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(54) **Extractor hood**

(57) The invention relates to a fume collecting device via which fume-laden air is intended to be captured, incorporating a chassis portion which, inter alia, constitutes a substantial part of the exterior of the device, wherein the fume collecting device comprises means for procuring and controlling the intake and wherein a drive module (1a; 2a; 3a) is arranged as a separate unit and independently from the rest of the fume collecting device (1b; 2b; 3b) with the aim of providing for the said procurement and control. The invention also relates to a drive module for a fume collecting device and to a process for producing the fume collecting device.

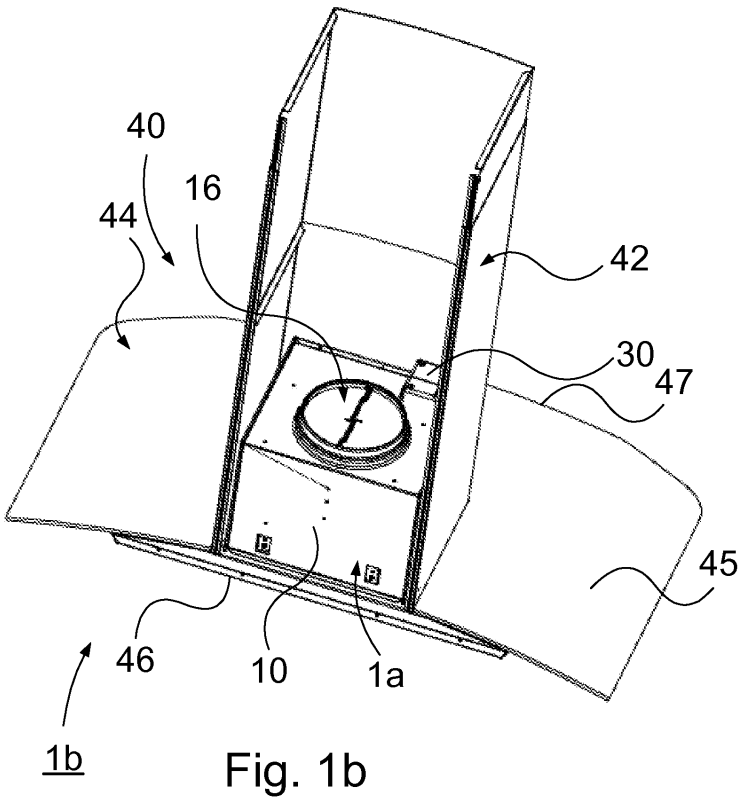

Fig. 1b

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Description

TECHNICAL FIELD

[0001] The application relates to a fume collecting device according to the preamble to Patent Claim 1. The application also relates to a drive module according to Claim 13 and to a process according to Claim 14.

BACKGROUND ART

[0002] There are a number of different fume collecting devices, i.e. devices intended to be arranged above a cooker to draw off cooking fumes, steam, etc. during cooking.

[0003] A cooker fan is a fume collecting device intended to be arranged in a separate kitchen flue. The cooker fan has an internal motor for driving a fan, in which the fan is normally integrated with the motor to form a unit, which fan is activated during use to draw off fume-laden air through the kitchen flue. The cooker fan can alternatively be equipped with an external motor for driving the fan, which external motor is placed in an attic or on the ceiling.

[0004] A cooker hood is another type of fume collecting device, which is arranged in a ventilation system. A cooker hood comprises a damper and, where appropriate, a timer for controlling the damper, as well as a transformer for controlling an external motor for operation of a ceiling fan. During use, the damper is opened, whereupon a forcing flow is obtained, so that, for example, fume-laden air is drawn off through the ventilation system. A cooker hood has no internal motor for driving a fan.

[0005] A further type of fume collecting device is a so-called Alliance, which is a cooker hood provided with a motor with fan, intended to be arranged in a ventilation system. During use, apart from opening the damper, an internal motor is also used to further improve the working. One advantage is that the air quantity can be increased without increasing the size of the external motor with fan.

[0006] Yet another type of fume collecting device is a carbon filter fan, this being cooker fans in which there is no facility to draw-off the fume-laden air to some flue. The carbon filter cleans the air of the cooking fumes.

[0007] More recently, so-called design hoods have become increasingly common. A design hood is a fume collecting device, normally a cooker fan, which is not intended to be built into a cupboard, but is intended to be arranged freely on the wall or in connection with a so-called kitchen island, where the look of the cooker fan is of importance. There are countless different configurations of such design hoods. These design hoods normally have a chassis portion having a lower part in which transformer, lighting, fan, electronics components for the control thereof, filter, motor, etc. are arranged, as well as a chimney part which is intended to cover the kitchen flue, which in turn is intended to lead away the food fumes. A problem with the increased number of variants of the chassis portion is that the installation of components, etc. must be matched to the design, thereby increasing the production costs.

OBJECT OF THE INVENTION

[0008] One object of the present invention is to provide a fume collecting device which allows more efficient production of the same.

DISCLOSURE OF INVENTION

[0009] This and other objects emerging from the following description are procured by means of a fume collecting device according to the above, and which also has the features set out in the characterizing part of the appended independent patent claims. Preferred embodiments of the fume collecting device are defined in the appended dependent claims.

[0010] According to the invention, the objects are procured with a fume collecting device via which fume-laden air is intended to be captured, incorporating a chassis portion which, inter alia, constitutes a substantial part of the exterior of the device, wherein the fume collecting device comprises means for procuring and controlling the intake, a drive module being arranged as a separate unit and independent from the rest of the fume collecting device with the aim of providing for the said procurement and control.

[0011] With such a drive module, great scope is given for configuration of the chassis portion of the fume collecting device, especially the lower part of the chassis portion, since regard does not need to be paid to devices for controlling and operating the fume collecting device. Product certification is also facilitated, since the drive module can be made identical for different designs of the fume collecting device and since essentially all basic devices for the control and operation are present in the drive module. In addition, production and product development are facilitated. The production is more cost-effective and development time and production time can be shortened. The drive module produces greater flexibility, since the function, such as cooker hood, cooker fan or Alliance, is only determined once a choice of drive module is made, which can be done in the final stage of the production. Adjustment is simplified, since the drive module for the specific function is identical for different designs of the fume collecting device. Servicing is also simplified, since the drive module, and the placement of devices therein, are the same for different designs of fume collecting devices.

[0012] According to one embodiment, the drive module comprises at least one damper arranged to be moved between a closed and a substantially open position, in which open position the fume-laden air is arranged to be discharged through the drive module. The inclusion of a damper in the drive module produces a cooker hood in which the cooker hood function is seated in the drive

module, which is independent from the design of the chassis portion. Adjustment of the damper is simplified, since the adjustment of damper and air flow looks similar for each cooker hood.

[0013] According to one embodiment, the damper is made up of a number of disc-shaped elements arranged one on top of the other, in which one of the disc-shaped elements is integrated in the drive module. The individual disc-shaped elements are simple to produce, at the same time as, assembled into a unit, offering a damper with good and reliable working. An upper portion of the drive module can constitute the lowermost disc-shaped element of the damper. One of the disc-shaped elements can form a first hatch device and another of the disc-shaped elements can form a second hatch device, in which the first hatch device is intended to be operated by a user and the second hatch device is intended to be adjusted by an installation engineer. Preferably, the first hatch device can also be adjusted by an installation engineer. The hatch devices are laterally slidable, which enables the adjustment. The provision of two adjustable hatch devices means that the damper can be optimized firstly for normal ventilation flow, and secondly for a more powerful flow, which can be used, for example, during cooking. The more powerful flow is procured by opening of the first hatch device by the user. The first hatch device can be a swing hatch and the second hatch device can be in the form of a sliding hatch.

[0014] According to one embodiment, the drive module comprises a fan for sucking in fume-laden air. The inclusion of a fan in the drive module produces a cooker fan in which the cooker fan function is seated in the drive module. The fan can be driven with an external or internal motor.

[0015] According to one embodiment, the drive module comprises a motor for driving the fan. This means that the whole of the cooker fan function is seated in the drive module.

[0016] According to one embodiment, the drive module comprises devices for controlling the damper and/or motor. Control for a drive module for a cooker hood is therefore obtained, in which the damper is controlled and/or external motor is controlled; for a cooker fan, in which the motor, and hence the fan, is controlled; or an Alliance, in which the damper and motor with fan are controlled.

[0017] According to one embodiment, the fume collecting device further comprises a control module comprising the said control devices. The arrangement of the control devices in the control module facilitates fault-finding in the said devices. The working of the control module can be checked before this is arranged in the drive module. The exchange costs and servicing are also reduced.

[0018] According to one embodiment, the control module is configured to be arranged in the drive module. This enables in simple fashion a function checking of the drive module with mounted control module prior to the completion of the fume collecting device. The control module and the drive module can be configured such that the control module can be fitted into the upper part of the drive module. This enables the control module to be arranged in the drive module without the flow through the drive module being disturbed by the control module.

[0019] According to one embodiment, the drive module comprises a housing in which alternative devices for alternative functions for the fume collecting device are intended to be arranged. This produces a simple configuration for enabling different functions of the drive module, such as cooker hood, cooker fan and Alliance.

[0020] According to one embodiment, the housing is preferably substantially parallelepipedal. With such a configuration of the housing, it is easy to mount devices in the housing and also easy to mount the housing on the chassis portion.

[0021] According to one embodiment, the drive module comprises an interface which is configured to constitute a fastening to the chassis portion. The interface enables the drive module to be easily fastened to the chassis portion, so that the fastening is substantially the same for the drive module, regardless of the function of the drive module and the design of the chassis portion, especially its lower part.

[0022] According to the invention, the objects are further met by a process for producing a fume collecting device. The process comprises the step of choosing a drive module from amongst a group of drive modules which are suited to fume collecting devices of different types. Such fume collecting devices comprise cooker fan, cooker hood, Alliance and carbon filter fan. In another step, a control module is chosen from amongst a group of control modules which are suited to fume collecting devices of the said different types. The working of the control module can be checked in a separate step. This check can be made by connecting a monitoring member to connection terminal boards of the control module. The checked control module is then arranged in the chosen drive module, whereafter it is also possible to check the working of the drive module with mounted control module. In the next step, a chassis portion is chosen from amongst a group of chassis portions of different configuration, whereupon the fume collecting device is completed by the arrangement of the drive module, with control module mounted therein, in the chosen chassis portion. Following the completion of the fume collecting device, in an additional step, which is important from a certification viewpoint, the working of the finished fume collecting device is checked. This is realized by the fume collecting device being connected to a voltage source and the respective functions being checked with the aid of the actuators of the fume collecting device.

BRIEF DESCRIPTION OF DRAWINGS

[0023] The present invention will be better understood with reference to the following detailed description read together with the appended drawings, in which the same

reference symbols relate to the same parts in the many views throughout, and in which:

Fig. 1a shows schematically a perspective view, viewed from above, of a drive module according to a first embodiment of the present invention;

Fig. 1b shows schematically a perspective view, viewed from above, of a fume collecting device having a drive module according to Fig. 1a;

Fig. 2a shows schematically a perspective view, viewed from above, of a drive module according to a second embodiment of the present invention;

Fig. 2b shows schematically a perspective view, viewed from above, of a fume collecting device having a drive module according to Fig. 2a;

Fig. 3a shows schematically a perspective view, viewed from above, of a drive module according to a third embodiment of the present invention;

Fig. 3b shows schematically a perspective view, viewed from above, of a fume collecting device having a drive module according to Fig. 3a;

Fig. 4 shows schematically a perspective view of a control module according to one embodiment of the present invention;

Fig. 5 shows schematically a perspective view from below of the drive module in Fig. 1a;

Fig. 6 shows schematically a perspective view from below of the drive module in Fig. 2a;

Fig. 7 shows schematically a perspective view from below of the drive module in Fig. 3a; and

Fig. 8 shows schematically the structure of a damper integrated in a drive module.

MODE(S) FOR CARRYING OUT THE INVENTION

[0024] In the embodiments below, by cooker fan is meant a fume collecting device with internal motor intended for arrangement in a separate kitchen flue, intended to capture and discharge fume-laden air. As previously stated, a cooker fan can also be equipped with an external motor for driving the fan. By cooker hood is meant a fume collecting device without motor, comprising a damper, and which can comprise a timer for controlling the damper, i.e. opening and closing the damper, which fume collecting device is intended to be installed in a ventilation system. A cooker hood can also comprise a control system for a central fan and a central motor. By Alliance is meant a cooker hood, provided with a motor, intended to be arranged in a ventilation system, wherein, instead of merely opening the damper to obtain an increased flow, an internal motor is also provided to drive a fan, so as thereby to improve the working.

[0025] Fig. 1a shows schematically a perspective view of a drive module 1a according to a first embodiment of the present invention. The drive module 1a comprises a housing 10, which according to this variant is substantially parallelepipedal, having an upper portion 12 or roof portion and side walls 14a, 14b, 14c, 14d. In the upper portion 12 there is a recess or opening containing a damper 16, which damper 16 is arranged to be opened by means of pressure from fume-laden air which is arranged to flow through the housing 10 during use. The damper 16 is rotatable about an axis between a closed position and an open position. The damper is a non-return damper intended to prevent downdraught in the absence of a natural draught of the kitchen flue. The damper 16 is removable. According to one variant, i.e. when natural draught exists in the kitchen flue, the drive module comprises no damper, but only the opening for leading the fume-laden air out of the drive module. Fig. 5 shows schematically a perspective view from below of the drive module 1a according to the first embodiment.

[0026] The drive module further comprises a fan motor 20 complete with fan, which fan motor is arranged in the housing 10. The fan motor 20, which can be seen from Fig. 5, is arranged to drive the fan 22. The fan is arranged to suck up fume-laden air, in which case the fume-laden air is arranged to flow through the housing and, by means of pressure, forces the damper 16, or alternatively flows directly through an opening when there is no damper present.

[0027] The drive module 1a further comprises a control module 30, which according to this variant is mounted in connection with the upper portion 12 of the housing 10. Fig. 4 shows the control module 30 according to one variant of the present invention. The control module 30 comprises a printed circuit board 32 and a transformer 34, and a casing 36 for holding these. The printed circuit board 32 contains devices, i.e. electronic components, for controlling the transformer 34, fan and lighting. The transformer 34 is arranged to control the fan motor 20 and thus the fan.

[0028] Fig. 1b shows schematically a fume collecting device 1b containing a drive module 1a according to Fig. 1a, the fume collecting device 1b constituting a cooker fan 1b.

[0029] The fume collecting device comprises a chassis portion 40, which, inter alia, constitutes a substantial part of the exterior of the fume collecting device 1b. The chassis portion 40 has an upper part 42, which is configured as a flue, and a lower part 44, which according to this variant has a flat, somewhat curved profile and a substantially rectangular shape. The flue part 42 is arranged on the top side 45 of the lower part 44 of the chassis portion 40. On the bottom side 46 of the lower part 44 of the chassis portion 40, which side is intended to face the

cooker, there are preferably arranged lighting and filters for filtering the fume-laden air. In addition, on the front side 47 of the lower part 44 of the chassis portion 40, or in connection therewith, actuators/switches are provided for operating the fan and lighting. The chassis portion is intended to be arranged on a wall, the flue part being arranged to be connected to a kitchen flue for the evacuation of fume-laden air.

[0030] The lower part 44 of the chassis portion and the flue part 42 are fluidically connected, so that the fume-laden air is allowed to flow therebetween. The bottom side 46 of the lower part 44 of the chassis portion has an opening/openings for letting through the fume-laden air.

[0031] The drive module 1a is arranged in the flue part 42 of the chassis portion. The drive module 1a is arranged for fastening in the chassis portion 40. The control module 30 is connected to the actuators/switches, preferably by means of cabling for electrical connection, in such a way that lighting and fan can be operated by means of the actuators/switches.

[0032] The drive module 1a further comprises an interface 18, which is arranged to fit when fastened to the chassis portion 40 of the fume collecting device. According to this embodiment, the interface constitutes outturned flaps of the lower part of the respective wall 14a, 14b, 14c, 14d of the housing 10, which flaps 18 are arranged to be fastened to the chassis portion 40 by means of fastening elements.

[0033] During operation in cooking, for example, when the fan of the drive module 1a is activated, fume-laden air is arranged to flow through the lower part 44 of the chassis portion in through an opening in the bottom of the housing 10 of the drive module 1a and onward through the damper 16, which is arranged to be opened by means of gas pressure, i.e. the pressure of the fume-laden air, the fume-laden air being arranged to be evacuated in a kitchen flue.

[0034] Hence, by means of the drive module 1a according to the first embodiment, the cooker fan function is obtained, in which the drive module 1a constitutes a unit separate from the chassis portion 40.

[0035] Fig. 2a shows schematically a perspective view from above of a drive module 2a according to a second embodiment of the present invention. The drive module 2a comprises a housing 50, which according to this variant is substantially parallelepipedal, having an upper portion 52 or roof portion and side walls 54a, 54b, 54c, 54d. In the upper portion 52 there is a recess or opening containing a damper 56. The damper 56 is arranged to move between a closed position and an open position. Fig. 6 shows a perspective view from below of the drive module 2a according to the second embodiment.

[0036] Fig. 8 illustrates the structure of the damper 56. The damper 56 can be made up of a plurality of disc-shaped elements S1-S5. The disc-shaped elements can be constituted, for example, by steel plates. Here, five disc-shaped elements S1-S5 are used. Two of the disc-shaped elements S2, S4 are constituted, in turn, by two disc-shaped elements S2, S2', S4, S4', the damper 56 comprising seven disc-shaped elements in total.

[0037] The lowermost disc-shaped element S 1 of the damper 56 is constituted by the roof portion 52 of the drive module 2a. The damper 56 is thereby integrated in the drive module 2a. The roof portion 52 with its, in this case, rectangular opening, and a number of rivet or screw holes arranged around this opening, here constitutes the lowermost, or first, disc-shaped element S 1 of the damper 56.

[0038] The second disc-shaped element S2 of the damper 56 is constituted by two disc-shaped elements in the same plane S2, S2', which are articulately fastened to each other by a hinge 70. One (the right-hand one in the figure), fixed, S2' of the disc-shaped elements S2, S2' is clamped to the first disc-shaped element S1 of the damper 56 with the aid of the third disc-shaped element S3. A swing hatch is thereby formed, which is openable inwards into the drive module 2a and is constituted by the movable element S2 (the lefthand one in the figure). The third disc-shaped element S3 is a simple rectangular element having a rectangular opening. As a result of the second disc-shaped element S2 being clamped between the first disc-shaped element S 1 and the third disc-shaped element S3, the second disc-shaped element S2 is slidable in its longitudinal direction. This slidability means that the opening through the damper, in the closed position of the swing hatch, can be adjusted. A locking screw (not shown) can be manipulated to lock the position of the second disc-shaped element S2 relative to the roof portion 52.

[0039] The fourth disc-shaped element S4 of the damper 56 is constituted, just like the second disc-shaped element S2, by two disc-shaped elements in the same plane S4, S4'. One disc-shaped element S4 is an outer element of rectangular shape, having a rectangular opening. In the rectangular opening there is arranged the second, inner disc-shaped element S4'. The inner element S4' can be arranged at various lateral positions in the outer element S4. In this way, the fourth disc-shaped element S4 forms an adjustable hatch. The different positions of the inner element S4' in the outer element S4 correspond to the different degrees of opening of the damper 56. One outer side edge of the inner element S4' and the corresponding side edge of the opening in the outer element are serrated. The inner element S4' can thereby be locked relative to the outer element S4 in a particular position by the interaction of these serrations 72. The inner element S4' is secured from below by the second, fixed, disc-shaped element S2' and from above by the fifth disc-shaped element S5. The fifth disc-shaped element S5 is a rectangular element having a rectangular opening.

[0040] When the swing hatch S2 is in the closed, raised position, the opening through the damper 56 is defined by the outer edge of the swing hatch S2, an edge of the opening in the fourth disc-shaped element S4, and two opposite edges of the opening in the fifth disc-shaped

element S5. All the edges which delimit the opening of the damper 56 are slightly turned up, as can be seen from Fig. 8. Turbulence in the air flow is thereby minimized, which gives a low noise level. The swing hatch S2 is normally set, by displacement in its longitudinal direction, such that the damper 56, even when the swing hatch S2 is closed, has an opening allowing a flow through the damper 56. This flow corresponds to a ventilation flow.

[0041] When the swing hatch S2 is in its open, lowered position, the damper 56 has a larger opening allowing a large flow, which is used, for example, to transport away fume-laden air during cooking. This larger opening through the damper 56 is defined by the fourth disc-shaped element S4 and the fifth disc-shaped element S5, as can be seen from Fig. 8. Once again, all the edges which delimit the opening of the damper 56 are slightly turned up.

[0042] As a result of the slidability of the second disc-shaped element S2 and the fourth disc-shaped element S4, an installation engineer is able to adjust the respective flows through the damper in respect of an open and closed swing hatch respectively. The flows can thereby be optimized, in line with prevailing building standards, for normal ventilation (closed swing hatch) and the evacuation of fume-laden air during cooking (open swing hatch).

[0043] The above-described structure of the damper 56 is cost-effective and reliable. Each of the seven disc-shaped elements in total which are put together to form the damper 56 are easy to produce. The disc-shaped elements can be produced by relatively uncomplicated punching operations and are then joined together in a simple and automatable manner, giving a cost-effective damper with good and reliable working.

[0044] The drive module 2a further comprises a control module 30, which according to this variant is mounted in connection with the upper portion 52 of the housing. The control module comprises a printed circuit board 32 and a casing 36 for holding the printed circuit board 32. The printed circuit board 32 contains devices, i.e. electronic components, for controlling the damper 56 and the lighting. The printed circuit board can also be arranged to control damper, lighting and external motor with fan.

[0045] Fig. 2b shows schematically a fume collecting device 2b, in which a drive module according to Fig. 2a is arranged, the fume collecting device constituting a cooker hood 2b.

[0046] The chassis portion 40 of the cooker hood 2b according to Fig. 2b is substantially identical with the chassis portion 40 of the cooker fan according to Fig. 1b. The chassis portion 40 according to Fig. 2b differs from the chassis portion 40 according to Fig. 1b only in that the actuator/switch is arranged to operate damper 56 and lighting instead of fan and lighting.

[0047] The drive module 2a is arranged in the flue part 42 of the chassis portion. The drive module 2a is arranged for fastening in the chassis portion 40. The control module 30 is connected to the actuators/switches, preferably by means of cabling for electrical connection, in such a way that lighting and damper can be operated by means of the actuators/switches.

[0048] The drive module 2a further comprises an interface 18, which is arranged to fit when fastened to the chassis portion 40 of the fume collecting device. According to this embodiment, the interface constitutes outturned flaps belonging to the lower part of the respective wall 54a, 54b, 54c, 54d of the housing 50, which flaps 18 are arranged to be fastened to the chassis portion 40 by means of fastening elements.

[0049] During operation in cooking, for example, when the damper 56 of the drive module 2a is in its open position or substantially open, fume-laden air is arranged to flow through the lower part 44 of the chassis portion 40 in through an opening in the bottom of the housing 50 of the drive module 2a and onward through the damper 56, in which the damper 56 during operation is arranged to be opened by means of the actuator, the fume-laden air being arranged to be evacuated in a kitchen flue.

[0050] Hence, by means of the drive module 2a according to the second embodiment, the cooker hood function is obtained, in which the drive module 2a constitutes a unit separate from the chassis portion 40.

[0051] Fig. 3a shows schematically a perspective view of a drive module 3a according to a third embodiment of the present invention.

[0052] The drive module 3a comprises a first housing 60, which according to this variant is substantially parallelepipedal, having an upper portion 62 or roof portion and side walls 64a, 64b, 64c, 64d. In the upper portion 62 there is a recess or opening containing a damper 66. The damper is arranged to move between a closed position and an open position. The upper housing 60 with the damper 66 has substantially the same function as the drive module 2a and constitutes a sub-module 2a'. For a detailed description of how the damper 66 can be designed, reference is made to the description of Fig. 8.

[0053] The drive module comprises a second housing 10, which according to this variant is substantially parallelepipedal, having an upper portion 12 or roof portion and side walls 14a, 14b, 14c, 14d. In the upper portion there is a recess or opening containing a damper. In the upper portion 12 there is a recess or opening through which the fume-laden air is arranged to flow.

[0054] The drive module 3a further comprises a fan motor 20 complete with fan in the second housing 10. The fan motor 20, as can be seen from Fig. 7, which shows schematically a perspective view from below of the drive module 3a according to the third embodiment, is arranged to drive the fan 22. The fan 22 is arranged to suck up cooking fumes and air, the cooking fumes and the air flowing through the second housing through the opening. According to this embodiment, the second housing 10 has substantially the same dimensions as the housing 10 according to the first embodiment. The second housing 10 with fan motor 20 complete with fan

constitutes a second sub-module, substantially corresponding to the first drive module 1a.

[0055] The drive module 3a further comprises a control module 30, which according to this variant is mounted in connection with the upper portion 12 of the second housing 10. Fig. 3 shows a perspective view of the control module 30 according to one variant of the present invention. The control module 30 comprises a printed circuit board 32 and a transformer 34, and a casing 36 for holding these. The printed circuit board 32 contains devices, i.e. electronic components, for controlling transformer, fan, damper and lighting. The transformer 34 is arranged to control the fan motor 20 and thus the fan.

[0056] Fig. 3b shows schematically a fume collecting device containing a drive module 3a according to Fig. 3a, the fume collecting device 3b constituting an Alliance.

[0057] The chassis portion of the Alliance 3b according to Fig. 3b is substantially identical with the chassis portion of the cooker fan according to Fig. 1b. The chassis portion according to Fig. 3b differs from the chassis portion according to Fig. 1b only in that the actuator/switch is arranged to also operate the damper 66 in addition to the fan and lighting.

[0058] The drive module 3a is arranged in the flue part 42 of the chassis portion 40. The drive module 3a is arranged for fastening in the chassis portion 40. The control module 30 is connected to the actuators/switches, preferably by means of cabling for electrical connection, in such a way that lighting, fan of the fan motor 20 and damper 66 can be operated by means of the actuators/switches.

[0059] The drive module 3a further comprises an interface 18, which is arranged to fit when fastened to the chassis portion 40 of the fume collecting device. According to this embodiment, the interface constitutes outturned flaps belonging to the lower part of the respective wall 14a, 14b, 14c, 14d of the lower housing 10, which flaps 18 are arranged to be fastened to the chassis portion 40 by means of fastening elements.

[0060] During operation in cooking, for example, when the fan in the second housing 10 of the drive module 3a is activated, fume-laden air is arranged to flow through the lower part 44 of the chassis portion 40 in through an opening in the bottom of the second housing 10 of the drive module 3a and onward through the opening in the upper portion of the second housing 10. During operation, the damper 66 is connected with the first housing 60 of the drive module 3a in its open position, or substantially open, the fume-laden air being arranged to flow further in through an opening in the bottom of the housing 60 of the drive module 3a and onward through the damper 66, in which the damper 66 during operation is arranged to be opened, by controlling of electronic components of the printed circuit board, by means of the actuator, the fume-laden air being arranged to be evacuated in a kitchen flue.

[0061] Hence, by means of the drive module 3a according to the third embodiment, the Alliance function is obtained, in which the drive module 3a constitutes a unit separate from the chassis portion.

[0062] Above, various embodiments of the present invention have been described. By providing a drive module which constitutes a separate unit and is independent of the rest of the fume collecting device, in which the drive module is intended to be arranged for procuring and controlling the intake of fume-laden air in, for example, cooking, a host of advantages are obtained.

[0063] The interface 18 of the drive module 1a, 2a, 3a according to the first, second and third embodiments is substantially the same, fastening of the respective drive module being the same for the different drive modules.

[0064] In all chassis portions in which a drive module according to any of the embodiments above is arranged, a cooker fan, a cooker hood or an Alliance is respectively obtained. The drive module constitutes the function of the fume collecting device and is standardized for the respective cooker fan, cooker hood and Alliance such that the respective drive module has the same size and function. The function is hence moved from the chassis portion itself to a separate drive module. In this way, great scope is given for designing the chassis portion, especially the lower part of the chassis portion, in accordance with different requirements, without regard having to be paid to different components, such as devices for controlling and operating the fume collecting device. The chassis portion 40 having the lower part 44 according to the first, second and third embodiments is only one example of a chassis portion and any suitable design whatsoever of the chassis portion is possible, in which the lower part, in particular, can have substantially different looks.

[0065] The drive module according to the present invention facilitates, for example, product certification, since all the components, and the entire construction concerning the way in which these components are installed, are identical in all products. The chassis portion per se comprises just lighting and filter, instead of, as previously, everything which according to the invention is now instead arranged in the drive module. The chassis portion can then most probably be allowed to vary without affecting the certification, since those parts which are essential from the certification aspect are included in the drive module.

[0066] The production is facilitated, since the fume collecting device is not product-specific or customer-specific until the drive module is to be arranged in the finished/definitive chassis portion. It further facilitates future product development, since focus, as has been stated, can then be placed on the lower part of the chassis portion. In the design of the lower part of the chassis portion, regard needs only be paid to switches, lighting and filters, all other functions and components being found in the standardized drive module, i.e. that which is associated with electrical safety, working and product design. Hence all technical difficulties, such as the placement of damper, transformers, electronics, motors, etc., do not need to be

solved, since a solution is already provided in the drive module.

[0067] The development time for new products is shortened. Many different models of the cooker fan, cooker hood and Alliance can be cost-effectively produced, since the drive module is substantially the same for the respective fume collecting device, and only lighting and filters are not included in the drive module. The large volumes lie in the production of the drive modules, which are then mounted in the chassis portion. According to a preferred embodiment, the fastening of the drive module to the chassis portion is intended to be the same for all models. The design of the lower part of the chassis portion can here range from large volumes down to single piece production. With the drive module according to the present invention, cost-effective production of all models in all embodiments is enabled.

[0068] One advantage is hence that the choice of product, i.e. cooker fan, cooker hood or Alliance, can be made in the final stage of the production, thereby giving increased flexibility. In the event of a wrong order, a swap can easily be made.

[0069] The present invention results in simplified adjustment of the damper, since adjustment and measurement of the air flow, adjustment of the damper, and, where appropriate, adjustment of output voltage from the transformer look substantially the same for each cooker fan, cooker hood and Alliance, regardless of the outer design of the product, i.e. the look of the chassis portion. The same applies to servicing. Through product training for the drive module according to the present invention, the knowledge is acquired to service all products. At present the components are seated in different places, the dampers facing in different directions, different printed circuit boards, different encapsulations, etc., which calls for product training for a greater number of products.

[0070] The number of articles is also reduced, resulting in additional cost savings. The mounting method is always the same, which simplifies assembly. The respective drive module then looks the same. The components are seated in the same place.

[0071] Fig. 4 shows schematically a perspective view of the control module 30 according to one embodiment of the present invention. The control module 30 is dimensioned in such a way that it can be fitted in the housing 10; 50 of the drive module 1a; 2a; 3a according to any of the embodiments according to Figs. 1a, 2a, 3a. One advantage of the control module 30 being able to be arranged in the drive module 1a; 2a; 3a is that function checking of the drive module 1a; 2a; 3a with mounted control module can easily be carried out at the factory. The fitting of the control module 30 in the upper part of the drive module 1a; 2a; 3a means that it advantageously does not obstruct the flow through the drive module 1a; 2a; 3a.

[0072] According to the first and third embodiments, the control module comprises a printed circuit board comprising devices for controlling transformer, fan and lighting, in which the lighting is arranged outside the drive module in connection with the lower part of the chassis portion, as well as a transformer for controlling the internal fan motor and/or external motor. The control module comprises so-called connection terminal boards to which connecting leads are coupled, which connecting leads are connected to transformer, fan motor and/or damper.

[0073] According to the second embodiment, the control module comprises just one printed circuit board, which comprises devices for controlling damper and lighting. Should an external motor with fan be used, the control module also comprises a transformer 34. The transformer can be arranged on the top side of the control module such that it is accessible from the top side of the drive module even after the control module has been mounted in the drive module. Switching inside the transformer is thereby able to be easily done should the output voltage of the transformer require adjustment.

[0074] The casing of the control module is arranged to be able to receive and accommodate printed circuit board and transformer, connection terminal boards, etc. The printed circuit board has the same configuration, but comprises different devices depending on the intended drive module, i.e. drive module for cooker fan, cooker hood or Alliance. The casing of the control module has the same configuration for the drive modules according to the different embodiments, whereas the components in the control module vary depending on the drive module. The casing is configured to be fitted and arranged in the housing of the drive module for the different embodiments and is configured such that opening of the housing, damper, and/or fan motor/fan is not affected.

[0075] According to a preferred embodiment, the control module is exchangeable, which is advantageous in the event of a wrong order or a swap, where a control for a central fan is desired, for example, a new control module being able to replace the previous one, whereupon the new functions are obtained.

[0076] It is also beneficial in production to install the control modules, which are then mounted in the housing. The drive module can be handled in an assembly in which everything is completed, whereupon a function check is made.

[0077] It is also advantageous to be able to exchange the control module during servicing. Through the provision of a control module, fault-finding is made easier. The components in the control module are relatively expensive; if the whole of the control module is changed, fault-finding and repair of electronic components and/or the transformer can be realized, with the control module being able to be reused. The replacement costs are also reduced, since the exchange can be made in shorter time. Even if it turns out that the electronics are defective, these can be repaired and reused. In servicing, the cooker fan, i.e. the whole of the chassis, does not need to be removed, but only the control module. Finally, all that remains is to connect up the lighting.

[0078] Any damper whatsoever, such as a slidable,

rotatable, plastics damper, sheet-metal damper, etc. can be used.

[0079] The drive module according to the first, second and third embodiments has different dimensions. The drive module according to the second embodiment for a cooker hood is shorter than the drive module according to the first embodiment for a cooker fan, since the cooker hood does not require any motor, whereas a fan motor is accommodated in the housing of the drive module according to the second embodiment. By making the drive module according to the second embodiment shorter, advantage is obtained in transportation thereof, since the packaging takes up less space.

[0080] According to one variant of the present invention, the housing of the drive module for a cooker hood has the same dimensions as the housing of the drive module for a cooker fan. This yields the advantage that only one size of housing needs to be produced for cooker fan and cooker hood, in which case production is simplified and the number of articles reduced. It also increases flexibility, since the housing can be used for either cooker fan or cooker hood.

[0081] According to one variant of the present invention, the housing of the drive module for a cooker fan and the housing of the drive module for a cooker hood have the same dimensions as the housing of the drive module for an Alliance, i.e. the same size of housing of a drive module for cooker fan, cooker hood and Alliance. This yields the advantage that only one size of housing needs to be produced for cooker fan, cooker hood and Alliance, in which case production is simplified and the number of articles reduced. It also increases flexibility, since the housing can be used for either cooker fan, cooker hood or Alliance.

[0082] According to the first, second and third embodiments of the present invention, the housing of the cooker fan, the housing of the cooker hood, and the first and second housings of the Alliance are substantially parallelepipedal. However, the housing, or the first and second housings, can assume any suitable geometric form for facilitating fastening of the same, as well as placement/fastening of components in the same. The housing could, for example, be frustoconical.

[0083] According to one embodiment (not shown) of the present invention, the drive module is intended for a carbon filter cooker fan, the fan and fan motor for driving the fan being arranged in the housing. In this case, a carbon filter is arranged on the drive module in order, during operation, to filter cooking fumes from the fume-laden air. According to one variant, the filter is arranged on the suction side of the fan. According to another variant, the filter is arranged on the pressure side of the fan.

[0084] The above-described fume collecting device can advantageously be produced by a process comprising the steps:

- choice of drive module 1a; 2a; 3a from amongst a group of drive modules which are suited to fume collecting devices of different type. Such fume collecting devices comprise cooker fan, cooker hood, Alliance and carbon filter fan,
- choice of control module 30 from amongst a group of control modules which are suited to fume collecting devices of the said different types,
- checking of the working of the control module 30,
- arrangement of the chosen control module in the chosen drive module,
- choice of a chassis portion 40 from amongst a group of chassis portions of different configuration,
- arrangement of the drive module, with control module mounted therein, in the chosen chassis portion, and
- checking of the working of the fume collecting device.

[0085] The present fume collecting device, and the process for its production, effectively minimizes the number of faulty fume collecting devices delivered ex factory. The fact that the control modules - in which possible faults are likely to arise - can be checked in a separate step prevents faulty control modules from being installed in the drive modules. This means that the faults are detected at an early stage in the production. It is also possible in a separate stage to check the working of the drive module, with control module mounted therein, prior to installation in the chassis.

[0086] The invention should therefore not be deemed limited to the above-specified embodiments, but can be varied within its scope defined by the appended patent claims.

Claims

1. Fume collecting device via which fume-laden air is intended to be captured, incorporating a chassis portion (40) which, inter alia, constitutes a substantial part of the exterior of the device, wherein the fume collecting device comprises means for procuring and controlling the intake, **characterized by** a drive module (1a; 2a; 3a) arranged as a separate unit and independently from the rest of the fume collecting device (1b; 2b; 3b) with the aim of providing for the said procurement and control.

2. Fume collecting device according to Claim 1, wherein the drive module comprises at least one damper (16; 56; 66) arranged to be moved between a closed and a substantially open position, in which open position the fume-laden air is arranged to be discharged through the drive module.

3. Fume collecting device according to Claim 2, wherein the damper (56; 66) is made up of a number of disc-shaped elements (S1-S5) arranged one on top of the other, in which one of the disc-shaped elements (S1-S5) is integrated in the drive module (2a; 3a).

4. Fume collecting device according to Claim 3, wherein, during use, an upper portion (52, 62) of the drive module (2a; 3a) constitutes, during use, the lowermost disc-shaped element (S1) of the damper (56; 66).

5. Fume collecting device according to Claim 4, wherein one of the disc-shaped elements (S2, S2') forms a first hatch device and another of the disc-shaped elements (S4, S4') forms a second hatch device, in which the first hatch device is intended to be operated by a user and the second hatch device is intended to be adjusted by an installation engineer.

6. Fume collecting device according to any one of the preceding claims, wherein the drive module comprises a fan (22) for sucking in fume-laden air.

7. Fume collecting device according to any one of the preceding claims, wherein the drive module (1a; 3a) comprises a motor (20) for driving the fan (22).

8. Fume collecting device according to any one of the preceding claims, wherein the drive module (1a; 2a; 3a) comprises devices (32; 32, 34) for controlling the damper and/or motor.

9. Fume collecting device according to Claim 8, further comprising a control module (30) comprising the said control devices (32; 32, 34).

10. Fume collecting device according to Claim 9, wherein the control module (30) is configured to be arranged in the drive module (1a; 2a; 3a).

11. Fume collecting device according to Claim 10, wherein the control module (30) and the drive module (1a; 2a; 3a) are configured such that the control module can be fitted into the upper part of the drive module (1a; 2a; 3a).

12. Fume collecting device according to any one of the preceding claims, wherein the drive module (1a; 2a; 3a) comprises an interface (18) which is configured to constitute a fastening to the chassis portion (40).

13. Drive module (1a; 2a; 3a) according to any one of the preceding claims, intended to be arranged in connection with the chassis portion (40) of a fume collecting device.

14. Process for producing a fume collecting device according to any one of the preceding claims, comprising the steps:

- choice of drive module (1a; 2a; 3a) from amongst a group of drive modules which are suited to fume collecting devices of different type,
- choice of control module (30) from amongst a group of control modules which are suited to fume collecting devices of different type,
- checking of the working of the control module (30),
- arrangement of the chosen control module (30) in the chosen drive module (1a; 2a; 3a),
- choice of a chassis portion (40) from amongst a group of chassis portions of different configuration,
- arrangement of the drive module (1a; 2a; 3a), with mounted control module (30) in the chosen chassis portion (40), whereafter the fume collecting device is completed.

15. Process according to Claim 14, further comprising the step:

- checking of the working of the drive module (1a; 2a; 3a) with mounted control module (30), following the arrangement of the chosen control module (30) in the chosen drive module (1a; 2a; 3a).

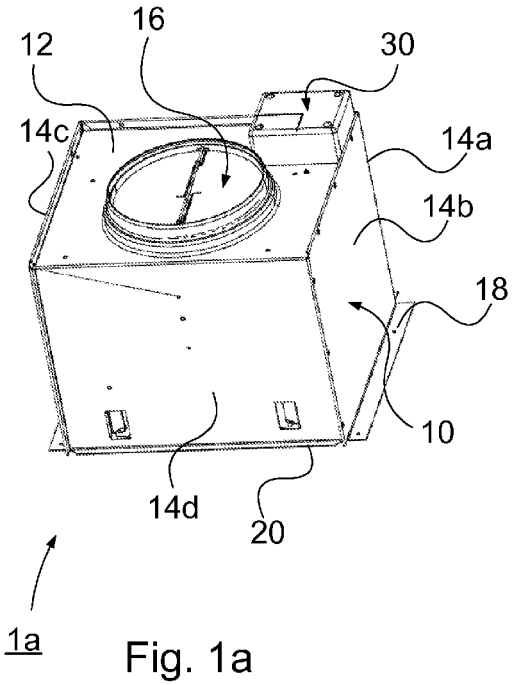

Fig. 1a

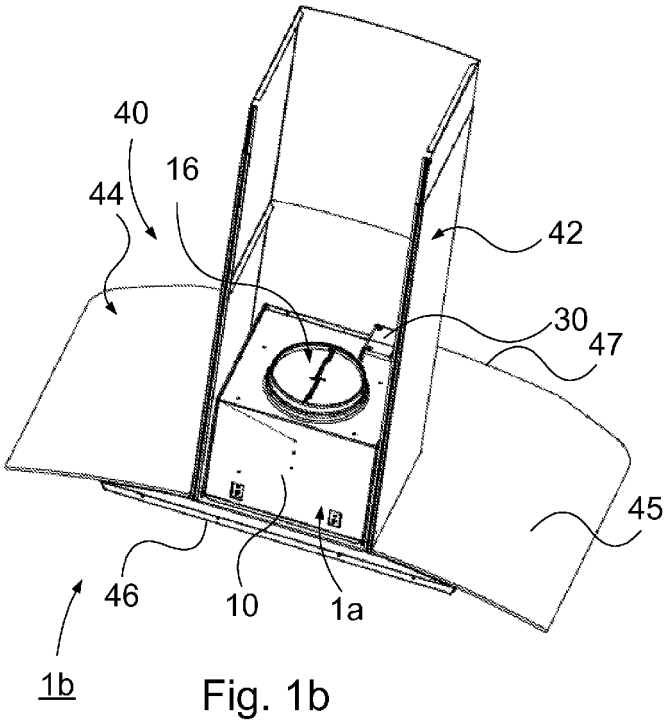

Fig. 1b

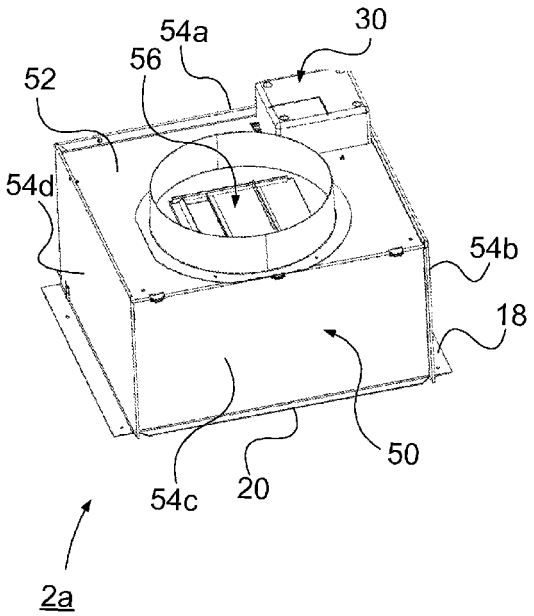

Fig. 2a

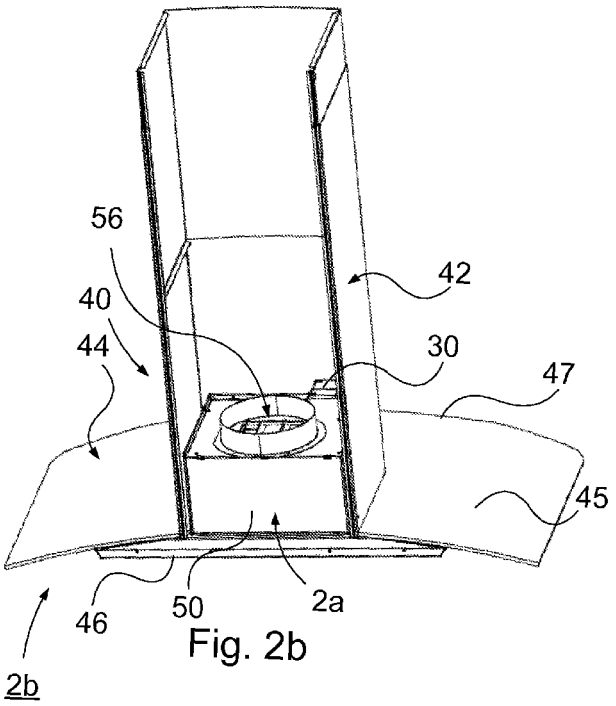

Fig. 2b

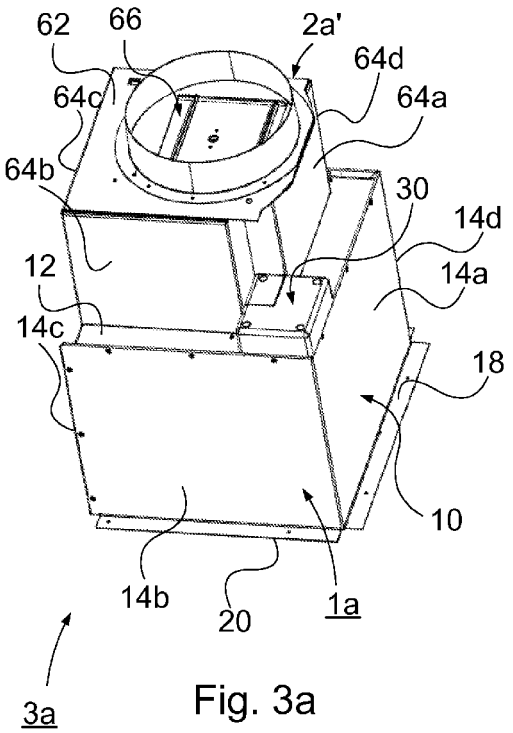
62
66
2a'
64d
64a
64c
64b
30
14d
12
14a
14c
18
10
14b
20
1a
3a

Fig. 3a

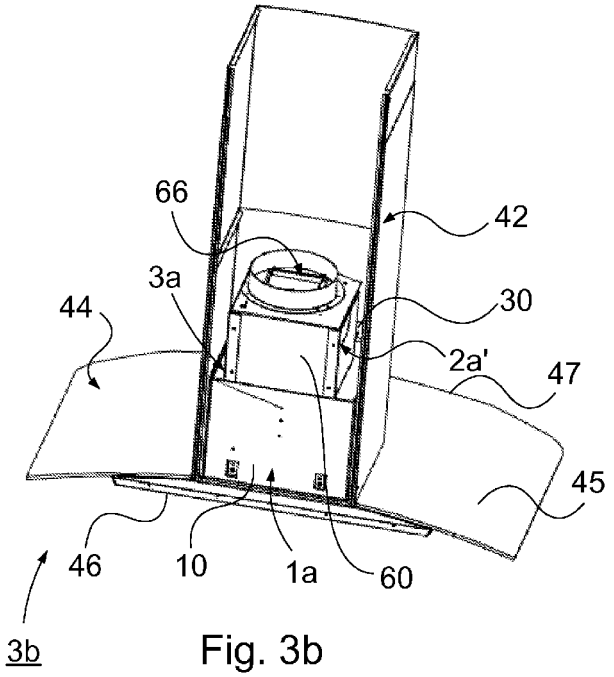
66
42
3a
44
30
2a'
47
45
46
10
1a
60
3b

Fig. 3b

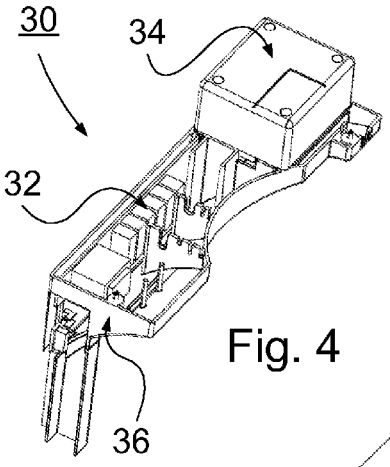

Fig. 4

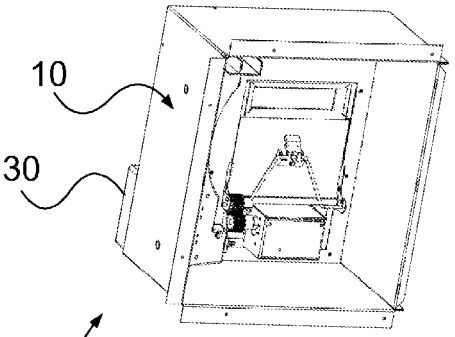

Fig. 6

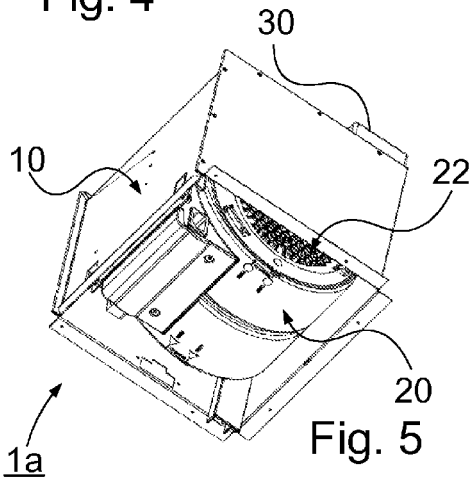

Fig. 5

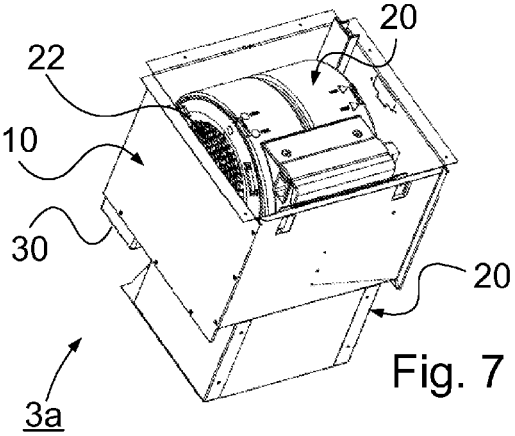

Fig. 7

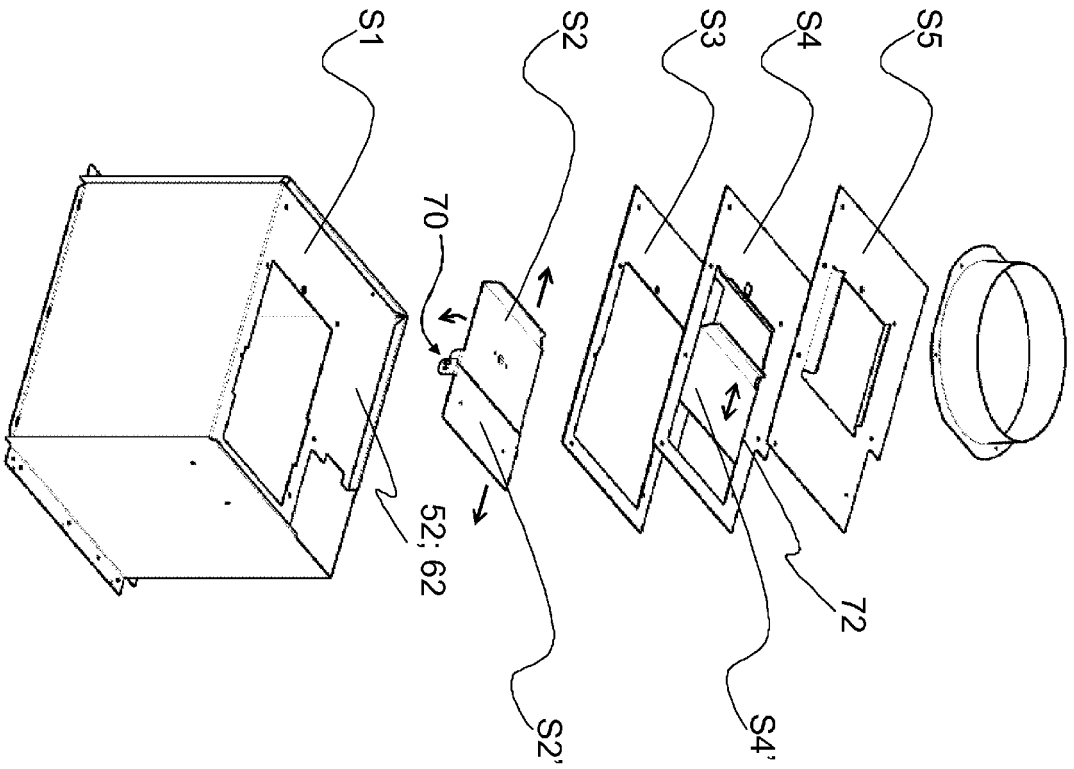

Fig.8