching unit (6) provide a form (51), existing on the mold (5), to be provided above the metal layer (4), and at the same time, they provide formation of the connection opening (110). The form (51) provides formation of the connection opening (110), and besides, it provides embossed forms (111) to the metal layer (4).

[0023] Figure 7a is a lateral perspective view of the retaining element (7). Figure 7b is a lateral two dimensional view of the retaining element (7). Figure 7c is a top two dimensional view of the retaining element (7). The fixation section (71) of the retaining element (7) comprises a threaded housing (711). There is an " α " angle between a plane of the fixation section (71) and a plane of the threaded housing (711). The connection element (2) is fixed to the threaded housing (711). Since the plane of the threaded housing (711) is angled, the connection element (2) is prevented from being accidentally removed from the place thereof or being turned and released accidentally.

[0024] In an alternative embodiment of the present invention, a hole can be formed instead of the threaded housing (711). In case a hole is to be formed, a bolt is used as the connection element (2), and a nut is used corresponding thereto.

[0025] Figure 8a is the lateral view of the connection element (2). The connection element (2) is a screw. At least one cutting edge (201) is formed at a lower section of a head section (20) of the connection element (2). Figure 8b is the view where the cutting edges (201) of the connection element (2) can be seen when the connection element (2) is viewed from the bottom.

[0026] Figure 9a is the bottom view of a washer (3), and Figure 9b is a lateral two dimensional view of a washer (3). In an alternative embodiment of the present invention, there is a serrated washer (3) placed to the cutting edges (201) of the connection element (2). Both sides of the washer (3) have cutting edges.

[0027] In more details, the operation of the present invention is as follows. The cooktop plate (10) or a frame (11) of the cooking device (1) provided at a bottom section so as to carry the cooktop plate (10) is formed by using metal layers (4). Said metal layer (4) is covered by an insulation paint or a coating. The insulation layer (40) may be an enamel layer. By means of this, the electrical conductivity provided on the cooktop is eliminated. However, a functional element like an electrical heating unit (12) shall be grounded.

[0028] The present invention relates to providing a grounding between a cooktop plate (10) whereon insulation coating is provided and an electrical heating unit (12) whereon there is no insulation layer (40), during assembly of the cooktop plate (10).

[0029] As a result of an insulation layer (40), formed on the metal layer (4) having wall thickness of 0,5 mm and above, exceeding 90 micrometer thickness, grounding cannot be provided in case the insulation layer (40) cannot be removed from between the retaining element (7) and the frame (11). Therefore, the insulation layer (40) shall be removed from the metal layer (4). For this purpose, at the point where the retaining element (7) is connected to the frame (11), the insulation layer (40) is stripped. The connection element (2) having the cutting edge (201) cannot strip the insulation coating under approximately 3 Newton-meter torque. At higher torque values, the teeth of the connection element (2) and a threaded housing (711) of the retaining element (7) are deformed, and they cannot fulfil their functions. In this case, said connection section of the frame (11) has an even surface, and it has a planar form. In order to overcome this problem, the subject matter embossed form (111) is created, and it is integrated to the production - assembly step.

[0030] The section on the frame (11), to which the cutting edge (201) of the connection element (2) contacts or to which a washer (3), connected thereto, contacts, is the embossed form(s) (111). The embossed form (111) is an elevation form on a periphery of the connection opening (110), and it is formed on the periphery (11) of the cooktop plate (10). The embossed form (111) on the frame (11) and at the same time, the connection opening (110) are formed by using a mold (5) and a punching unit (6) or female and male molds (5). The formation thereof by using mold (5) and punching unit (6) can be seen in Figure 6. On the mold (5), an opening is formed, and around the openings, depressions are formed. The metal layer (4) is placed to an upper surface of the mold (5), and afterwards, the punching tips (61) of the punching unit (6) press on the metal layer (4). The punching tips (61) form the connection openings (110) on the metal layer (4). At the same time, the depression form on the mold (5) provides formation of embossed form (111) on the metal layer (4). When the punching tips (61) apply pressure on the mold (5), both the connection openings (110) are formed and also the embossed forms (111) are formed.

[0031] The diameter (R1) of the connection opening formed on the metal layer (4) is greater than the diameter (R2) of the connection element (of a handle section (21)) used in fixation of the retaining element (7). Since the diameter difference is big, the connection element (2) passes through the connection opening (110) of the metal layer (4) in a contactless manner. However, the connection element (2) can be tightly fixed to a threaded housing (711) of the retaining element (7). During said fixation, as the connection element (2) is turned, it strips and forms the embossed forms (111) provided on the metal layer (4). The embossed forms (111) provide the insulation layer (40) to be stripped and exposed, and they provide the connection element (2) to contact the conductive layer (41). During stripping and formation of the

embossed forms (111), sharp and serrated protrusions are formed. These sharp and serrated protrusions overlap with the cutting edges (201) of the connection element (2) or with the cutting edges of the washer (3). The connection element (2) is made of a metal material providing conduction of electricity. They are connected to each other in a shrink-fit manner. Electrical transmission is realized in a firm manner through this connection.

[0032] In an alternative embodiment of the present invention, the washer (3), fixed on a bottom section of the connection element (2), is turned during the assembly of the connection element (2) to the threaded housing (711), and it provides stripping of the insulation layer (40).

[0033] The embossed forms (111) provide the breakage of the surface of the insulation layer (40) in a more rapid and efficient manner, and they provide having surface breakages on the conductive layer (41).

[0034] In more details, the grounding through the cooktop plate (10) is provided as follows. Particularly grounding of the electrical heating unit (12) is provided. The retaining element(s), which retain(s) the electrical heating unit (12) from one or more than one point thereof, are made of metal materials. The electrical current desired to be grounded through the electrical heating unit (12) passes to the retaining element (7) and afterwards to the connection element (2). The electrical current, existing on the connection element (110), passes through the connection opening (110), whose insulation layer (40) is stripped, to the conductive layer (41). Since the conductive layer (41) is provided along the whole frame (11), it passes through the conductive layer (41) of the whole frame (11). Afterwards, it passes to a grounding terminal (8) connected to another connection opening (110) provided on the frame (11). From here, it is grounded by means of a grounding cable (9).

[0035] In a preferred embodiment of the present invention, a wall thickness of the metal layer (4) is 2 mm. Moreover, the torque value during the assembly of the connection element (2) is below 3 Newton-meters, and a wall thickness of the insulation layer (40) is above 90 micrometers.

[0036] The subject matter embossed forms (111) are created in a single and same process during formation of the connection openings (110) provided on the frame (11).

[0037] Thanks to the embossed forms (111), the stripping/removal of the insulation layer (40) and bringing thereof into contact with the conductive layer (41) are provided in a rapid and easy manner with desired efficiency. Efficiency is important for providing electrical transmission and afterwards for providing grounding.

REFERENCE NUMBERS

[0038]

1. Cooking device
2. Connection element

3. Washer
4. Metal layer
5. Mold
6. Punching unit
7. Retaining element
8. Grounding terminal
9. Grounding cable
10. Cooktop plate
11. Frame
12. Electrical heating unit
13. Cooking chamber
14. Button
15. Burner
20. Head section
21. Handle section
40. Insulation layer
41. Conductive layer
51. Form
61. Punching tip
70. Retaining section
71. Fixation section
110. Connection opening
111. Embossed form
201. Cutting edge
711. Threaded housing
1111. Retaining surface
1112. Stripping surface
- R1: Connection opening diameter
- R2: Connection element diameter

Claims

1. A cooking device (1) comprising a cooktop plate (10) made of metal material and having an insulation layer (40); an electrical heating unit (12) fixed to the cooktop plate (10) by means of a retaining element (7); and at least one metal connection element (2) providing fixation of the retaining element (7) to a frame (11) of the cooktop plate (10) through a connection opening (110); in order to provide grounding of the electrical heating unit (12), the cooktop plate (10) is **characterized by** comprising at least one embossed form (111) defined at the periphery of the connection opening (110) so as to correspond to at least one cutting edge (201) of the connection element (2).
2. The cooking device (1) according to claim 1; wherein the embossed form (111) is in the form of an elevation formed by a metal layer (4) forming the frame (11) and by an insulation layer (40) which covers at least one side of the metal layer (4).
3. The cooking device (1) according to claim 1 or 2; wherein the embossed form (111) comprises a retaining surface (1111) so as to correspond to the cutting edge (201) of the connection element (2), and

a stripping surface (1112) which at least partially encircles the retaining surface (1111).

4. The cooking device (1) according to claim 1; wherein the connection element (2) is positioned so as to contact the retaining element (7) made of metal material and the metal layer (4) of the frame (11). 5
5. The cooking device (1) according to claim 4; wherein the connection element (2) is a screw. 10
6. The cooking device (1) according to claim 1; wherein the retaining element (7) comprises a retaining section (70) which is bendable so as to absorb the forces applied on the electrical heating unit (12). 15
7. The cooking device (1) according to claim 6; wherein the retaining element (7) comprises a threaded housing (711) through which the connection element (2) passes and whereto the connection element (2) is fixed. 20
8. The cooking device (1) according to claim 7; wherein the threaded housing (711) of the retaining element (7) is formed on the fixation section (71) so as to be angled with respect to the fixation section (71). 25
9. A method for formation of a grounding line between an electrical heating unit (12) and a cooktop plate (10) made of metal material and having an insulation layer (40) thereon and having a retaining element (7) fixing an electrical heating unit (12) to a frame (11) of the cooktop plate (10), during assembly of the cooktop plate (10), said method is **characterized by** comprising the method steps of fixing the retaining element (7) to a connection opening (110) of the frame (11) by means of a metal connection element (2); and bringing the connection element (2) into contact with a conductive layer (41) by means of stripping an insulation layer (40), provided on an embossed form (111) of the cooktop plate (10), by a cutting edge (201) of the connection element (2) during the assembly of the connection element (2) in order to provide an electrical transmission line realizing grounding. 30
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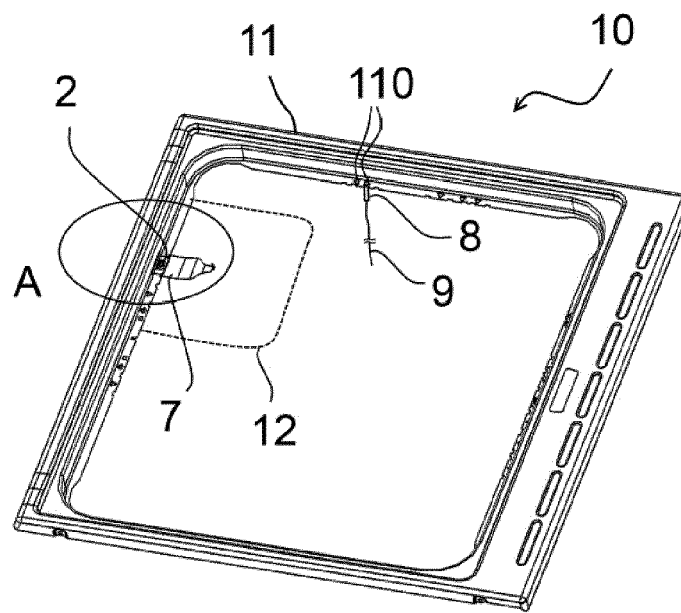


Figure 1

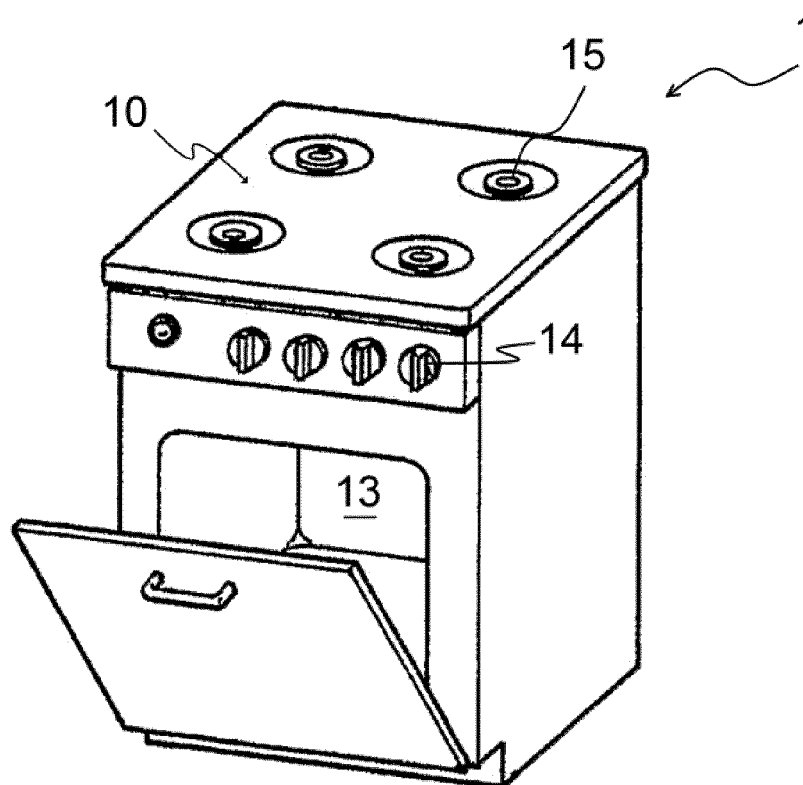
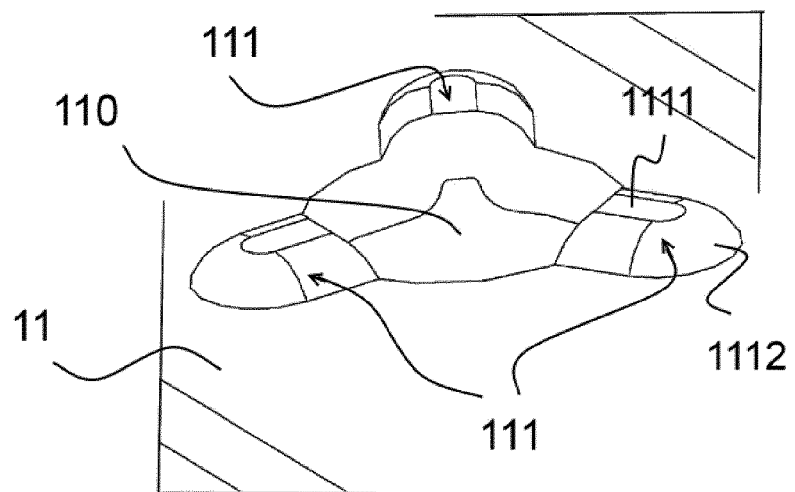
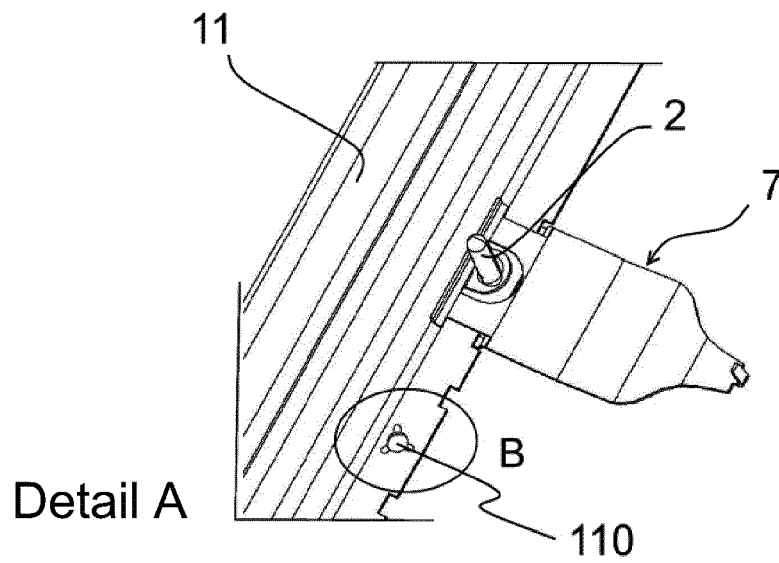


Figure 2



Detail B

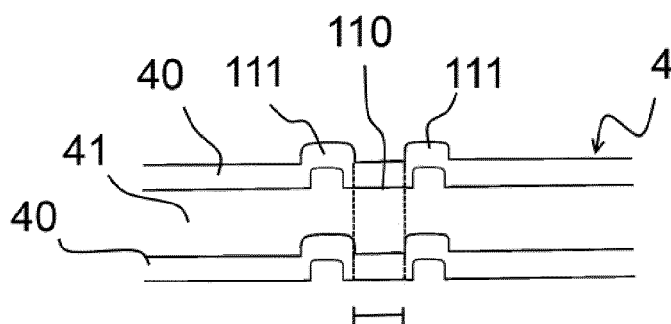
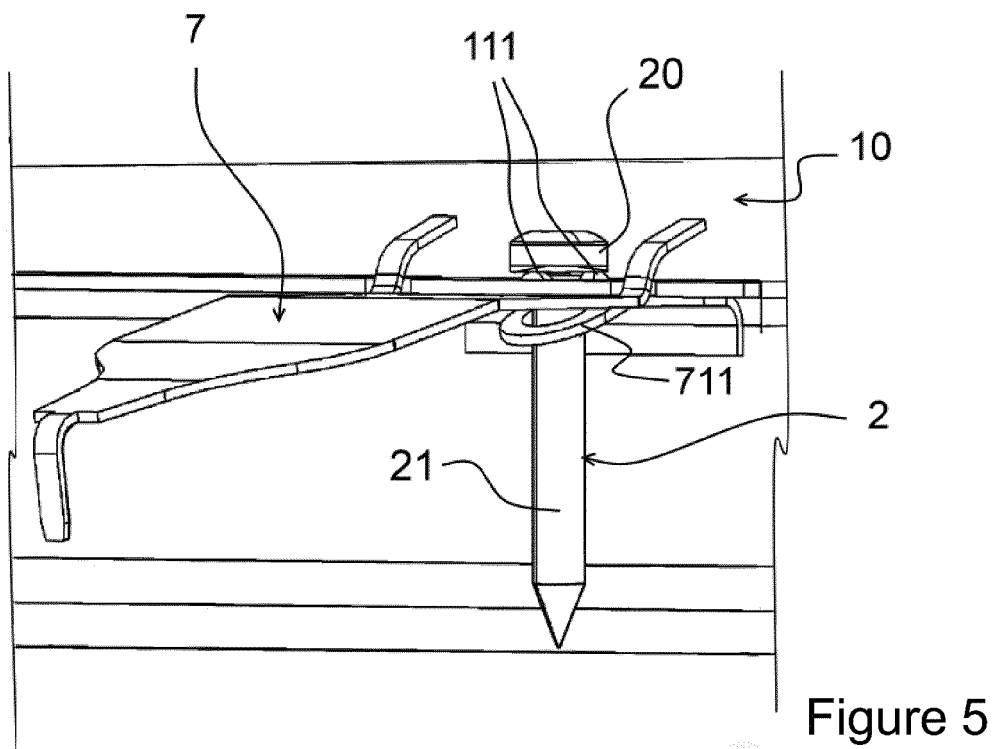
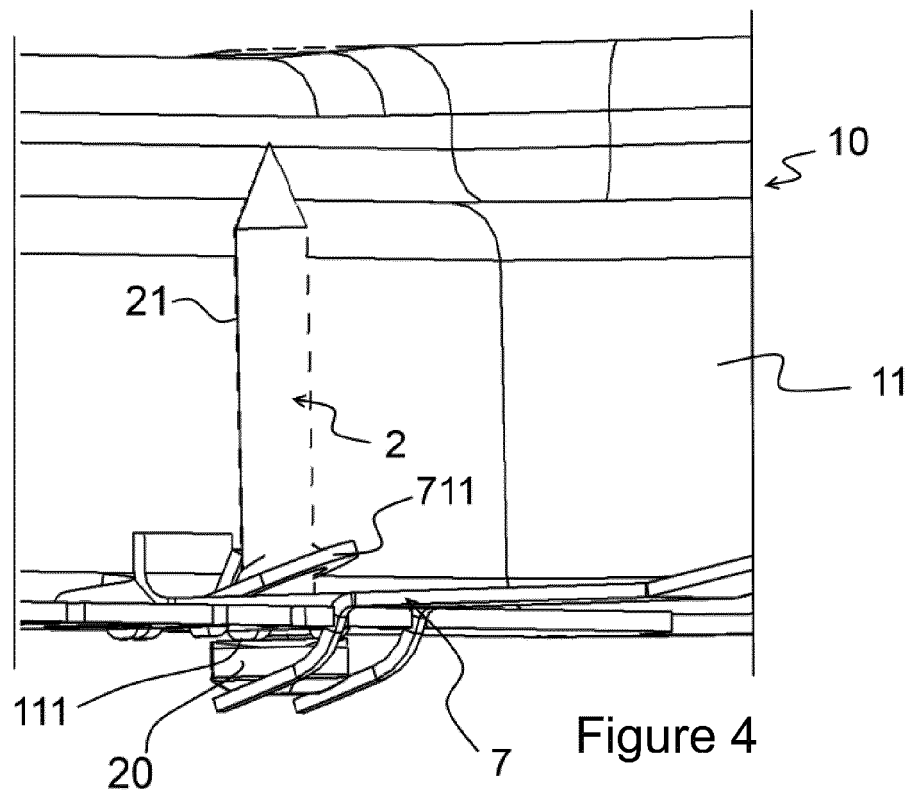


Figure 3



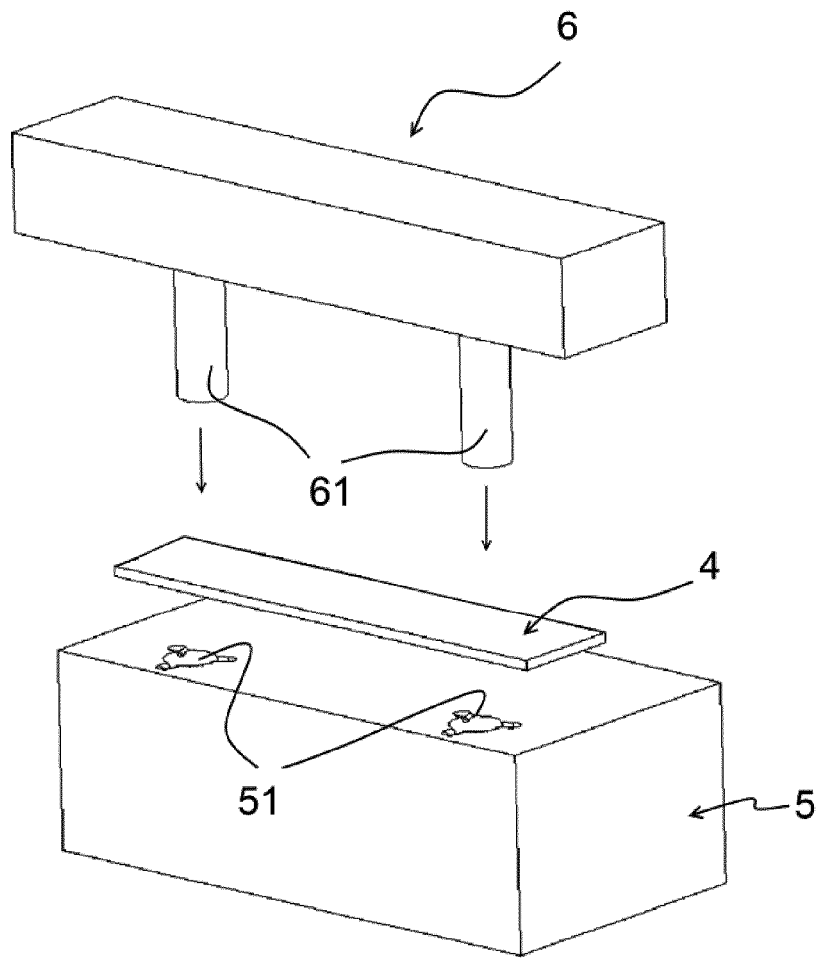


Figure 6

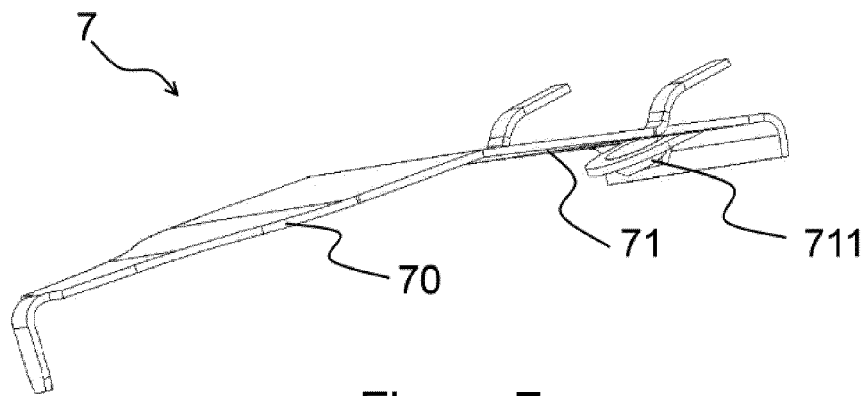


Figure 7a

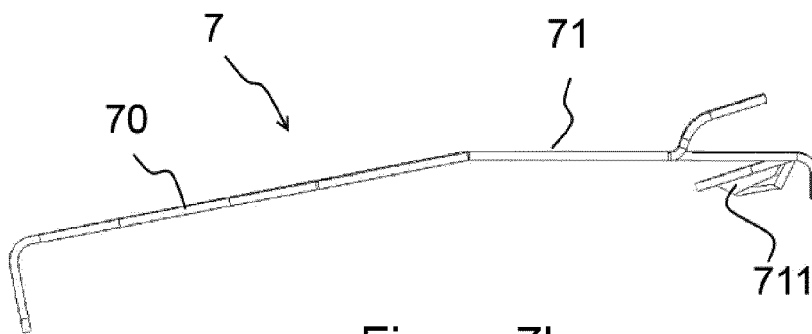


Figure 7b

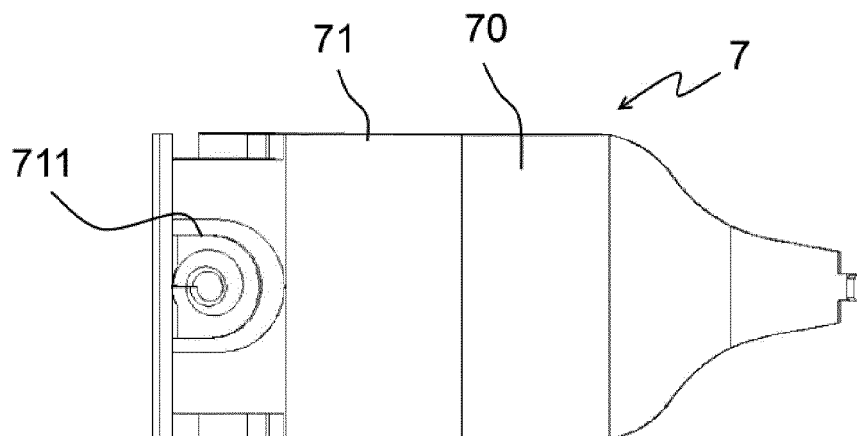


Figure 7c

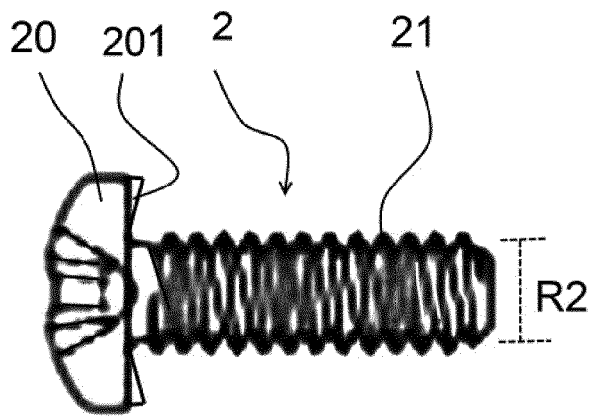


Figure 8a

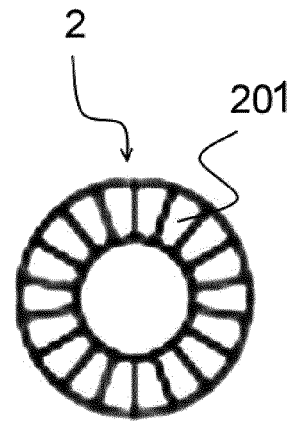


Figure 8b

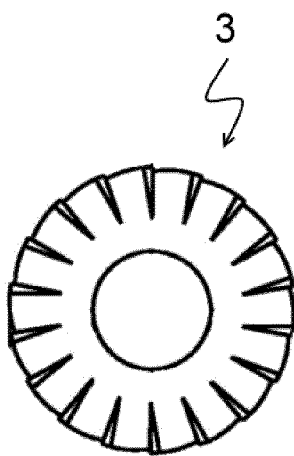


Figure 9a

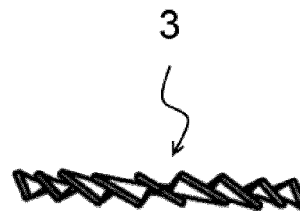


Figure 9b



EUROPEAN SEARCH REPORT

Application Number
EP 15 18 1588

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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
Y	GB 2 143 030 A (BOSCH SIEMENS HAUSGERAETE) 30 January 1985 (1985-01-30) * page 2, line 118 - page 3, line 50; figures 5-7 *	1-9	INV. F24C15/10
Y	DE 88 11 910 U1 (BOSCH-SIEMENS HAUSGERAETE GMBH) 10 November 1988 (1988-11-10) * page 4, line 9 - line 34; figures 2,3 * * page 3, line 26 - line 28; figures 2,3 * * page 4, line 19 - line 23; figures 2,3 *	1-9	
A	WO 2008/072936 A1 (LG ELECTRONICS INC [KR]; ROH HEE-SUK [KR]; PARK BYEONG-WOOK [KR]) 19 June 2008 (2008-06-19) * sentence 19 - sentence 24; figure 2 *	1-9	
A	GB 561 669 A (ENGLISH ELECTRIC CO LTD; JOHN ALLISTAIR FRASER; ROBERT WILLIAM HUMM) 30 May 1944 (1944-05-30) * page 3, line 7 - line 52; figures 1-4 *	1-9	
A	US 2003/005829 A1 (TAPLAN MARTIN [DE] ET AL) 9 January 2003 (2003-01-09) * paragraph [0029]; figure 1 *	1-9	
A,D	DE 10 2005 010044 A1 (BSH BOSCH SIEMENS HAUSGERAETE [DE]) 7 September 2006 (2006-09-07) * paragraph [0013]; figures 1-4 *	1-9	TECHNICAL FIELDS SEARCHED (IPC)
A	GB 2 281 155 A (DAIICHI DENSO BUHIN [JP]) 22 February 1995 (1995-02-22) * abstract; figure 1 *	1-9	F24C
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
The Hague		12 January 2016	Mendão, João
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			

EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 15 18 1588

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
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

12-01-2016

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15

20

25

30

35

40

45

50

55

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
GB 2143030 A	30-01-1985	DE 3324783 A1	17-01-1985
		ES 289155 U	16-08-1986
		ES 292952 U	01-07-1986
		FR 2548765 A1	11-01-1985
		GB 2143030 A	30-01-1985
		IT 1174232 B	01-07-1987
		NL 8402097 A	01-02-1985
		NO 842752 A	09-01-1985
DE 8811910 U1	10-11-1988	PT 78849 A	01-08-1984
		NONE	
		DE 8811910 U1	10-11-1988
		WO 2008072936 A1	19-06-2008
		EP 2095022 A1	02-09-2009
		KR 20080054882 A	19-06-2008
		US 2010018961 A1	28-01-2010
		WO 2008072936 A1	19-06-2008
GB 561669 A	30-05-1944	NONE	
		US 2003005829 A1	09-01-2003
		CN 1396411 A	12-02-2003
		DE 10132899 C1	06-02-2003
		FR 2827036 A1	10-01-2003
		GB 2381860 A	14-05-2003
		JP 2003045626 A	14-02-2003
		TW 591192 B	11-06-2004
US 2003005829 A1	09-01-2003	US 2003005829 A1	09-01-2003
		DE 102005010044 A1	07-09-2006
		NONE	
		GB 2281155 A	22-02-1995
		CA 2129605 A1	19-02-1995
		CN 1109221 A	27-09-1995
		DE 4428699 A1	02-03-1995
		GB 2281155 A	22-02-1995
GB 2281155 A	22-02-1995	HK 1001074 A1	22-05-1998
		JP 2816800 B2	27-10-1998
		JP H0757793 A	03-03-1995
		SG 67878 A1	19-10-1999
		US 5458512 A	17-10-1995

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- GB 2154079 A [0003]
- DE 102005010044 [0004]