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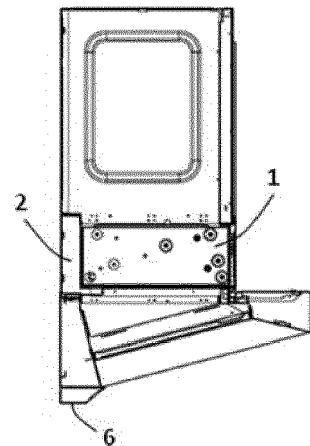
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(54) **RANGE HOOD AND HOUSING COMPONENT THEREOF**

(57) The present application provides an improved range hood and a housing component thereof. The range hood provided in the present application includes an electrostatic absorption apparatus (1) and a high-voltage power supply module (2) that supplies power to the electrostatic absorption apparatus (1), the high-voltage power supply module (2) supplies power to the electrostatic absorption apparatus (1) by means of insertion connection. The technical solution of the present application can be used to reduce hidden dangers.



**FIG. 1**

**Description****BACKGROUND****Technical Field**

[0001] The present application relates to the field of range hoods, and in particular to the field of housing components of range hoods.

**Related Art**

[0002] At present, a solution about a range hood provided with an electrostatic absorption apparatus has been proposed. Generally, the range hood is usually further provided with a high-voltage power supply module that supplies power to the electrostatic absorption apparatus. The high-voltage power supply module of the conventional range hood is usually mounted and disposed in an electric box of the range hood, and supplies power to the electrostatic absorption apparatus through a high-voltage direct current power supply wire. The high-voltage direct current power supply wire usually transmits a high voltage of thousands of volts, and has hidden dangers once it is shorted or short-circuited, or directly contacts with a human body.

[0003] It does not mean that the prior art herein is well-known to a person of ordinary skilled in the art of the present application before the filing date of the present application unless sufficient evidence can be provided for supporting.

**SUMMARY**

[0004] The present application provides an improved range hood and a housing component thereof, so as to solve at least one of the foregoing problems.

[0005] The range hood provided by the present application includes an electrostatic absorption apparatus and a high-voltage power supply module that supplies power to the electrostatic absorption apparatus, and the high-voltage power supply module supplies power to the electrostatic absorption apparatus by means of insertion connection. If the technical solution of the present application is adopted, the high-voltage direct current power supply wire does not need to be provided, thereby reducing hidden dangers.

[0006] Optionally, the range hood further includes an accommodation cavity adapted to accommodate the electrostatic absorption apparatus, and the high-voltage power supply module is used as a partial wall body of the accommodation cavity. Thus, when the electrostatic absorption apparatus is placed in the accommodation cavity, the electrostatic absorption apparatus and the high-voltage power supply module are adjacent to each other and can be connected by insertion easily.

[0007] Optionally, the high-voltage power supply module is used as at least a partial rear wall of the accom-

modation cavity, the accommodation cavity includes a placement opening, and the electrostatic absorption apparatus is disposed to adapt to penetrate through the placement opening to be placed in the accommodation cavity toward the rear wall of the accommodation cavity till the electrostatic absorption apparatus is connected to the high-voltage power supply module by insertion. Thus, when the electrostatic absorption apparatus is placed in the accommodation cavity, the electrostatic absorption apparatus and the high-voltage power supply module are adjacent to each other, and can be connected by insertion easily.

[0008] Optionally, the accommodation cavity includes a placement opening and a rear wall gap disposed opposite to each other and the high-voltage power supply module blocks the rear wall gap. Thus, when the electrostatic absorption apparatus is placed in the accommodation cavity, the electrostatic absorption apparatus and the high-voltage power supply module are adjacent to each other, and can be connected by insertion easily.

[0009] Optionally, one of the high-voltage power supply module and the electrostatic absorption apparatus is provided with a plug portion, and the other of the high-voltage power supply module and the electrostatic absorption apparatus is provided with a socket portion adapted to connect to the plug portion by insertion.

[0010] Optionally, the socket portion includes an insertion connection spring.

[0011] Optionally, the plug portion is disposed on the electrostatic absorption apparatus, and the plug portion includes a ground electrode plug portion, an absorption electrode plug portion, and an ionization electrode plug portion sequentially arranged. Thus, the ground electrode plug portion and the ionization electrode plug portion that have a large voltage difference have a long creepage distance there-between, thereby reducing or avoiding a creepage phenomenon.

[0012] Optionally, at least one insulation isolation wall is disposed between the ground electrode plug portion and the absorption electrode plug portion and at least two insulation isolation walls are disposed between the absorption electrode plug portion and the ionization electrode plug portion, thereby reducing or avoiding a creepage phenomenon.

[0013] Optionally, the high-voltage power supply module includes a mains power supply wire or a low-voltage direct current power supply wire used to supply power to the high-voltage power supply module.

[0014] Optionally, the range hood further includes a housing, the housing includes a gap portion, and the high-voltage power supply module blocks the gap portion, thereby reducing the thickness of the range hood.

[0015] Optionally, the accommodation cavity is provided with a bottom air inlet and a top air outlet.

[0016] Optionally, the range hood further includes a fan and the fan is located above the top air outlet of the accommodation cavity.

[0017] Optionally, the range hood further includes a

filter net, and the filter net is located below the bottom air inlet of the accommodation cavity.

[0018] The present application further provides a housing component of a range hood that includes a housing, the housing including an accommodation cavity adapted to accommodate an electrostatic absorption apparatus, and further includes a high-voltage power supply module adapted to supply power to the electrostatic absorption apparatus. The high-voltage power supply module is fixed on the housing and includes a plug portion or a socket portion used to supply power to the electrostatic absorption apparatus. If the technical solution of the present application is adopted, the high-voltage direct current power supply wire does not need to be provided, thereby reducing hidden dangers.

[0019] Optionally, the high-voltage power supply module is used as a partial wall body of the accommodation cavity. Thus, when the electrostatic absorption apparatus is placed in the accommodation cavity, the electrostatic absorption apparatus and the high-voltage power supply module are adjacent to each other, and can be connected by insertion easily.

[0020] Optionally, the housing includes a gap portion and the high-voltage power supply module blocks the gap portion, thereby reducing the thickness of the housing component.

[0021] Optionally, the housing further includes a chassis and a smoke collection cover and the accommodation cavity is located between the chassis and the smoke collection cover.

[0022] It should be noted herein that, the azimuth expressions such as "rear wall", "bottom air inlet", "top air outlet", "above", "under", "bottom", "bottom surface", "top surface", and "side surface" in the present application refer to common use states of a range hood if no particular indication is provided.

[0023] The content of the technical solution of the present application does not describe all possible embodiments of the present application. In the whole application, examples are provided in many positions to provide instructions, and the examples can be used in various feasible combinations.

### BRIEF DESCRIPTION OF THE DRAWINGS

[0024] The following accompanying drawings only describe and interpret the present application exemplarily, and do not limit the scope of the present application, wherein:

FIG. 1 is a sectional diagram of embodiment 1 of the range hood of the present application;

FIG. 2 is a schematic structural diagram of embodiment 1 of the range hood of the present application;

FIG. 3 is a schematic diagram of a partial structure of embodiment 1 of the range hood of the present

application;

FIG. 4 is an enlarged diagram of position A in FIG. 3; and

FIG. 5 is a schematic structural diagram of the electrostatic absorption apparatus of embodiment 1 of the range hood of the present application.

### 10 DETAILED DESCRIPTION

[0025] In order to make the objective, solution, and beneficial effects of the present application more clear and comprehensible, the present application is further described with reference to the accompanying drawings and the preferred embodiments.

#### Embodiment 1

[0026] The present application provides an embodiment of a range hood, including a fan, a filter net 5, an oil cup 6, a chassis 3, a smoke collection cover 4, a decorative cover, an electrostatic absorption apparatus 1, a high-voltage power supply module 2 that is used to supply power to the electrostatic absorption apparatus 1 directly, and an accommodation cavity 7 adapted to accommodate the electrostatic absorption apparatus 1, as shown in FIGs. 1 and 2. The fan is disposed in the chassis 3. The oil cup 6 is fixed on a bottom end of the smoke collection cover 4. The accommodation cavity 7 is located between the chassis 3 and the smoke collection cover 4. The accommodation cavity 7 is provided with a bottom air inlet and a top air outlet, as shown in FIG. 3. Specifically, the fan is located above the top air outlet of the accommodation cavity 7, and the filter net 5 is located below the bottom air inlet of the accommodation cavity 7.

[0027] The electrostatic absorption apparatus 1 includes an absorption electrode plate and an ionization wire. There are two electrostatic absorption apparatuses 1, and the two electrostatic absorption apparatuses 1 are arranged in the accommodation cavity 7 in parallel. In FIG. 3, the left electrostatic absorption apparatus 1 is accommodated in the accommodation cavity 7, but the right one 1 is not accommodated yet. The structures of the electrostatic absorption apparatus 1 are the same and the installation positions thereof can be exchanged.

[0028] The accommodation cavity 7 is cuboid, as shown in FIG. 3, the bottom air inlet is located on the bottom surface of the cuboid accommodation cavity 7, and the top air outlet is located on the top surface of the cuboid accommodation cavity 7. The accommodation cavity 7 includes a placement opening and a rear wall gap disposed opposite to each other. The placement opening is located on a side surface of the accommodation cavity 7. The high-voltage power supply module 2 blocks the rear wall gap. The high-voltage power supply module 2 is used as a partial wall body of the accommodation cavity 7, and specifically, the high-voltage power

supply module 2 is used as a rear wall of the accommodation cavity 7. The electrostatic absorption apparatus 1 is disposed to adapt to penetrate through the placement opening to be placed in the accommodation cavity 7 in a horizontal direction toward the rear wall of the accommodation cavity 7, till the electrostatic absorption apparatus 1 is connected to the high-voltage power supply module 2 by insertion, as shown in FIGs. 1 and 2. The decorative cover (not shown) is placed on the smoke collection cover 4 so as to shield the chassis 3 and the electrostatic absorption apparatus 1.

**[0029]** The high-voltage power supply module 2, also called as a high-voltage generator, has an English abbreviation HVPS (high voltage power supply). The high-voltage power supply module 2 includes a mains power supply wire that is used to supply power to the high-voltage power supply module 2. In this embodiment, the mains power supply wire provides a 220v alternating current to the high-voltage power supply module 2. The high-voltage power supply module 2 supplies power to the electrostatic absorption apparatus 1 by means of insertion connection, that is, when the high-voltage power supply module 2 and the electrostatic absorption apparatus 1 are connected by insertion, the high-voltage power supply module 2 and the electrostatic absorption apparatus 1 are electrically connected, and the high-voltage power supply module 2 supplies a high-voltage direct current required by operation of the electrostatic absorption apparatus 1 to the electrostatic absorption apparatus 1 through the insertion position. The rear side wall of the high-voltage power supply module 2 is exposed outside and faces an installation wall (in this embodiment, the range hood is fixed on the installation wall).

**[0030]** The electrostatic absorption apparatus 1 is provided with a plug portion, the high-voltage power supply module 2 is provided with a socket portion adapted to connect to the plug portion by insertion. Specifically, the plug portion of the electrostatic absorption apparatus 1 includes a ground electrode plug portion 9, an absorption electrode plug portion 10, and an ionization electrode plug portion 11 sequentially arranged, as shown in FIG. 5. The absorption electrode plug portion 10 is electrically connected to the absorption electrode plate of the electrostatic absorption apparatus 1. The ionization electrode plug portion 11 is electrically connected to the ionization wire of the electrostatic absorption apparatus 1. An insulation isolation wall is disposed between the ground electrode plug portion 9 and the absorption electrode plug portion 10, and two parallel insulation isolation walls are disposed between the absorption electrode plug portion 10 and the ionization electrode plug portion 11. The high-voltage power supply module 2 is provided with three socket portions that are one-to-one corresponding to the ground electrode plug portion 9, the absorption electrode plug portion 10, and the ionization electrode plug portion 11 of the electrostatic absorption apparatus 1. Each socket portion has the same structure and includes insertion connection spring 8. For example, the socket portion that

is connected to and cooperates with the ground electrode plug portion 9 by insertion shown in FIG. 4 includes two insertion connection springs 8 that have a gap there-between. When the ground electrode plug portion 9 is inserted into the gap, the two insertion connection springs 8 are deformed elastically to be far away from each other (the gap become large), the ground electrode plug portion 9 is held by the two insertion connection springs 8, and the high-voltage power supply module 2 and the electrostatic absorption apparatus 1 are connected by insertion. At this time, if a user extracts the electrostatic absorption apparatus 1 from the accommodation cavity 7, the ground electrode plug portion 9 is separated from the two insertion connection springs 8, and the two insertion connection springs 8 are recovered from the elastic deformation. It should be noted herein that, since there are two electrostatic absorption apparatuses 1, the high-voltage power supply module 2 has six socket portions in total correspondingly.

**[0031]** When the fan is working, an air flow flows through the filter net 5 and then into the bottom air inlet of the accommodation cavity 7, then flows through the electrostatic absorption apparatus 1 and then out of the top air outlet of the accommodation cavity 7, and is finally discharged from the fan.

**[0032]** The foregoing embodiment is only a preferred embodiment of the present application, and other embodiments can be deduced by adding, deleting, altering or replacing some technical features. For example, the mains power supply wire that is used to supply power to the high-voltage power supply module can be replaced as the low-voltage direct current power supply wire, and one end of the low-voltage direct current power supply wire is electrically connected to the high-voltage power supply module, and the other end is electrically connected to an electric box of the range hood. For example, the electrostatic absorption apparatus is provided with a socket portion and the high-voltage power supply module is provided with a plug portion adapted to connect to the socket portion by insertion. In addition, the specific structures of the plug portion and the socket portion and the cooperation manner are not limited to this embodiment, and similar technical solutions of insertion connection in the prior art may also be referred to, for example, the cooperation structure of the power supply plug and the socket.

## Embodiment 2

**[0033]** The present application further provides an embodiment of a housing component of a range hood that includes a housing and a high-voltage power supply module adapted to supply power to an electrostatic absorption apparatus.

**[0034]** The housing includes an accommodation cavity adapted to accommodate the electrostatic absorption apparatus, and the high-voltage power supply module is used as a partial wall body of the accommodation cavity.

[0035] The high-voltage power supply module is fixed to the housing. The high-voltage power supply module includes a socket portion that is used to supply power to the electrostatic absorption apparatus.

[0036] If an electrostatic absorption apparatus is installed into the accommodation cavity of the housing component, one end surface of the electrostatic absorption apparatus is attached to the high-voltage power supply module, and the electrostatic absorption apparatus and the high-voltage power supply module are connected by insertion. Of course, in order to realize the insertion connection with the housing component, the corresponding electrostatic absorption apparatus needs to be provided with a plug portion matching the socket portion of the housing component.

[0037] The foregoing embodiment is only a preferred embodiment of the present application, and other embodiments can be deduced by adding, deleting, altering or replacing some technical features. For example, the housing may also include a chassis and a smoke collection cover, and the accommodation cavity is located between the chassis and the smoke collection cover. Furthermore, for example, the high-voltage power supply module may also be disposed in the housing, and specifically, the high-voltage power supply module is attached onto the inner wall of the housing. Furthermore, for example, the housing may also include a gap portion, and the high-voltage power supply module blocks the gap portion.

[0038] The members in different embodiments can be combined in any feasible manner, so as to realize the objective of the present application.

[0039] It should be additionally noted that, the present application shall not be understood to be limited to the foregoing embodiments, but shall be understood to cover all possible situations determined according to the claims and the disclosure of the specification of the present application. Therefore, any simple alteration, equivalent change or modification made to the above embodiments according to the technical essence of the present disclosure without departing from the content of the present disclosure shall fall within the scope of the present application.

[0040] Reference numerals: 1-electrostatic absorption apparatus, 2-high-voltage power supply module, 3-chassis, 4-smoke collection cover, 5-filter net, 6-oil cup, 7-accommodation cavity, 8-insertion connection spring, 9-ground electrode plug portion, 10-absorption electrode plug portion, 11-ionization electrode plug portion.

## Claims

1. A range hood, comprising an electrostatic absorption apparatus (1) and a high-voltage power supply module (2) that supplies power to the electrostatic absorption apparatus (1), **characterized in that:** the high-voltage power supply module (2) supplies

power to the electrostatic absorption apparatus (1) by means of insertion connection.

2. The range hood according to claim 1, **characterized by:**

further comprising an accommodation cavity (7) adapted to accommodate the electrostatic absorption apparatus (1), wherein the high-voltage power supply module (2) is used as a partial wall body of the accommodation cavity (7).

3. The range hood according to claim 2, **characterized in that:**

the high-voltage power supply module (2) is used as at least a partial rear wall of the accommodation cavity (7);

the accommodation cavity (7) comprises a placement opening; and

the electrostatic absorption apparatus (1) is disposed to adapt to penetrate through the placement opening to be placed in the accommodation cavity (7) toward a rear wall of the accommodation cavity (7) till the electrostatic absorption apparatus (1) is connected to the high-voltage power supply module (2) by insertion.

4. The range hood according to claim 2, **characterized in that:**

the accommodation cavity (7) comprises a placement opening and a rear wall gap disposed opposite to each other; and

the high-voltage power supply module (2) blocks the rear wall gap.

5. The range hood according to any one of the claims 1 to 4, **characterized in that:**

one of the high-voltage power supply module (2) and the electrostatic absorption apparatus (1) is provided with a plug portion, and the other of the high-voltage power supply module (2) and the electrostatic absorption apparatus (1) is provided with a socket portion adapted to connect to the plug portion by insertion.

6. The range hood according to claim 5, **characterized in that:**

the socket portion comprises an insertion connection spring (8).

7. The range hood according to claim 5 or 6, **characterized in that:**

the plug portion is disposed on the electrostatic absorption apparatus (1); and

the plug portion comprises a ground electrode plug portion (9), an absorption electrode plug portion (10), and an ionization electrode plug portion (11) sequentially arranged.

8. The range hood according to claim 7, **characterized in that:**

at least one insulation isolation wall is disposed between the ground electrode plug portion (9) and the absorption electrode plug portion (10); and

at least two insulation isolation walls are disposed between the absorption electrode plug portion (10) and the ionization electrode plug portion (11).

9. The range hood according to any one of the claims 1 to 8, **characterized in that:**

the high-voltage power supply module (2) comprises a mains power supply wire or a low-voltage direct current power supply wire used to supply power to the high-voltage power supply module (2).

10. The range hood according to any one of the claims 1 to 9, **characterized by:**

further comprising a housing that comprises a gap portion, wherein the high-voltage power supply module (2) blocks the gap portion.

11. The range hood according to any one of the claims 2 to 10, **characterized in that:**

the accommodation cavity (7) is provided with a bottom air inlet and a top air outlet.

12. The range hood according to any one of the claims 2 to 11, **characterized by:**

further comprising a fan; wherein the fan is located above the top air outlet of the accommodation cavity (7).

13. The range hood according to any one of the claims 2 to 12, **characterized by:**

further comprising a filter net (5); wherein the filter net (5) is located below the bottom air inlet of the accommodation cavity (7).

14. A housing component of a range hood, comprising a housing, the housing comprising an accommodation cavity (7) adapted to accommodate an electrostatic absorption apparatus (1); **characterized by:**

further comprising a high-voltage power supply module (2) adapted to supply power to the elec-

trostatic absorption apparatus (1); wherein the high-voltage power supply module (2) is fixed to the housing; and the high-voltage power supply module (2) comprises a plug portion or a socket portion used to supply power to the electrostatic absorption apparatus (1).

15. The housing component according to claim 14, **characterized in that:**

the high-voltage power supply module (2) is used as a partial wall body of the accommodation cavity (7).

16. The housing component according to claim 14 or 15, **characterized in that:**

the housing comprises a gap portion; and the high-voltage power supply module (2) blocks the gap portion.

17. The housing component according to anyone of the claims 14 to 16, **characterized in that:**

the housing further comprises a chassis (3) and a smoke collection cover (4); and the accommodation cavity (7) is located between the chassis (3) and the smoke collection cover (4).

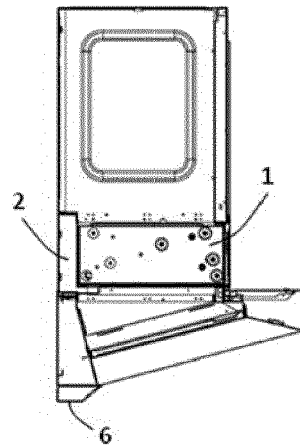


FIG. 1

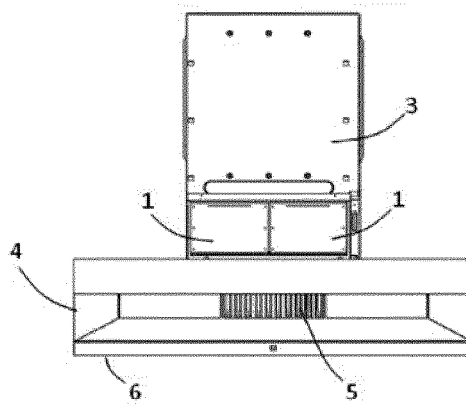


FIG. 2

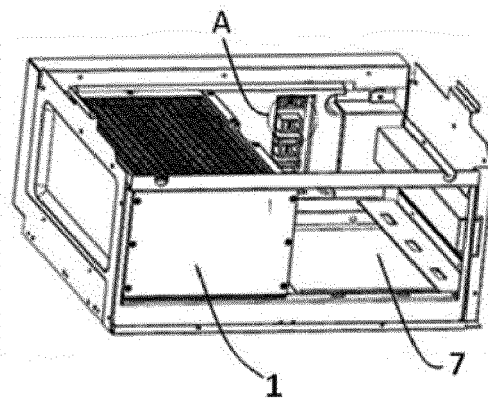


FIG. 3

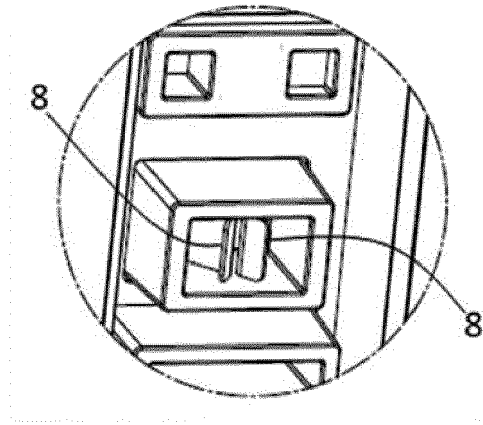


FIG. 4

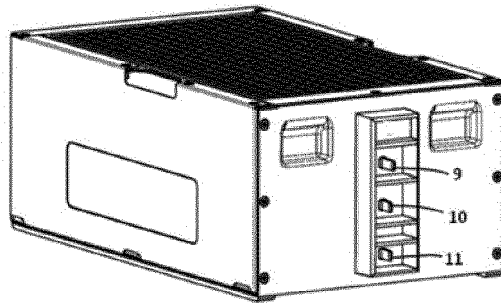


FIG. 5





EUROPEAN SEARCH REPORT

Application Number  
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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)
X	US 3 785 124 A (GAYLORD A) 15 January 1974 (1974-01-15)  * figures 1,2,5 *	1,2,5, 9-12, 14-16	INV. F24C15/20
X	CN 204 268 544 U (ZHONGSHAN RISHUN KITCHEN & BATH CO LTD) 15 April 2015 (2015-04-15) * figures 1,2 *	1,2,5, 9-17 3,4,6-8	
Y	US 3 989 486 A (EMERSON ELECTRIC CO) 2 November 1976 (1976-11-02) * column 2, lines 12-15, 21-27, 37-44; figures 1,2 *	3,4	
Y	US 2007/039462 A1 (HELT ROBERT W [US] ET AL) 22 February 2007 (2007-02-22) * paragraph [0051] *	6-8	
			TECHNICAL FIELDS SEARCHED (IPC)
			F24C
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 9 November 2018	Examiner Canköy, Necdet
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  
ON EUROPEAN PATENT APPLICATION NO.

EP 18 17 9132

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

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30

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40

45

50

55

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 3785124 A	15-01-1974	AU 465037 B2	18-09-1975
		CA 940761 A	29-01-1974
		CH 560358 A5	27-03-1975
		DE 2237843 A1	15-02-1973
		FR 2154430 A1	11-05-1973
		GB 1350857 A	24-04-1974
		JP S509095 B1	10-04-1975
		US 3785124 A	15-01-1974
		ZA 7204721 B	25-04-1973
-----			
CN 204268544 U	15-04-2015	NONE	
-----			
US 3989486 A	02-11-1976	NONE	
-----			
US 2007039462 A1	22-02-2007	CA 2614818 A1	22-02-2007
		CN 101242903 A	13-08-2008
		EP 1915215 A1	30-04-2008
		US 2007039462 A1	22-02-2007
		WO 2007021854 A1	22-02-2007
-----			