

⑫ **EUROPEAN PATENT APPLICATION**

⑲ Application number: 86110662.3

⑤ Int.Cl.⁴: **D 06 F 58/24**

⑳ Date of filing: 01.08.86

⑳ Priority: 02.08.85 IT 3405285 U

④③ Date of publication of application:
25.02.87 Bulletin 87/9

④④ Designated Contracting States:
AT BE CH DE FR GB IT LI LU NL SE

⑦① Applicant: **Zanussi Elettrodomestici S.p.A.**
Via Giardini Cattaneo, 3
I-33170 Pordenone-C.P. 147(IT)

⑦② Inventor: **Del Frate, Franco**
Via Monte Pelmo 12
I-33170 Pordenone(IT)

⑦③ Representative: **Patentanwälte Grünecker, Kinkeldey,**
Stockmair & Partner
Maximilianstrasse 58
D-8000 München 22(DE)

⑤④ **Condenser laundry dryer.**

⑤⑦ In a laundry dryer having a rotatable drum, with circulation of the drying air in a closed circuit and circulation of the condensing air in an open circuit, and provided with a condenser unit having a cooling air outlet opening, a deflector element is provided for mounting adjacent the cooling air outlet of the condenser unit. The deflector element may selectively be mounted in one of two positions for deflecting the cooling air escaping from the condenser unit directly towards a discharge opening of the machine or towards the interior of the machine, and for at the same time defining an enclosed chamber underneath the condenser unit. The first position of the deflector element permits a removable condensate collector receptacle to be placed in an upper portion of the dryer, while in the second position of the deflector element, the removable receptacle is accommodated in the enclosed chamber underneath the condenser unit.

The invention permits the construction of the dryer to be standardized as far as possible with a view to the accommodation of the receptacle in either position.

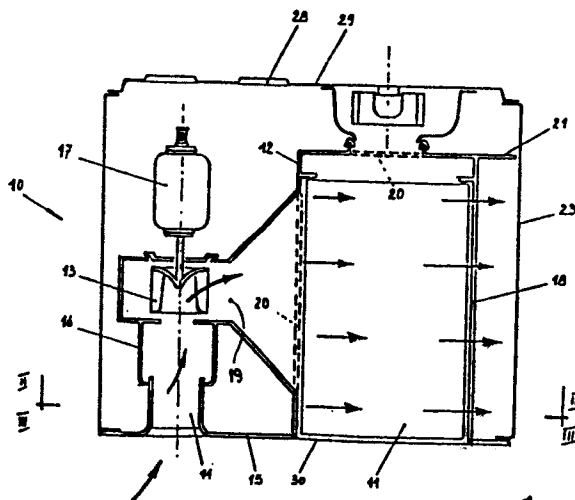


Fig 1

EP 0 211 418 A2

1 Condenser Laundry Dryer

Description

5 The present invention relates to a condenser laundry dryer,
particularly of the domestic type having a rotating drum,
in which the discharge flow of the cooling air of the
condenser unit may selectively be directed along different
discharge flowpaths from the machine, depending on the
10 location of the condensate collector receptacle, which in
the laundry dryer according to the invention may be pos-
itioned in an upper or a lower portion of the machine.

In known condenser laundry dryers, the condensed water is
15 collected in a receptacle removably accommodated in the
interior of the machine so that it can be emptied when
the collected water attains a maximum filling level.
The condensate collector receptacle is usually of the
open-top type. In the more economic models of laundry
20 dryers, it is usually placed directly underneath the
condenser unit so as to be filled with the condensate
flowing from the surfaces of the condenser by the action
of gravity. In the more sophisticated models of laundry
dryers, the receptacle is frequently placed at a more
25 convenient location in an upper portion of the machine so
as to be removable therefrom. In this case, the condensed
water accumulates in a collector disposed below the con-
denser and is conveyed therefrom to the collector recept-
acle by means of a transfer conduit connected to a centri-
30 fugal pump.

The positioning of the condensate collector receptacle
sometimes in the lower portion and sometimes in the upper
portion of the machine has finally resulted in the con-
struction of functionally and structurally widely different
35 laundry dryers.

In addition to requiring different indispensable compon-
ents, such as the transfer conduit with the associated

1 centrifugal pump, the two basic types of dryers are pro-
vided with different discharge flowpaths for the cooling
air, resulting in an uneconomical diversification in the
manufacture of dryers conforming to one or the other basic
5 type.

It would thus be advantageous, and is therefore an object
of the invention, to provide a laundry dryer the construct-
ion of which is standardized as far as possible for the
10 two basic types of dryers for thus enabling the condensate
collector receptacle to be selectively positioned in a
lower portion or an upper portion of the machine, so that
the desired dryer model can be obtained by carrying out
simple modifications during the final stage of assembly.
15 A laundry dryer of this construction would also be more
readily adaptable to the composition of so-called laundering
columns, in which case the laundry dryer would be
placed on top of a laundry washing machine, so that, to be
readily accessible, the condensate collector receptacle
20 would necessarily have to be located in the lower portion
of the machine.

These objects are attained according to the invention in a
laundry dryer having a rotatable drum, with circulation of
the drying air in a closed circuit, and circulation of the
25 condensing air in an open circuit, said dryer being pro-
vided with a removable condensate collector receptacle and
a condenser unit housed in a box-shaped container formed
with inlet and outlet openings for the condensing air,
wherein a deflector element mounted on the outlet opening
30 of the box-shaped container is adapted to selectively assume
one of two positions in a first of which it cooperates with
the walls of the dryer and with baffles integrally formed
with the box-shaped container to form a conduit for the
discharge of the condensing air to the exterior, and in
35 the second of which it forms a partition defining a chamber
for the accomodation of the removable receptacle below the
condenser unit, and simultaneously establishes communic-
ation of the condenser unit with the interior of the hous-

1 ing of the dryer.

The characteristics and advantages of the invention will become more clearly evident from the following description, given by way of example with reference to the accompanying drawings, wherein:

- fig. 1 shows a cross-sectional view of the laundry dryer according to the invention,
- 10 figs. 2 and 3 show longitudinal sectional views of the laundry dryer of fig. 1 with a condensate collector receptacle accommodated respectively in an upper portion and a lower portion of the dryer,
- fig. 4 shows a sectional view taken along the line IV-IV in fig. 3, and
- 15 figs. 5 and 6 show sectional views of the dryer taken respectively along the lines V-V and VI-VI in figs. 2 and 3.

The laundry dryer 10 according to the invention is of the 20 type having a rotatable drum (not shown) and includes an air-cooled condenser unit 11 housed in a box-shaped container 12 fixedly mounted in a lower portion of the dryer.

The cooling air for condenser unit 11 is aspirated by means of a fan 13 through an opening 14 formed in a 25 bottom portion 15 of a front wall 30 of the dryer.

The interior rim of opening 14 is extended towards the interior of the machine so as to permit the respective part of bottom portion 15 to be received in a connector 30 element 16 to thus define a flowpath for the air aspirated by fan 13. Fan 13 is rotated by a motor 17 of the machine so as to convey the aspirated air through the drying air condenser unit 11 and to expel it from box-shaped housing 12 through at least one outlet opening 18 formed in the 35 housing opposite an inlet opening 19 thereof.

Box-shaped housing 12 is integrally formed with a lower baffle 20 delimiting an area below condenser unit 11.

1 Adjacent the side of the machine baffle 20 is upwards
extended by a lateral baffle 21. Baffles 20 and 21 and the
bottom of box-shaped container 12 cooperate with the bottom
22 of the machine to define a chamber 31 communicating
5 with the remainder of the dryer 10 through a passage 24
(fig. 3) extending between cooling air outlet opening 18
and a sidewall 23 of the machine 10.

The above described machine is adapted to accommodate a
10 condensate collector receptacle 25 selectively in
chamber 31 underneath condenser unit 11 (figs. 3, 6) or
in an upper portion of dryer 10, as diagrammatically shown
in fig. 2.

15 For preparing the machine to the configuration with recept-
acle in the upper position, provisions are made for the
application to cooling air outlet opening 18 of a deflect-
or element 26 having a substantially L-shaped cross-section
and extending over the full length of opening 18 between
20 front wall 30 of the machine and lateral baffle 21 of
box-shaped container 12. Deflector element 26 may be
secured to the upper boundary of outlet opening 18 by
means of threaded fasteners or in a snap fit, and in
engagement with the adjacent sidewall 23 of the machine,
as shown in fig. 2, so as to deflect the cooling air towards
25 chamber 31 underneath container 12, from where the air
escapes to the exterior of machine 10 through openings 27
in the base of the housing. This solution offers the addit-
ional advantage that the cooling air escaping from condenser
unit 11 at a temperature which is always lower than that
30 of the drying drum is prevented from sweeping the walls
of the drum and from thereby impairing the efficiency of
the drying process, instead of which it is directly dis-
charged from the machine.

35 For obtaining a laundry dryer with receptacle 25 accommod-
ated in chamber 31, the same deflector element 26 is
secured to the lower rim of outlet opening 18 and in
contact with sidewall 23 of the machine in the position

1 depicted in fig. 3. In this position, deflector element 26
deflects the air escaping from outlet opening 18 upwards
into the free space in the interior of the machine, from
which it escapes through openings 28 formed in the rear
5 wall 29 of the machine.

There is thus attained the main object of providing a
laundry dryer 10 the construction of which is standardized
as far as possible with a view to the accommodation of the
condensate collector receptacle 25 in the two positions by
10 simply repositioning deflector element 26 to obtain the
desired dryer model.

Depending on the positioning of deflector element 26 and
collector receptacle 25, the dryer has of course to be
15 provided with the known components required for its oper-
ation in the respective configuration.

It is for instance known to provide box-shaped container 12
with a lower opening (not shown in the drawings), which in
20 the configuration with receptacle 25 in the lower position
permits the condensate to flow into a hopper 40 communic-
ating with receptacle 25 (figs. 3, 6).

In the configuration with receptacle 25 in the upper pos-
25 ition, on the other hand, provisions are made for the
addition of a pump (not shown) for the transfer of the
liquid from hopper 40 to receptacle 25 via a transfer
conduit 41 (figs. 2, 5).

30

35

GRUNECKER, KINKELDEY, STOCKMAIR & PARTNER

PATENTANWÄLTE
EUROPEAN PATENT ATTORNEYS

1

A GRUNECKER DPL. ING.
DR H KINKELDEY, DPL. ING.
DR W STOCKMAIR, DPL. ING. AF E. (CA)TECH.
DR K SCHUMANN DPL. PHYS.
P H JAKOB, DPL. ING.
DR G BEZOLD, DPL. CHEM.
W MEISTER DPL. ING.
H HILGERS DPL. ING.
DR H MEYER-PLATH, DPL. ING.
DR M BOTT-BODENHAUSEN, DPL. PHYS.
DR U KINKELDEY, DPL. ING.5 Zanussi Elettrodomestici S.p.A.
Via Giardini Cattaneo, 3
33170 Pordenone-C.P. 147

I t a l y

*LICENCE EN DROIT DE L'UNY DE GENEVE

8000 MUNCHEN 22
MAXIMILIANSTRASSE 22

10

EP 2974

15

20

Condenser Laundry DryerPatent Claims

1. A laundry dryer having a rotatable drum, with
 25 circulation of the drying air in a closed circuit and
 circulation of the condensing air in an open circuit,
 provided with a removably mounted condensate collector
 receptacle and a condenser unit housed in a box-shaped
 container formed with inlet and outlet openings for the
 30 condensing air, characterized in that a deflector element
 (26) mounted on said outlet opening (18) of said box-
 shaped container (12) is adapted to selectively assume one
 of two positions, in the first of which it cooperates with
 the walls of the machine (10) and with baffles (20, 21)
 35 integrally formed with said box-shaped container (12) to
 define a flowpath for the discharge of the condensing air
 to the exterior of the machine, and in the second of which
 it defines a chamber (31) below said condenser unit (11)

1 for the accommodation of said removable receptacle (25),
at the same time establishing communication of said
condenser unit (11) with the interior of the housing of
the machine (10).

5

2. A laundry dryer according to claim 1, characterized
in that in said first position said deflector element (26)
is mounted along the upper rim of said outlet opening (18)
so as to cooperate with a sidewall (23) and the bottom (22)
10 of the machine (10), and with a lateral baffle (21) and a
lower baffle (20) extending into contact respectively with
said sidewall (23) and said bottom (22) of the machine (10)
for thus forming a discharge flowpath for the cooling air
towards discharge openings (27) provided in said chamber
15 (31).

3. A laundry dryer according to claim 1, characterized
in that in said second position said deflector element (26)
is mounted along the lower rim of said outlet opening (18)
for deflecting the flow of the cooling air towards discharge
20 openings (28) formed in the rear wall (29) of the machine,
and for defining, in cooperation with said sidewall (23),
said bottom (22), and said baffles (20, 21), a closed
chamber (31) underneath said box-shaped container (12) of
the condenser unit for the accommodation therein of the
25 removable condensate collector receptacle (25).

4. A laundry dryer according to any of the preceding
claims, characterized in that said deflector element (25)
has a substantially L-shaped cross-section and is secured
30 at one of its ends, by means of threaded fasteners or in a
snap fit, to the upper or lower rim of said cooling air
outlet opening (18) so that its other end contacts the
adjacent sidewall (23) of the machine (10).

35

1/3

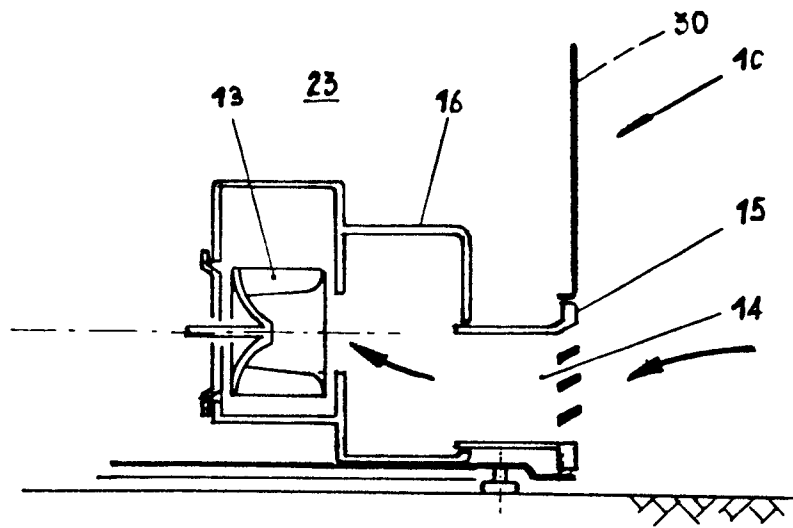


Fig 4

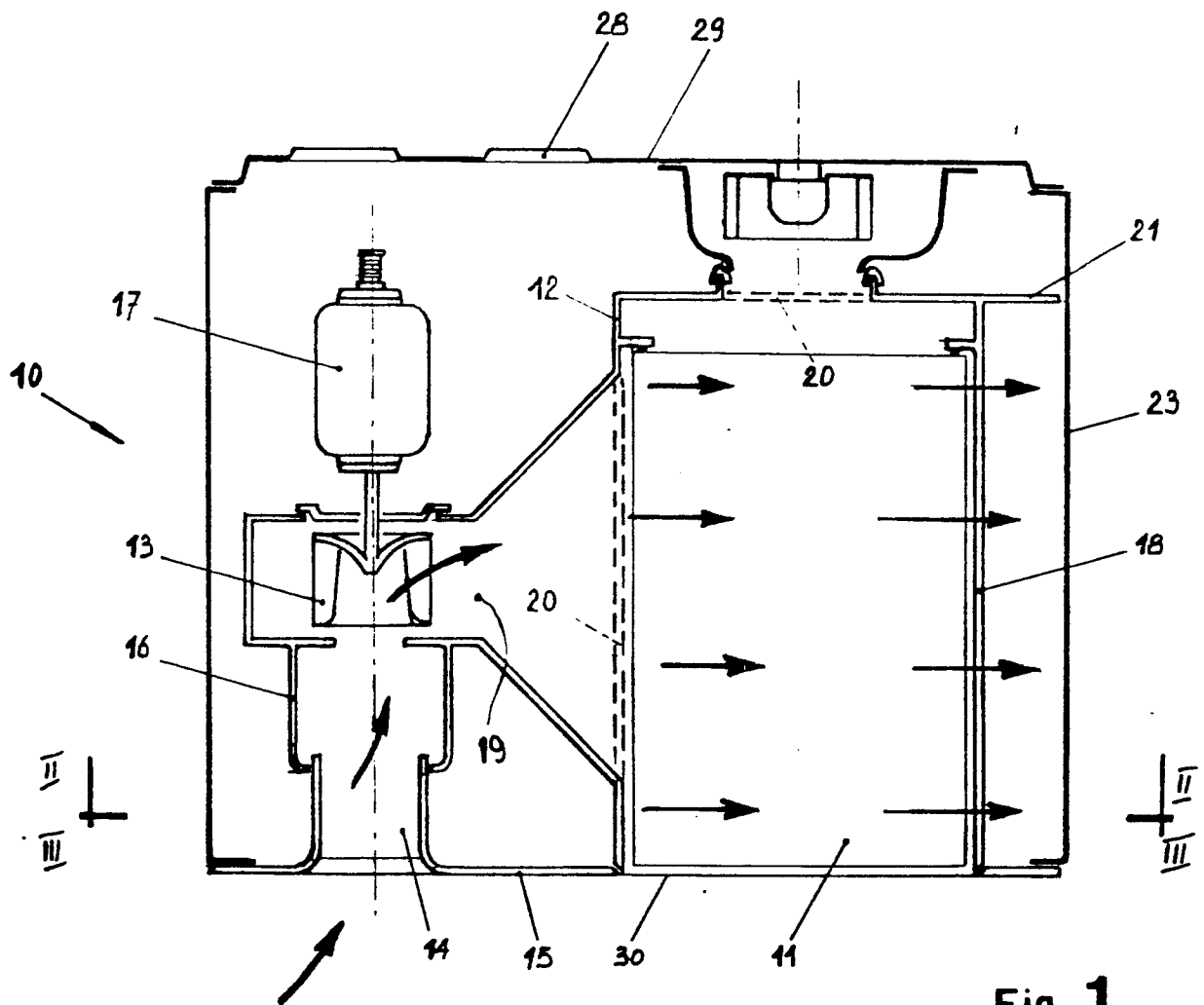


Fig 1

2/3

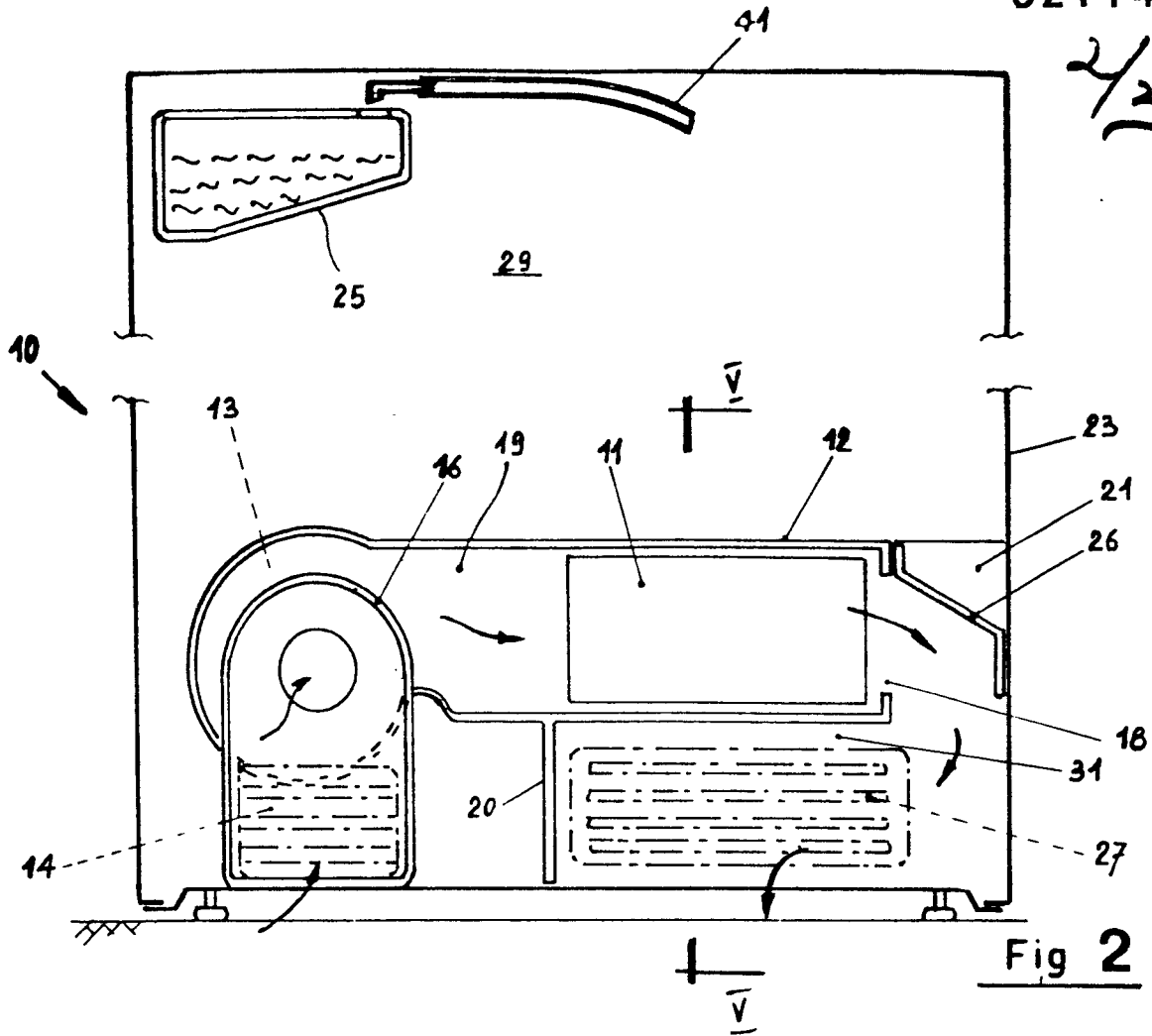


Fig 2

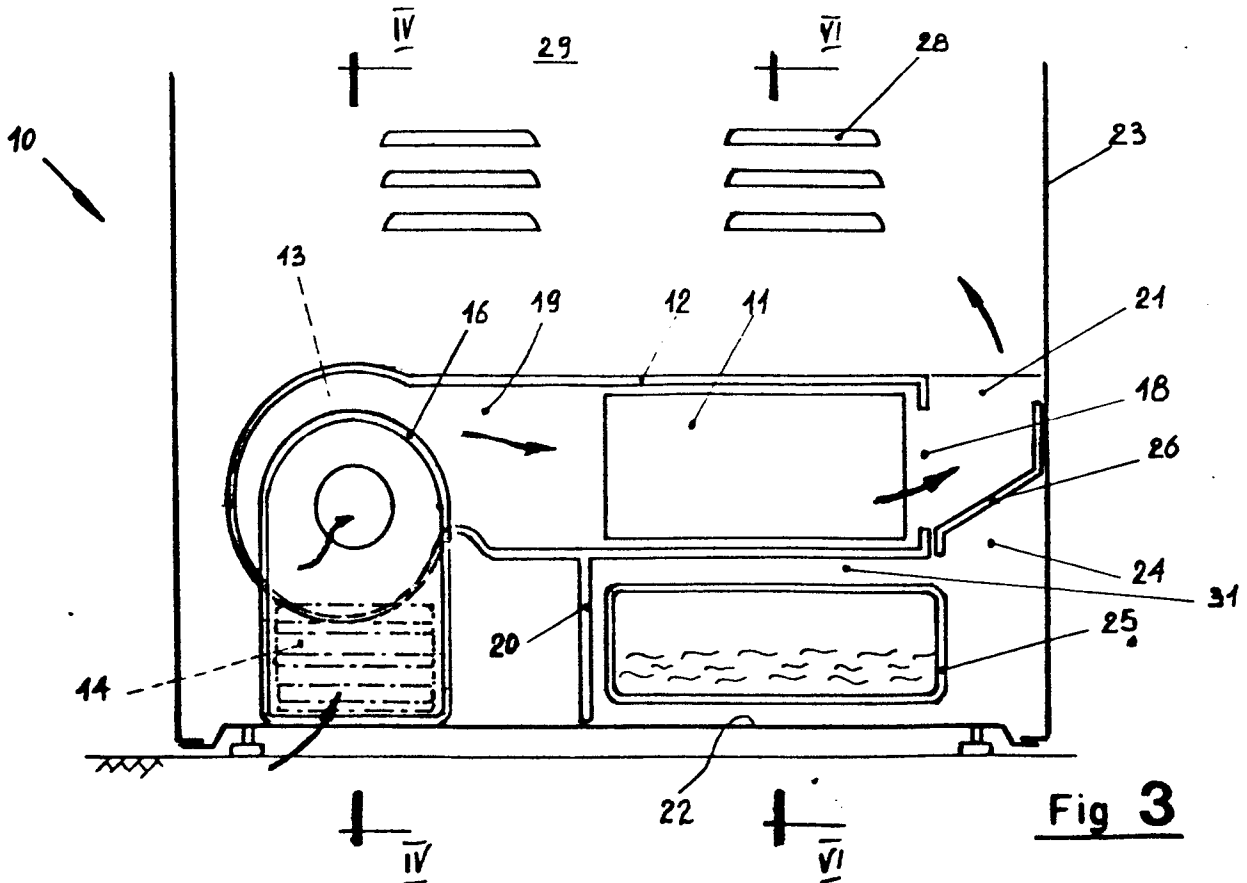


Fig 3

3/3

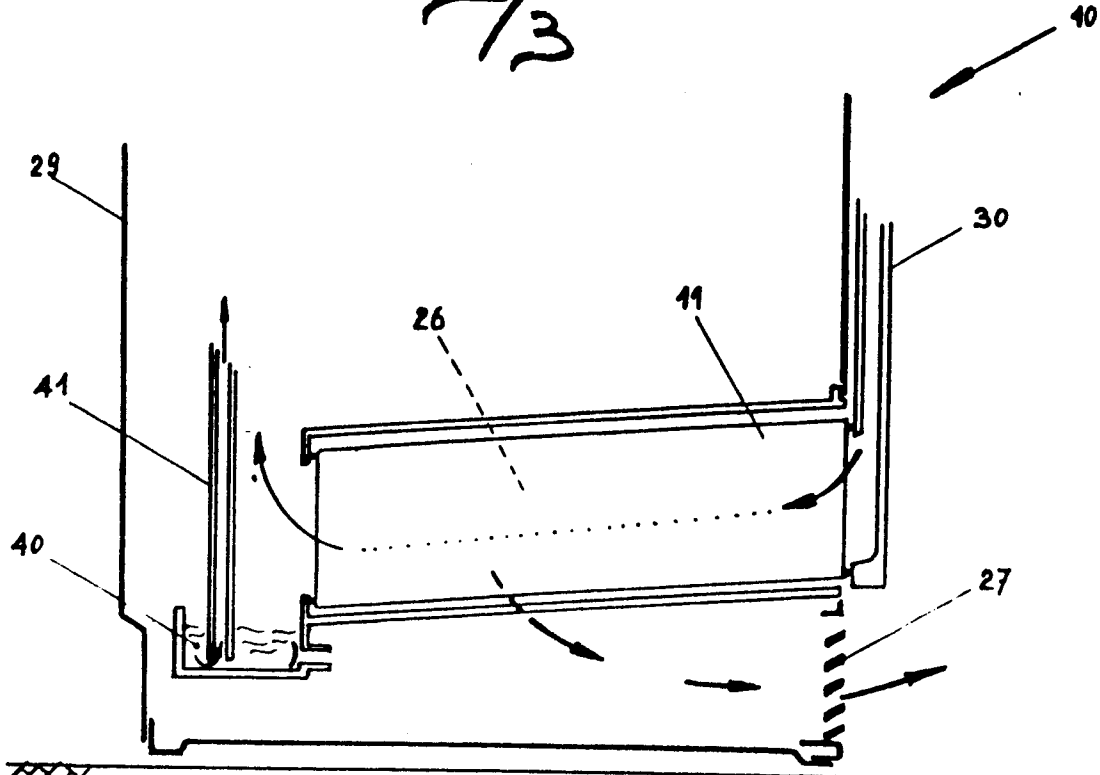


Fig 5

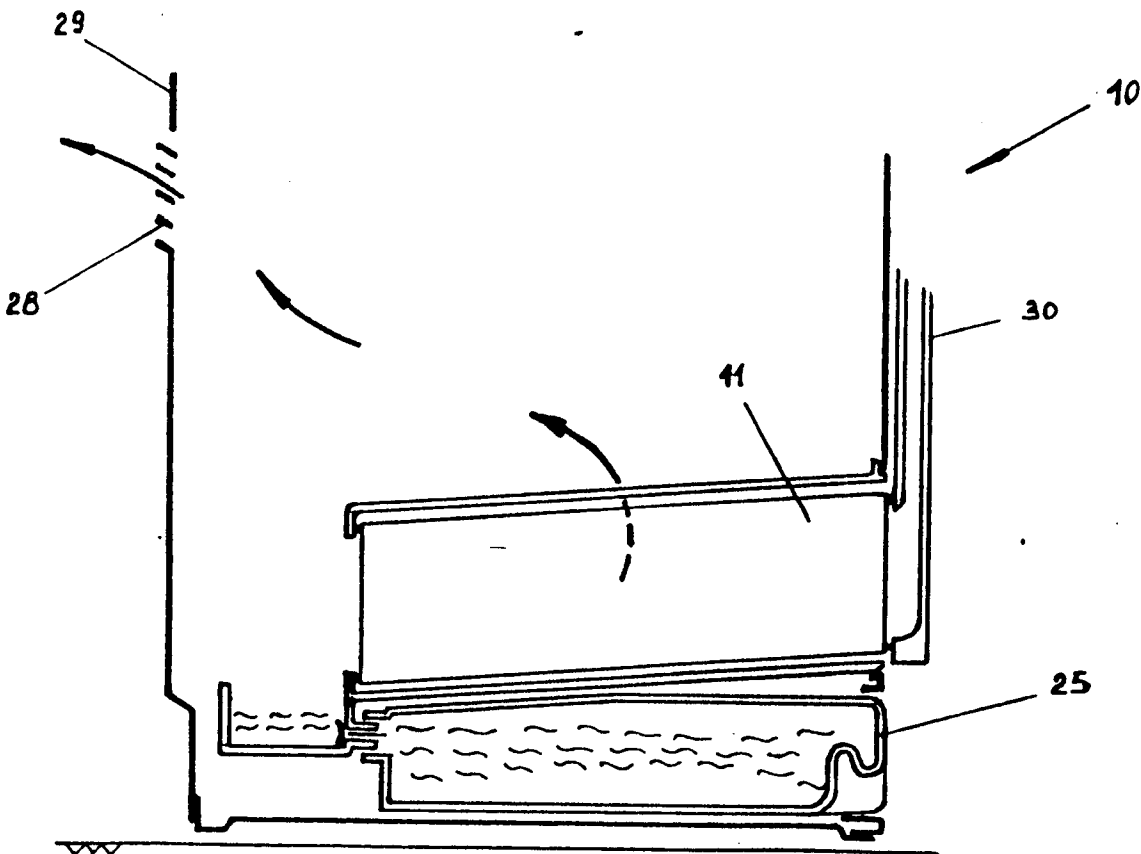


Fig 6