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(54) **A VENTILATION ARRANGEMENT FOR AN ASH HANDLING SYSTEM**

BELÜFTUNGSVORRICHTUNG FÜR EIN SYSTEM ZUR AUFNAHME VON ASCHE

DISPOSITIF DE VENTILATION POUR SYSTEME D'EVACUATION DE CENDRES

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EP 1 469 749 B1

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Description

[0001] The present invention concerns a ventilation arrangement for an ash handling system according to the preamble of claim 1.

[0002] An ash handling system comprising ash receiving channel, an ash receptacle and a valve mechanism between the channel and the ash receptacle is described in PCT/SE02/02024, claiming priority from SE 0103825-6. The latter application was filed on 16 November 2001 by the same applicant and the same inventor, and was not published on the day of filing of the present application.

[0003] In that prior system, the ash receiving channel comprises an ash receiving part, an inverse bell-like funnel, connected to a vertically extending tubular member opening in operation into the ash receptacle. The connection between the funnel and the tubular member is sealed by an O-ring. The valve mechanism includes a balance lever swingable about a fulcrum and having an arm having a sealing surface abutting and sealing a lower, open end of the tubular member in a normal rest position of the balance lever.

[0004] This arrangement should normally result in a sufficient seal between the ash receptacle and the interior of the tubular member so that escape of odours from the interior of the receptacle through the funnel is prevented. In case of malfunction of the valve, however, such as due to tar having accumulated on the sealing surface, annoying odours may escape to the environment.

[0005] German Patent DE 26 00 881, corresponding to the preamble of claim 1, discloses an ash handling device solving the problem of preventing odours from the receptacle to escape to the environment. However, the location of its valve arragement is objectionable since the air flow is led partly through the receptacle, this in turn resulting in the risk that glowing cigarette ends etc. catch fire. ,

[0006] An object of the present invention is to provide a solution to the first mentioned, possible problem of preventing odours from escaping to the environment by providing a ventilation method and arrangement removing possible escaping odours from within the tubular member, while not exhibiting the drawback of the German Patent referred to.

[0007] In the ventilation method according to the present invention, air is withdrawn from the ash-receiving channel so as to create an airflow into the ash-receiving channel, i.e., normally from above, preventing odours from escaping to the environment, i.e., in the opposite direction. When the ash receiving channel, as preferred, and as in the first mentioned prior art ash handling system referred to above, is a two-part structure made up of an ash receiving funnel and a tubular member, air is withdrawn from the tubular member at its upper end through at least one space between the tubular member and the funnel. This odour-containing airflow is then disposed of at another location.

[0008] In the ventilation arrangement according to the present invention, instead of providing a seal between the tubular member and the funnel, there is provided at least one air flow space between them, so as to enable an air flow directed into the funnel and the tubular member to be withdrawn from the interior of the tubular member through said air flow space between the funnel and the tubular member.

[0009] An embodiment of the present invention will be described hereinafter, reference being made to the accompanying drawings, wherein:

Fig. 1 is a cross sectional view through an ash handling system according to the prior application;

Fig. 2 is a cross sectional view through an ash handling system according to Fig. 1 modified with a ventilation arrangement according to the present invention;

Fig. 3 is a cross section through a modified ash handling system provided with a ventilation arrangement according to the present invention;

Fig. 4 is a side view of a smoker's booth provided with the ventilated ash handling system according to Fig. 3;

Fig. 5 is a partial cross section through the smoker's booth of Fig. 4; and

Fig. 6 is a view from below towards a portion of an ash handling system provided with a modified ventilation arrangement according to the present invention.

[0010] The prior ash handling system shown in Fig. 1 includes an ash receiving channel 11, an ash receptacle 12 and between them a valve mechanism 13.

[0011] The ash receiving channel is shown to comprise an inverse bell-like funnel 14, a lower end 14' of which is introduced into an upper end 15' of a vertically extending tube 15 having a circular cross section. An 0-ring 16 seals between the funnel end 14' and the tube end 15'.

[0012] The tube 15 opens with a chamfered edge 15" into the ash receptacle 12 being a cylindrical container having a circular, substantially flat bottom 17 allowing it to rest on, e.g., a non-shown table. Its vertical cylinder wall 18 upwardly merges with a horizontal upper wall 19 having a recessed portion 20, including a first annular, step-like shoulder 21 and a lower, likewise annular shelf 22.

[0013] The shoulder 21 is adapted to receive and support a circumferential rim 23 of the funnel 14, thereby supporting the latter. A non-shown O-ring seals between the shoulder 21 and the rim 23.

[0014] The annular shelf 22 supports an annular circumferential portion 24 of a circular disc 25. A non-shown

annular sealing strip seals between the shelf 22 and the annular portion 24. The disc 25 has in its centre a circular aperture receiving the upper end 15' of the tube 15 into which the lower portion 14' of the funnel 14 is inserted and sealed by the O-ring 16.

[0015] The recessed portion 20 defines - together with the funnel 14 and the disc 25 - a space 26 separated from the ash receptacle 12.

[0016] The valve mechanism 13 comprises a valve element 27 operable to open passage between the tube 15 and the receptacle 12 upon loading by an object received in the tube, and when unloaded to resume, or maintain, a normal, closed position. In the closed position, a flat surface 28 thereof facing the edge 15" seals the receptacle 12 from the tube 15 and the connecting funnel 14, thereby preventing odours from within the container to escape to the environment outside the ash handling system.

[0017] In case of malfunction of the valve mechanism 13, such as if tar adheres to any of the sealing surfaces 15", 27 of the valve mechanism, there is a risk that odours from within the receptacle 12 may escape through the tube 15 and the funnel 14.

[0018] The ventilation arrangement according to the present invention prevents such escape by withdrawing air from the interior of the tube 15.

[0019] Fig. 2 shows this concept applied to the prior ash handling system of Fig. 1. In Fig. 2, a hole 29 is provided in the tube 15, and a conduit, such as a tube 30 as shown, or a suitable hose, is connected to the tube to extend through a hole 31 in the wall 18 of the receptacle 12. The projecting free end 30' of the tube 30 may be connected to any suitable suction source to withdraw air from the interior of the tube 15 (arrow A) and, thus, possible odours entering the tube from the ash receptacle.

[0020] As an alternative, air may be removed from the space 26 by means of a similar tube 32 (shown wish dashed lines in Fig. 2) and passing through the wall 18 and fitted in the wall 20' of the recessed portion 20. In such case, it would be suitable to remove the O-ring 26 to allow unimpeded air flow between the lower funnel end and the upper tube end 15'.

[0021] This latter concept is further realised in the embodiment shown in Fig. 3. Also in this embodiment, instead of providing a seal, such as O-ring 16, there is no seal between the lower end 14' of the funnel and the upper end 15' of the tube 15. Instead there is provided a small annular space 33 between the tube end and the funnel end. The space 26' is evacuated as indicated by arrows B so that a pressure below that of the atmospheric pressure is created within that space. Consequently, air is introduced into the space 26' from the interior of the tube 15 through the annular space 33 as indicated by arrows C. Fresh air is introduced into the tube 15 from the funnel 14 as indicated by an arrow D.

[0022] Fig. 4 shows a side view of a smoker's booth including the first embodiment of the present invention as shown in Fig. 3, and Fig. 5 is a partial section therethrough at a larger scale. It further comprises a stand 34, a rear supporting wall 35, a shelf 36 carried by the wall 35, a wall 37 supported by the wall 35, and roof 38. An air exhaust device including a lower baffle wall 39 is mounted in the roof. An ash receptacle 40 is mounted under the shelf to receive ashes from the tube 15 upon opening of the valve mechanism 13. An air channel 41 is provided in the shelf to communicate with the space 26', and a connecting air channel 42 is provided in the wall 37. The baffle wall 39 leaves an interspace 43 to the wall 37. Non-shown air moving means is provided to cause an air flow E from the smoker's both out through the interspace 39. This airflow is primarily to withdraw smoke from the both. In this instance, however, it is also used to create an ejector flow F from the upper end of the channel 33. This ejector flow is sufficient to establish the very small airflow D - C^D - B needed to withdraw possible odours from the interior of the tube 15. The air flow E together with the ejector flow F is brought to suitable air treatment equipment of the exhaust device, or, located at another location.

[0023] It has also been seen that very light ash flakes sticking to the walls of the funnel 14 tend to come loose by the air flow and be brought along thereby.

[0024] As an alternative to an annular space 33 between the funnel end 14' and the circular upper tube end 15', Fig. 6 shows the situation when a rectangular, in this case square, tube 15B is used. This creates four equal, enlarged openings 44 a, b, c, d between the lower funnel end 14' and the upper tube end 15B' to create four air flows C'. Each such opening may join the adjacent ones in case there is a continuous space 33' between the funnel end 14' and the tube 15B as shown.

[0025] Evidently, as an alternative to an ejector flow, a suitable fan or other air moving means may be used to create an air flow D - C'- B.

Claims

1. A ventilation arrangement for an ash handling system and comprising an open, funnel shaped, ash receiving entrance channel (11), an ash receptacle (12) below the ash receiving channel, a valve mechanism (13) arranged downstream of the ash receiving channel and co-operating with a tubular channel member (15) to control the flow connection between the ash receiving channel (11) and the ash receptacle (12), and an air withdrawal channel (33) serving to prevent escape of odours from the ash receptacle (12), **characterized in that** said air withdrawal channel comprises an air flow exit space (33; 44a-44d) provided downstream of the ash receiving channel (11) but upstream of the valve arrangement (33; 44a-44d) of the tubular channel member (15) so as to be able to withdraw air from this portion of the air flow path and lead it on to air treatment equipment.

2. The ventilation arrangement according to claim 1, **characterized in that** said air flow space is an annular space (33) provided adjacent the junction between the lower end of the ash receiving receptacle (11) and the upper end (15B') of the tubular channel member (15).

3. The ventilation arrangement according to claim 1 , **characterized in that** the air flow space comprises four equal openings (44a-44d) provided adjacent the junction between the lower end of the ash receiving receptacle (11) and the upper end (15B') of a rectangular cross-section tubular channel member (15).

Patentansprüche

1. Eine Ventilationsanordnung für ein Aschen-Handhabungs-System, das einen offenen, trichterförmigen, Asche aufnehmenden Eingangskanal (11), eine Aschen-Aufnahme (12) unterhalb des Aschenaufnahme-Kanals, einen stromabwärts des Aschen-Aufnahmekanals angeordneten Ventilmechanismus (13), der mit einem rohrförmigen Kanalteil (15) zur Steuerung der Durchflussverbindung zwischen dem Aschen-Aufnahmekanal (11) und der Aschen-Aufnahme (12) zusammenwirkt, und einen Luft-Abzugskanal (33) aufweist, der dazu dient, ein Ausströmen von Gerüchen aus der Aschenaufnahme (12) zu unterbinden,
dadurch gekennzeichnet, dass der Luft-Abzugskanal einen Luftstrom-Austrittsraum (33; 44a-44d) aufweist, der stromabwärts des Aschen-Aufnahmekanals (11), jedoch stromaufwärts der Ventilanordnung (33; 44a-44d) des rohrförmigen Kanalteils (15) angeordnet ist, um so in der Lage zu sein, Luft von diesem Abschnitt des Luftstromweges abzuziehen und sie zu einer Luftbehandlungsausrüstung zu leiten.

2. Die Ventilationsanordnung nach Anspruch 1,
dadurch gekennzeichnet, dass der Luftstromraum ein ringförmiger Raum (33) ist, der benachbart zur Verbindung zwischen dem unteren Ende der Aschen-Aufnahme (11) und dem oberen Ende (15B') des rohrförmigen Kanalteiles (15) angeordnet ist.

3. Die Ventilationsanordnung nach Anspruch 1,
dadurch gekennzeichnet, dass der Luftstromraum vier gleiche Öffnungen (44a-44d) aufweist, die benachbart zur Verbindung zwischen dem unteren Ende der Aschen-Aufnahme (11) und dem oberen Ende (15B') eines rohrförmigen Kanalteiles (15) mit rechteckigem Querschnitt vorgesehen sind.

Revendications

1. Agencement de ventilation destiné à un système d'évacuation de cendres et comprenant un canal d'entrée (11) ouvert, en forme d'entonnoir pour la réception de cendres, un réceptacle (12) pour cendres sous le canal de réception de cendres, un mécanisme (13) de soupape agencé en aval du canal de réception de cendres et coopérant avec un élément (15) de canal tubulaire pour réguler la liaison d'écoulement entre le canal (11) de réception de cendres et le réceptacle (12) pour cendres, et un canal (33) de retrait d'air qui sert à empêcher le dégagement d'odeurs du réceptacle (12) pour cendres, **caractérisé en ce que** ledit canal de retrait d'air comprend un espace (33 ; 44a-44d) de sortie de l'écoulement d'air pourvu en aval du canal (11) de réception de cendres mais en amont de l'agencement (33 ; 44a-44d) de soupape de l'élément (15) de canal tubulaire de façon à pouvoir retirer l'air de cette partie du chemin d'écoulement d'air et de le diriger vers un équipement de traitement d'air.

2. Agencement de ventilation selon la revendication 1, **caractérisé en ce que** ledit espace d'écoulement d'air est un espace annulaire (33) prévu adjacent à la jonction entre l'extrémité inférieure du canal (11) de réception de cendres et l'extrémité supérieure (15B') de l'élément (15) de canal tubulaire.

3. Agencement de ventilation selon la revendication 1, **caractérisé en ce que** l'espace d'écoulement d'air comprend quatre orifices égaux (44a-44d) prévus adjacents à la jonction entre l'extrémité inférieure du canal (11) de réception de cendres et l'extrémité supérieure (15B') d'un élément (15) de canal tubulaire à section transversale rectangulaire.

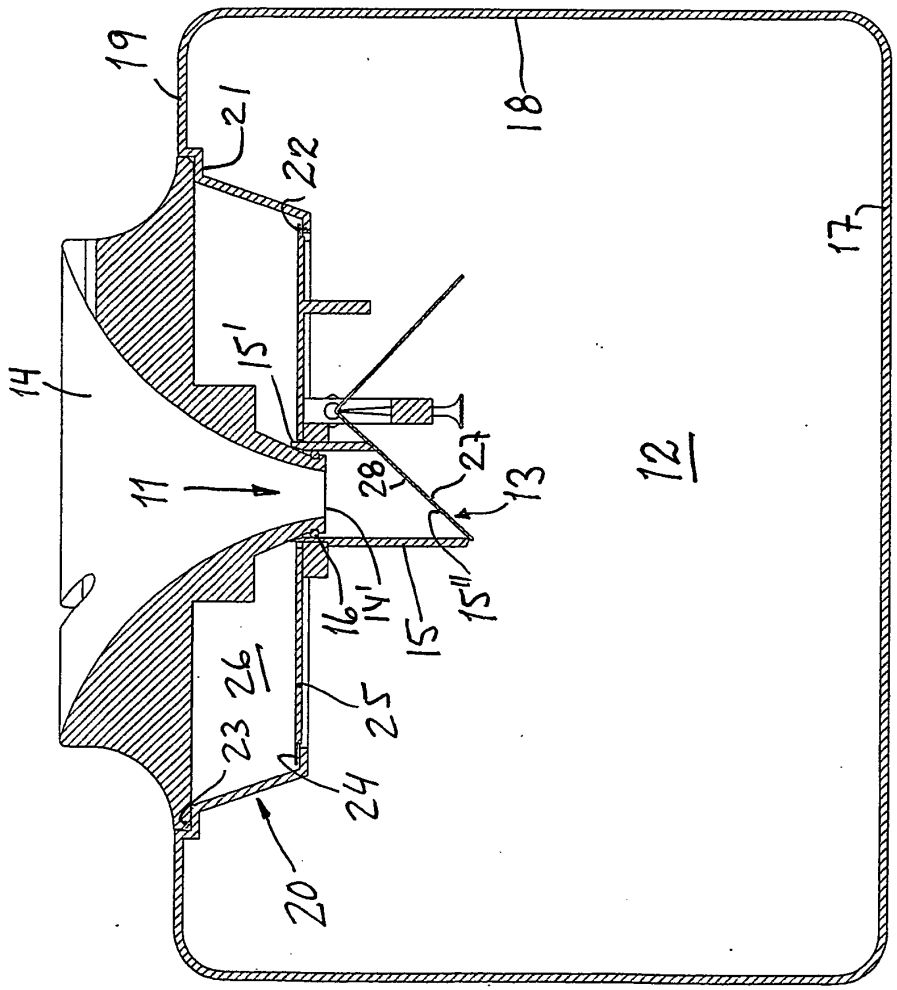


Fig. 1
PRIOR ART

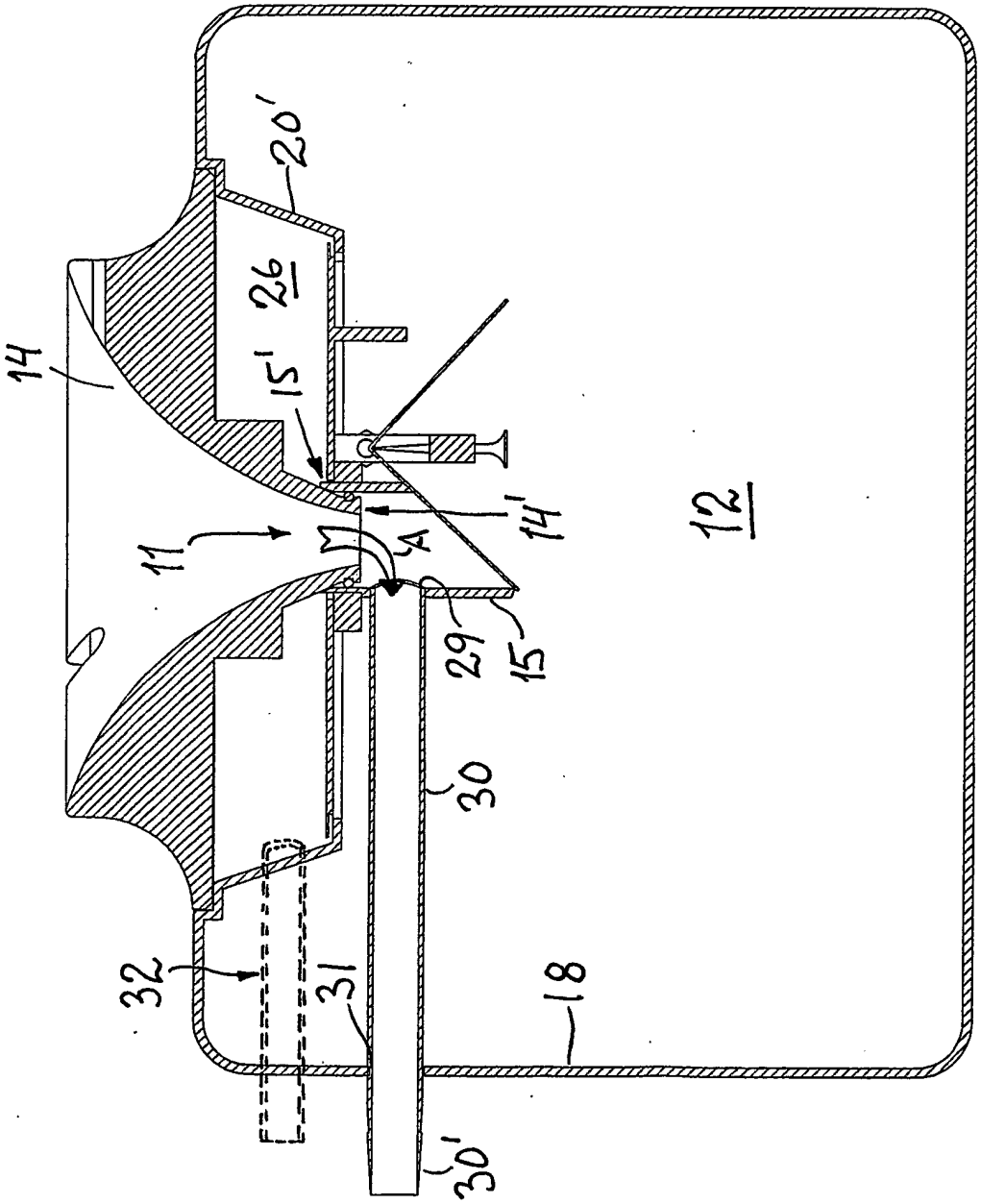


Fig. 2

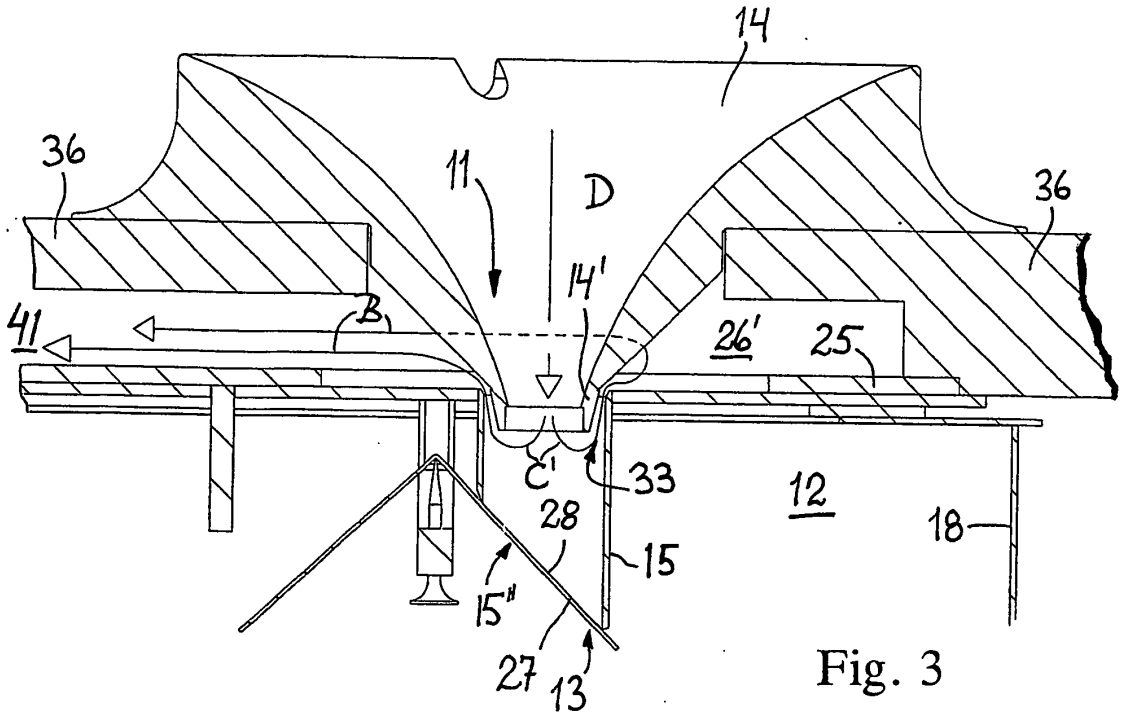

14
36
11
D
36
14'
41
B
26'
25
C'
33
12
28
18
15
15"
27
13

Fig. 3

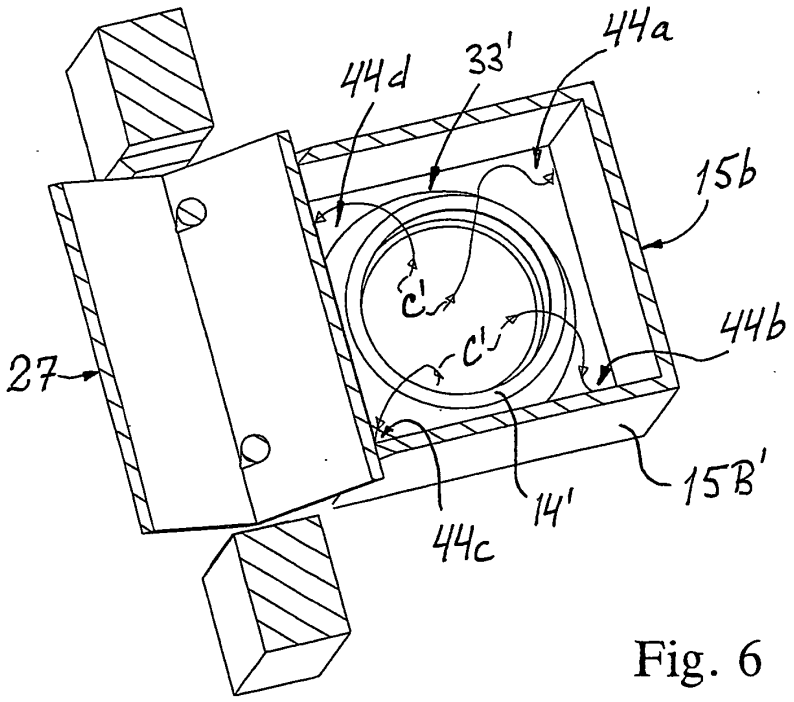
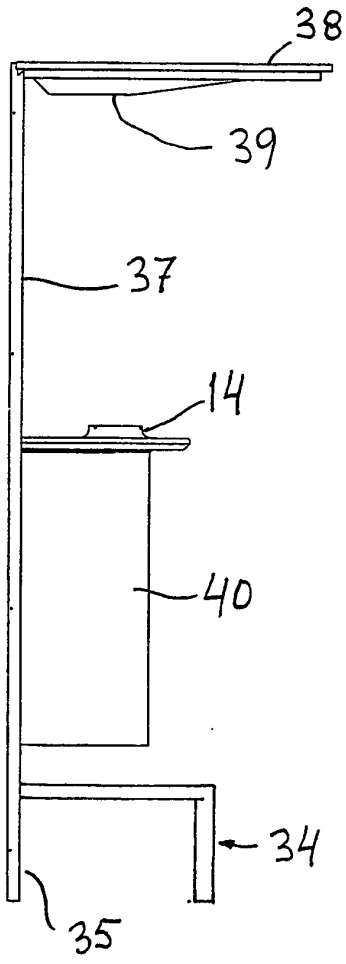

44a
44d
33'
15b
C'
C'
44b
27
15B'
14'
44c

Fig. 6

Fig. 4



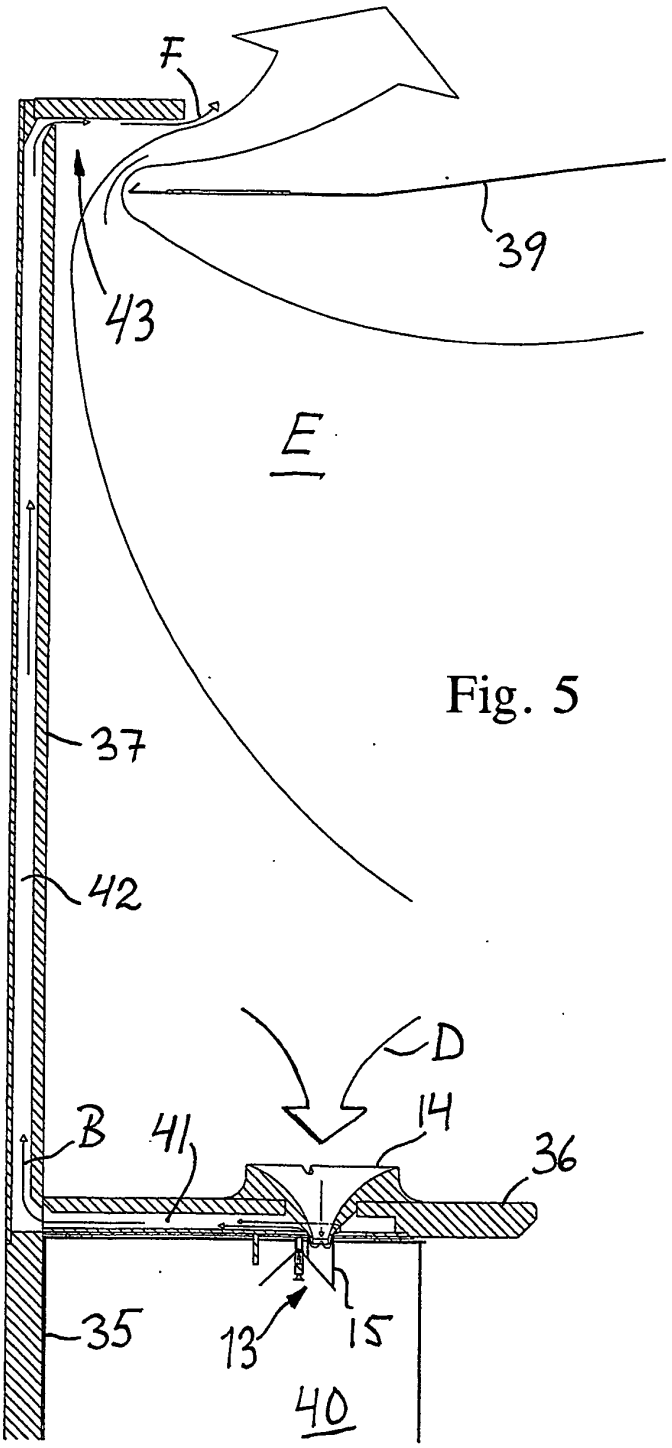


Fig. 5

REFERENCES CITED IN THE DESCRIPTION

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- SE 01038256 **[0002]**
- DE 2600881 **[0005]**