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(54) **Cooking hob**

(57) The invention relates to a Cooking hob (2), wherein the hob (2) has a plurality of heating elements (3, 3', 3", 3"', 3"") and wherein the heating elements (3, 3', 3", 3"', 3"") have a rectangular shape. To improve the flexibility of the hob, the invention is characterized in that each heating element (3, 3', 3", 3"', 3"") is controlled separately by a controlling device (4, 4', 4", 4"', 4"") and groups of adjacent heating elements can be switched together and/or activated by the controlling device.

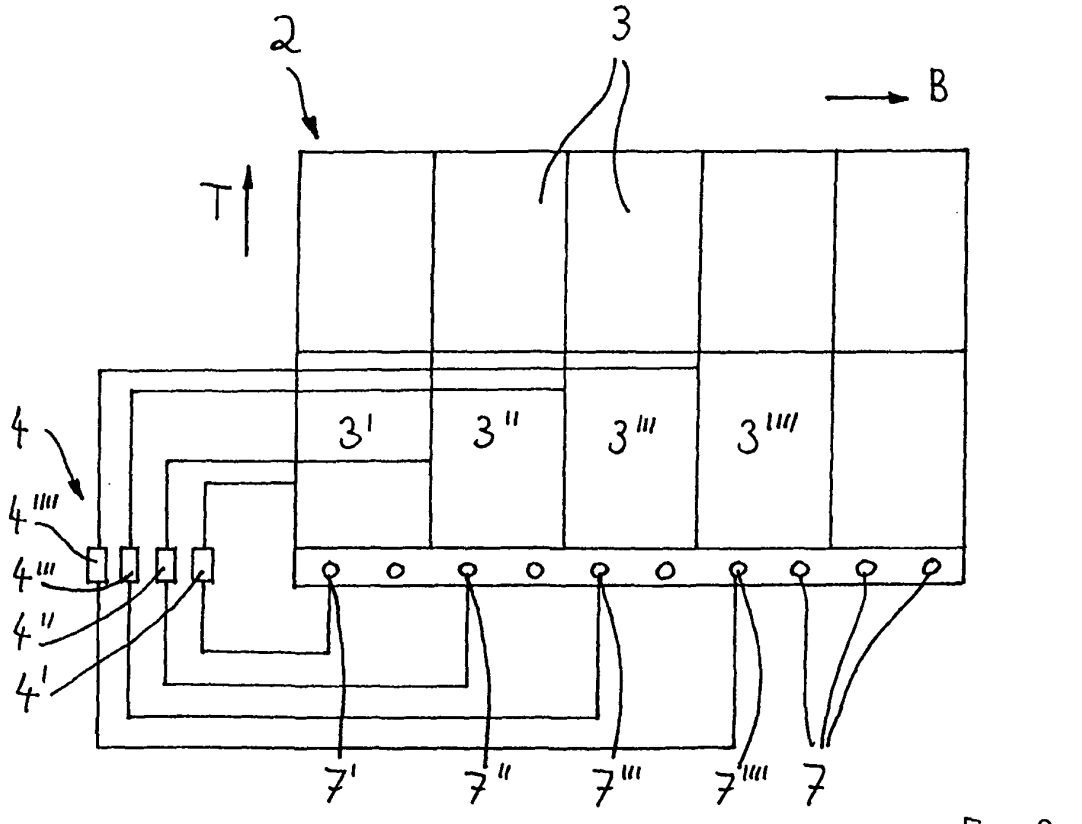


Fig. 2

EP 2 001 266 A1

Description

[0001] The invention relates to a cooking hob, wherein the hob has a plurality of heating elements and wherein the heating elements have a rectangular shape.

[0002] Hobs of this kind are known for example from EP 0 921 711 A1. Here, an induction oven is disclosed which has a hob which is divided into separate,hob parts. All hob parts are equipped with rectangular induction coils. To reduce the space required for cooking using a certain number of cooking pots the disclosed induction oven supplies each hob part with two induction coils which are controlled together, i. e. dependently from each another.

[0003] It has been found that it is beneficial to improve such a hob so that a higher degree of flexibility can be obtained. The different cooking pots should be heated up in an optimal way dependent on their size. Also the introduction of heating energy should take place in an efficient way depending on the geometry of the cooking pots.

[0004] Therefore, it is an object of the invention to further develop a cooking hob according to the above mentioned kind, so that a plurality of cooking pots of different sizes can be heated up in an optimised way in term of energy consumption. So, the flexibility of the hob in the daily practice should be improved.

[0005] The solution of this object according to the invention is characterized in that each heating element is controlled separately by a controlling device and groups of at least two adjacent heating elements can be switched together and/or activated by the controlling device.

[0006] By designing a cooking hob in this way it becomes possible to focus or adapt the action of the different heating elements on the specific size of a cooking pot or utensil in which food is to be heated up, namely by selecting the group of heating elements on which the pot stands or which are closest to the pot by means of the controlling device.

[0007] Preferably a detection device, e.g. an inductive or capacitive detection device, is provided to detect on which of the heating elements the pot or cooking utensil is standing or is closest to and these heating elements are grouped together as a cooking zone or activated to heat the pot.

[0008] Preferably the heating elements are induction heating elements or coils. I this case the heating elements themselves can be part of an inductive detection device for detecting the presence and size of a cooking utensil or pot.

[0009] It is also possible that the heating elements are resistance heating elements.

[0010] The hob is preferably divided into at least two rows of hob parts which are arranged along a direction from the front side to the rear side of the hob, wherein each hob part has one heating element. Also it is beneficial that the hob is divided into at least four columns of hob parts which are arranged along a direction transversely to the direction from the front side to the rear side of the hob, wherein each hob part has one heating element.

[0011] The extension of the hob parts in the direction from the front side to the rear side is advantageously between 200 mm and 250 mm. The extension of the hob parts in the direction transversely to the direction from the front side to the rear side is preferably between 130 mm and 160 mm.

[0012] Preferably, the extensions of all hob parts are equal in the direction from the front side to the rear side; also the extensions can be equal in the direction transversely to the direction from the front side to the rear side.

[0013] In a preferred embodiment of the invention four or five hob parts are arranged along the direction transversely to the direction from the front side to the rear side and two hob parts are arranged along the direction from the front side to the rear side.

[0014] Preferably, each heating element is switchable on and off by a separate switch which is part of the controlling device. Also, a preferred embodiment comes up with each heating element being adjustable in its energy consumption by a separate switch which is part of the controlling device.

[0015] By this design of a cooking hob the flexibility is enhanced when using cooking devices of different sizes. It can be made sure that only the required area is heated up, depending on the specific geometry of the cooking dish.

[0016] In the drawings an embodiment of the invention is depicted.

Fig. 1 shows schematically a domestic oven in perspective view,

Fig. 2 shows a top plan view of the empty hob of the oven and

Fig. 3 shows the top plan view of the hob of the oven with different cooking pots.

[0017] Fig. 1 shows a domestic oven 1. On the upper surface of the oven 1 a cooking hob 2 is located. The hob is supplied with a plurality of heating elements 3. A selection of heating elements are numbered with 3', 3", 3"' and 3"". Each heating element 3 has a rectangular shape in the top view. As can be seen in fig. 2 each heating element 3 forms with regard to its extensions a respective part of the hob 2, i. e. a hob part.

[0018] It is an important feature of the present invention that each heating element 3, 3', 3", 3"', 3"" is controlled separately by a controlling device 4, 4'; 4", 4"', 4"". The switching on and off as well as the adjustment of the heating power is done by a number of switches 7, which are arranged in the front side 5 of the oven 1.

[0019] Each individual switch 7', 7", 7"', 7"" is connected to a separate controlling device 4, 4', 4", 4"', 4"" as illustrated in fig. 2.

[0020] So, it becomes possible to switch and to adjust each individual heating element 3', 3", 3"' and 3"" by a separate switch 7', 7", 7"' and 7"".

[0021] The arrangement and the relative size of the heating elements 3 are apparent from figures 2 and 3.

[0022] In the direction T from the front side 5 to the rear side 6 of the oven 1 two rows of heating elements 3 or hob parts are arranged.

[0023] In the direction B transversely to the direction T five columns of heating elements 3 or hob parts are arranged.

[0024] Consequently, the depicted embodiment of the hob 2 has 2 x 5 = 10 separate heating elements 3 which can be switched and/or adjusted separately.

[0025] The advantage of this design becomes apparent from fig. 3, which shows an example only for using the hob 2. Here, different cooking pots or cooking dishes are schematically depicted which are placed on the hob 2.

[0026] A big pot 8 is arranged on two of the hob parts or heating elements 3', 3" respectively. So, by activating the heating elements 3' and 3" the big pot 8 can be heated up'.

[0027] The hob part or heating element in the left upper corner is used when a small pot 9 is to be heated up.

[0028] The middle hob part or heating element in the upper row of heating elements is used when a pan 10 is to be heated up.

[0029] Finally, the four heating elements in the upper and lower row, which are located on the right side of the hob 2, are used to heat up a roasting tray 11. Here, the energy of four heating elements is employed.

[0030] So, the placement of cooking dished on the hob is more flexible compared with pre-known solutions.

[0031] The pot/dish/tray can be placed so that one heating element is covered - specifically the centre of it - and the boarder line between the different heating elements is not passed.

[0032] An alternative positioning is to place the pot/dish/tray so that more than one heating element is covered. Here, the common boarder line of two or more adjacent heating elements is not passed.

[0033] There is no fix zone or zone size on the hob; the effective area of the hob used for heating up a specific pot is adjusted and therefore optimized.

[0034] A preferred embodiment of the invention has a width of the oven 1 (in direction B) of about 80 cm. The effective width of the hob 2 (in direction B) is e. g. 715 mm. Here a single hob part or heating element 3 has a width of 143 mm.

[0035] The extension of the heating element or hob part in the direction T can be 227.5 mm, so that the total extension is 455 mm.

[0036] The cooking hob 2 can also be a built-in cooking hob instead of being part of an oven 1.

Reference Numerals

[0037]

1	Domestic oven
2	Hob
3	Heating element
3', 3", 3"', 3""	Heating element
4	Controlling device
4', 4", 4"'	
4""	Controlling device
5	Front side
6	Rear side
7	Switch
7', 7", 7"'	
7""	Switch
8	Big pot
9	Small pot
10	Pan
11	Roasting tray
T	Direction
B	Direction

Claims

1. Cooking hob (2) having a plurality of heating elements (3, 3', 3", 3"', 3"") and wherein the heating elements (3, 3', 3", 3"', 3"") have a rectangular shape, **characterized in that**
each heating element (3, 3', 3", 3"', 3"") is controlled separately by a controlling device (4, 4', 4", 4"', 4"") and groups of adjacent heating elements can be switched together and/or activated by the controlling device.

2. Cooking hob according to claim 1, **characterized in that** the heating elements (3, 3', 3", 3"', 3"") are resistance heating elements.

3. Cooking hob according to claim 1, **characterized in that** the heating elements (3, 3', 3", 3"', 3"") are induction heating elements.

4. Cooking hob according to at least one of claims 1 to 3, **characterized in that** the hob is divided into at least two rows of hob parts which are arranged along a direction (T) from the front side (5) to the rear side (6) of the hob, wherein each hob part has one heating element (3, 3', 3", 3"', 3"").

5. Cooking hob according to at least one of claims 1 to 4, **characterized in that** the hob is divided into at least four columns of hob parts which are arranged along a direction (B) transversely to the direction (T) from the front side (5) to the rear side (6) of the hob (1), wherein each hob part has one heating element

(3, 3', 3", 3"', 3"").

6. Cooking hob according to claim 4 or 5, **characterized in that** the extension of the hob parts in the direction (T) from the front side (5) to the rear side (6) is between 200 mm and 250 mm.

7. Cooking hob according to at least one of claims 4 to 6, **characterized in that** the extension of the hob parts in the direction (B) transversely to the direction (T) from the front side (5) to the rear side (6) is between 130 mm and 160 mm.

8. Cooking hob according to at least one of claims 4 to 7, **characterized in that** the extensions of all hob parts are equal in the direction (T) from the front side (5) to the rear side (6).

9. Cooking hob according to at least one of claims 4 to 8, **characterized in that** the extensions of all hob parts are equal in the direction (B) transversely to the direction (T) from the front side (5) to the rear side (6).

10. Cooking hob according to at least one of claims 4 to 9, **characterized in that** four or five hob parts are arranged along the direction (B) transversely to the direction (T) from the front side (5) to the rear side (6) and that two hob parts are arranged along the direction (T) from the front side (5) to the rear side (6).

11. Cooking hob according to at least one of claims 1 to 10, **characterized in that** each heating element (3, 3', 3", 3"', 3"") can be switched on and off by a separate switch (7, 7', 7", 7"', 7"") which is part of the controlling device (4, 4', 4'', 4"', 4"").

12. Cooking hob according to at least one of claims 1 to 11, **characterized in that** each heating element (3, 3', 3", 3"', 3"") is adjustable in its energy consumption by a separate switch (7, 7', 7", 7"', 7"") which is part of the controlling device (4, 4', 4", 4"', 4"").

13. Cooking hob according to any of the preceding claims, comprising a detection device to detect on which of the heating elements the pot or cooking utensil is standing or is closest to, wherein the controlling device groups together or activates these adjacent heating elements as a cooking zone to heat the pot.

14. Cooking hob according to claim 13, wherein heating elements in each pair of adjacent hob parts in rows or columns can be jointly activated or switched on by the controlling device.

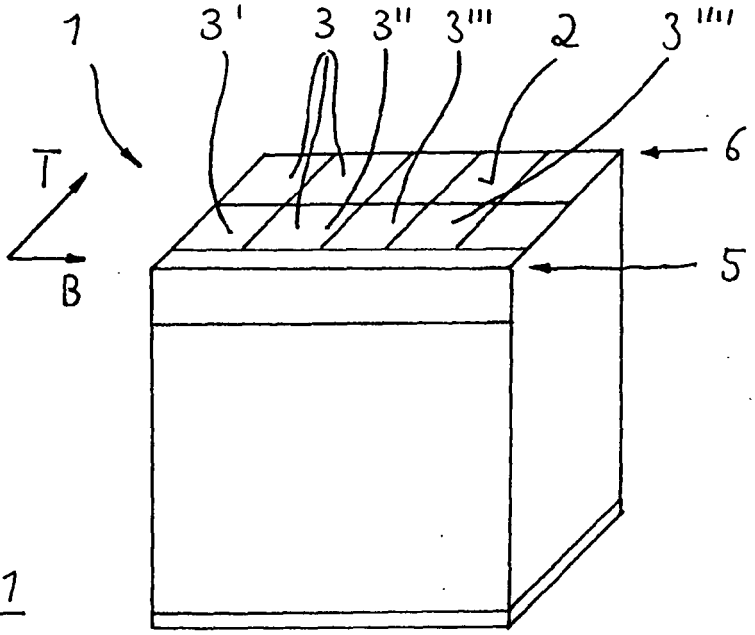


Fig. 1

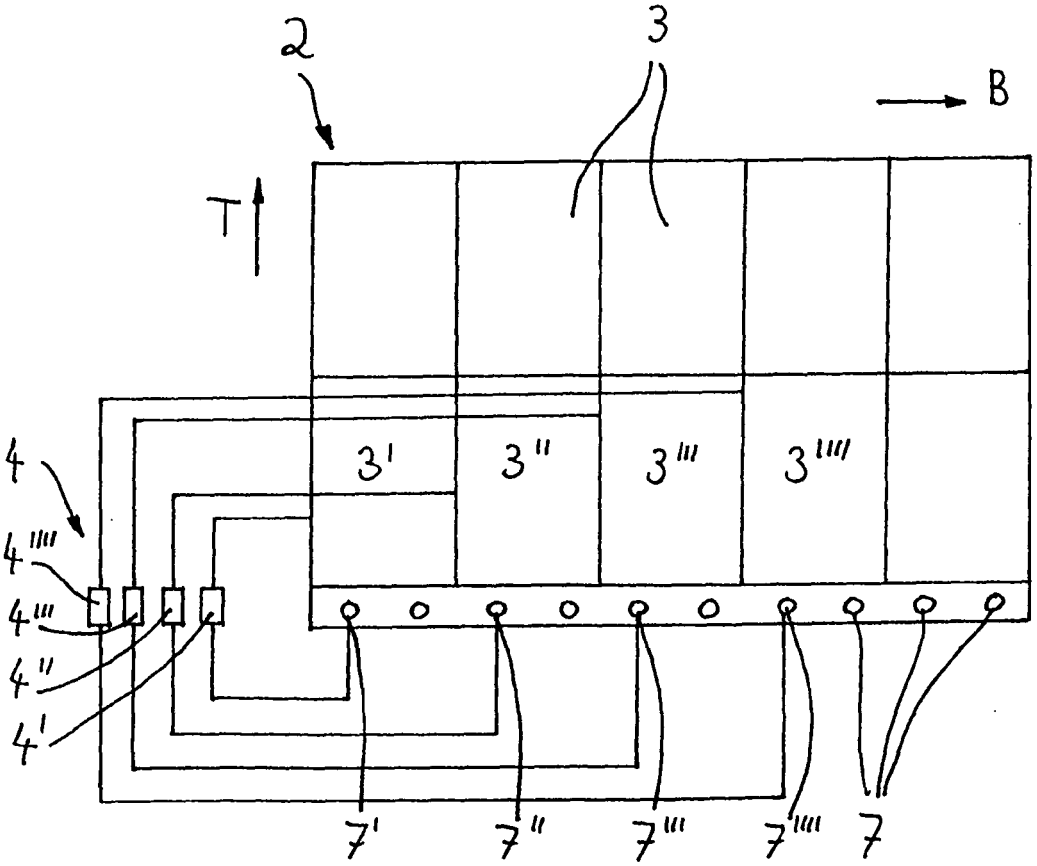
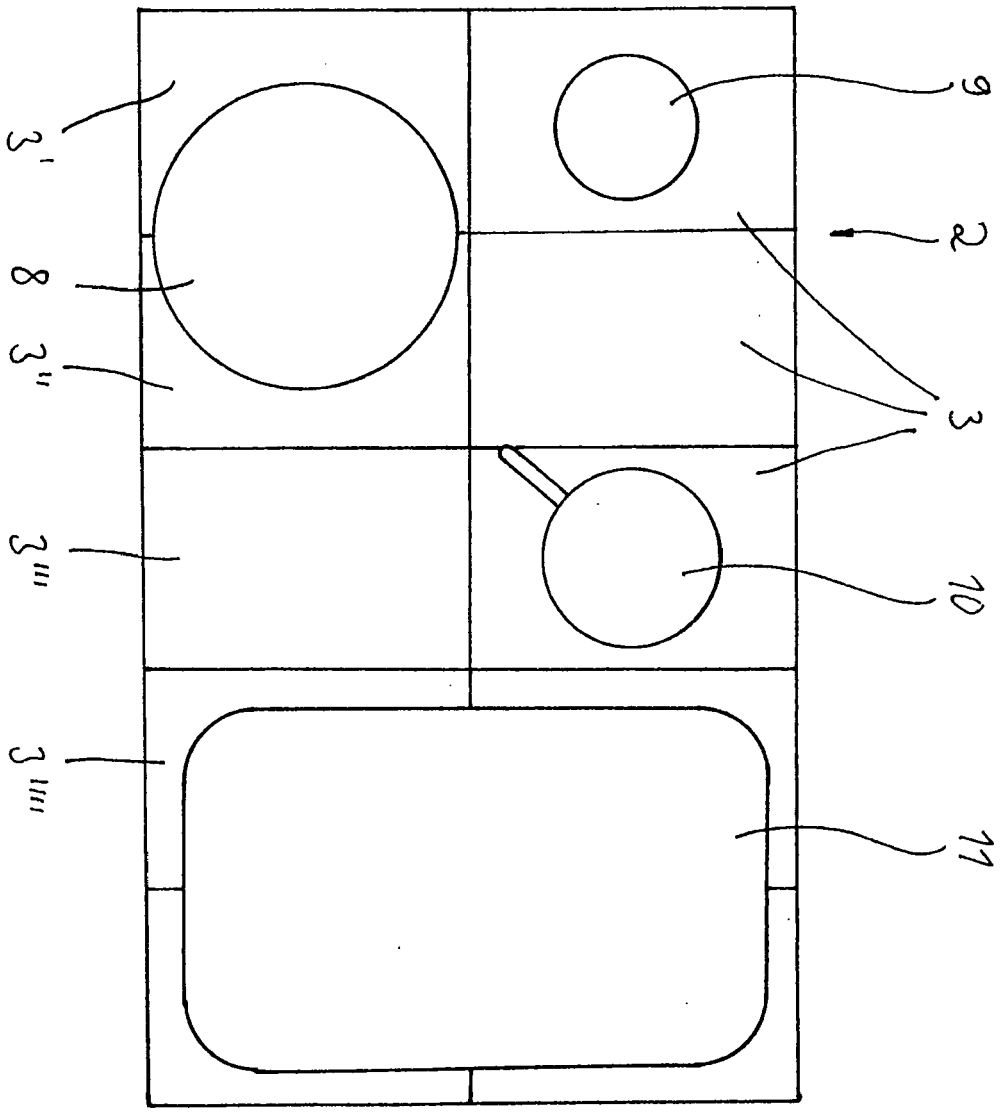


Fig. 2

Fig. 3



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EUROPEAN SEARCH REPORT

Application Number
EP 07 01 1312

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	DE 40 07 680 A1 (GRASS AG [AT]) 19 September 1991 (1991-09-19) * the whole document *	1-14	INV. H05B3/74 H05B6/12
X	US 2003/071031 A1 (GEROLA DAVIDE [IT] ET AL) 17 April 2003 (2003-04-17) * abstract *	1	
X	DE 36 13 902 A1 (EGO ELEKTRO BLANC & FISCHER [DE]) 29 October 1987 (1987-10-29) * abstract *	1	
X	US 6 498 325 B1 (AKEL DOMINIQUE [FR] ET AL) 24 December 2002 (2002-12-24) * abstract *	1	
X	DE 23 55 412 A1 (BOSCH SIEMENS HAUSGERAETE) 15 May 1975 (1975-05-15) * abstract *	1	
X	GB 2 389 767 A (CITY UNIVERSITY OF HONG KONG [HK]) 17 December 2003 (2003-12-17) * abstract *	1	TECHNICAL FIELDS SEARCHED (IPC) H05B
X	EP 0 033 082 A (NEFF WERKE [DE]) 5 August 1981 (1981-08-05) * abstract *	1	
X	EP 1 505 854 A1 (WHIRLPOOL CO [US]) 9 February 2005 (2005-02-09) * abstract *	1	
X	EP 0 706 304 A (WUEST ERNST MENU SYSTEM [CH]) 10 April 1996 (1996-04-10) * abstract *	1	

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	1 October 2007	Garcia, Jesus

CATEGORY OF CITED DOCUMENTS

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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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01-10-2007

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE 4007680 A1	19-09-1991	DE 9007495 U1	11-06-1992
US 2003071031 A1	17-04-2003	NONE	
DE 3613902 A1	29-10-1987	NONE	
US 6498325 B1	24-12-2002	BE 1013307 A3	06-11-2001
		DE 10017175 A1	30-11-2000
		ES 2173022 A1	01-10-2002
		FR 2792158 A1	13-10-2000
		GB 2350766 A	06-12-2000
		IT MI20000771 A1	10-10-2001
		NL 1014886 C2	10-10-2000
DE 2355412 A1	15-05-1975	US 3953711 A	27-04-1976
GB 2389767 A	17-12-2003	NONE	
EP 0033082 A	05-08-1981	DE 3002623 A1	30-07-1981
EP 1505854 A1	09-02-2005	ES 2280009 T3	01-09-2007
		US 2005029245 A1	10-02-2005
EP 0706304 A	10-04-1996	AT 5955 U2	27-01-2003
		CH 689063 A5	31-08-1998

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REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- EP 0921711 A1 **[0002]**