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(54) **Extractor hood integrated in a hob**

(57) Powered extractor hood, integrated in a hob, suitable to slide inside a container comprising a movable part, through which are extracted the fumes and vapours from cooking; driving mechanisms to control the displacement of said movable part between one rest position and an operating position; at least one actuator controlled by a control unit for controlling said driving mechanisms; a compartment connected to the container and containing adaptors for outflow conduits for venting the air and the fumes and vapours being extracted; filters inserted in the container for cleaning the fumes and vapours being removed.

Said driving mechanisms include cams or eccentric discs connected to the respective actuator and suitable to operate in synchronism runners which slide in vertical guides integrated in the container to lift and lower the movable part of the extractor hood.

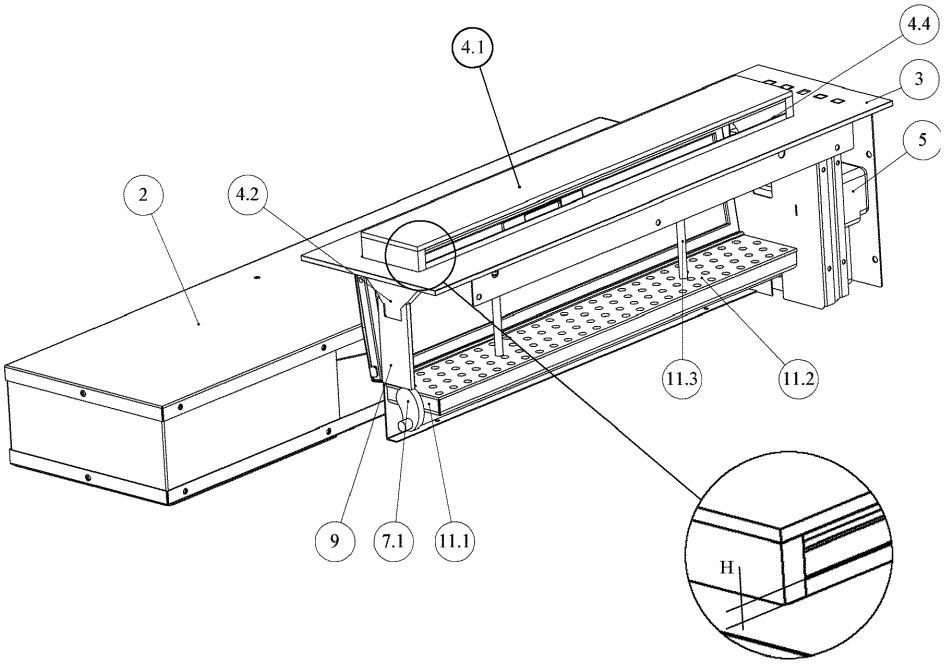

Fig. 2

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Description

TECHNICAL FIELD OF INVENTION

[0001] The present invention is relative to an extractor hood, with powered fan, for venting fumes and vapours generated during the preparation and cooking of food, built into the working top of a kitchen or integrated in a hob.

BACKGROUND OF THE INVENTION

[0002] Similar solutions of this type are known that however comprise complicated mechanisms for driving said hoods between the recessed rest position and the protruding operating position, that suck downward the fumes and vapours to circulate them in the room where they are installed or to vent them outside the kitchen environment.

[0003] The EP2105674 European patent application describes a powered extractor hood for kitchens. The driving power is provided by an actuator, in particular a hydraulic jack which, fastened to the bottom of the compartment that houses the movable part, moves upward or downward the movable element of the hood. On the movable element is mounted a shaft that rotates freely, the ends of which are provided with gears that engage corresponding racks so that, during their movement, the axis of the movable element remains parallel to the direction of displacement of the movable element. A different preferred embodiment contained in the same document proposes the substitution of the hydraulic jack with an electric motor, mounted on the wall of the movable element, that drives the shaft to rotate the gears that engage the racks installed on the sides of the housing.

[0004] The US2008029081 patent application also describes a retractable telescopic fan of limited thickness. The solution employs a pantographic device with an end fastened to the structure of the fan through a bracket and an end connected to the movable element to cause the upward and downward movement of the latter. An actuator rotates a threaded shaft that engages an arm of the pantograph to control the upward and downward movement of the hood.

SUMMARY OF THE INVENTION

[0005] A main objective of the invention is to propose an extractor hood for fumes and vapours that can be recessed in the working top or built into a hob, perfectly flush with the top when it is in a rest position and protruding a few centimetres when in operation so as not to be an encumbrance during cooking. The proposed solution employs simple and innovative mechanisms to displace said extractor hood between the operating position and the rest position. The technical options adopted make it so that the extractor hood according to the invention can be easily positioned along any side of the hob or in the spaces between the burners.

[0006] Another objective of the invention is to provide an extractor hood of the type mentioned above that allows an easy and effortless extraction of the lid or of the upper movable part in order to clean it.

[0007] A further objective of the invention is to contain small spills of liquids and to collect any liquids that could leak out on the hob.

[0008] These and other objectives are achieved with the extractor hood the characteristics of which are defined in the claims attached at the end the present description.

BRIEF DESCRIPTION OF THE FIGURES

[0009] The technical characteristics of the invention will be described with the help of the enclosed figures, which illustrate an embodiment as a non-limiting example, in which:

- Fig. 1 is a perspective view of the extractor hood subject matter of the present invention in a closed position;
- Fig. 2 is a perspective view of the extractor hood subject matter of the present invention in an open position without the external container;
- Fig. 3 is a perspective view of the mechanisms inside the extractor hood without the movable part of the extractor hood;
- Fig. 4 is a perspective view of the movable part of the extractor hood;
- Fig. 5 is a perspective view of an internal detail of the extractor hood;
- Fig. 6 is a perspective view of the bottom side of the extractor hood;
- Fig. 7 is a perspective view of a second alternative embodiment of the mechanisms for controlling the displacement of the extraction hood;
- Fig. 8 is a perspective view of a third alternative embodiment of the mechanisms for controlling the displacement of the extraction hood;

DETAILED DESCRIPTION OF THE INVENTION

[0010] The structure of an extraction hood according to the present invention is illustrated in Figures 1 and 2, respectively in a rest position and in an operating position. The reference numeral 1 indicates a container of the general device which, with the extractor hood in the rest position, is completely closed by a plane surface consisting of a frame element 3 and a top plate 4.1 of a movable part 4 of the extractor hood (Fig. 4). The reference numeral 2 indicates another connecting and holding compartment connected with the container 1.

[0011] Through a control device, for example a push-button strip on the frame element or alternatively a remote control unit with a button strip installed on the hob (not shown) connected to a control unit 8 (Fig. 6) contained

in the compartment 2, are controlled one or more actuators 5, preferably electric motors, to operate said extractor hood.

[0012] Said actuators are connected, directly or through shafts, with devices which, through their rotation, make it possible to lift or lower the movable part 4. In the preferred embodiments shown in the figures, an electric motor 5 rotates a shaft 6 having cams 7.1 mounted on its ends.

In particular, the actuators 5 must be capable to rotate in one direction and in the opposite direction so that, through the rotation, the movement of the lateral surface of the cam 7.1 transmits the movement generated by the actuators so as to open and close the extractor hood.

Further, this type of installation requires the presence of devices, such as for example limit switches (not shown), to control the amplitude of rotation of said cams 7.1.

[0013] As an alternative, the opening and closing of the extractor hood can be provided by a number of electric motors 5 that drive respective cams 7.1 and are connected with the control unit 8 which controls their synchronized operation.

[0014] Lifting runners 9 (Fig. 2) rest on the lateral surfaces of the cams 7.1. Said runners 9 are engaged in vertical guides 10 (Fig. 3) and, thanks to a cam-tappet mechanism, convert a rotational movement into a linear movement that is transmitted to the movable part 4 of the extractor hood. The vertical guides 10 are fastened to head surfaces 4.2 of the external container 1.

[0015] Said runners 9 have a generally rectangular shape and can be provided with projecting fins 9.1 (Fig. 3) to engage the vertical guide 10 so as to obtain a lower stop for the runner 9 and thus for the movable part 4. On their upper part is provided a seat 9.2 in which is engaged by contact the corresponding head surface 4.2. Said movable part 4 is not coupled to the runner 9 for reasons that will be illustrated below.

[0016] In a prior art solution, the movable part remains substantially recessed in the cooktop or hob, with the shortcoming of collecting possible spills from the hob or cooktop. In a second solution, the hood with the movable part protrudes by a few tens of centimetres and represents a serious obstruction for the operator.

Unlike these prior art solutions, the present invention provides a movable hood which, in the operating position projects from two centimetres up to a maximum of about 5 centimetres above the hob, with considerable advantage for the user, who can operate freely in addition to avoiding visible obstacles.

As will be mentioned later, the hood according to the invention is however provided with a safety anti-spill device.

[0017] The movable part 4 (Fig. 4) is characterized by a box-like structure; the two head surfaces 4.2 are solid and terminate with a shape suitable to engage with the corresponding seat 9.2 formed on the respective runner 9; the two lateral surfaces 4.3 have a smaller height compared to the head surfaces 4.2 and are provided with a slit 4.4. The presence of a gasket (not shown) on the contact perimeter of the frame 3 with the head and lateral surfaces, together with the position and the height of said slit 4.4, makes it possible to have on one hand a sufficient extraction of the fumes and vapours produced during cooking and, on the other hand, to prevent small quantities of liquids accidentally spilled on the hob to flow into the compartment that contains the extractor hood when it is in operation. For this purpose, as is shown in the detail in Fig. 2, the lower edge of the slit is at a distance H from the level of the cooking top or the recess.

[0018] As already explained, the upper movable part 4 rests on but is not coupled to the runners 9; on one hand for reasons of safety: in fact, in the case in which an operator accidentally has the fingers inserted into the slit, the downward movement of the runners does not drag the movable upper part 4 downward, and the part simply rests on the fingers without causing harm; and on the other hand, for reasons of cleanliness: the removal of the upper movable part allows the cleaning of the same and access to the compartment housing the hood. When the compartment is open, it is possible to remove a tray 11 and some filters 12, which will be described below.

[0019] The tray 11 shown in Fig. 2 consists of a hollow body 11.1 having a perforated and removable closing surface 11.2. The holes in the tray allow any particles and liquids that enter through the slit 4.4 to settle in the hollow body 11.1 of the tray 11. When it is in position, the closing surface 11.2 is engaged on pins 11.3 fixed to the base of the tray; preferably, said pins 11.3 extend for a sufficient height to be gripped by an operator who wants to extract the tray to carry out the periodic checks or cleaning operations.

[0020] Said tray 11 may contain a filter (not shown) capable of trapping liquids and particles captured by the filters 12 and any other liquids that may flow over the edge of the slit 4.4 of the movable part 4.

[0021] In Fig. 3 are also shown the filters 12, applied to the vertical lateral surfaces of the container 1; they are standard components commonly available on the market and, preferably, they can be provided with magnets inserted into their frame element to help stabilize their position, in addition to the pressure exerted by suction and by the force of gravity.

[0022] The external container 1 that houses the extractor hood communicates with the other compartment 2 separated in two zones (Fig. 6) by a vertical wall 13: one zone is dedicated to housing the control unit 8 and another to house the connector 14 with the ducts that convey the fumes and vapours to a filter (not shown) to be circulated in the kitchen space or vented outside the kitchen.

[0023] A second embodiment functionally equivalent to the previous one to obtain the movement of the movable part 4 employs eccentric discs 7.2 (Fig. 5) installed on the shaft 6 in place of the cams 7.1.

[0024] Advantageously, the choice of eccentric discs 7.2 (Fig. 5) makes it possible to raise and lower the ex-

tractor hood without requiring the reversal of the direction of rotation of the shaft 6 on which said eccentric discs are installed.
In this case, too, the opening and closure of the extractor hood can be achieved by more electric motors 5 that drive respective eccentric discs 7.2.

[0025] A third embodiment functionally equivalent to the previous ones to obtain the raising and lowering of the extractor hood is shown in Fig. 7. A cylinder 15, which is anchored to the extractor hood, contains a pin 16 which projects laterally from an opening on the cylinder 15; said pin 16 is mobile and is rotated, through a lever 17 fastened at one of its ends, by a linear actuator (not shown); the pin 16 transmits its rotational movement to a tooth 18, integral to the same pin, which in turn controls the lifting of the runner 9 that supports the movable part 4 of the extractor hood. Naturally, two such devices are provided at the opposite ends of the movable part 4.

[0026] A fourth embodiment, functionally equivalent to the previous ones, employs a pulley mechanism shown in Fig. 8. A force generated by an actuator (not shown) is applied through a cable 20 to a block 19 which slides in the guide 10 and on which rests the base of a runner 9 that supports the movable part 4 of the extractor hood. A plurality of pulleys 21 makes it possible to reverse the direction of application of the force to lift and lower the movable part 4.

Claims

1. Extractor hood integrated in a hob and adapted to slide inside a container (1), comprising

   - a movable part (4), through which fumes and vapors of the cooking are aspirated;
   - driving mechanisms (6, 7, 9), for controlling the displacement of said movable part (4) between a rest position and an operating position;
   - at least one actuator (5) controlled by a control unit (8) for controlling said driving mechanisms,
   - a compartment (2) connected to the container (1) and containing adaptors for sucked air and vapors outflow conduits,
   - filters (12) inserted into the container (1) to purify sucked fumes and vapors,

   characterized in that

   said driving mechanisms include cams (7.1) or eccentric discs (7.2) connected to the respective actuator (5) and capable to operate in synchronism runners (9) which slide in vertical guides (10), built in the container (1), to lift and to lower the movable part (4) of the extractor hood.

2. Extractor hood integrated in a hob according to claim 1, **characterized in that** said cams (7.1) or said eccentric discs (7.2) are connected to respective actuators (5) via a rotating shaft (6).

3. Extractor hood integrated in a hob according to claim 1, **characterized in that** a cylinder (15) is mounted inside the container (1); said cylinder (15) contains a pin (16) at one end of which is attached a lever (17) which rotates said pin (16) transmitting the force generated by the actuator (5); a tooth (18) protruding laterally from the cylinder (15) and rotating integrally with said pin (16) moves said runners (9) to lift and lower the movable part (4) of the extractor hood.

4. Extractor hood integrated in a hob according to claim 1, **characterized in that** said runners (9) rest on blocks (19) connected by a cable (20) and a plurality of pulleys (21) to the respective actuator (5); said blocks (19) are moved in synchronism by said actuators (5) to lift and to lower the movable part (4) of the extractor hood.

5. Extractor hood integrated in a hob according to claim 1, **characterized in that** said movable part (4) simply rests on runners (9).

6. Extractor hood integrated in a hob according to claim 1, **characterized in that** in the container (1) is housed a tray (11) composed of a hollow body (11.1), closed on top by a perforated plate (11.2), on which are fixed vertical pins (11.3) adapted to be grabbed to extract said tray (11), said perforated plate (11.2) being engaged onto said pins (11.3).

7. Extractor hood integrated in a hob according to claim 1, **characterized in that** the compartment (2) is divided into two zones by a vertical wall (13), one zone to accommodate the control unit (8) and the other zone to accommodate the adaptors for the pipes (14) to recirculate or download the fumes and vapors.

8. Extractor hood integrated in a hob according to claim 1, **characterized in that** on the lateral surfaces (4.3) of the movable part (4) are performed slits (4.4) at an height such that to constitute a containment edge for small spills of liquids on the hob.

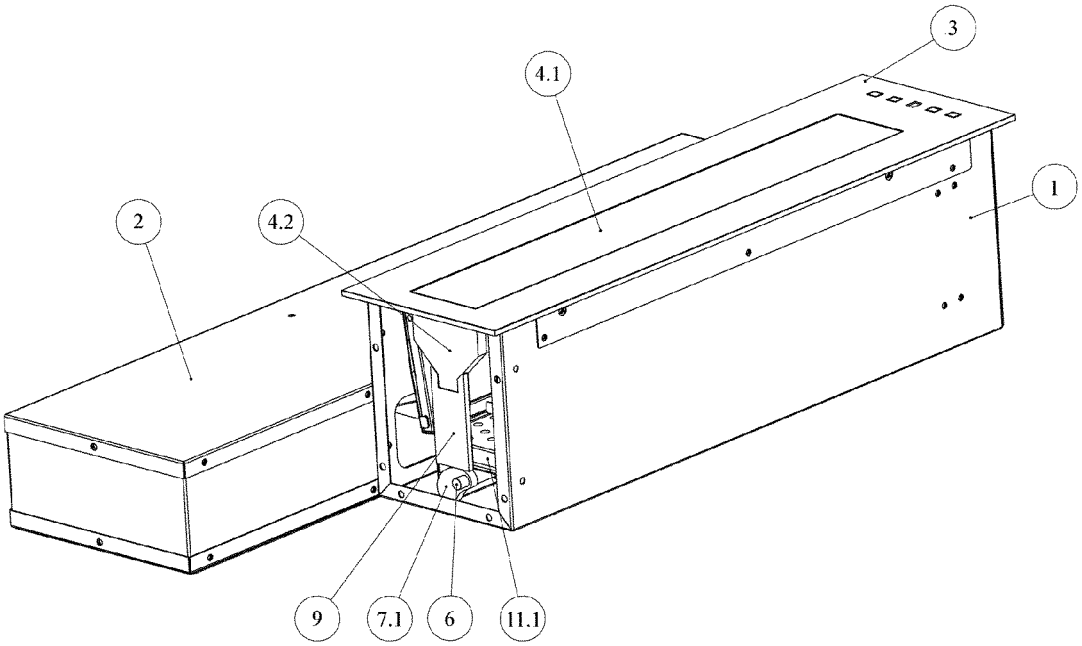

Fig. 1

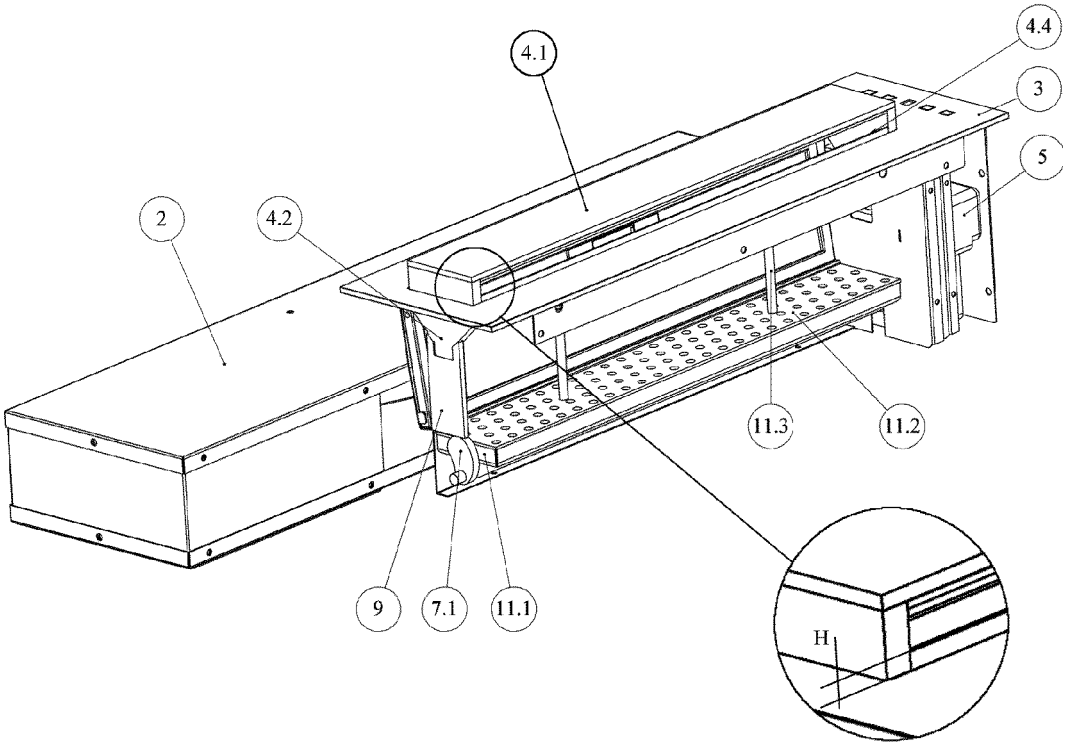

Fig. 2

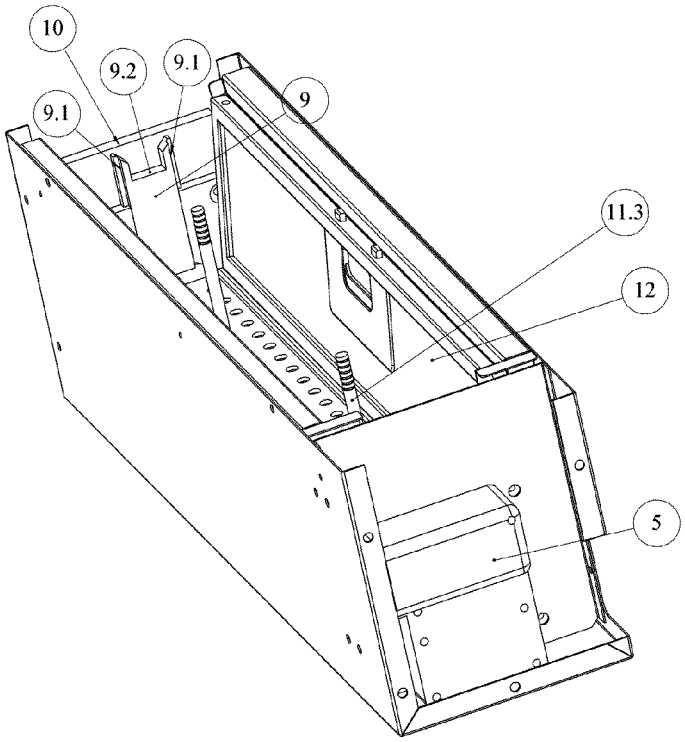

Fig. 3

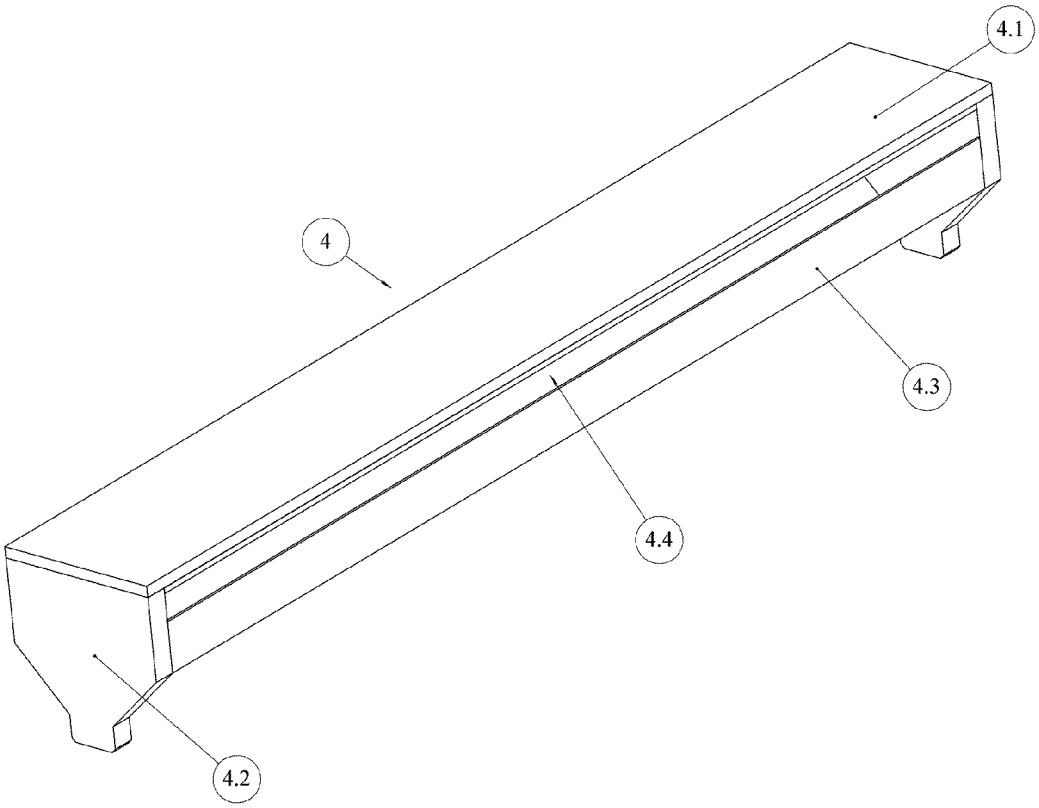

Fig. 4

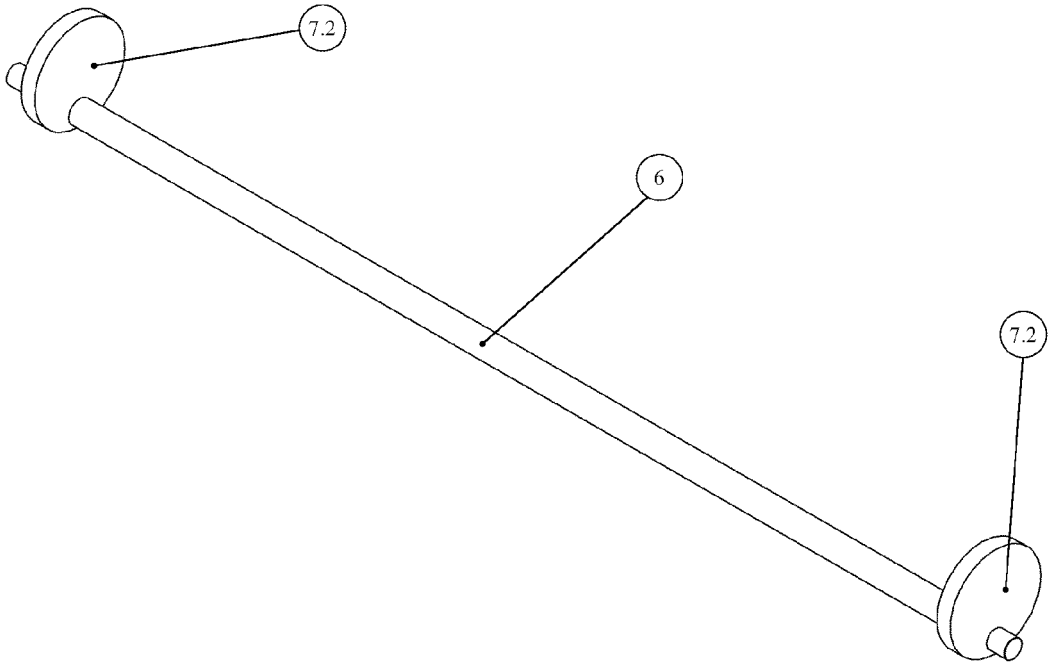

Fig. 5

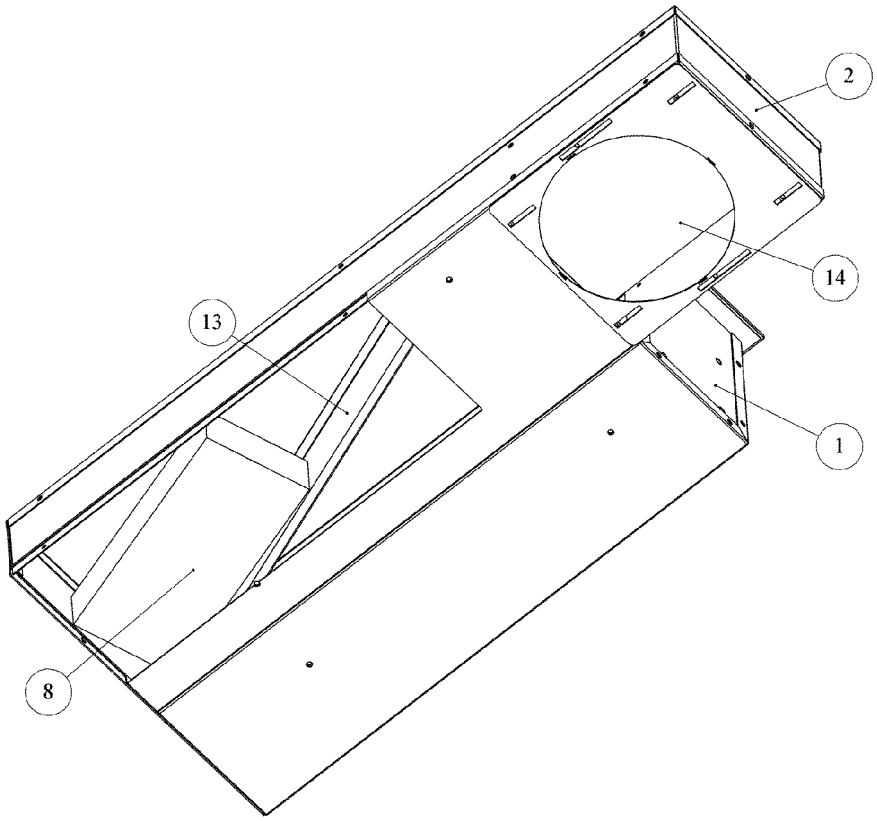

Fig. 6

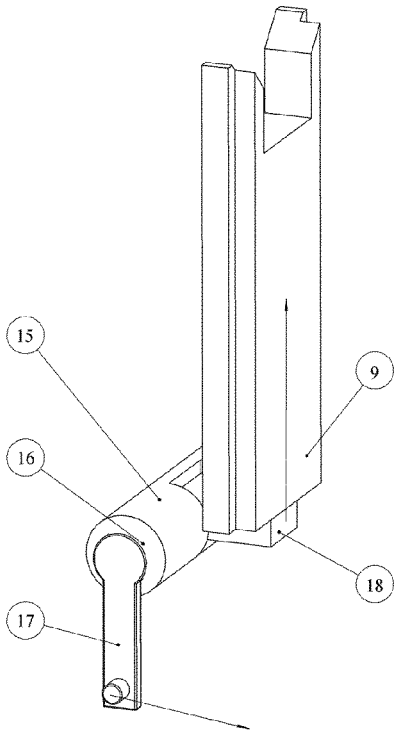

Fig. 7

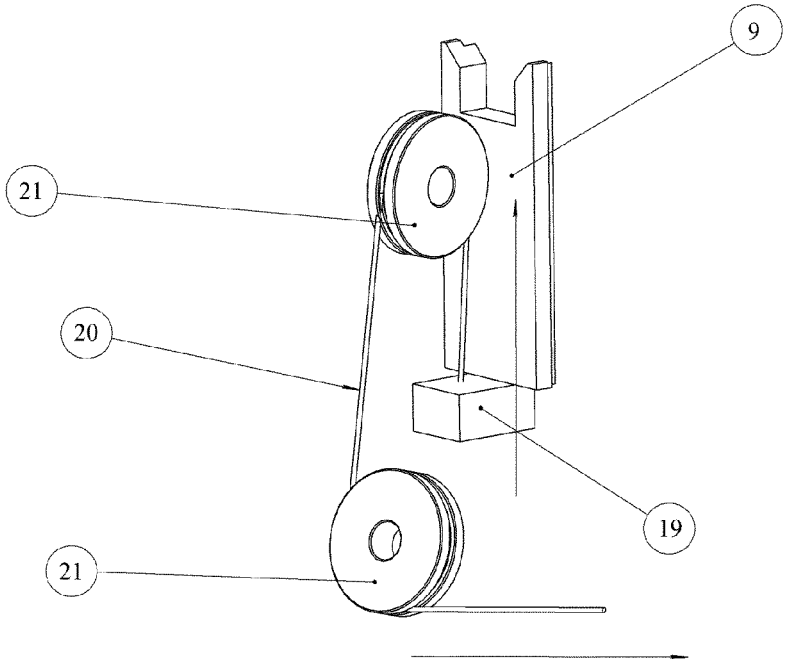

Fig. 8

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EUROPEAN SEARCH REPORT

Application Number
EP 14 19 1693

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			F24C

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	15 April 2015	Vesselinov, Vladimir

CATEGORY OF CITED DOCUMENTS

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