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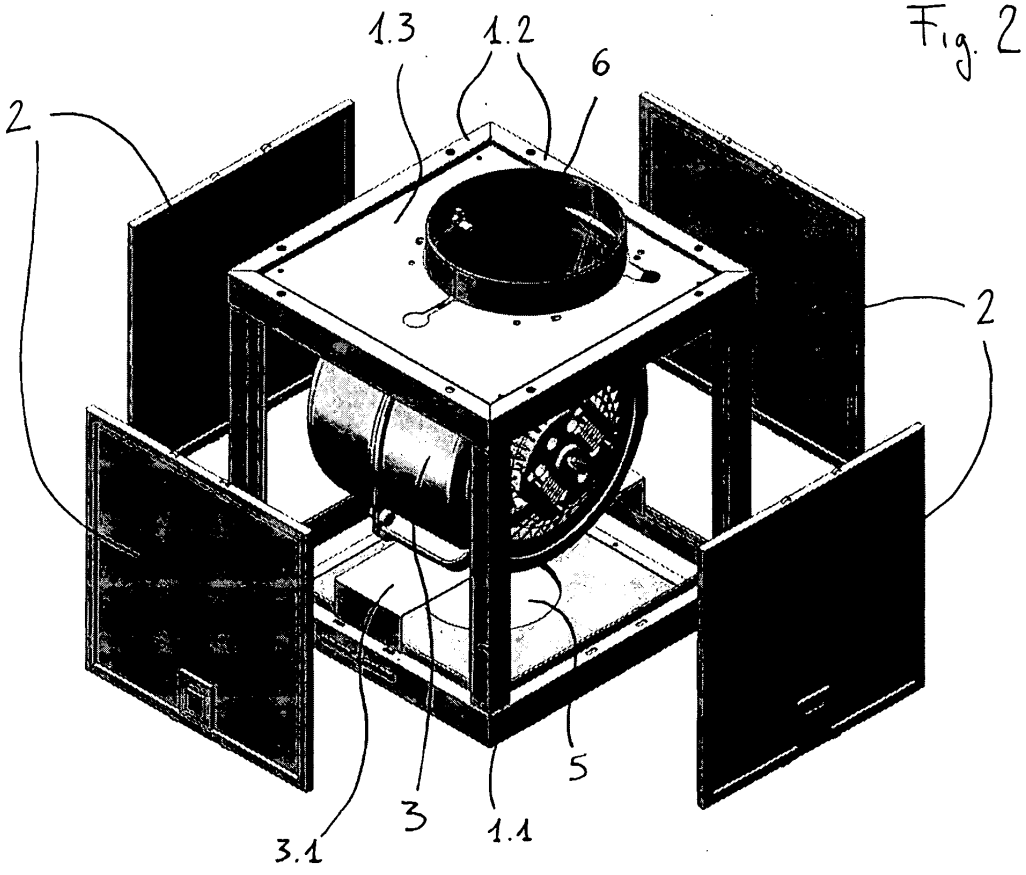
(54) Single-block structure of a suction hood

(57) The object of the present invention is a single-block structure (1) of a suction hood, comprising a support frame (1) suitable for supporting and seating the filtering unit (2), the suction unit (3), the lighting unit (5) and the control means (4.1) of said hood.

The suction unit (3) is placed inside said support frame (1) whereas said filtering unit (2) consists of one or more filtering panels (2) constituting one or more walls of said support frame (1).

Fig. 2



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Description

[0001] The object of the present invention is a suction hood the main structural components whereof are seated inside a single compact structure.

[0002] The present invention relates to the field of suction hoods intended for eliminating smoke and vapours produced to the environment. As known, cooker hoods, in particular household cookers, are intended for eliminating smoke, odours and vapours (hereinafter globally referred to as "cooking smoke" for shortness of description) coming from the underlying cooking top, in order to vent them to the external environment and/or purify them with special carbon filters.

[0003] The operation and the structure of a suction hood of this type are now commonly known and standardised, thus the description thereof shall not be dealt with at length. Herein, it is sufficient to say in brief that the main components consist of:

- a filtering unit provided with at least one anti-grease filter, having the function of retaining greasy substances suspended in cooking smoke in the form of aerosol, so as to prevent them from returning into the environment and clogging the internal structural and functional parts of the hood;
- a suction unit consisting of a motorized air conveyor, suitable for sucking the cooking smoke and venting it outside to the environment, through venting conduits variedly sized according to the type of hood and to the modality of installation of the same;
- control and supply means for operating the hood, recently increasingly contained in an electronic control module.

[0004] In addition to such essential component elements, a hood may also have further additional components, not essential from the functional point of view, but by now almost always present in the most widespread hoods, and generally consisting of:

- a lower or front structure mainly having an aesthetic design function but also for guiding the cooking smoke towards the overlying filtering and suction units;
- a lighting unit for providing light to the underlying cooking top or to the area in general.

[0005] The above mentioned components are spatially arranged inside the overall suction hood structure, according to different aesthetic versions, but all needing suitable dimensions in order to contain said separate structures.

[0006] Recently conceived hoods are known in the reference field, which aim at decreasing the space required for said structural components, providing for the arrangement thereof into modular units side by side or superimposed on one another or positioned in different zones and away from the hood.

[0007] For example, suction hoods are known which are provided with a modular structure and combining the function of filtering unit and lighting unit, the suction unit instead being positioned at the top or even placed outside the building. A significant advantage is obtained with this kind of hood in terms of reduction of space compared to the hoods known so far, however there is still the drawback of having to provide a structure capable of seating separate units, at least for the filters and for the motorized air conveyor.

[0008] In addition to these overall dimensions-related drawbacks, the separate arrangement, in generally vertical line, of the filtering unit and of the suction one causes certain efficiency reduction in the hood suction capacity.

[0009] The object of this invention is to overcome at least a part of the drawbacks described above, by providing a suction hood having all the main structural components in a single and compact unit.

[0010] These and other objects, which shall appear clearly hereinafter, are achieved with a single-block structure of a suction hood according to claim 1.

[0011] Other advantages may be further achieved by the additional features of the dependent claims.

[0012] Further features of this invention will appear more clearly from the following description of a preferred embodiment thereof, according to the patent claims and illustrated, by way of a non-limiting example, in the annexed drawings, wherein:

Figure 1 shows an isometric perspective view of the single-block hood according to the invention;
Figure 2 shows an exploded view of the single-block hood according to the invention. The features of the finding shall now be described using the references contained in the figures.

[0013] With reference to any of the figures, reference numeral 1 indicates the single-block hood as a whole, the structure whereof consists of a support frame 1 suitable for supporting and seating all of the hood functional components.

[0014] Said support frame 1 is shaped as a parallelepiped provided with vertical 1.1 and horizontal 1.2 uprights that define the framework thereof.

[0015] In the version shown in the annexed figures, the support frame 1 is shaped as a cube, the framework whereof, consisting of the vertical 1.1 and horizontal 1.2 uprights, therefore defines six faces; however, nothing prevents the provision of a support frame 1 having any other geometrical shape, such as for example a cylinder or a polyhedron with a pentagonal, hexagonal base, etc., in such cases it being enough to provide for the other component elements to have a shape suitable for being supported and seated by said frame 1, differing from that shown in the annexed figures but in any case falling within the scope of protection given by the present invention.

[0016] The lower and upper base faces of said support

frame 1 are respectively occupied by a box element consisting of a module 4, containing the lighting unit 5 and the control means 4.1 of the hood, and by a closing panel 1.3, whereon there is obtained an opening 6 for coupling the venting conduit of the cooking smoke, not shown in the figure.

[0017] The side walls of the support frame 1 (in a number of four in the example in the figure) are occupied, at least some but preferably all, by filtering panels 2, that therefore are the filtering unit of the hood. Said filtering panels 2 are constrained to the support frame 1 by known coupling means, such as for example tabs engaging in special slits obtained on the horizontal uprights 1.2.

[0018] According to the prior art, said filtering panels are of the so-called anti-grease type, and they usually consist of multiple superimposed layers of a metal mesh obtained from thin aluminium sheets. Such type of filter offers a relatively low resistance to the passage of air, at least as long as it is clean, and it is easy to maintain as it may be washed in a dishwasher too.

[0019] Reference 3 indicates the suction unit represented by a common motorized air conveyor, optionally resting on an underlying support bracket 3.1 secured to the support frame 1. Said air conveyor 3 may be fixed by known means to the lower part of the closing panel 1.3 and its outlet is associated to the opening 6 obtained on said closing panel 1.3.

[0020] The motorized air conveyor 3, preferably consisting of a usual half-screw and dual impeller fan, may be of any desired power, for example 250 to 1000 m^3/h.

[0021] In short, the compact single block represented by the support frame 1 seats and supports all of the functional components of the hood:

- the filtering unit represented by the filtering panels 2, vertically arranged on all or some of the side walls of the support frame 1;
- the suction unit represented by the motorized air conveyor 3, located inside said support frame 1 and therefore surrounded by the filtering panels 2;
- the lighting unit 5 and the control means 4.1, seated in the lower base of said support frame 1.

[0022] Unlike the prior art, therefore, the suction unit is not positioned outside (generally at the top) the filtering unit, but therein, being surrounded by the filtering panels 2 positioned on all or some of the side walls of the support frame 1.

[0023] In this way, the cooking smoke flows towards the filtering unit in centripetal direction from all or some of the side walls provided with filtering panels 2.

[0024] Such peculiarity implies different orders of advantages, the most obvious whereof consists in the considerable reduction of the space required for seating the complete structure of a suction hood. The single-block structure described above may safely entirely act as suction hood, without the need of providing further component elements, but the usual venting conduit of the cooking smoke sucked which fits on opening 6 obtained on the closing panel 1.3.

[0025] A second order of advantages may be found in the improved suction efficiency provided by such innovative solution: the fact that the motorized air conveyor 3 is positioned inside the single block and preferably entirely surrounded by the vertical filtering panels 2, allows all of the cooking smoke to be sucked into the single block through a considerable larger side suction zone (and substantially equal to the sum of the surfaces of such vertical filtering panels 2) compared to what occurs according to the prior art, where only one face of the hood, generally the lower one, is used for seating the filtering unit.

[0026] Moreover, such arrangement optimises the suction efficiency also compared to a hood provided with vertical filters but having the suction unit positioned at the top rather than inside the filtering unit: in fact in this case of the prior art, the collection area of the cooking smoke substantially matches the lower zone of the hood, and not the wider side collection zone of this invention.

[0027] More precisely, defining the "suction efficacy" of a hood as the ratio between suction capacity in the presence of filters and suction capacity without the same, it has been found that by the arrangement of the filtering and suction units in a single block according to the present invention it is possible to obtain a suction efficiency of about 98%, without increasing the overall dimensions compared to a traditional filtering unit. In other words, load losses caused by the filters are virtually eliminated.

[0028] It is clear that several versions of the single-block structure 1 object of the invention are possible to the man skilled in the art, without departing from the novelty scopes of the inventive idea, as well as it is clear that in the practical embodiment of the invention the various components described above may be replaced with technically equivalent ones.

[0029] In particular, the single-block structure 1 described above may safely entirely act as suction hood, without the need of providing further component elements, but the usual venting conduit of the cooking smoke sucked which fits on opening 6 obtained on the closing panel 1.3 (said venting conduit may also be used as carrying structure to be fixed to the ceiling, in the case of a hood for an island structure).

[0030] But said single-block structure may also be coated with special aesthetic covers, having the main function of design elements and to a smaller extent, of means for facilitating smoke conveying towards said single-block structure.

[0031] As mentioned above, the single-block structure 1 needs not necessarily consist of a cubic-shaped parallelepiped, as it may have any geometrical shape, with the functional components sized and shaped accordingly. For example, the support frame 1 may be of cylindrical shape and the filtering panels 2 may consist of a single cylindrical panelling or multiple curved filtering panels which, side by side, cover the cylindrical wall of said sup-

port frame.

[0032] Moreover, the filtering panels 2 need not occupy all the side walls of the support frame 1, for completely surrounding the motorized air conveyor 3, as they may well occupy only some of these side walls or also be placed in the front face of said support frame 1. Finally, while a hood in suction mode only has been described, the same teachings may be easily applied to a hood in filtering/purifying mode, proceeding to the replacement of the filtering panels 2 or adding suitable active carbon filters thereto.

Claims

1. Single-block structure (1) of a suction and/or filtering hood, suitable for eliminating the cooking smoke produced to the environment, said hood consisting at least of:

   - a filtering unit (2) provided with one or more anti-grease filters (2),
   - a suction unit (3) consisting in a motorized air conveyor (3),
   - control means (4) for operating said hood,

   characterised in that

   - said single-block structure (1) comprises a support frame (1) suitable for supporting and seating said filtering (2) and suction (3) unit,
   - said suction unit (3) is placed inside said support frame (1),
   - said filtering unit (2) consists of one or more filtering panels (2) constituting one or more walls of said support frame (1).

2. Single-block structure (1) according to the previous claim,
   characterised in that said support frame (1) also seats the lighting unit (5) and the control means (4.1) of the hood, said elements (5, 4.1) being placed in a module (4).

3. Single-block structure (1) according to the previous claim,
   characterised in that said module (4) acts as lower base to said support frame (1).

4. Single-block structure (1) according to any previous claim,
   characterised in that said support frame (1) is provided with an upper closing panel (1.3) whereon an opening (6) is obtained for fitting the venting conduit of the cooking smoke, said opening (6) being associated to the outlet of the motorized air conveyor (3).

5. Single-block structure (1) according to any previous claim,
   characterised in that the support frame (1) may define a volume of any geometrical shape.

6. Single-block structure (1) according to the previous claim,
   characterised in that said support frame (1) has a parallelepiped shape and said filtering panels (2) are positioned on the four side walls of said parallelepiped.

7. Single-block structure (1) according to any previous claim,
   characterised in that it may be coated with a cover having an aesthetical function.

8. Single-block structure (1) according to any previous claim,
   characterised in that the filtering panels (2) of the filtering unit (2) may be of any suitable type, suitable for operating the hood both in suction mode and in filtering/purifying mode.

9. Single-block structure (1) according to any previous claim except for 3,
   characterised in that the filtering panels (2) may also be positioned on the lower face of the support frame (1).

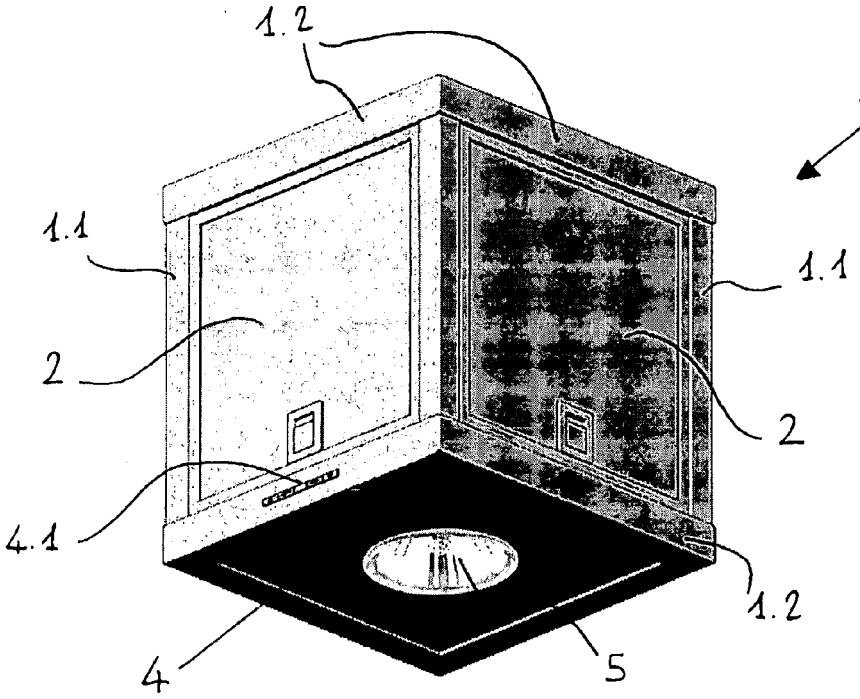

Fig. 1

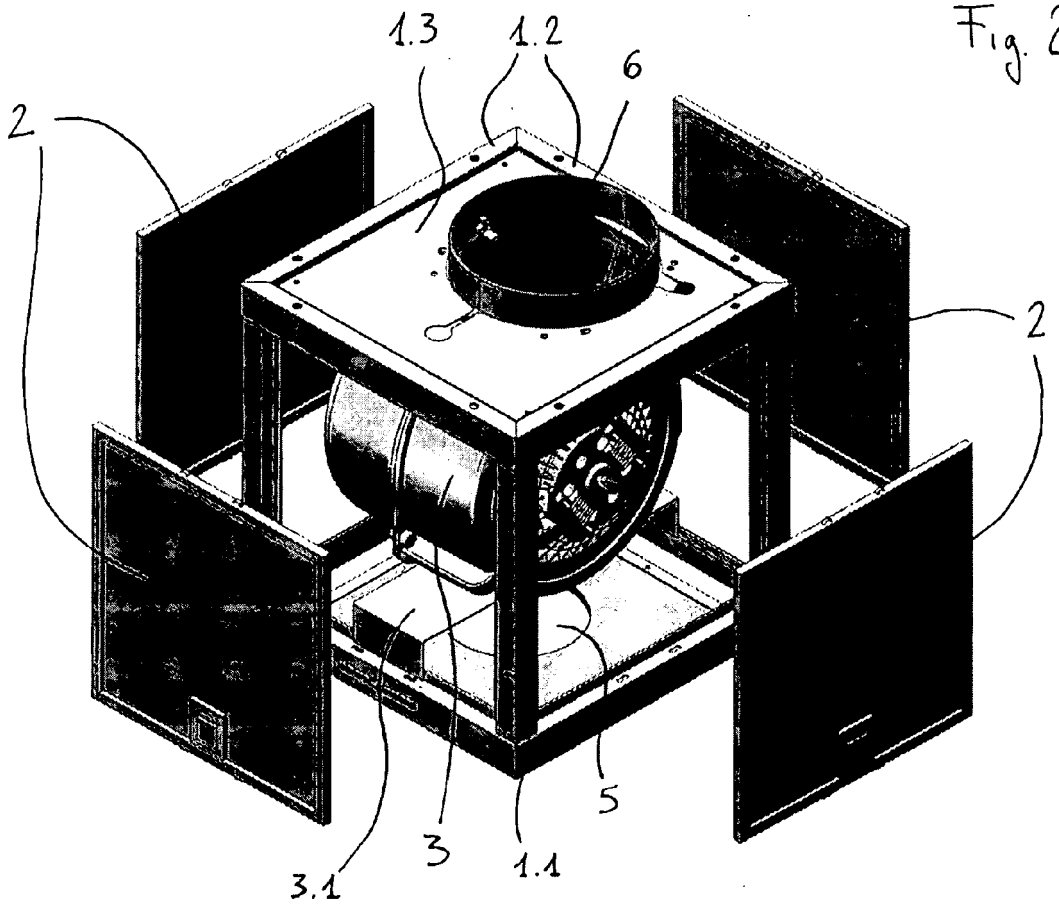

Fig. 2

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EUROPEAN SEARCH REPORT

Application Number
EP 09 00 2175

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 201 22 340 U1 (BUERCHER FRIEDRICH [DE]) 9 June 2005 (2005-06-09) * the whole document *	1-8	INV. F24C15/20
X	WO 2006/077064 A (LUFTTECHNIK & METALLBAU AG [CH]; TIEFENAUER KURT [CH]; FABRICIUS FINN) 27 July 2006 (2006-07-27) * the whole document *	1,4-6,8, 9	
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TECHNICAL FIELDS SEARCHED (IPC)

F24C

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	4 June 2009	Vanheusden, Jos

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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L : document cited for other reasons

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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 09 00 2175

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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04-06-2009

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