



(12)

EUROPEAN PATENT APPLICATION

(43)

Date of publication:
06.09.2017 Bulletin 2017/36

(51)

Int Cl.:
F24C 15/20^(2006.01)

(21)

Application number: 16204789.8

(22)

Date of filing: 16.12.2016

<div>(84)</div> <div>Designated Contracting States: AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR Designated Extension States: BA ME Designated Validation States: MA MD</div>	<div>(71)</div> <div>Applicant: ELICA S.p.A. 60044 Fabriano (AN) (IT)</div> <div>(72)</div> <div>Inventor: Crisà, Fabrizio 60044 Fabriano AN (IT)</div> <div>(74)</div> <div>Representative: Ciceri, Fabio et al Perani & Partners Piazza San Babila, 5 20122 Milano (IT)</div>
<div>(30)</div> <div>Priority: 03.03.2016 IT UA20161328</div>	

(54)

DOMESTIC HOOD HAVING AN EXTERNAL COMMAND AND CONTROL UNIT

(57) The present invention relates to a domestic hood (1) comprising a housing frame (2) which defines a perimeter whose projection (A) falls on a plane (P) that is parallel to a cooktop plane (C), when said domestic hood is in operation, a forced air extraction unit (5) housed in said housing frame (2) and comprising at least one gas flow intake section (3); at least one first opening (3) in said housing frame (2), in fluid communication with the intake section of said forced air extraction unit (5); a control and monitoring unit (8) having a control interface (15) in electrical signal communication with said air extraction

unit (5) all, and configured to control and monitor said air extraction unit (5). The hood (1) is characterized by comprising suspension means (9) which extend from said housing frame (2), said control and monitoring unit (8) being located outside said housing frame (2) and being mechanically connected thereto by said suspension means (9), such that a projection (B) of said control and monitoring unit (8) will lie on said plane (P) and fall within said projection (A) of said housing frame (2) on the same plane (P).

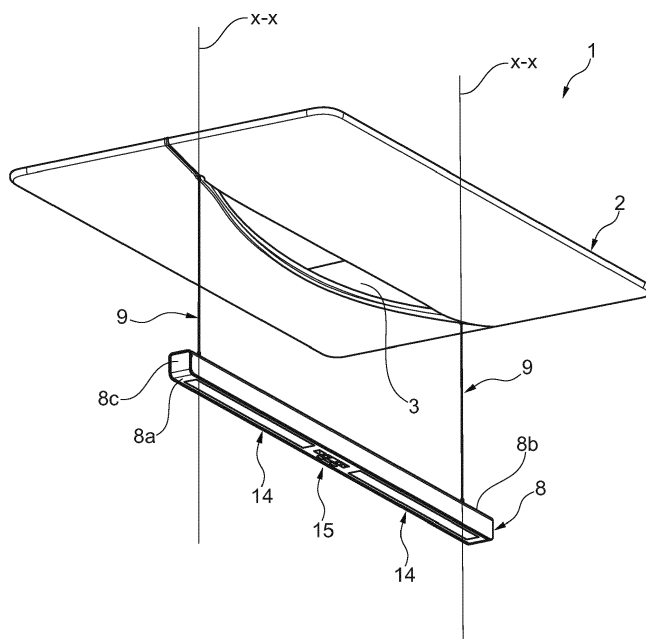


Fig. 1

Description

FIELD OF THE INVENTION

[0001] The present invention relates to a domestic hood having a control and monitoring unit external to the hood, as defined in the preamble of claim 1.

[0002] The present invention relates particularly, but without limitation, to a domestic hood of the pendant or ceiling-mounted type, having a control and monitoring unit external to the hood.

BACKGROUND OF THE INVENTION

[0003] Various types of hoods are known in the art, including the so-called pendant hoods, ceiling hoods and the like.

[0004] Pendant hoods are installed with the hood hanging down from the ceiling by means of cables or tubes. Particularly, these hoods do not include a fume exhaust duct, and can only operate in filter hood mode.

[0005] Once pendant hoods are installed, they are at a given distance (e.g. 100 cm) from the cooktop.

[0006] This will provide advantages in terms of simplified installation, as the works for installation of a fume exhaust duct are avoided, and lower visual impact, as they do not occupy the volume directly facing the cooktop.

[0007] Hoods known as ceiling hoods provide the same advantages as pendant hoods, i.e. a very low visual impact, and do not block the view for a user due to their installation, as they are mounted to the ceiling of a room or are more often embedded in a false ceiling, possibly at distances exceeding 150 cm from the cooktop.

[0008] Nevertheless, since both pendant and ceiling hoods hang at a considerable distance from the cooktop, they require higher power light sources for lighting the cooktop in a manner that is adequate and comfortable for the user.

[0009] This will require the use of one or more light sources, each having a higher power value than would be needed if the hood were disposed above the cooktop within standard requirements, i.e. at a minimum distance of 50 cm from the cooktop.

[0010] The use of such light sources will increase power consumption of the hood and may reduce the energy-efficiency class of the hood, which will have an obvious environmental and commercial impact.

[0011] Another drawback of the aforementioned hoods is that they must be radio controlled for switching on and off, modulating the extraction speed of the air extraction unit, as well as for switching on and off the light sources and/or other features in the hood, such as transducers for temperature, fumes and/or Volatile Organic Compounds (VOC).

[0012] The radio control may often be lost, be exposed to interferences or power failures as the batteries therein may suddenly go out of power.

[0013] This will obviously result in hood function re-

strictions, which are less and less tolerated by the users of these types of hoods.

[0014] Therefore the object of the present invention is to obviate the aforementioned prior drawbacks.

SUMMARY OF THE INVENTION

[0015] According to the present invention, the aforementioned technical purpose and objects are fulfilled by a domestic hood as defined in the characterizing part of claim 1.

[0016] The present invention provides a domestic hood that can have monitoring and control features, as well as lighting, located at a proper height from the cooktop, for more efficient use of the hood, particularly in case of ceiling or pendant hoods.

[0017] This invention can also afford all the advantages of pendant or ceiling hoods, in addition to the advantage of providing the control and monitoring features at a user-convenient height without requiring the use of a radio control.

BRIEF DESCRIPTION OF THE DRAWINGS

[0018] Further features and advantages of the present invention will result more clearly from the illustrative, non-limiting description of a preferred, non-exclusive embodiment of a fluid collection device as shown in the annexed drawings, in which:

- Figure 1 shows a perspective view of one embodiment of a domestic ceiling hood with the control and monitoring unit external to the hood, according to the present invention;
- Figure 2 shows a perspective view of one embodiment of a domestic ceiling hood in filter mode, according to the present invention;
- Figure 3 shows a perspective view of the hood of Figure 2 with the projections of the hood and the control and monitoring unit on a projection plane;
- Figure 4 shows a perspective view of the control and monitoring unit of the present invention;
- Figure 5 shows a detail view of the control and monitoring unit of Figure 4.

DETAILED DESCRIPTION

[0019] Although this is not expressly shown, the individual features described with reference to each embodiment shall be intended as auxiliary and/or interchangeable with other features, as described with reference to other embodiments.

[0020] A domestic hood of the present invention has been generally designated by numeral 1 in the figures.

[0021] Preferably, the hood 1 of the present invention is a ceiling or pendant hood.

[0022] Particularly, this hood 1 comprises a housing frame 2, preferably made of metal and possibly having

decorative parts made of plastic.

[0023] As used herein, the term housing frame is intended to designate a structural element designed to contain hood operating devices (as explained in greater detail below), comprising specially shaped elements and/or covering panels that impart a particular aesthetic appearance to the hood.

[0024] The housing frame 2 is designed to be secured to a wall, preferably the ceiling, in an area located above a cooktop plane C (see Figure 3).

[0025] For instance, the cooktop plane C may be an island plane, as schematically shown in Figure 3, or be part of a furnishing element, such as a countertop of a kitchen cabinet.

[0026] Particularly, the cooktop plane C includes one or more burners, which may be gas or electric/induction burners (not shown).

[0027] For example, referring to Figure 3, the hood 1 is shown to be at a height H from a walkway plane Z, i.e. the indoor floor surface of a building. Generally, the height H at which the hood 1 is disposed is greater than 150 cm and, in the particular embodiment as shown in the annexed figures, is placed for instance at 270 cm from the walkway plane Z.

[0028] The cooktop C defines a plane P parallel to the walkway plane Z.

[0029] The housing frame 2 defines a perimeter or layout whose projection A is visible on the plane P, when the hood 1 is in use.

[0030] Particularly, also referring to the particular embodiment of Figure 3, the projection A of the housing frame 2 is found on the plane P, i.e. the cooktop plane C in which food-cooking burners are placed.

[0031] In other embodiments, the plane P might not coincide with such top surface, and be at a distance therefrom.

[0032] The housing frame 2 comprises a first opening 3, and at least one, preferably two, second openings 4, preferably placed on lateral portions of the housing frame (see Figure 2).

[0033] The first opening is designed to be engaged by a fume exhaust duct for exhausting cooking fumes outside the house (e.g. through a chimney flue).

[0034] The second opening 4 is in fluid communication with the environment outside the frame 2 and, in the embodiment of Figure 2, within the house, to reintroduce appropriately treated air into the domestic environment, thereby operating in filter mode.

[0035] Alternately, the second embodiment 4 is in fluid communication with the environment outside the frame 2 and, through a chimney flue, such second opening 4 exhausts the extracted gases outside the environment in which the hood is installed, thereby operating in extraction mode.

[0036] For these purposes, the hood 1 comprises a forced air extraction unit 5, comprising an intake section (e.g. delimited by a frame wall exposed to an airflow), and a delivery outlet. The forced ventilation unit 5 is, for

example, a fan (of axial or centrifugal type), or another electric operating machine that can withdraw air from an extraction area and send it to a delivery outlet.

[0037] The intake section is placed in a bottom region of the frame 2, i.e. a frame region that faces the cooktop when the hood 1 is in operation.

[0038] It shall be noted that the first opening 3 is in fluid communication with the intake section of the forced extraction unit 5, whereas the second opening 4 is in fluid communication with the delivery outlet of the forced air extraction unit 5.

[0039] The hood 1 further comprises at least one filter (not shown), which is operably put in fluid communication with the intake section of the forced ventilation unit 5 and with the environment outside the housing frame 2.

[0040] In other words, the at least one filter is operably placed upstream from the intake section 5a, such that it will face the cooktop (when the hood is in operation).

[0041] In one aspect, the hood 1 comprises a control and monitoring unit 8, which is configured to be in electric signal communication with the air extraction unit 5.

[0042] Particularly, the control and monitoring unit 8 is configured to control and monitor the air extraction unit 5 and to supervise other features of the hood 1, as more clearly explained below.

[0043] It shall be noted that the control and monitoring unit 8 can at least switch on/off the air extraction unit 5.

[0044] In one aspect of the present invention, the hood 1 comprises suspension means 9 extending from the housing frame 2.

[0045] Particularly, the control and monitoring unit 8 is located outside the housing frame 2, i.e. is remote from the frame 2, and is mechanically connected thereto by the suspension means 9.

[0046] Advantageously, still referring to Figure 3, the control and monitoring unit 8 is in such a spatial position, relative to the housing frame 2, that its projection B lies on the projection plane P and is particularly contained in the projection A of the housing frame 2 defined in the same plane P.

[0047] As shown in Figure 3, the projection B of the control and monitoring unit 8 (as shown by arrows B') on the plane P is contained within and does not extend beyond the projection A of the housing frame 2 (as shown by arrows A').

[0048] With this arrangement of the control and monitoring unit 8 relative to the housing frame 2, the control and monitoring unit 8 will eventually be external to or remote from housing frame 2, but still be exposed to the impinging flow of gases extracted by the air extraction unit 5.

[0049] Particularly, the gas flow that impinges upon the control and monitoring unit 8 is the gas flow that will be created in the space volume defined between the cooktop plane C and the housing frame 2 of the hood 1, when the forced air extraction unit 5 is on.

[0050] In one aspect, the projection B of the control and monitoring unit 8 and the projection A of the housing

frame 2 are orthogonal projections on the plane P of the perimeters defined by the control and monitoring unit 8 and by the housing frame 2 respectively.

[0051] In a preferred embodiment, the suspension means 9 will extend from the housing frame 2 in a predetermined direction of extension X-X.

[0052] Here, the plane P is not only parallel to the cooktop plane C, but is also perpendicular to the predetermined direction of extension X-X.

[0053] Particularly, the suspension means 9 will extend to a length L from the housing frame 2 in the direction X-X, and will be designed for the control and monitoring unit 8 to be external to and remote from the frame 2.

[0054] For example, A feasible length L of the suspension means 9 ranges from 60 cm and 120 cm.

[0055] In this context, the control and monitoring unit 8 will be placed at the distance S from the cooktop plane C which is equal to:

$$S = H - L,$$

i.e. equal to or greater than 50 cm.

[0056] Advantageously, this distance S is the best distance for efficient use of the hood 1 by the user, without incurring the aforementioned drawbacks of prior art hoods, because the control and monitoring unit 8 is easily reached by the user, but the housing frame 2 of the hood 1 is out of the field-of-view of the user, thereby providing the free-space feeling of ceiling or pendant hoods.

[0057] For the control and monitoring unit 8 to be connected to the housing frame 2, the hood 1 comprises latching means 10 for latching the suspension means 9 such that the unit 8 may be fixed at the distance S from the cooktop plane C.

[0058] Particularly, the latching means 10 will be disposed in the housing frame 2 and in the unit 8 and preferably in a portion of the unit 8 and in a portion of the frame 2, such portions being in a mutually faced relationship.

[0059] According to one embodiment, the latching means 10 comprise a cable, preferably a pair of cables, but also three, four or more cables, which are designed to support the mass of the control and monitoring unit 8.

[0060] It shall be noted that the Figures only show the part of the latching means that is situated on the units 8, as the one on the frame 2 is hidden to the view by the covering panel that imparts particular aesthetic appearance to the hood 1.

[0061] For this purpose, the cable or pair of cables has a diameter ranging from 0.8 mm to 1.6 mm, preferably all 1.2 mm.

[0062] For example, the single cable or the pair of cables may be formed from a metal material such as steel or other materials, provided the aforementioned diameter values will be met.

[0063] If the suspension means 9 are embodied as a

pair of cables, such pair is in such a position that the cables will lie parallel to each other in the direction of extension X-X and perpendicular to the cooktop plane C.

[0064] This arrangement of the cables will advantageously provide balanced connection of the control and monitoring unit 8 to the housing frame 2, i.e. with no tilt of the control and monitoring unit 8 relative to the cooktop plane C.

[0065] Alternatively, the suspension means 9 are embodied as metal or polymeric rods or tubes and may extend not only along a straight line, like cables, but also along polygonal broken lines, possibly also connected by curvilinear elements or along curvilinear elements.

[0066] Particularly, in this context, the path of suspension means 9 may be also external to the projection A of the frame 2 defined on the plane P, although the control and monitoring unit 8 will be preferably arranged for its projection B to fall within the projection A of the frame on the plane P.

[0067] In one aspect, also referring to Figures 4 and 5, the control and monitoring unit 8 comprises a control interface 15, which comprises at least one transducer for measuring physical quantities 11 and/or a light source 14.

[0068] The transducer 11 for measuring physical quantities can detect characteristic parameters in the gas flow extracted by the forced air extraction unit 5 for automatically enabling/disabling the forced air extraction unit.

[0069] Particularly, the transducer for measuring physical quantities 11 is embodied as a sensor for temperature, heat, humidity and/or Volatile Organic Compounds (V.O.C.) and/or a combination thereof.

[0070] The light source 14 has a power value that is equal to that of a light source installed in a T-shaped or vertical hood (i.e. a hood other than a ceiling or pendant hood), which means that the hood of the present invention can advantageously accommodate light sources of lower power than those of the about discussed prior art.

[0071] Particularly, the light source 14 may be implemented with LED lamps or, alternatively, with other types of lamps.

[0072] With the control and monitoring unit 8 being located at an appropriate height S from the cooktop plane C, the presence of the transducer 11 can actuate automatically, i.e. with no action by a user, the forced air extraction unit 5, as soon as such transducer detects a value that exceeds a predetermined threshold.

[0073] The control interface 15 on the control and monitoring unit 8 comprises one or more of the following devices:

- a first manually-operated control member 12 for switching on/off the forced air extraction unit and optionally specific switches 12', 12" for increasing/decreasing the extraction speed of the air extraction unit 5 respectively;
- a second manually-operated control member 13 for turning on/off the light source 14;
- LED indicators 16 showing the operating state of the

hood 1 and/or the light source 14.

[0074] Particularly, the first manually-operated control member 12 can switch on/off the forced air extraction unit 5 whenever the user believes that gases should be extracted from the room in which the hood 1 is installed.

[0075] This first control member 12 integrates the automatic operation of the transducer 11 for fully efficient use of the hood 1 by the user.

[0076] Still referring to the accompanying figures and particularly to Figures 4 and 5, it shall be noted that, in a preferred embodiment, the control and monitoring unit 8 defines at least one first surface 8a and one second surface 8b, which are opposite to each other, and when the hood 1 is in operation, the first surface 8a faces the cooktop plane C and the second surface 8b faces the housing frame 2, particularly the opening 3 of such frame 2.

[0077] In one aspect, the first surface 8a is designed to accommodate the control interface 15, with the second surface 8b housing the latching means.

[0078] It shall be noted that the position of the control interface 15, and particularly the transducer 11, in the surface 8a that faces the cooktop plane C will provide a maximized probability for the transducer to detect the physical quantity of interest, while ensuring a greater effectiveness as compared with prior art food installations.

[0079] It shall be also noted that since the first member 12 and/or the second member 13 are placed in the surface 8a, i.e. the surface that directly faces the cooktop plane C, as the user presses the first and/or the second members 12, 13, the actuating pressure on such members 12 and/or 13 is applied upwards. By this arrangement, as the first and/or the second members 12, 13 are pressed, the control and monitoring unit 8 will not, or will minimally be subjected to such pressure and will not swing, and will instead remain still in its position relative to the housing frame 2.

[0080] This advantage is maximized if the first member 12 and/or the second member 13 are formed with "soft touch" mechanisms.

[0081] Preferably, the first and second surfaces 8a and 8b define respective flat surfaces, connected by a lateral surface 8a, which may also be flat.

[0082] According to a particular embodiment, as shown in the Figures, the surfaces 8a, 8b and 8c define the control and monitoring unit 8 as a parallelepiped in which the length L is much greater than the width "1" and the thickness T.

[0083] In one aspect, the electric signal communication between the control and monitoring unit 8 and the air extraction unit 6 comprises a wired communication.

[0084] Preferably, such wired communication carries both an electrical power signal for supplying power to the control and monitoring unit 8 and an electrical data signal, such as a signal comprising the data detected by the transducer 11.

[0085] Alternatively, the electric signal communication between the control and monitoring unit 8 and the air

extraction unit 6 comprises a wired and Radio-Frequency communication.

[0086] Preferably, the wired communication carries an electrical power signal for supplying power to the control and monitoring unit 8 and the Radio-Frequency communication carries an electrical data signal, such as a signal comprising the data detected by the transducer 11.

[0087] It shall be noted that, if Radio-Frequency communication is implemented, the control and monitoring unit 8 will comprise a first transceiver device (not shown), with the housing frame 2 comprising a second transceiver device (not shown).

[0088] Such first and second transceiver devices are in signal communication with each other to transmit the data signal, such as a signal comprising the data detected by the transducer 11, with a Bluetooth, Zigbee or Radio-Frequency data transmission protocols.

[0089] Preferably, the first and second transceiver device are formed as transceivers operating in the 470MHz band, with proprietary protocols such as gate-opening radio controls.

[0090] Those skilled in the art will obviously appreciate that a number of changes and variants may be made to the arrangements as described hereinbefore to meet incidental and specific needs. All of these variants and changes fall within scope of the invention, as defined in the following claims.

Claims

1. A domestic hood (1) comprising:

- a housing frame (2) defining a perimeter, whose projection (A) falls on a plane (P) parallel to a cooktop plane (C) when said domestic hood is in operation;
- a forced air extraction unit (5) housed in said housing frame (2) and comprising at least one gas flow intake section (3);
- at least one first opening (3) in said housing frame (2), in fluid communication with the intake section of said forced air extraction unit (5);
- a control and monitoring unit (8) having a control interface (15) in electrical signal communication with said air extraction unit (5), and configured to control and monitor said air extraction unit (5);

characterized in that it comprises suspension means (9) which extend from said housing frame (2), said control and monitoring unit (8) being located outside said housing frame (2) and being mechanically connected thereto by said suspension means (9), such that a projection (B) of said control and monitoring unit (8) will lie on said plane (P) and fall within said projection (A) of said housing frame (2) on the same plane (P).

2. A domestic hood as claimed in claim 1, wherein said suspension means (9) extend from said housing frame (2) in a predetermined direction of extension (X-X), said plane (P) being perpendicular to said predetermined direction of extension (X-X). 5
3. A domestic hood as claimed in claim 1 or 2, wherein said control interface (15) comprises at least one transducer (11) for measuring physical quantities, that can detect characteristic parameters in said gas flow extracted by said forced air extraction unit for automatically enabling/disabling said forced air extraction unit and/or a light source (14). 10
4. A domestic hood as claimed in claim 3, wherein said control interface (15) comprises one or more of the following devices: 15
 - a first manually-operated control member (12) for turning on/off the forced air extraction unit; 20
 - a second manually-operated control member (13) for turning on/off said light source (14).
5. A domestic hood as claimed in any of the preceding claims 2 to 4, wherein said suspension means (9) extend to a preset length (L) from said housing frame (2), said hood (1) comprising latching means (10) for latching said suspension means (9) such that said control and monitoring unit (8) will be external to and remote from said frame. 25 30
6. A domestic hood as claimed in claims 3 to 5, wherein said control and monitoring unit (8) defines at least one first surface (8a) and one second surface (8b), which are opposite to each other, wherein when said hood (1) is in operation, said first surface (8a) faces said cooktop plane (C) and said second surface (8b) faces said housing frame (2), wherein said first surface accommodates said control interface (15) and said second surface (8b) accommodates said latching means (10). 35 40
7. A domestic hood as claimed in any of the preceding claims, wherein said electrical signal communication between said control and monitoring unit (8) and said air extraction unit (5) comprises a wired communication, wherein said wired communication carries both an electrical power signal for supplying power to said control and monitoring unit and an electrical data signal. 45 50
8. A domestic hood as claimed in any of the preceding claims 1 to 6, wherein said electrical signal communication between said control and monitoring unit (8) and said air extraction unit (5) comprises a wired and radio-frequency communication, wherein said wired communication carries an electrical power signal for supplying power to said control and monitoring unit 55
- and said radio-frequency communication carries an electrical data signal.
9. A domestic hood as claimed in claim 8, wherein said hood (1) comprises a first transceiver device associated with said control and monitoring unit (8) and a second transceiver device associated with said housing frame (2), said first and second transceiver devices being in signal communication with each other to transmit said data signal according to a data transmission protocol, such as Bluetooth, Zigbee or radio-frequency.
10. A domestic hood as claimed in any of the preceding claims, wherein said suspension means (9) comprise a pair of cables whose diameter ranges from 0.8 mm to 1.6 mm.
11. A domestic hood as claimed in claim 1, wherein:
 - said air extraction unit (5) comprises a delivery outlet,
 - said housing frame (2) comprises a second opening (4) in fluid communication with the delivery outlet of said forced air extraction unit and with the environment outside the housing frame,
 - said first (3) and said second (4) openings being designed to be engaged by a flue exhaust duct,
 - said hood comprising at least one filter, which is operably placed in fluid communication with the intake section of said forced air extraction unit and with the environment outside said housing frame, for filtering said extracted gas flow.

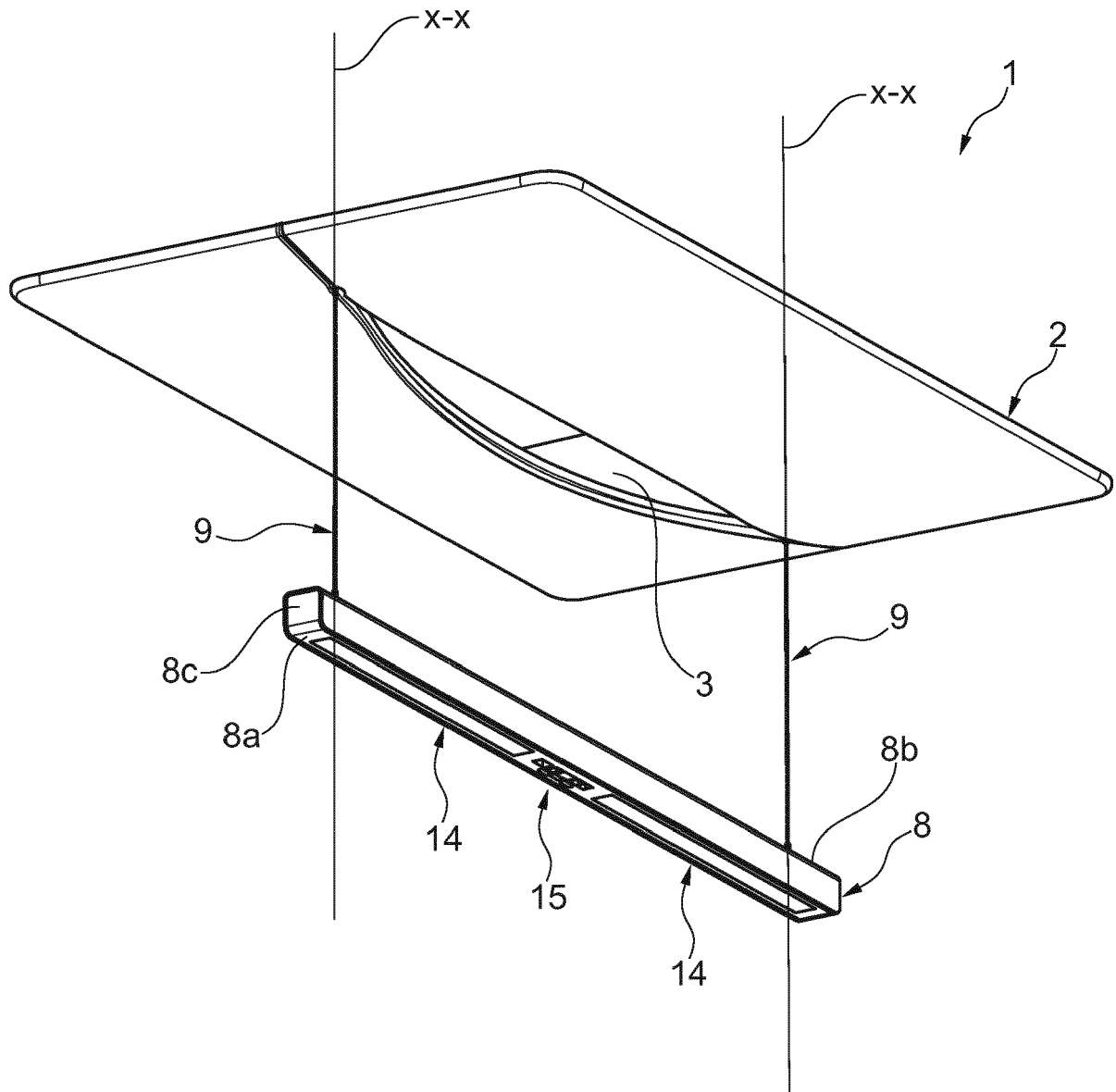


Fig. 1

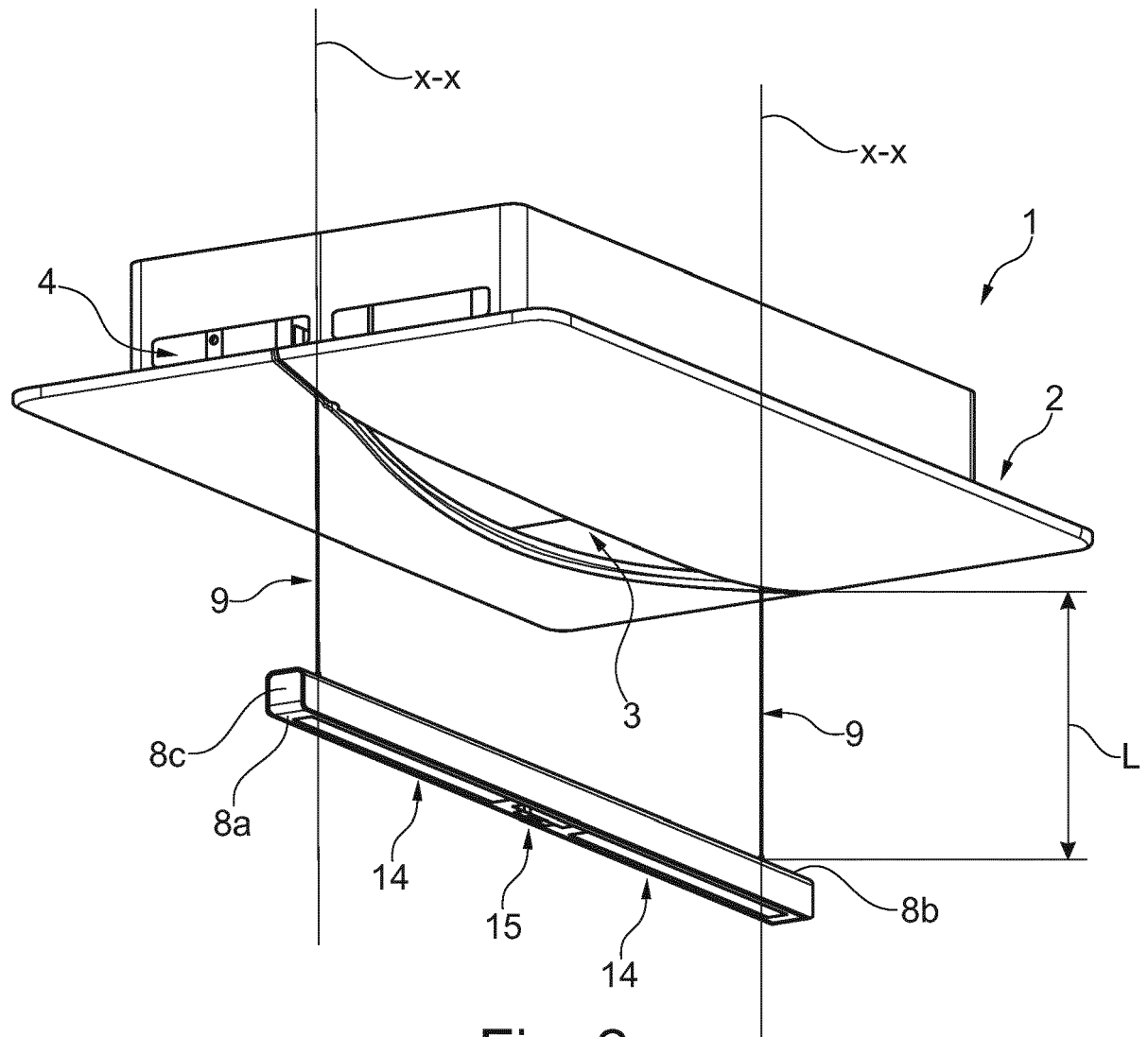


Fig. 2

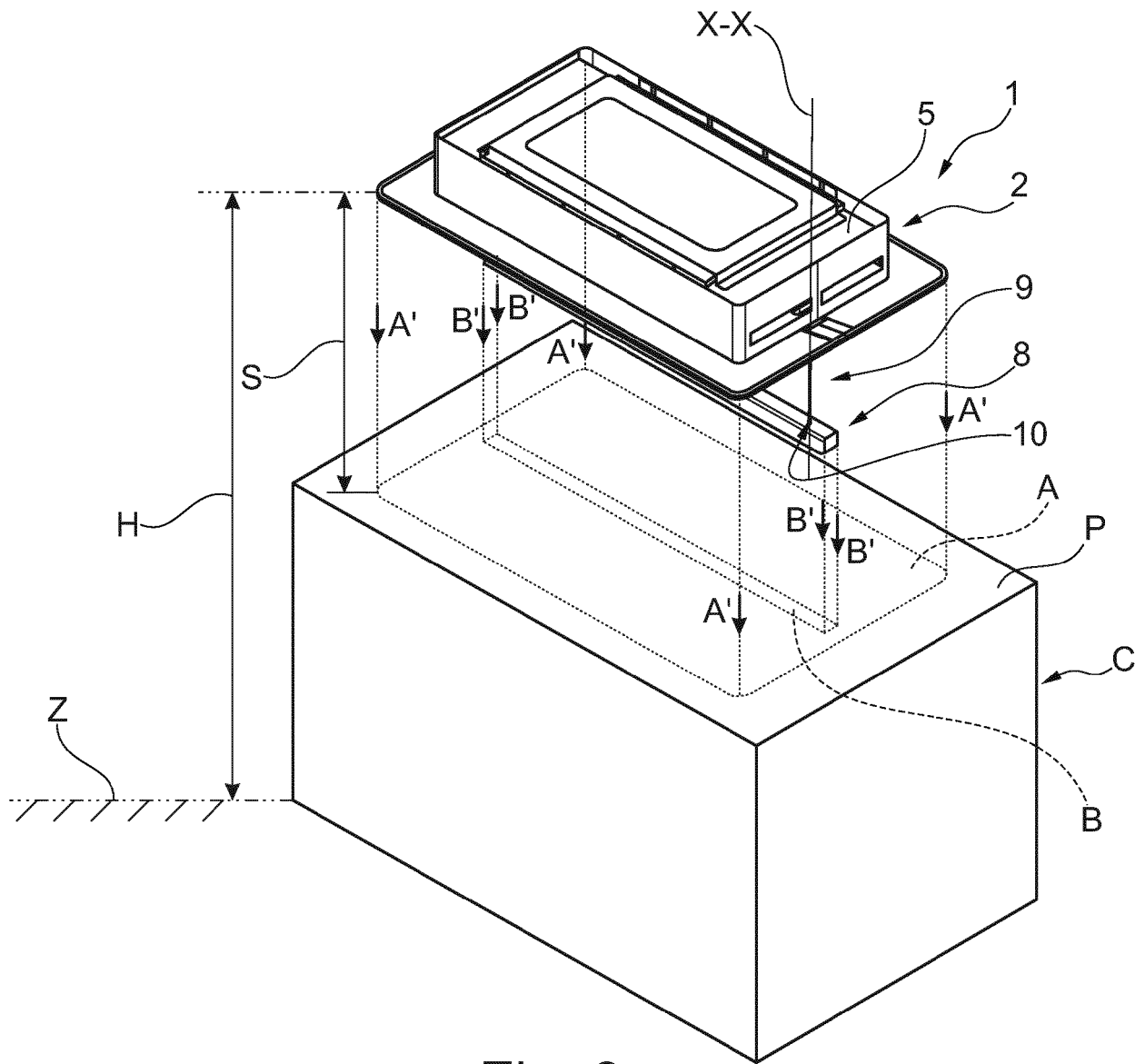


Fig. 3

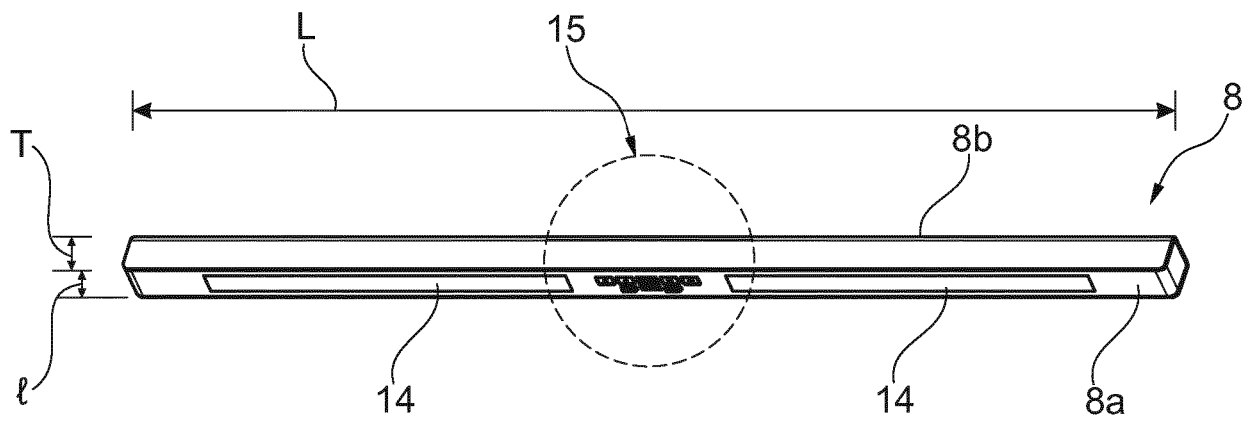


Fig. 4

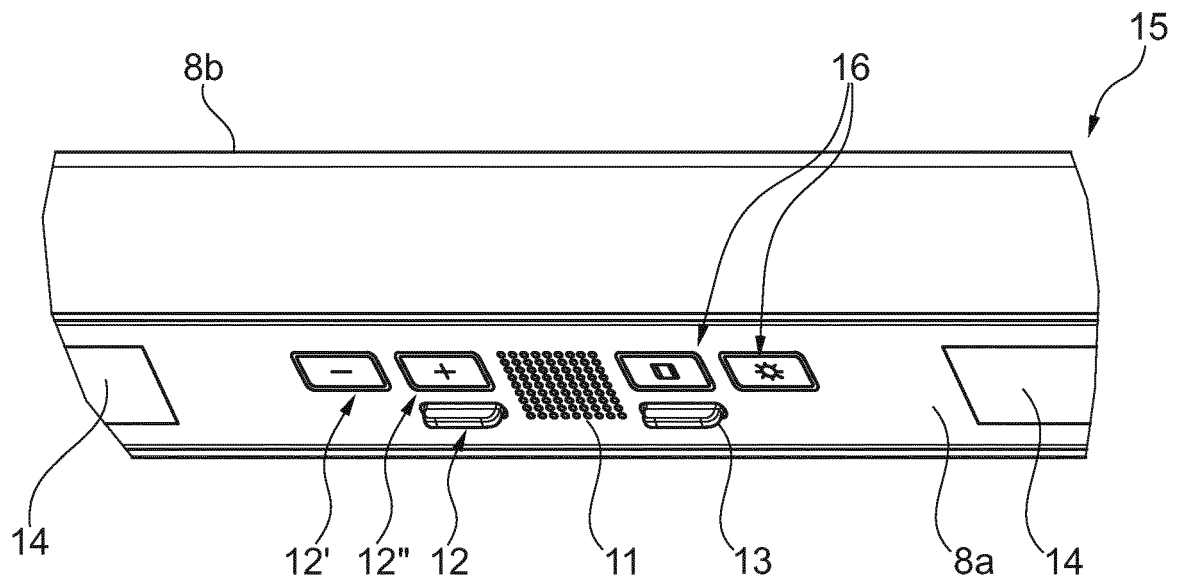


Fig. 5



EUROPEAN SEARCH REPORT

Application Number
EP 16 20 4789

5

10

15

20

25

30

35

40

45

50

55

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	EP 2 327 936 A1 (FABER SPA [IT]) 1 June 2011 (2011-06-01) * the whole document *	1-10	INV. F24C15/20
A	EP 2 775 214 A1 (BSH BOSCH UND SIEMENS HAUSGERÄTE GMBH [DE]) 10 September 2014 (2014-09-10) * paragraphs [0027], [0031] *	9	
A	FR 2 671 498 A1 (DIETRICH EQUIP MENAGER [FR]) 17 July 1992 (1992-07-17) * the whole document *	1-10	
A	DE 41 42 440 A1 (BOSCH SIEMENS HAUSGERÄTE [DE]) 24 June 1993 (1993-06-24) * the whole document *	1-10	
A	EP 2 161 507 A2 (BSH BOSCH SIEMENS HAUSGERÄTE [DE]) 10 March 2010 (2010-03-10) * the whole document *	1-10	
			TECHNICAL FIELDS SEARCHED (IPC)
			F24C
<p>2 The present search report has been drawn up for all claims</p>			
Place of search		Date of completion of the search	Examiner
The Hague		16 February 2017	Makúch, Milan
<p>CATEGORY OF CITED DOCUMENTS</p> <p>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</p> <p>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</p>			

EPO FORM 1503 03.82 (P04C01)



Application Number

EP 16 20 4789

CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing claims for which payment was due.

☐ Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due and for those claims for which claims fees have been paid, namely claim(s):

☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due.

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

☐ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.

☐ As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.

☐ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:

☒ None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:

1-10

☐ The present supplementary European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims (Rule 164 (1) EPC).

**LACK OF UNITY OF INVENTION
SHEET B**

Application Number

EP 16 20 4789

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. claims: 1-10

Inventive concept I: claims 2 to 10 directed to a domestic comprising a transducer (see claim 3).

2. claim: 11

Inventive concept II : 11 directed to a domestic hood comprising a second opening and a filter.

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

EP 16 20 4789

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.

16-02-2017

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 2327936 A1	01-06-2011	EP 2327936 A1	01-06-2011
		EP 2504628 A1	03-10-2012
		WO 2011063969 A1	03-06-2011
EP 2775214 A1	10-09-2014	DE 102013203676 A1	11-09-2014
		EP 2775214 A1	10-09-2014
FR 2671498 A1	17-07-1992	NONE	
DE 4142440 A1	24-06-1993	NONE	
EP 2161507 A2	10-03-2010	DE 102008041738 A1	04-03-2010
		EP 2161507 A2	10-03-2010

EPO FORM P0459

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