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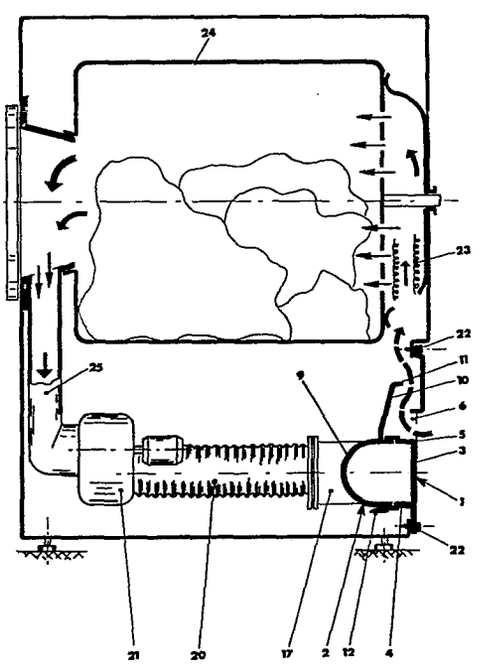
(54) Air suction and discharge device for clothes dryers.

(57) An improved air suction and discharge device for a domestic dryer with a rotatable drum and an open air circulating circuit.

An inlet portion of the air suction conduit and an end portion of the moisture discharge conduit are defined by means of two structural elements (1, 2) having a particular profile and joined by snap-action fasteners (12).

The two structural elements (1, 2) define also a labyrinth inlet path for the air sucked from the outside of the dryer.



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DESCRIPTION

AIR SUCTION AND DISCHARGE DEVICE FOR CLOTHES DRYERS.

The present invention relates to a clothes dryer, particularly of domestic type with a rotatable drum and an open air circulating circuit, having an improved air suction and discharge device.

Contrary to apparatuses wherein moisture is condensed inside, in the dryer referred to room air is drawn in from the environment, it is heated and passed through clothes and, finally, it is discharged outside of the machine together with the moisture removed from clothes.

Air may be discharged outside from the apparatus into the room wherein the dryer is located, if there are good ventilating conditions, or it is discharged outside the room through a flexible conduit connected to the dryer and passing through a fenster or a wall, in order to avoid condensation of moisture inside the room.

For these reasons, known dryers are provided with an air suction and discharge device comprising several conduits which need ccuplings not

ensuring good air-tight connections.

Moreover, said ccuplings are mounted inside the dryer and are accessible only after disassembling of the rear wall of the dryer; therefore, servicing is difficult and involves undesirable long and costly operations.

At last, a serious drawback of known dryers are possible water sprinkles from the room towards the inside of the machine, which may damage electrical parts and cause short-circuiting thereof.

Normally, this drawback is avoided by the use of foils made of polyethylene which protect electric components, but involve further complications for servicing.

A first scope of the present invention is to provide an air suction and discharge device forming an open circuit and made by a reduced number of components.

A further scope of the invention is to provide a device of the kind mentioned above having a structure which prevents water sprinkles from entering the dryer, said device being easy to assemble and disassemble in order to allow a more convenient and quick servicing.

According to the present invention, there is provided an air suction and discharge device for a clothes dryer, particularly of domestic type, having a rotatable drum and an open air circulating circuit, said dryer having a fan and conduits for the air circulation, characterized in that it comprises a first structural element at least partially forming

the rear wall of the dryer, and a second structural element which, in use, is snap-action coupled together with said first element in order to provide an inlet portion of the suction conduit and an end portion of the discharge conduit, said first element being provided with at least one air inlet whose upper edge is able to cooperate with a baffle integral with said second element in order to provide a labyrinth inlet path for the air sucked from the outside of the dryer.

The invention will be further described, by way of non-limiting example, with reference to the accompanying drawings in which:

Figure 1 diagrammatically shows a partially sectioned side view of a dryer provided with the device in accordance with the invention;

Figure 2 diagrammatically shows a rear view of the dryer of Fig. 1;

Figure 3 shows the device in accordance with the invention sectioned along line III - III of Fig. 2.

With reference to the drawings, a domestic clothes dryer with a rotatable drum and an open air circulating circuit is shown. In the rear wall of the dryer it is located the improved air suction and discharge device according to the invention.

As shown in Fig. 1, said device substantially comprises an outer structural element 1, which forms at least a part of the rear wall of the dryer, and an inner structural element 2. Said outer and inner elements are able to be snap-action coupled

longitudinally in order to provide an end portion of the discharge circuit for the moisture and an inlet portion of the suction conduit for the fresh air.

Accordingly, each element 1 and 2 has a properly shaped, single-piece structure and the unit formed by the snap-action coupling of said elements performs the air suction and discharge functions into and from the dryer.

The outer element 1 has a plate portion 3 and a conduit portion comprising two walls 4,5 projecting toward the interior of the dryer.

The plate portion 3 has a rectangularly shaped body (Fig. 2), the upper part of which is provided with at least an air inlet 6, whereas the lower part is provided with a circular outlet 7 for discharging the moisture.

The cross section of the plate portion 3 (Fig. 1) is rectilinear in the lower portion of the inlet 6 and has a stepped profile in the upper portion of the same.

In particular, the upper edge of the inlet 6 projects toward the interior of the dryer.

The walls 4,5 of the element 1 are located below the inlet 6 and define, together with the portion of the plate 3 between said walls, a portion of conduit having a U-shaped cross section.

The inner element 2, similarly to the outer element 1, shows two different portions, i.e. a lower shell 9 with a semicircular cross section and an upper baffle 10 integral with the shell 9 and protruding upwards from its upper edge.

The baffle 10 is substantially vertical and its free edge 11 is bent toward the rear wall of the dryer.

The conduit portion defined by the walls 4,5 of the outer element 1 and the shell 9 of the inner element 2 can be easily coupled to each other by means of snap-action fasteners 12 integral with and placed along the connection edges of the elements (Fig. 1 shows only fasteners 12 on the lower edges).

In this way, an end conduit for discharging moisture and a labyrinth inlet path for fresh air sucked through the inlet 6 are obtained.

Fig. 3 shows the so shaped discharge conduit which is extending horizontally and is provided, besides the outlet 7 in the outer element 1, with two further outlets 13, 14 located at its opposite ends.

The outlet 13 is a lateral opening for discharging the moisture, while the mouth of the outlet 14 is substantially 45° oriented to form a releasable connection, with the interposition of a sealing ring 15, together with a corresponding opening 16 of a two-way fitting 17 which is fastened by screw means (not shown) to the rear wall of the dryer.

The two-way fitting 17 has an outlet 18 on one side and an opening 19 on another side for the connection to the delivery conduit 20 of a fan 21.

The connection of elements 1 and 2 allows also to obtain, above the discharge conduit, said labyrinth inlet path, which is defined by the upper edge of the inlet 6 and the baffle 10 having the bent

edge 11.

As stated above, the outer element 1 also forms at least a part of the rear wall of the dryer and is secured to said wall by means of screw means 22. In this preferred embodiment, the dryer is provided with a suction opening 6 and three discharge outlets 7, 13, 18, respectively, which are positioned on two sides and on the rear wall of the apparatus to allow the discharge of the moisture in the most favorable direction with respect to the positioning of the dryer in the room.

In fact, the discharge outlets which are possibly not utilized, are provided with closing caps (known per sè and not shown), while the outlet selected for the discharge of moisture is connected by means of a bush with a flexible discharge conduit, which conveys the moisture outside the room.

The closing caps and connecting bush may be connected to the corresponding outlets by means of snap-action couplings similar to those which are used to join elements 1 and 2.

The connection between the opening 14 of the discharge conduit and the opening 16 of the two--way fitting 17 can be easily released by traction in order to remove the device from the dryer.

In this way, the access which is necessary for servicing of components housed in the lower part of the dryer can be obtained with a simple operation.

Elements 1 and 2 may be easily disaccoupled, by loosening the snap-action fastener 12, and it is ensured the possibility to inspect the interior

of the suction and discharge conduits.

In the dryer provided with the device according to the invention, air is sucked through the opening 6, flows along the suction conduit, is heated by electrical resistances 23, enters the drum 24, from which moisture flows out which flows through the conduit 25, the fan 21 and the delivery conduit 20. Then, moisture reaches the discharge conduit and is discharged through one or more openings 7, 13, 18 depending on the choice of the user.

An important feature is represented by the fact that the inlet portion of the suction conduit forms a labyrinth path defined by the upper edge of the opening 6 and the bent edge 11 of the baffle 10; this labyrinth path prevents possible leakages due to water sprinklings from the room into the dryer so as to fulfil the security standards.

It will be appreciated that the above-described device can be modified in many way, excepting the particular features claimed hereinafter.

CLAIMS

1. An air suction and discharge device for a clothes dryer, in particular of domestic type, having a rotatable drum and an open air circulating circuit, said dryer being provided with a fan and air circulation conduits, characterized in that it comprises a first structural element (1) at least partially forming the rear wall of the dryer and a second structural element (2) which, in use, is coupled together with said first element by means of snap-action fasteners (12) in order to provide an inlet portion of the suction conduit and an end portion of the discharge conduit, said first element (1) being provided with at least one air inlet (6), the upper edge of which is able to cooperate with a baffle (10) integral with said second element (2) in order to provide a labyrinth inlet path for the air sucked from the outside of the dryer.

2. A device according to claim 1, characterized in that the first element (1) has an integral plate (3) and a conduit portion defined by two walls (4,5) projecting toward the interior of the dryer, while the second element (2) includes an integral semicircular shell (9) and said baffle (10), this latter being provided with a free edge (11) bent toward the rear wall of the dryer.

3. A device according to claims 1 and 2, characterized in that the conduit portion defined by two walls

(4,5) of the first element (1) and the semicircular shell (9) of the second element (2) are joined to each other by means of said snap-action fasteners (12) so as to form a discharge conduit for the moisture and a labyrinth inlet path for the air sucked through the opening (6), said path being defined by the upper edge of the opening (6) and by the baffle (10) having the bent edge (11).

4. A device according to the preceding claims, characterized in that the discharge conduit, formed by the joined elements (1,2), extends horizontally and has an opening (7) in the first element (1), a lateral discharge opening (13) and an opening (14) whose mouth is substantially 45° oriented to form a releasable connection, with the interposition of a sealing ring (15), with a corresponding opening (16) of a two-way fitting (17), which has a lateral discharge outlet (18) on one side and, on another side, an opening (19) for the connection to the delivery conduit (20) of a fan (21).

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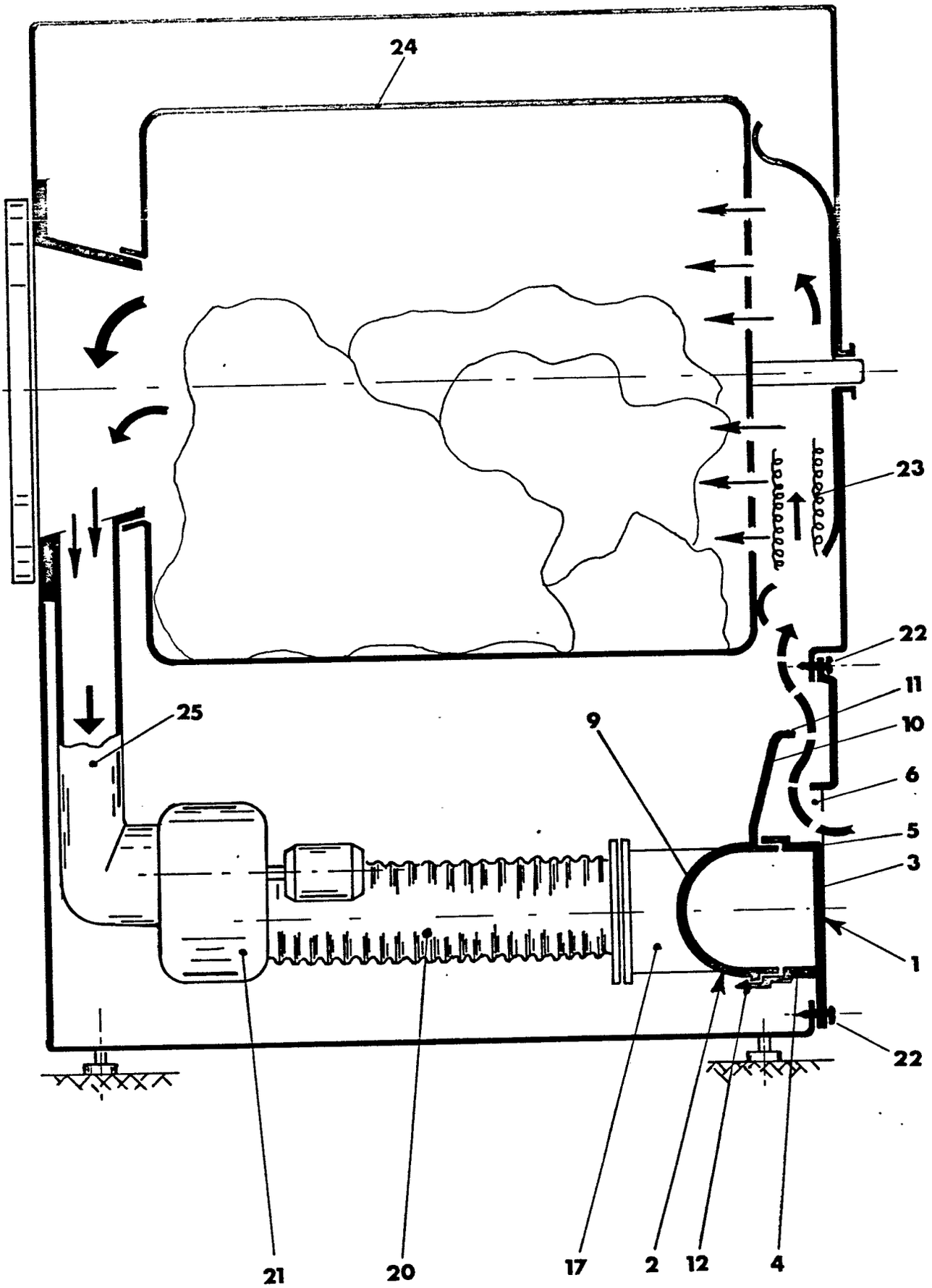

FIG. 1

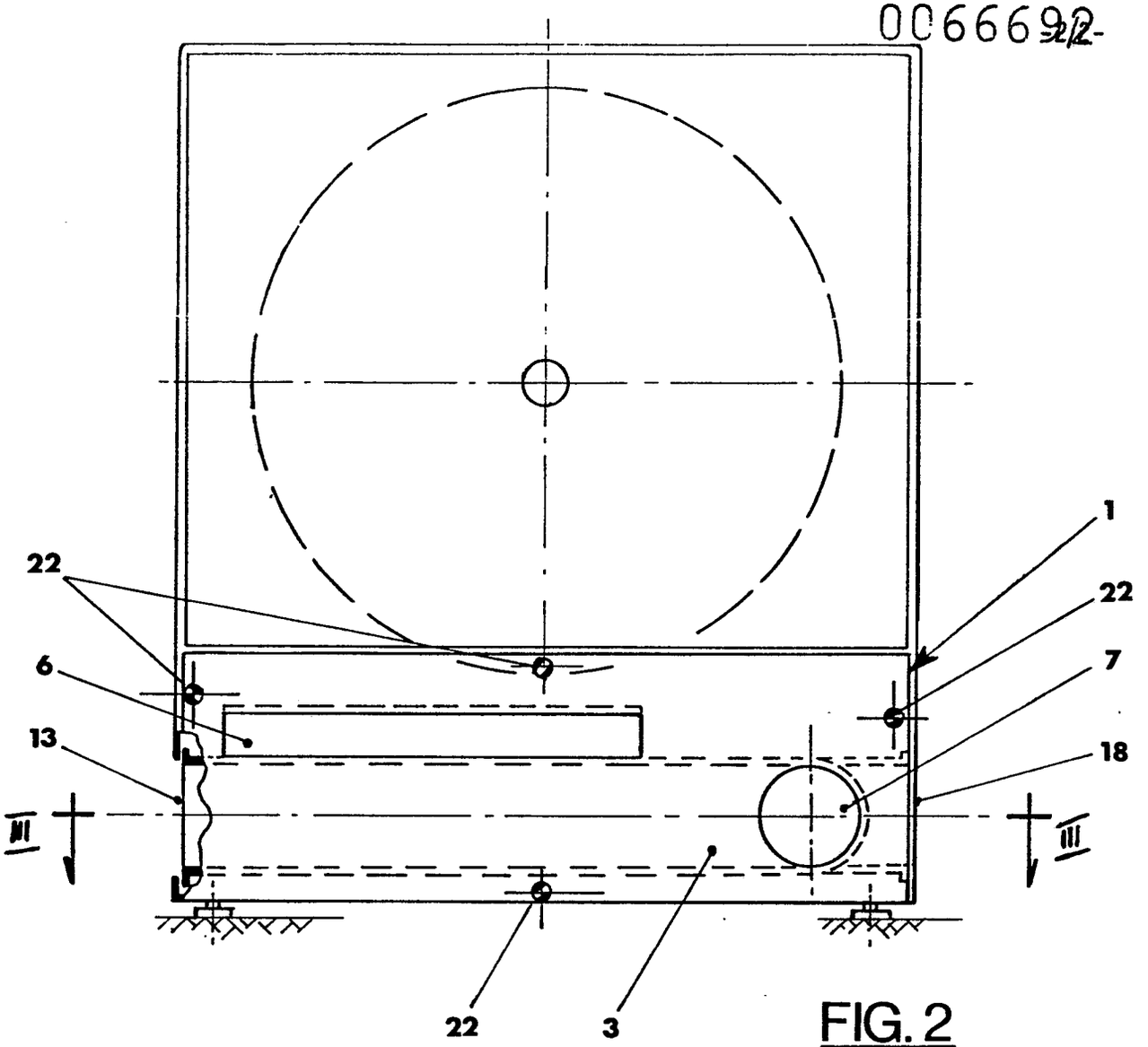

FIG. 2

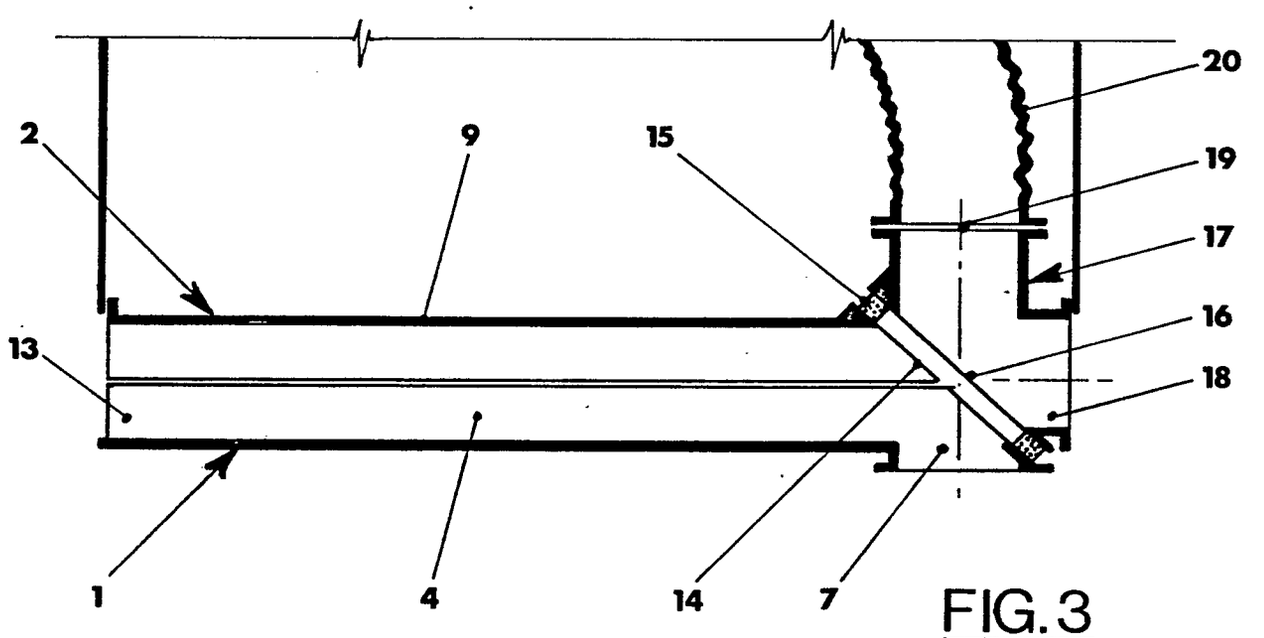

FIG. 3