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(54) Conveyor unit for hoods with manual and automatic ionic filter.

(57) The invention concerns a conveyor unit for hoods with manual and automatic ionic cleaning filter.

This invention is characterized in that under this conveyor unit there is a moulded compartment with rectangular plan, in which the ionic cleaning filter is fitted and from which it can be removed easily and quickly.

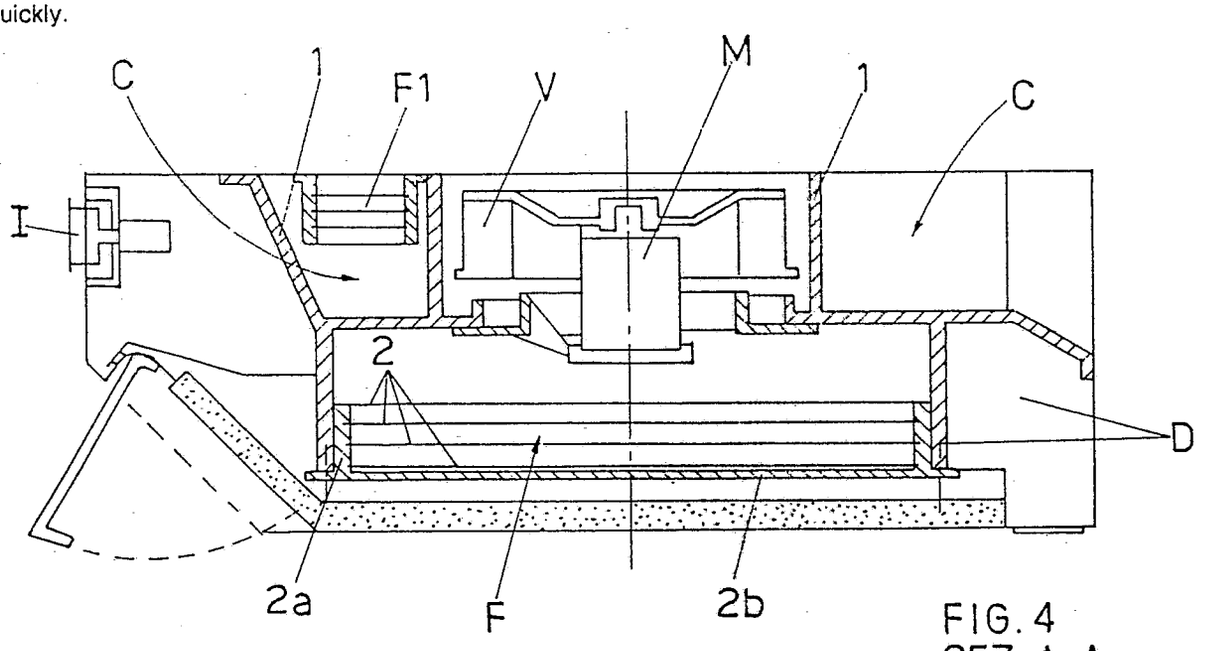

FIG. 4
SEZ. A-A

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Conveyor Unit for Hoods with Manual and Automatic Ionic Cleaning Filter.

This invention for an industrial utility model concerns a conveyor unit for hoods with manual and automatic ionic cleaning filter.

This invention was designed after considerable study and research to realize a device which would on one hand improve the performance and practicality of current home filtering hoods and on the other, provide specific functions which standard hoods do not offer.

In fact, current filtering hoods used over cookers for drawing the hot air and fumes produced by cooking, generally consist of an external, approximately parallelepiped casing in which all the mechanical and electrical components necessary for operation, are fitted. In particular, the following components which are fitted to a plastic modular unit are housed in this support casing:
the exhaust fan with motor, the air conveyor and various electrical controls in addition to a set of active carbon filters for cleaning the air drawn, before this is introduced into the room through an outlet.

To date, in these hoods, the air was filtered by a set of active carbon filters which removed all the harmful particles suspended in the air as it passed through the filters; these particles were then deposited and collected on these filtering elements.

Practical experience has however demonstrated that the practically of these active carbon filters can not be considered as totally satisfactory, firstly because the filtering action, above all in the case of carbon cartridges worn by extended use, is in no way perfect and secondly because these worn filtering cartridges must be replaced with new cartridges periodically, with the consequent need to make continuous purchases.

The new conveyor unit according to the invention was designed successfully to resolve these problems, in that the same can house an ionic cleaner which acts as the filtering elements, and can therefore ensure efficient operating results.

Regarding the cleaning of the ionic filter, this can be carried out periodically once a year, compared to the necessity of replacing the active carbon filtering cartridges every month.

The most significant feature of this invention is that the ionic cleaning filter, which is fitted together with the complete support block in a standard kitchen hood, has been interlocked with a series of controls which offer manual control by the user, and automatic control occurring in accordance to specific situations caused by the use of the cooker (production of fumes and/or heat).

A point of particular practical and economic importance is the easy installation of the ionic cleaning filter inside the compartment, which as will be explained later, can be filled by means of simple and inexpensive modifications to the modular support component according to the invention. it should be reiterated that an air conveyor and filtering device similar to that of this patent application, can be used not only in a standard parallelepiped casing for traditional use over a cooker, but also inside a steel box for use in different applications or even for use in rooms other than a kitchen - as for example in bathrooms - in which fumes or heat are produced and where there is the risk of harmful or dangerous gas leaks.

The most logical application for the model according to the invention, after all the necessary operating components have been fitted to the same, in the above external box-shaped parallelepiped casing, is in fact over a cooker hob for drawing and filtering the fumes.

This conveyor unit is made of moulded plastic materials in a shape suitable for containing the different device components, in particular the following: the actual air conveyor, the exhaust fan with a vertical axis and its operating motor.

The most important feature of this invention is that there is a moulded compartment with rectangular plan under this conveyor unit, in which the ionic cleaning filter is fitted and from which it can be removed easily and quickly.

Therefore when the fan fitted on the modular support component in question is switched on, the vitiated air is drawn into this compartment where it undergoes the ionic cleaning process and then returns into the conveyor placed above it and introduced out, duly cleaned.

This ionic filter consists of a series of identical metal plates made of a suitable material, fitted on top of one another horizontally with a small space between each other, on which an electrostatic field is created, by means of electric connections, to carry out the ionic cleaning process of the air flow passing through; this filtering process occurs since this electrostatic field holds back the dirt molecules in the air which passes through the metal plates.

Considering also that in addition to this new conveyor unit, a kitchen hood could be fitted with another ionic filter after the exhaust fan and close to the recycled air outlet , it is obvious how in this case the air entering this type of hood would be submitted to a double filtering action, giving very good results, in that the air expelled from a hood fitted in this way would be hygienically clean. It is obvious that the invention is very much more practical than similar models produced to date, considering also, as mentioned above, that sensors for

automatically detecting gas, heat or other fume leaks, are interlocked with the same; these sensors start the fan should this be necessary, regardless of any manual settings by the user thereby activating the above filtering process.

It is obvious that a device of this type ensures the fully automatic suction and cleaning of vitiated air of any fumes which are harmful to human health or dangerous for the safety of structures surrounding the heat source, even when the user is absent.

It has already been mentioned that the device according to this patent application can be fitted in a compartment having a different shape next to or above other types of home appliances such as boilers, burners, gas cookers etc., instead of being fitted above a cooking hob.

For major clarity the description of the invention continues with reference to the enclosed drawings, which are intended only for illustrative purposes and not in a limiting sense, in which:

- figure 1 is an axonometric top view of the conveyor unit according to the invention, in which the ionic filter housing compartment is indicated by an unbroken line, and the profile of the complete block is indicated by a broken line;
- figure 2 is an axonometric top view of the ionic filter for fitting in the conveyor unit illustrated in fig. 1;
- figure 3 is a top view of the cleaner unit according to the invention;
- figure 4 is a cross section of fig. 3 with a transverse vertical plane (A-A) of the conveyor unit according to the invention, with all its components and mounted in the casing of a kitchen hood.

With reference to the enclosed drawings, the device in question consists of a body made of moulded plastic materials (1) which is not only suitably shaped to act as an air conveyor but can also house the different operating parts necessary for drawing the air.

In fact, in addition to the air conveyor (C), inside the support block (1), a fan (V) with a vertical axis can be seen, for drawing the vitiated air and operated by an electric motor (M) which is in turn controlled by hand by means of switches (I) on the control panel fitted at the front of the hood, or alternatively operated as a result of automatic impulses transmitted to the same, when necessary, by sensors for detecting the presence of kitchen odours, vapours, heat or gas in the air.

A box-shaped, parallelepiped compartment (D) with rectangular plan is produced at the bottom of this block (1) during the only moulding phase, in which the actual ionic filter (F) can be fitted and fixed with screws; the ionic filter (F) consists of four rectangular, metal plates (2) supported in an overlying and staggered position by two longitudinal bearing sides (2a) where the longitudinal edges of these plates are embedded; these sides (2a) project from a base plate (2b) which is made of moulded plastic together with the two longitudinal sides (2a).

On the external wall of one of the longitudinal sides (2a), there is a moulded plastic terminal board (2c) in which the electric connection plug of the ionic filter (F) is fitted. The overlying plates (2) are shorter than the longitudinal sides (2a), inside of which they must be placed so that the respective air passages are not vertically aligned but alternated; in other words two consecutive plates must allow a passage for the air, one towards the side right hand edge and the other towards the left hand edge, and so on.

The ionic filter operates as follows: when the exhaust fan is switched on, the vitiated air which is drawn from the bottom towards the top, starts to enter the box-shaped compartment (D) through the passage on the lower plate (2), immediately behind the above bottom plate (2b); in order to rise to the air conveyor in the support component (1), the air is therefore forced to flow in the subsequent horizontal air spaces between the plates in alternating directions, from right to left, since the passages on the next plates, namely the only possible passage sections, are placed in alternating positions towards the two opposite side ends of the box-shaped compartment (D).

Considering that the electrical connections to which the different plates are submitted make it possible to create a strong electrostatic field, it is obvious that in these various horizontal alternating passages inside the compartment (D), the vitiated air is filtered and all the dirt molecules are deposited and settle on the metal plates.

Finally, to complete the description of the invention, it is specified that the complete conveyor unit (1), complete with ionic filter (F), is fitted in the casing of a kitchen hood (as illustrated in figure 3); an additional ionic filter (F1) could be fitted close to the air conveyor outlet, in order to filter the air again before this is returned to the room.

The practical importance of this invention is particularly worth mentioning, since the device is not only very efficient but also very simple and easy to use.

In fact, the filtering components, that is the metal plates, of an exhaust fan fitted with ionic filters, are not subject to wear as in the case of active carbon cartridges, but at the most may be subject to become progressively dirty as a result of the repeated deposits of dirt transported in the air which is drawn; in this regard, as mentioned previously, the structural shape of the ionic filter (F) has been designed to allow even the most inexperienced housewife to remove it easily and quickly in order to clean it, which as mentioned previously,

need only be done once a year.

In order to remove the filtering unit (F) from the compartment (D), simply remove the screws from the bottom of the perimeter of the base plate (2b) and passing through the edges of the compartment (D).

When the ionic filter (F) has been removed from the compartment (D), it can be washed easily by soaking in a solution of standard solvents.

Finally, it should be noted that the electric system for operating the cleaning system can also be housed on the conveyor unit in question, in addition to the box housing the electronic system for the automatic operation of the unit, which switches on automatically when heat, kitchen odours, fumes and even gas leaks are detected.

Obviously, many minor modifications can be made to the various components of the conveyor unit according to the invention without going beyond the invention concept.

In particular, the filter (F), an alternative construction version of which is illustrated in fig. 5, while maintaining its box shape, could be fitted with two transverse opposite sides (2a) instead of longitudinal edges, for supporting the four rectangular overlying and straggered metal plates (2′), with a smaller width than that of the support sides (2a′) projecting from the base plate (2b′) made in moulded plastic material together with the above two edges. The staggered arrangement of the four metal plates (2′) makes the air passages alternated, one in front of the filter and the other, immediately above or below, at the back of the filter.

This filter could also be fixed with release sliders instead of traditional screws, since the former are more practical and easier to move.

Claims

1) A conveyor unit of hoods with manual and automatic ionic cleaning filter, consisting of a one piece box moulded in plastic material in a shape suitable for housing the different components of the device, such as the air conveyor, the exhaust fan with electric motor, the control pushbutton panel, the sensors for automatic starting, the lamps, characterized in that there is a moulded box-shaped, parallelepiped, rectangular compartment (D) under the conveyor unit (1), in which the ionic filter (F) consisting of four rectangular metal plates (2), can be fitted and fixed; these plates are supported in an overlying and slightly staggered position by two longitudinal bearing sides (2a) in which the longitudinal edges of these metal plates (2) are embedded; the edges projecting from a bottom support plate (2b) moulded in plastic materials together with the sides (2a) which are slightly longer than the plates (2) so that inside the compartment (D) passage sections are created for the air to be cleaned, these being positioned alternatively at the left hand end and at the right hand end of the overlying plates, outside one of the longitudinal sides (2a) there is a moulded terminal board (2c) in which the electrical plug of the ionic filter (F) is fitted.

2) A conveyor unit for hoods with manual and automatic ionic filter, according to claim 1, characterized in that the ionic filter (F) is fixed inside the compartment (D) by means of screws or release sliders positioned along the perimeter of the above base plate (2b) and passing through the edges of the compartment (D).

3) A conveyor unit for hoods with ionic cleaning filter with manual or automatic control, according to the previous claims, characterized in that it can be started manually with the switches on the control panel fitted on the front of the kitchen hood.

4) A conveyor unit for hoods with ionic cleaning filter with manual or automatic control, according to claims 1 and 2, characterized in that it can be started by automatic impulses transmitted by sensors which can detect the presence of kitchen odours, fumes, heat and gas in the air.

5) A conveyor unit for hoods with ionic cleaning filter with manual or automatic control, according to claim 1, characterized in that the ionic filter (F) in a different embodiment consists of four rectangular metal plates (2′) supported in an overlying and staggered position by two bearing transverse sides (2a′), which are wider than the plates (2′) so that air passage sections through which the vitiated air flows are created inside the compartment (D), in alternating positions at the front and at the back of the overlying plates (2′).

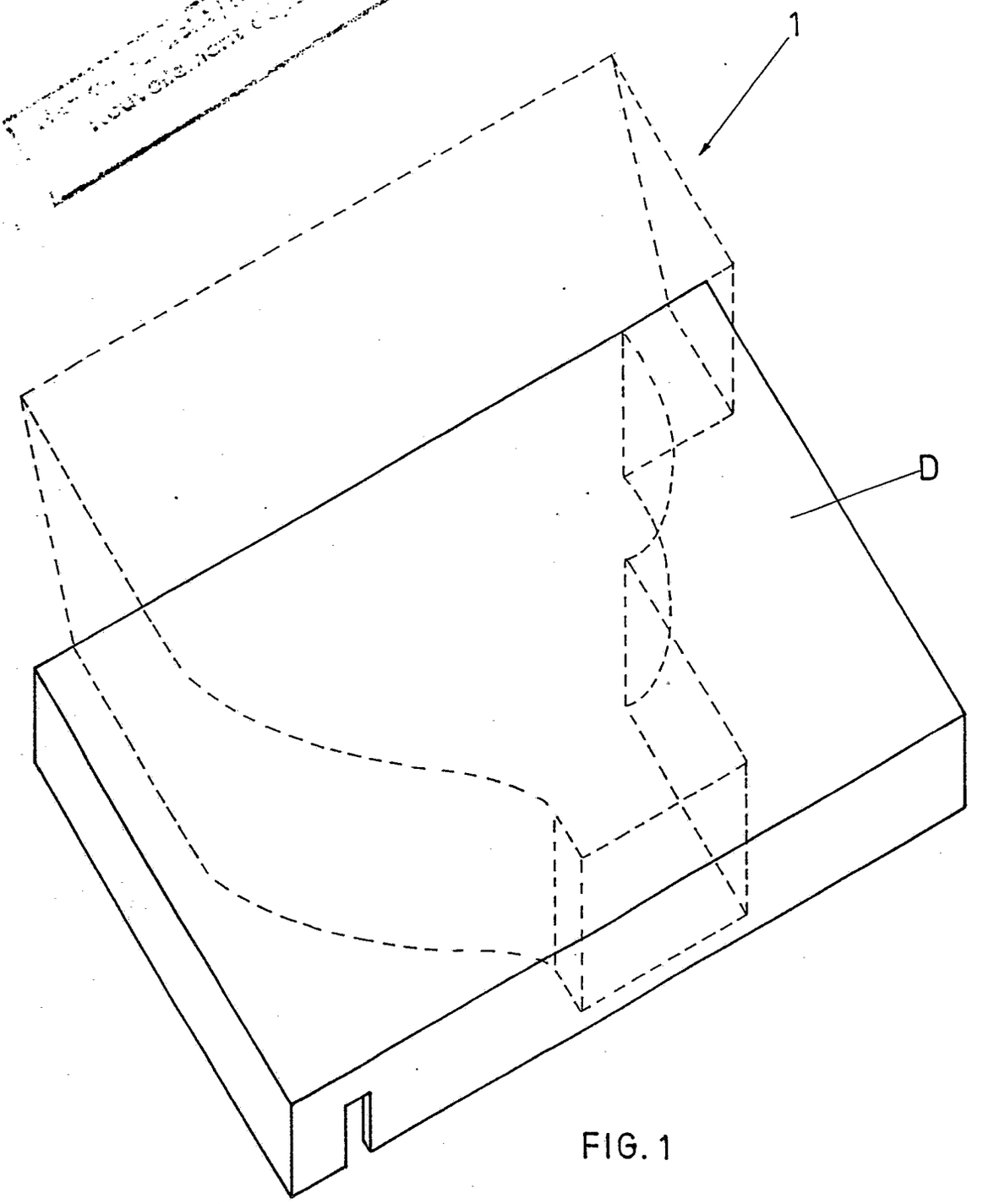

FIG. 1

TAV. 1 - 3

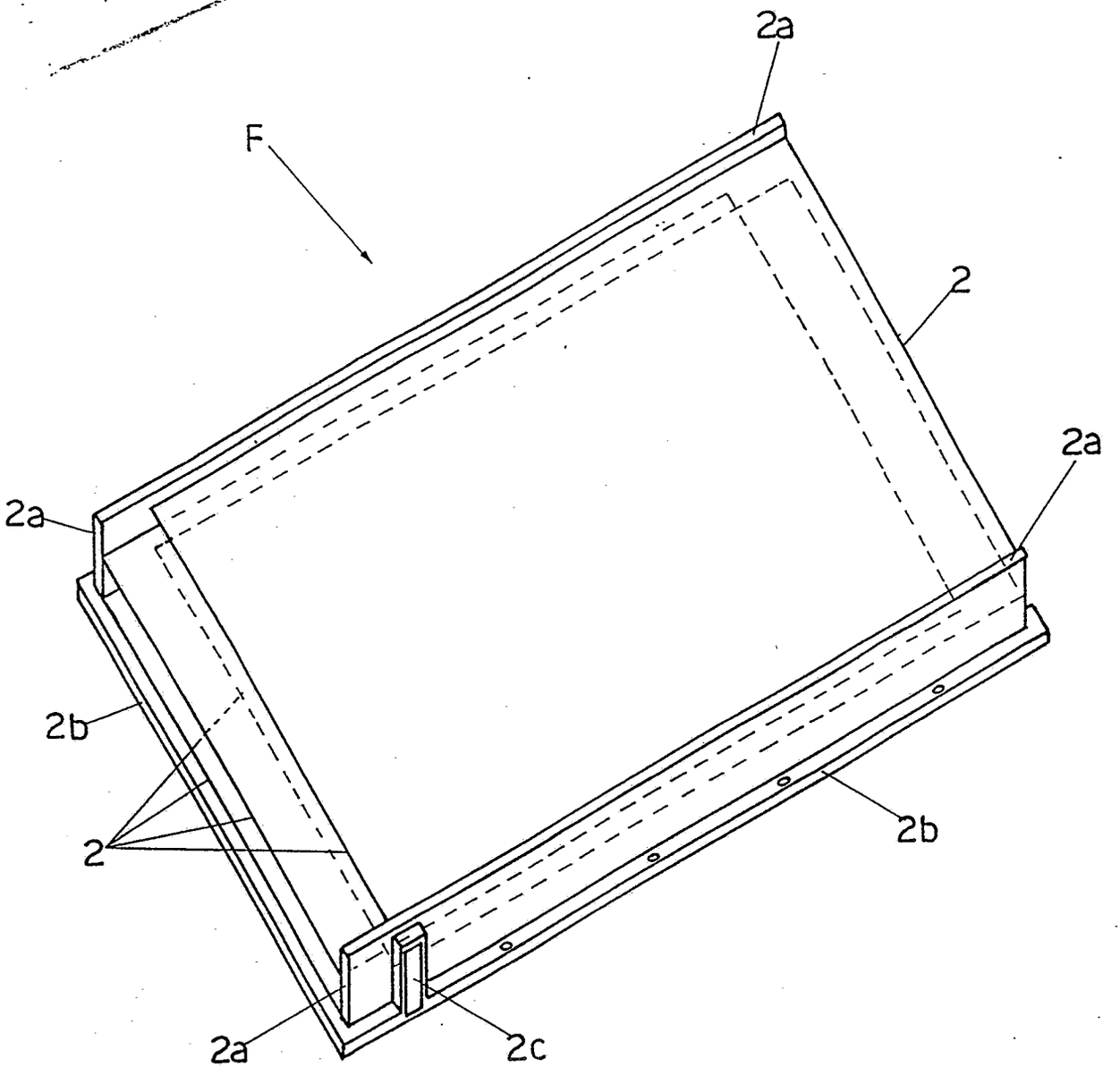

FIG. 2

TAV. 2-3

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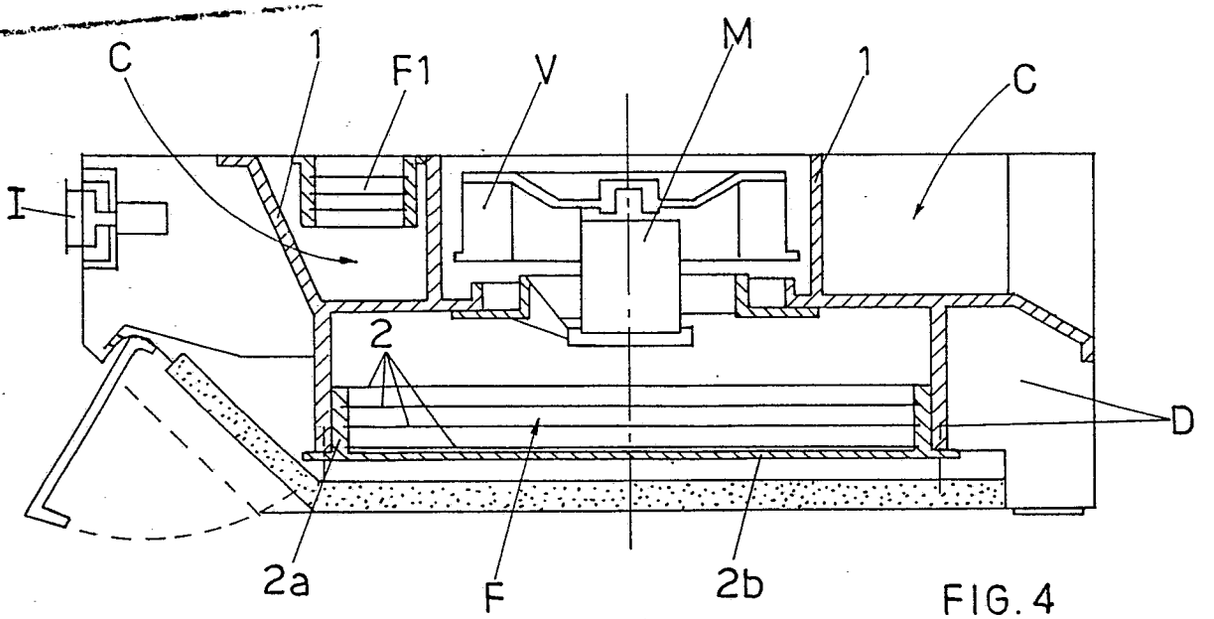

FIG. 4
SEZ. A-A

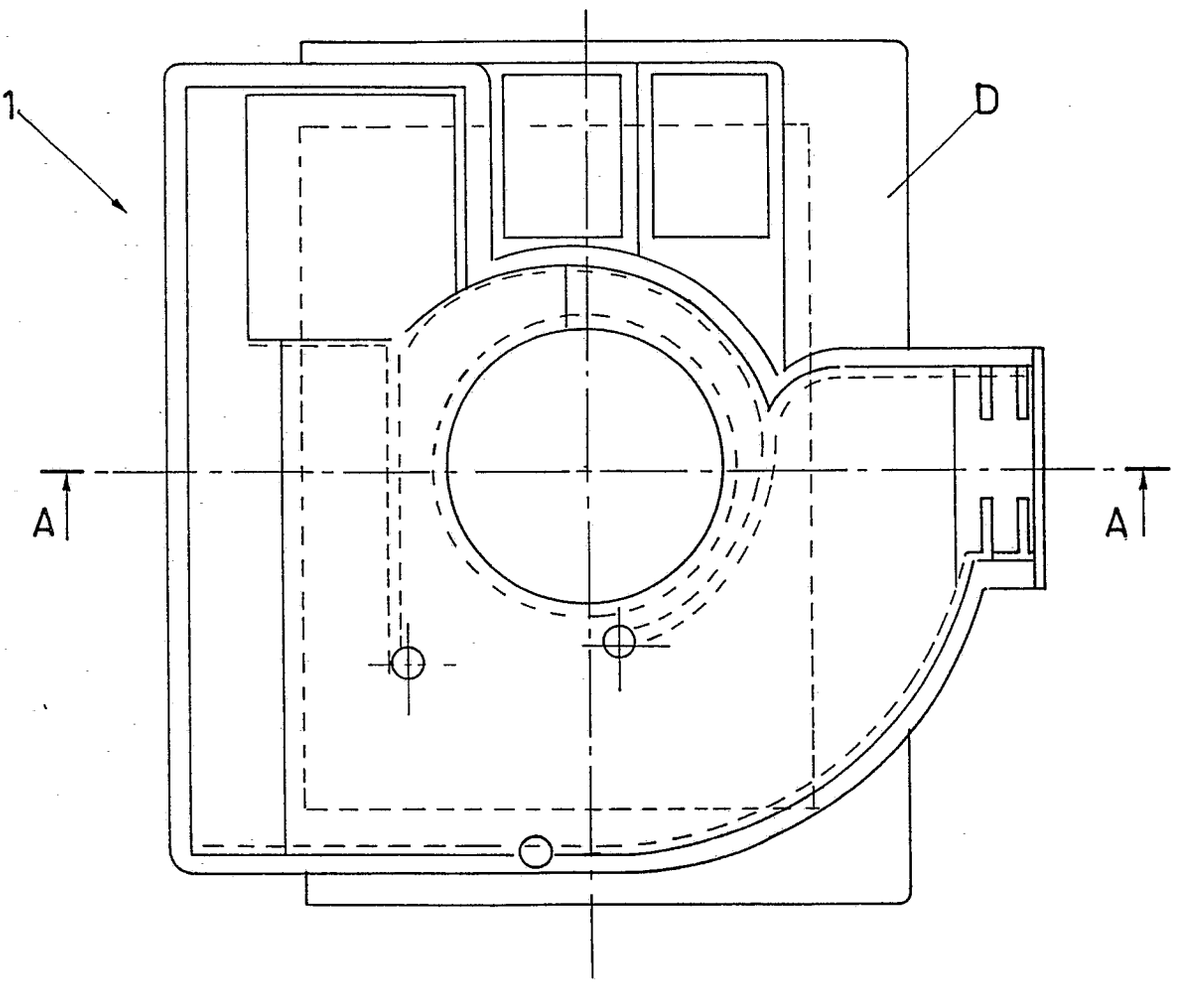

FIG. 3

TAV. 3-3

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