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(54) FILTERING BODY FOR AN EXTRACTOR HOOD AND EXTRACTOR HOOD COMPRISING A FILTERING BODY

(57) A filtering body (1) for a downdraught extractor hood (2), said extractor hood (2) being associated with a hob (3) and comprising an aspiration opening (5) created inside this hob (3), an aspiration unit (10) connected to this opening (5), and the filtering body (30) interposed between said opening (5) and the aspiration unit, said filtering body (1) comprising at least one filtering unit (30) below said opening, and overlying a unit for collection of liquids coming from the opening (5) in the hob (3) and/or of condensate which is created on the filtering unit; said filtering unit (30) has a central portion (35) going towards said opening (5) and lateral parts (36) going away from said opening, and being able to convey the liquids, oil and grease and/or condensate into the collection unit below which has an annular form.

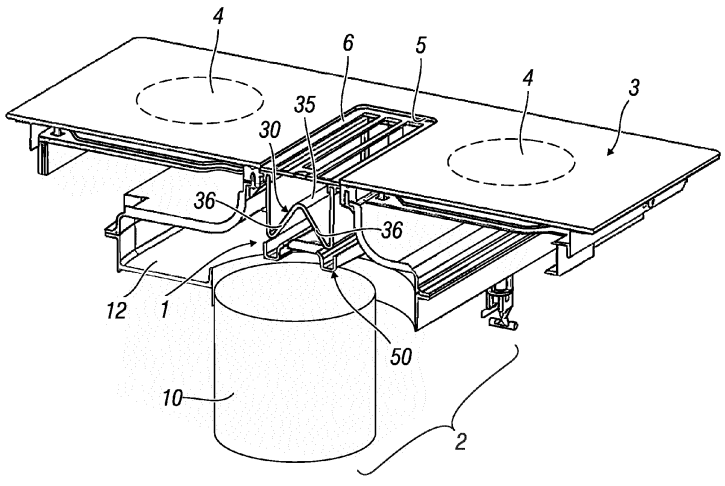

Fig. 1

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Description

[0001] The subject of the present invention is a filtering body for a downdraught extractor hood, according to the preamble of the main claim.

[0002] As is known, a downdraught extractor hood (or downdraught hood) is an extractor hood which is associated directly with a kitchen hob; this hood comprises an aspiration opening provided on this hob (centrally and between heating elements of said hob, or laterally thereto), through which the fumes which are generated on the hob itself during the preparation of food (containing water vapour and possibly grease) are aspirated by an aspiration unit placed below the hob and then emitted into the environment or ejected to the exterior thereof. Before being emitted from the hood, these fumes are filtered by at least one filtering unit which is placed between said opening on the hob and the aspiration unit. Channels optionally connect the components of the hood in an appropriate manner.

[0003] With a downdraught extractor hood of this type, there is the possible problem of intake of liquid emerging from the pots placed on the heating elements, into the aspiration opening, and possible transfer thereof to the piping and to the filtering unit. This could give rise to problems in filtering of the fumes, and in terms of the level of liquids and condensate in the pipes.

[0004] Solutions are known which can prevent, or at least attempt to prevent the above-described problem from arising. For example, US2019/0203949 describes an insert for a hood of the downdraught type which comprises a filtering unit and a collection element to receive liquids, this unit and this element being able to be connected to one another. The collection element has at least one surface for guiding the fumes aspirated, which surface can deflect the flow of these fumes. This surface has a curved or oblique form.

[0005] The objective of the present invention is to provide a filtering body for a downdraught extractor hood which permits the collection of any liquid entering the hood, said filtering body being improved in comparison with the known solutions.

[0006] In particular, the objective of the present invention is to provide a compact filtering body which is simple to produce and position in the hood.

[0007] Another objective is to provide a filtering body of the aforementioned type which does not affect the normal operation of the hood, i.e. which does not reduce the efficiency thereof.

[0008] Another objective is to provide a filtering body of the aforementioned type which is efficient in retaining the grease which is present in the fumes aspirated from the hob.

[0009] A further objective is to provide a downdraught hood which is provided with this filtering body.

[0010] These objectives and others, which will become apparent to persons skilled in the art, are achieved by a filtering body and a downdraught hood according to the corresponding independent claims.

[0011] For better understanding of the present invention, and purely by way of non-limiting example, the following drawings are appended in which:

figure 1 shows a schematic illustrative view of a downdraught hood according to the invention, provided with the filtering body according to the present invention;
figure 2 shows a view in perspective of a filtering body according to the invention;
figure 3 shows a cross-section according to the line 3-3 in figure 2;
figure 4 shows a view in perspective of the part shown in cross-section in figure 3;
figure 5 shows an enlarged view of the detail indicated as A in figure 3;
figure 6 shows a variant of the invention; and
figure 7 shows an enlarged view of a variant of part of the detail of figure 3.

[0012] With reference to the aforementioned figures, a filtering body 1 can be used in a downdraught extractor hood 2 which can be associated with a hob 3 with heating elements 4, for example induction heating elements. In particular, the hood 2 comprises an aspiration opening 5 provided with a grid 6 which is created in the hob 3, and is connected, as in figure 1, directly (or by means of a duct) to the filtering body 1, which in turn is interposed between the opening 5 and an aspiration unit 10 of a type which in itself is known. From this aspiration unit there extends a duct for output of the air aspirated and filtered (which duct is not shown), which air is ejected into the environment where the hob 3 is located, or to the exterior thereof, in known manners.

[0013] In a case in which the aspiration opening 5 has a rectangular form, the filtering body 1 which is placed below it has a solid prismatic geometric substantially parallelepiped form (see Fig. 2). If the opening has another form, for example circular, the filtering body could also have another form (cylindrical, cubic, or other).

[0014] The filtering body 1 comprises a perimeter frame 15 with openings 17 and 18 at an upper side or face and a lower side or face of the frame 15. The frame preferably also has openings 16 on two opposite lateral flanks (long flanks of the frame 15). The upper opening 17 faces towards the aspiration opening 5, whereas the lower opening 18 faces towards the underlying aspiration unit (to which the filtering body can be connected directly or indirectly by means of an appropriate duct, not shown).

[0015] The frame 15 is inserted inside a wide recovery tray 12, which is placed around this frame, and can recuperate liquids, oil or grease which may come from the hob 3, through the aspiration opening 5.

[0016] Inside the lateral openings 16 of the frame 15, there are placed portions 20A of a first filtering element 20 defined by a reticulated, optionally multi-layer body made of aluminium or a similar metal (such as also stain-

less steel). This first filtering element 20 is also present at the lower opening 18 of the frame 15 of the filtering body 1 with a lower portion 20B thereof.

[0017] The first filtering element has, at least at its (lower) portion 20B, a second filtering element which preferably surmounts at least partly the (lateral) portions 20A of the first filtering element. The filtering element 22 is a metal filter, preferably a filter for grease, comprising a body 23 made of metal plate, with a form which is substantially triangular (or that of an inverted "V"), or is at least curved in a part thereof 23A which is superimposed on the lower portion 20B of the first filtering element 20, i.e. its part 23A which is placed at the lower opening 18 of the frame 15 of the filtering body 1.

[0018] Said first and second filtering elements 20 and 22 define a filtering unit 30 of the filtering body 1.

[0019] This filtering unit 30 thus has a form which is triangular (or that of an inverted "V"), or alternatively has an arched transverse cross-section with a central portion or vertex 35 which goes (relatively) close to the aspiration opening 5, and lateral parts 36 which go away from both the sides of the portion 35, going towards the lower opening 18 of the frame 15. These lateral parts 36 are thus connected without interruption to flanks 37 which rise along the lateral openings 16 of said frame. The portion 35, the parts 36 and the flanks 37 are in contact with (or "cover") the first filtering element.

[0020] It should be noted that the second filtering element 22 has a plurality of covered openings 31 spaced from a corresponding superimposed portion 32 which is integral with the filtering element 22, said openings 31 and portions 32 providing the filtering element 22 with the form of a blind where the openings can be assimilated to the slats of the blind. The openings 31 and the corresponding portions 32 (obtained by mechanical deformation of the body 23 of the element 22) can or need not be provided at the vertex 35 of the filtering unit 30, where the second filtering element 22 is made of solid plate. In the case represented in figures 1-5, the first openings are provided, starting from this vertex 35, on the initial parts of the lateral parts 36 of the filtering unit; figure 6 shows the solution with the openings 31, which are also provided at the vertex 35.

[0021] It will be appreciated that the openings 31 can also be created with different forms and/or embodiments from those described in relation with the figures, which represent only a non-limiting example of the invention.

[0022] For example, these openings 31 can also have forms different from the one shown in figure 4 for example. In a first variant, instead of lying with its axis parallel to the long sides of the frame 15, each opening 31 lies along axes orthogonal to these long sides, as in figure 6; each opening can also have a circular or polygonal form, such as the one shown in figure 7, where it has the form of rhombus. This is a possible variant of the openings 31 present in the second filtering element 22 created by means of stretching of the metal plate from which the element is defined, without drawing work (like the openings 31 in figures 3-6), which variant is also more economical.

[0023] The thickness of the filtering element 22, the material from which it is obtained, the geometry and dimensions of each opening 31 can be different.

[0024] For example, with reference to figure 7, the thickness S can be between 0.2 and 1 mm, and advantageously between 0.3 and 0.7 mm. The width D of the openings 31 can be between 3 and 10 mm, preferably between 4 and 5 mm, and advantageously between 4 and 4.5 mm. The other dimension D1 of the rhombus of the openings 31 can be between 1 and 6 mm, and preferably between 2 and 4 mm.

[0025] The materials used can be stainless steel, and metal alloys, preferably aluminium alloys.

[0026] Going back to the example in figures 1-5, the filtering unit 30 thus comprises perforated lower lateral ends 38 where the lateral parts 36 converge (or at least where they end), and from which the flanks 37 rise. This unit is supported inside hollows 40 provided in the perimeter frame 15, at the lateral openings 16, and by brackets 41 which have a form complementary to that of the filtering unit 30, and are provided on flat end faces 42 and 43 of the frame 15, in the interior thereof.

[0027] Below the filtering unit 30 (i.e. between this unit, the recovery tray 12 and the aspiration unit 10) a body or unit 50 is provided for collection of liquids, oil and/or grease which may pass through the aspiration opening 5. This collection unit 50, which is associated with the filtering body 30 in a manner adjacent thereto, also receives the condensate of the fumes which are aspirated by the hood 2 through said opening 5.

[0028] More particularly, the collection unit 50 has a substantially annular form, in the sense that it has a central opening 51 which can permit aspiration of the air, through the filtering unit 30, from the opening 5, by the aspiration unit 10. The collection unit has a structure or body 52 which is rendered integral with the frame 15 in a known manner, i.e. by means of ultrasound welding or gluing or the like, in order to have a definitive connection with the frame 15, or by means of snap-coupling between parts of the frame and the structure 52, or by means of other, separable coupling units, if the frame 15 is connected in a manner which can be spaced from this structure.

[0029] The structure 52 has a channel 55 for collection of the liquid which is placed at the lateral ends 38 of the filtering unit, such as to be able to receive therefrom the condensate liquid, or liquid which may have entered the aspiration opening 5.

[0030] This structure 52 has raised lateral edges 52K at the ends of which there are provided lowered parts 88 which can allow the excess liquid which is present in the collection unit 50 to pass into the recuperation pan 12 which surrounds this unit 50. From there the liquid is discharged in any known manner (direct connection to a kitchen drain, drainage valve or the like).

[0031] Finally, the structure 52 itself has a form which

converges towards at least one tank 58 for collection of the liquids, oil and/or grease, such as, for example, appropriate inclination from a first end 52A to a second end 52B of the structure 52 itself, which thus conveys the liquid into the tank 58 placed at the second end 52B; alternatively, as shown in figure 2, two tanks 58 can be present symmetrically at both ends 52A and 52B of the unit 50, the structure of which clearly has parts which converge towards these ends.

[0032] Thanks to the invention, optimum protection of the aspiration unit 10 is obtained against the condensate liquid and against condensate which can penetrate from the aspiration opening 5. In fact, as indicated by the arrows K in Fig. 3, the vapour and any liquid, oil or grease which penetrates from the upper opening 17 of the frame 15 inside the filtering body 1 meets the second filtering element 22, and runs on it, or rather on the portions 32 which are placed above the openings 31 of this filtering element, and falls along the lateral parts 36 of the filtering unit towards the lateral ends 38. These ends are appropriately perforated, such that the liquid oil and/or grease collected can pass through the first filtering element 20 and then fall (arrows P in Fig. 3) into the collection channel 55, so as to reach the tank 58. In the case of "overflow", the liquid can pass to the recovery tray 12 and then be discharged therefrom.

[0033] On the other hand, the fumes can flow on the portions 32, and be returned into the openings 31 by the action of the aspiration unit 10, and thus be filtered before exiting from the filtering body 1, through the opening 41 of the unit 50 for collection of the liquid.

[0034] The filtering body 1 according to the invention is simple to create and move. It provides significant protection with respect to the liquids which may penetrate into the opening 5 from the hob 3, and it is simple to create and replace.

[0035] A description has been provided of a preferred embodiment of the invention. Others are also possible in the light of the content of the following claims.

Claims

1. Filtering body (1) for a downdraught extractor hood (2), which hood can aspirate vapours from a hob (3) through an aspiration opening (5) created in said hob, said filtering body being interposed between said aspiration opening (5) and an aspiration unit (10) of the downdraught hood (2), said filtering body (1) comprising a filtering unit (30) and a unit (50) for collection of liquids, and/or grease coming from the aspiration opening (5) and from the condensate of said aspirated vapours, said filtering body comprising a frame (15) with a solid prismatic or cylindrical geometric form, the frame (15) delimiting at least one upper opening (17) which faces towards said aspiration opening (5), and a lower opening (18) which faces towards said aspiration unit, the filtering unit (30) being inserted inside said frame, **characterised in that** said filtering unit (30) has a central portion (35) going towards said upper opening (17), from sides of said central portion (35), with lateral parts (36) extending, descending towards the lower opening (18) of the frame as far as lateral ends (38) of the filtering unit, the unit (50) for collection of the liquids, oil and grease being present below these ends (38), the frame (15) comprising lateral openings (16) on which there are placed flanks (37) of the filtering unit (30) which are connected to the lateral ends (38) of the lateral parts (36) of the filtering unit which overlie the unit for collection of the liquids, oil and grease, said filtering unit (30) thus rising along said lateral openings (16) of the frame (15), said lateral ends (38) having holes to permit the passage of said liquids, oil and grease into the collection unit (50) below.

2. Filtering body according to claim 1, **characterised in that** said filtering unit (30) has a triangular or arched form in transverse cross-section.

3. Filtering body according to claim 1, **characterised in that** said filtering unit comprises a metal filtering element (22) with a plurality of covered openings (31) spaced from corresponding superimposed portions (32) which are integral with the filtering element (22).

4. Filtering body according to claim 3, **characterised in that** the openings (31) and the portions (32) superimposed thereon have the form of blind slats.

5. Filtering body according to claim 3, **characterised in that** said filtering element (22) is a filter for grease.

6. Filtering body according to claim 3, **characterised in that** said filtering element (22) covers a further, metal filtering element (20) with a reticular body.

7. Filtering body according to claim 1, **characterised in that** said unit (50) for collection of the liquids, oil and grease has a body (52) with an annular form delimiting an opening (51) which faces towards the aspiration unit (10), said body being connected to said frame (15) of the filtering body.

8. Filtering body according to claim 7, **characterised in that** said body (52) has a channel (55) for collection of the liquid, which channel is placed at the lateral ends (38) of the filtering unit (30).

9. Filtering body according to claim 7, **characterised in that** said body has a form which converges towards at least one tank (58) for collection of the liquids, oil and grease, which tank is preferably placed at a corresponding end (52A, 52B) of said body (52).

10. Downdraught extractor hood (2), associated with a hob (3) and comprising an aspiration opening (5) created inside this hob (3), an aspiration unit (10) which is connected to this aspiration opening (5) and a filtering body (30) which is interposed between said opening (5) and the aspiration unit, said filtering body (1) comprising a frame (15) with a solid prismatic or cylindrical geometric form, the frame delimiting at least one upper opening (17) which faces towards said aspiration opening (5), and a lower opening (18) which faces towards said aspiration unit, in said frame there being inserted at least one filtering unit (30) which is below said aspiration opening (5) and overlies a unit (50) for collection of liquids, oil and/or grease coming from the aspiration opening (5) provided in the hob (3) and/or of the condensate which is created on the filtering unit, **characterised in that** said filtering unit (30) has a central portion (35) going towards said opening (5), and lateral parts (36) which are spaced from said opening, and can convey the liquids, oil and grease and/or the condensate inside the collection unit below with an annular form, the frame (15) comprising lateral openings (16) on which there are placed flanks (37) of the filtering unit (30) which are connected to the lateral ends (38) of the lateral parts (36) of the filtering unit overlying the unit for collection of the liquids, oil and grease, said filtering unit (30) thus rising along said lateral openings (16) of the frame (15), said lateral ends (38) having holes to permit the passage of said liquids, oil and grease into the collection unit (50) below.

11. Extractor hood according to claim 10, **characterised in that** said filtering unit (30) comprises a metal filtering element (22) which in transverse cross-section has a triangular or arched form, said filtering element having openings which are in the form of blind slats or are polygonal.

12. Extractor hood according to claim 11, **characterised in that** said filtering element (22) is superimposed on a further reticular filtering element (20).

13. Extractor hood according to claim 10, **characterised in that** it comprises a tray (12) for recuperation of the liquids, oil and/or grease, which tray is placed around the collection unit (50) and can receive said liquids, oil and/or grease which may emerge from said collection unit when it is full, said collection unit (50) having openings in its own frame (15) in raised positions, in order to discharge into the recovery tray (12) liquids, oil and/or grease which may reach a high level in the collection unit (50).

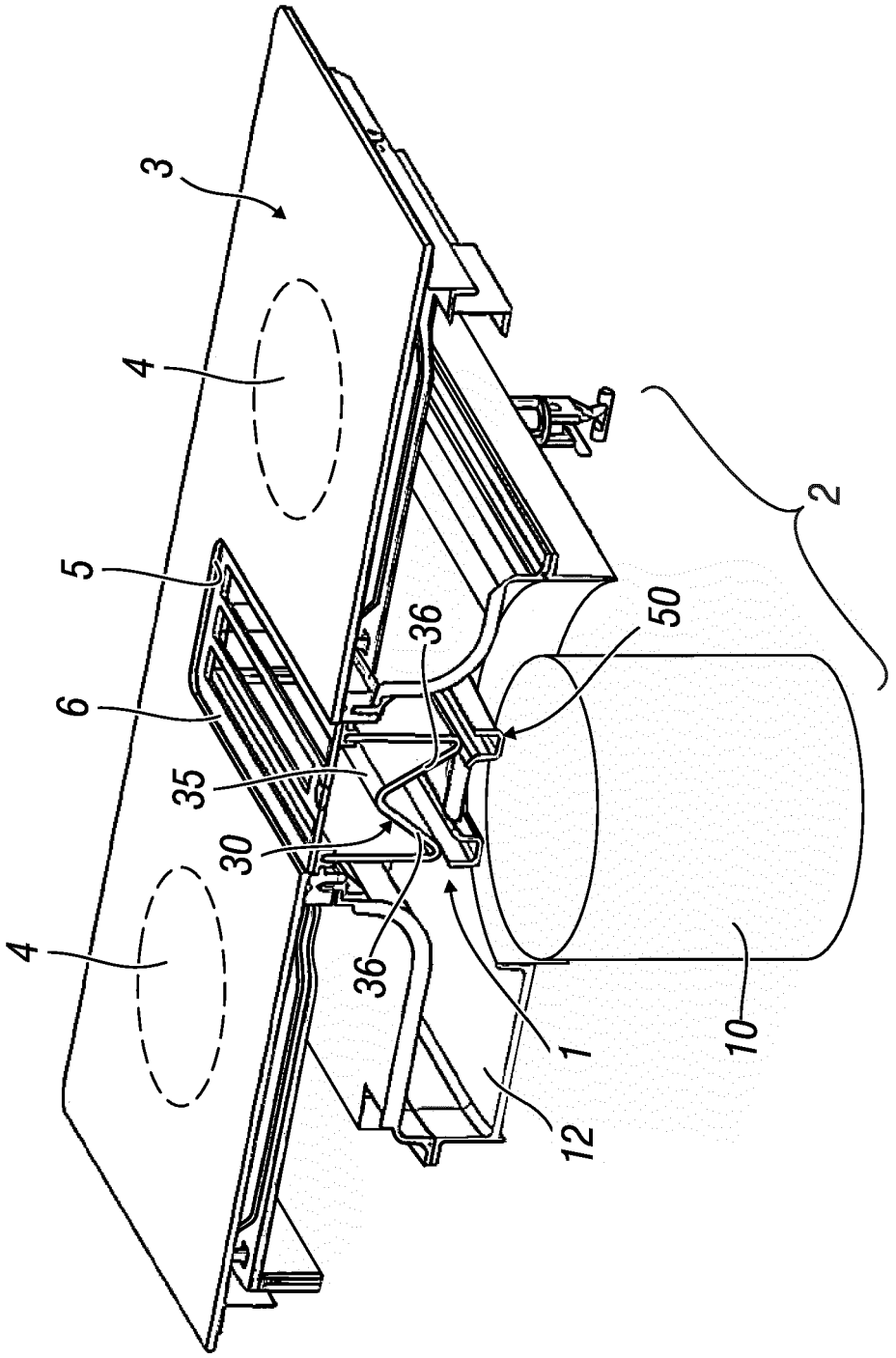

Fig. 1

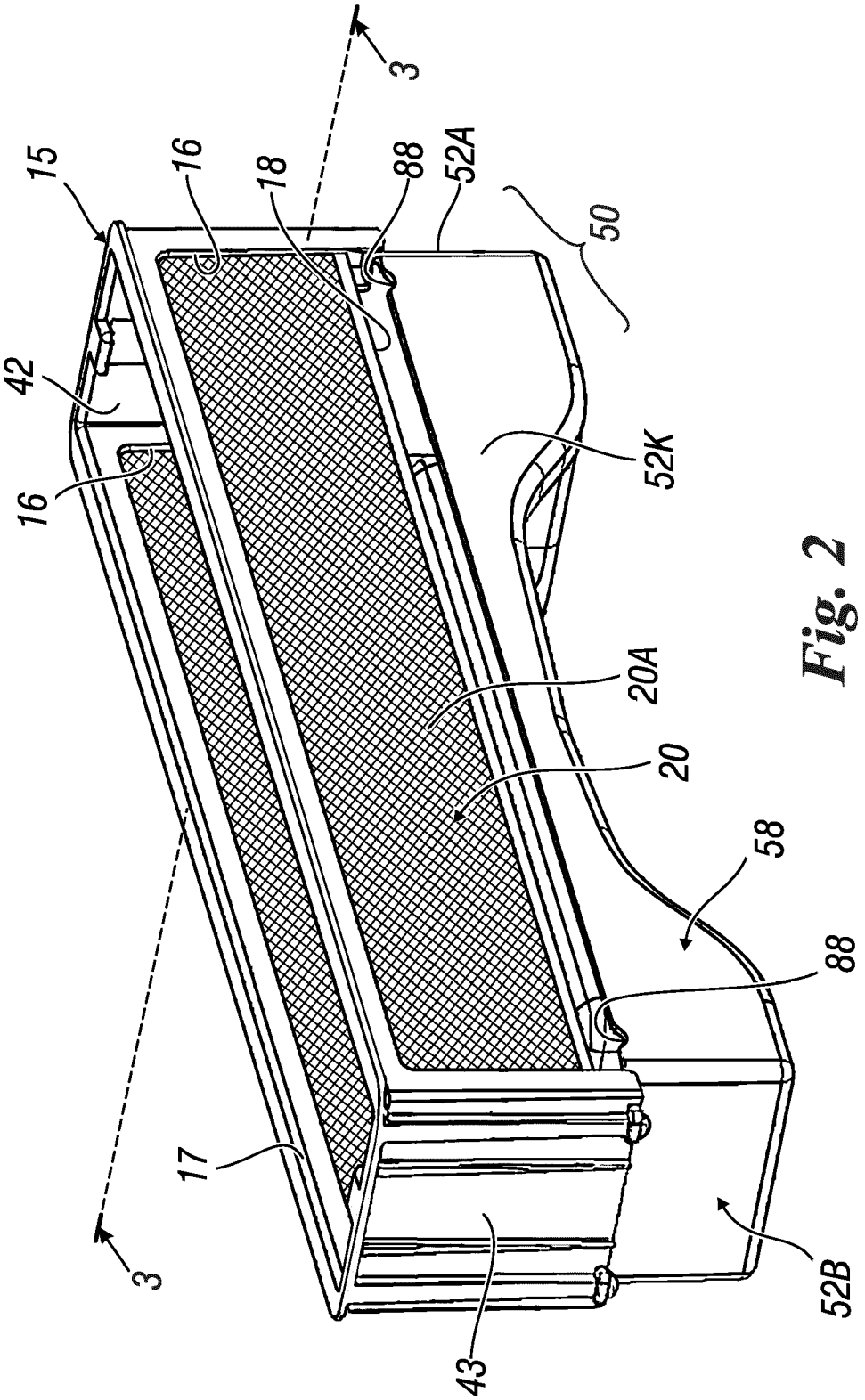

Fig. 2

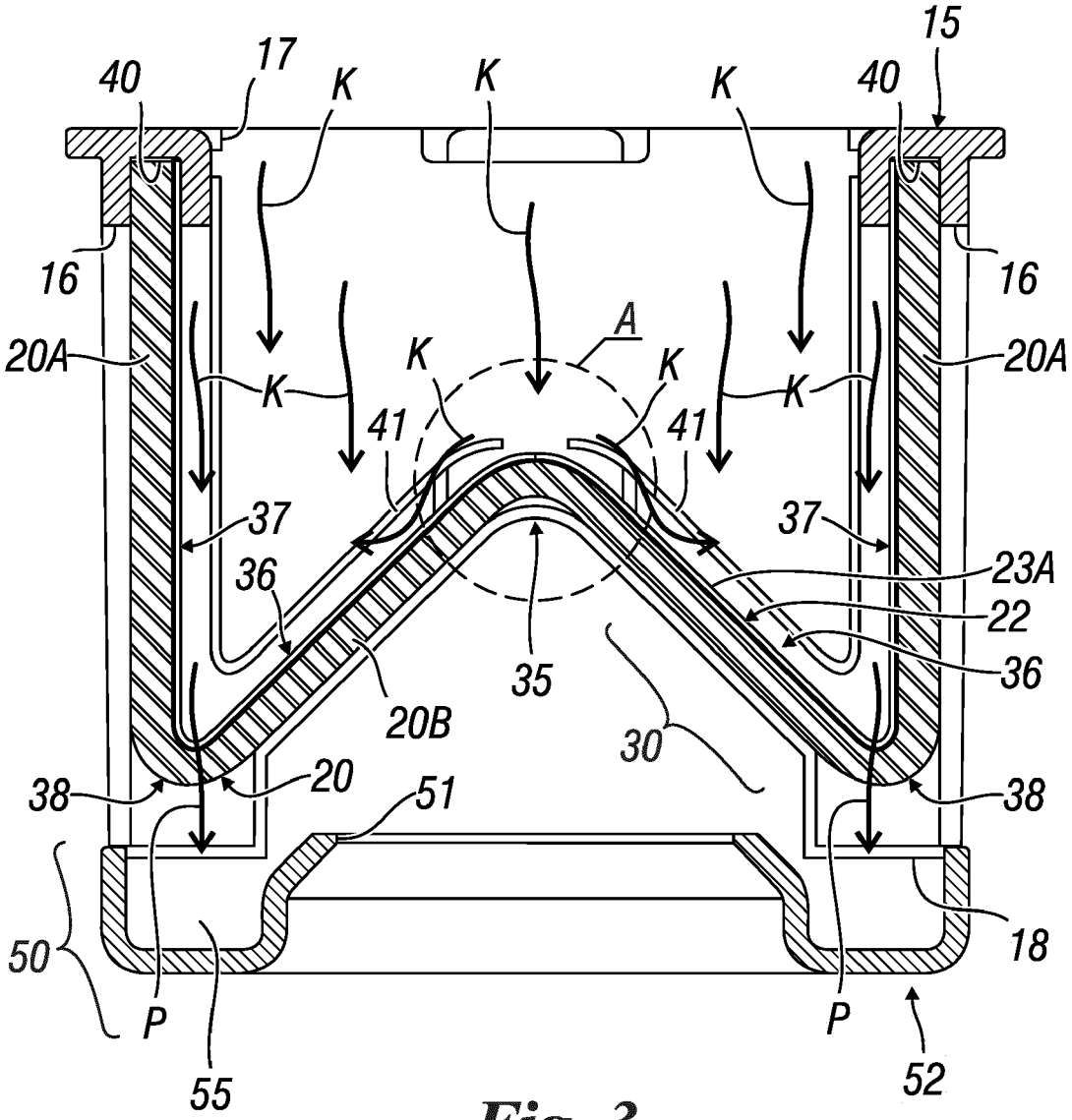
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Fig. 3

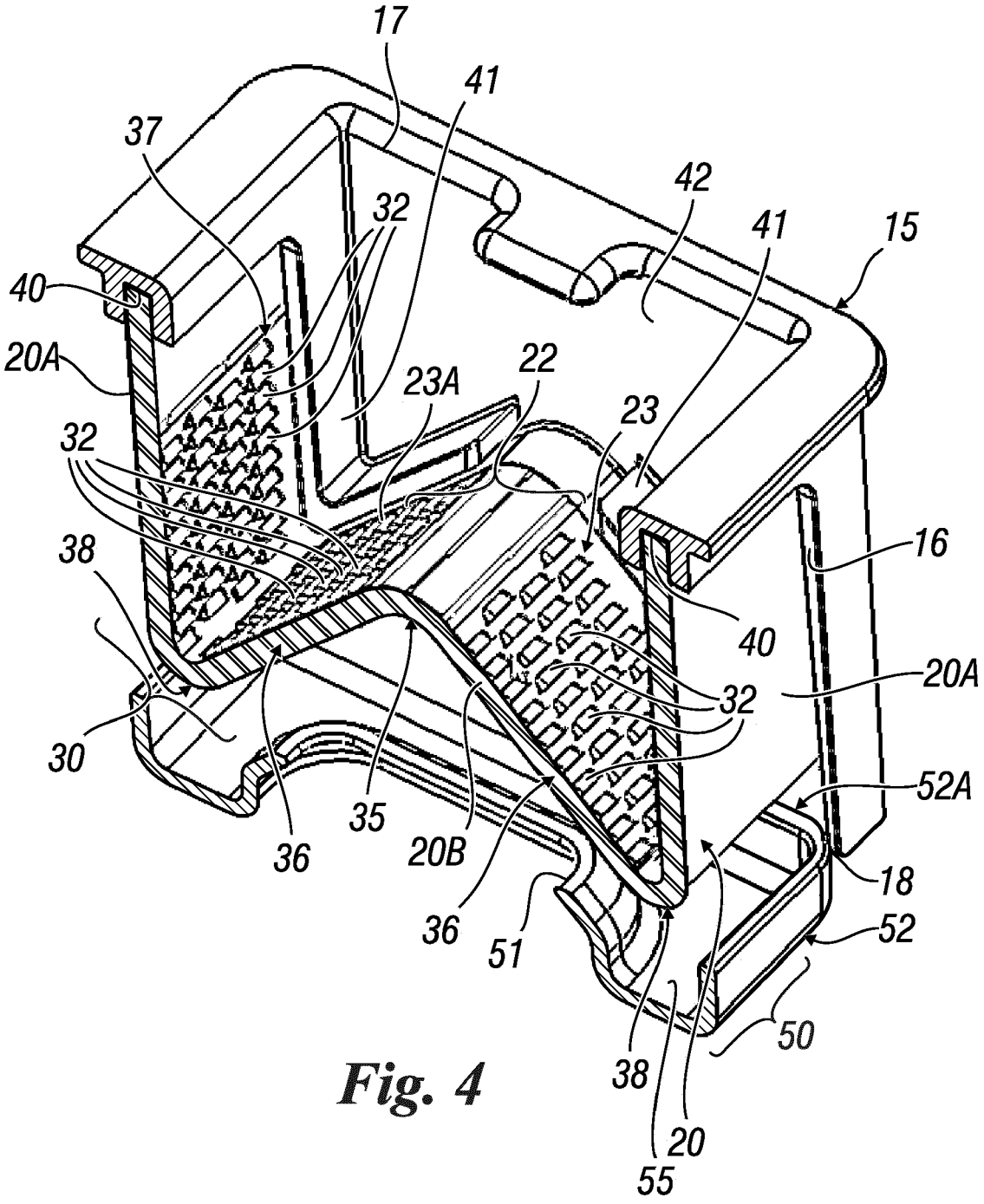
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Fig. 4

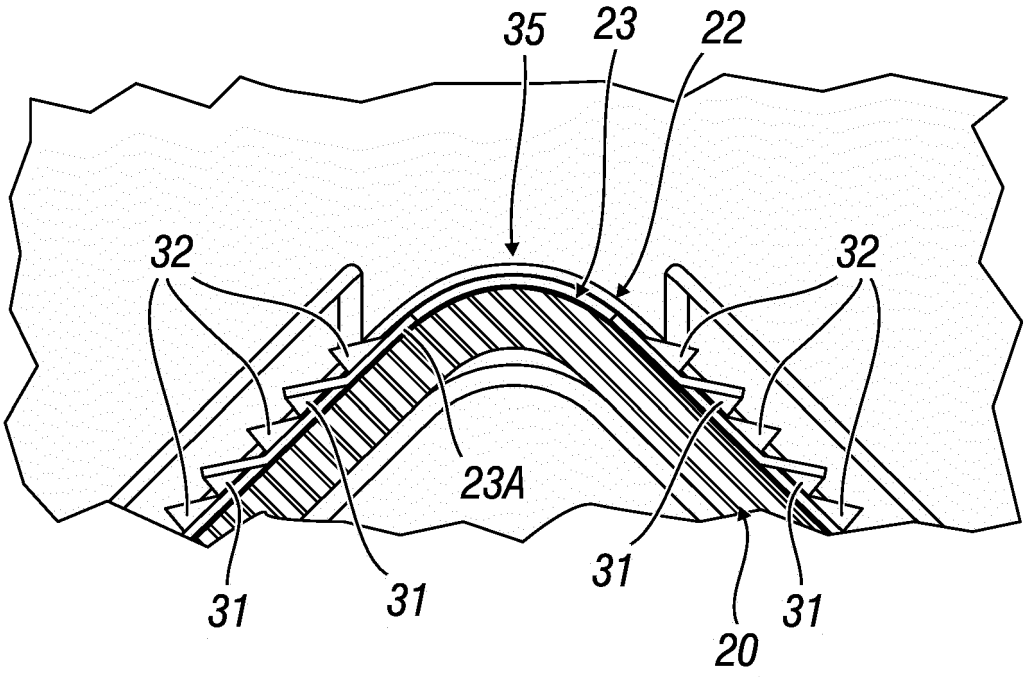

Fig. 5

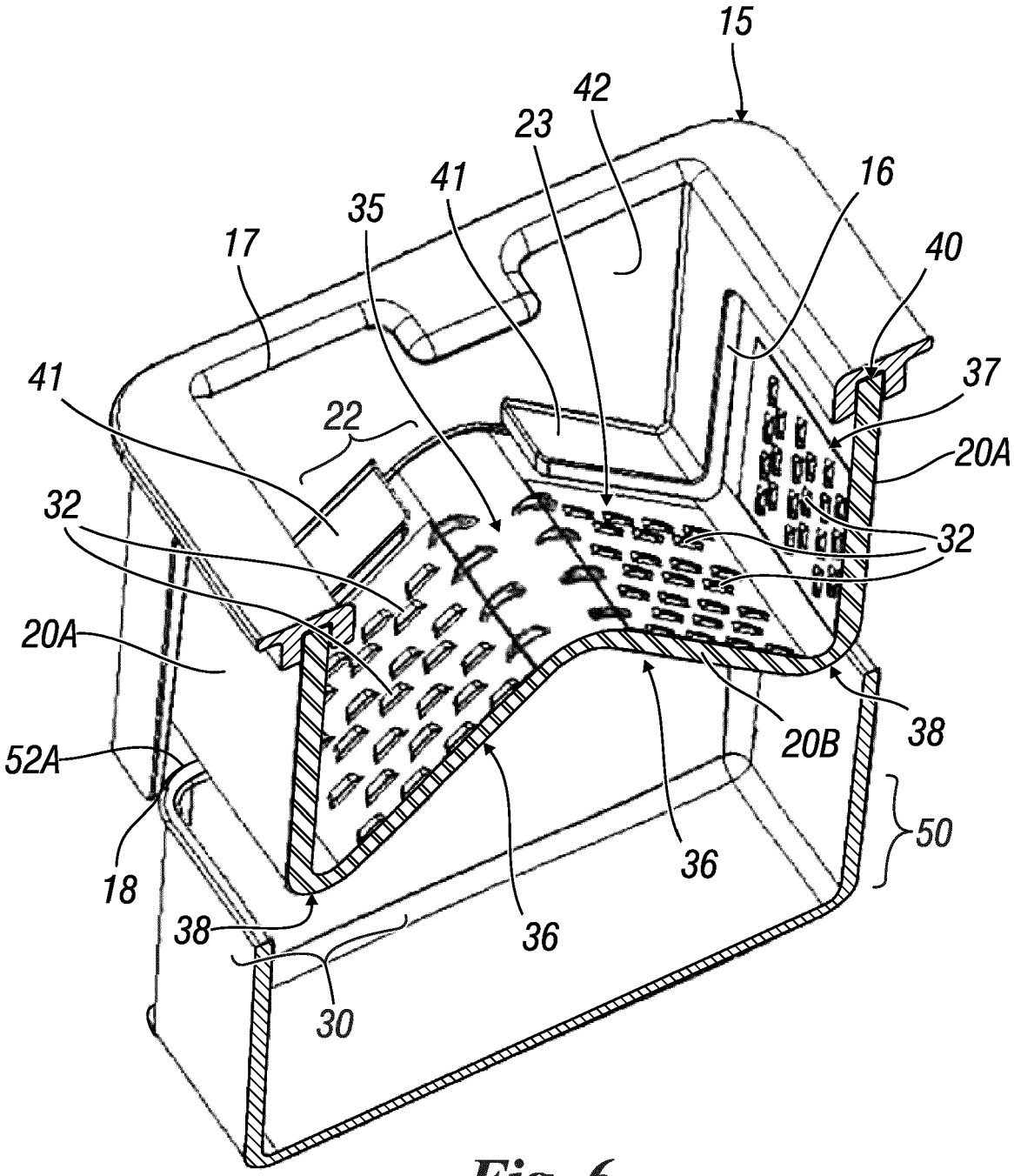
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Fig. 6

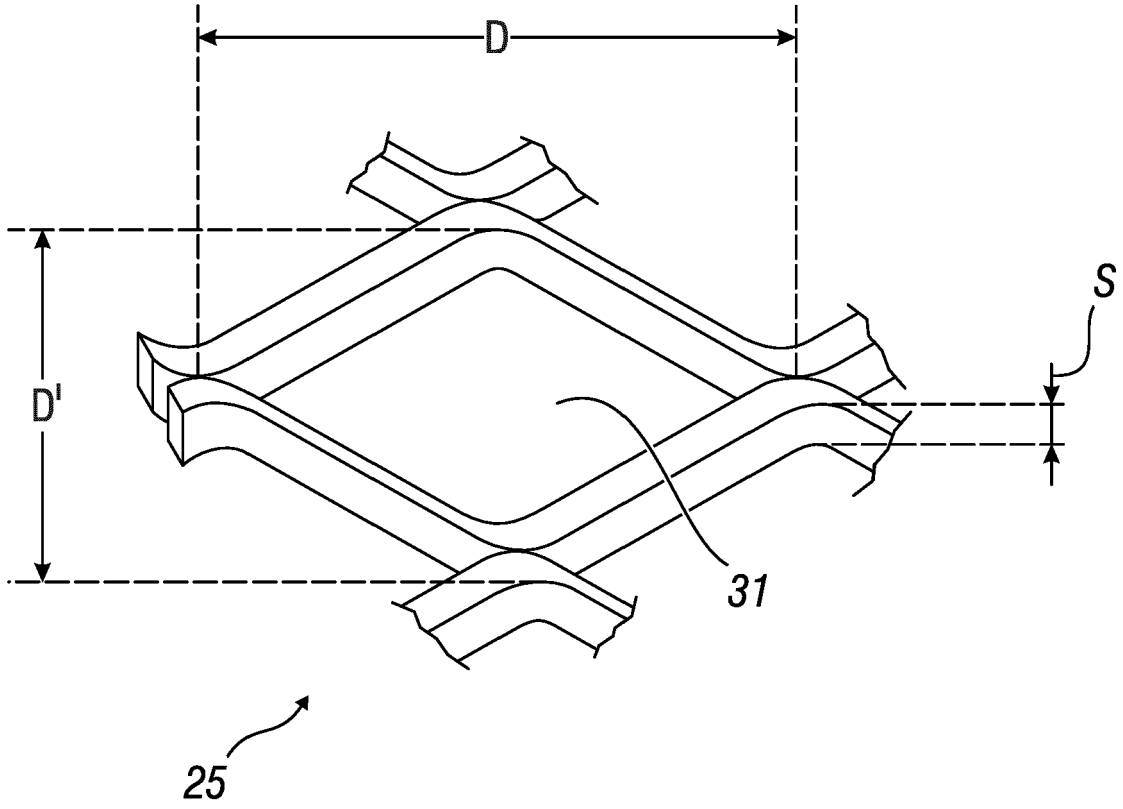

Fig. 7

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EUROPEAN SEARCH REPORT

Application Number
EP 21 20 6889

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 10 2018 213743 A1 (BRUCKBAUER WILHELM [DE]) 20 February 2020 (2020-02-20) * figure 4 *	1-13	INV. F24C15/20
A	US 6 455 818 B1 (ARNTZ TIMOTHY J [US] ET AL) 24 September 2002 (2002-09-24) * figure 2 *	1-13	
A	EP 3 287 701 A1 (BSH HAUSGERÄTE GMBH [DE]) 28 February 2018 (2018-02-28) * figure 2 *	1-13	
A	EP 3 473 937 A1 (WESCO AG [CH]) 24 April 2019 (2019-04-24) * figure 4 *	1-13	
A	EP 3 374 054 A1 (BSH HAUSGERAETE GMBH [DE]) 19 September 2018 (2018-09-19) * figure 1 *	1-13	
A	WO 2019/197055 A1 (BSH HAUSGERAETE GMBH [DE]) 17 October 2019 (2019-10-17) * figure 1 *	1-13	TECHNICAL FIELDS SEARCHED (IPC) F24C B01D
A	CN 205 002 197 U (OPPEIN HOME GROUP CO LTD) 27 January 2016 (2016-01-27) * figure 6 *	1-13	

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	16 March 2022	Adant, Vincent

CATEGORY OF CITED DOCUMENTS

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16-03-2022

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE 102018213743 A1	20-02-2020	NONE	
US 6455818 B1	24-09-2002	CA 2393810 A1	23-02-2003
		US 6455818 B1	24-09-2002
EP 3287701 A1	28-02-2018	NONE	
EP 3473937 A1	24-04-2019	CH 714258 A2	30-04-2019
		EP 3473937 A1	24-04-2019
EP 3374054 A1	19-09-2018	CN 108348831 A	31-07-2018
		EP 3374054 A1	19-09-2018
		WO 2017080781 A1	18-05-2017
WO 2019197055 A1	17-10-2019	CN 111971510 A	20-11-2020
		EP 3775700 A1	17-02-2021
		US 2021055002 A1	25-02-2021
		WO 2019197055 A1	17-10-2019
CN 205002197 U	27-01-2016	NONE	

EPO FORM P0459

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Patent documents cited in the description

- US 20190203949 A **[0004]**