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(54) **A FLUE FOR EXHAUSTING FUMES FROM ENVIRONMENTS, PARTICULARLY FOR EXHAUSTING COOKING FUMES AND DOMESTIC HOOD HAVING SUCH A FLUE**

ABZUG ZUR ABFÜHRUNG VON DÄMPFEN AUS UMGEBUNGEN, INSBESONDERE ZUM ABFÜHREN VON KOCHDÄMPFEN UND MIT SOLCH EINEM ABZUG AUSGESTATTETE ABZUGSHAUBE FÜR DEN HAUSGEBRAUCH

CONDUIT D'ÉVACUATION DE FUMÉES À PARTIR D'ENVIRONNEMENTS, EN PARTICULIER D'ÉVACUATION DE FUMÉES DE CUISSON, ET HOTTE DOMESTIQUE COMPRENANT UN TEL CONDUIT

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Description

Technical field

[0001] The present invention relates to a flue for evacuating fumes from rooms, in particular for evacuating cooking fumes.

[0002] Such flue advantageously may be used for extracting cooking fumes from kitchens of any type, for example within the scope of restaurants services, but also in private homes.

[0003] More specifically, the flues the object of the present invention are used together with the so-called "filtering hoods" which extract cooking fumes and after filtering them, re-emit them into the same indoor room.

Background art

[0004] A flue known from the background art comprises a first vertical and rectilinear stretch. Such first stretch has an inlet section which can be connected to any filtering hood on the market.

[0005] The first vertical stretch branches off into a pair of second curved stretches which diverge from one another. Each second stretch ends with a respective outlet opening of the fumes.

[0006] The fumes are discharged along a horizontal direction.

[0007] In other words, the outlet openings lie on respective parallel vertical planes.

[0008] The outlet openings are each closed by a respective grid so that it is possible to prevent the introduction of objects from the outside.

[0009] In particular, it is to be possible to prevent the introduction of a hand or tool, for safety reasons.

[0010] Disadvantageously, following the transit of the cooking fumes, the grid generates turbulence in the fumes themselves. The turbulence is transmitted therefore to the grid which, vibrating against the flue, becomes a significant source of noise.

[0011] An household hood according to the preamble of claim 1 is disclosed in document DE 10 2008 023311 A1.

[0012] Document GB 2 269 891 A discloses a terminal for exhausting flue gases, comprising a pair of outlet openings for discharging said fumes along a substantially horizontal direction. The outlet openings are symmetrical with respect to a centreline plane arranged along a vertical direction, are of a size to prevent the entry of birds into the terminal, and may be provided with a bird mesh.

SUMMARY OF THE INVENTION

[0013] In this context, the technical task at the basis of the present invention is to propose a flue for evacuating fumes from rooms, in particular for evacuating cooking fumes, which overcomes the above-mentioned drawbacks of the known technique.

[0014] In particular, it is the object of the present invention to make available a flue for evacuating fumes from rooms, capable of allowing a significant reduction of the acoustic noise generated.

5 [0015] The technical task identified and objects specified are substantially achieved by a flue for evacuating fumes from rooms, in particular for evacuating cooking fumes, comprising the technical features explained in one or more of the appended claims.

10 [0016] One embodiment of the invention relates to a flue for evacuating fumes from rooms, in particular for evacuating cooking fumes. Such flue comprises a first stretch that develops along a vertical direction from an inlet section.

15 [0017] The flue has at least one outlet opening for discharging the fumes along a substantially horizontal direction. Such outlet opening has a height along the vertical direction and a width along a direction orthogonal to the vertical direction.

20 [0018] The flue comprises a second joining stretch between the first stretch and the outlet opening.

[0019] The height of the opening is less than 40 mm, preferably less than 35 mm.

25 [0020] The flue according to the invention resolves the technical problem. Indeed, by reducing the height of the outlet opening and optionally varying the width thereof, it is possible to keep the same aerodynamic performances of the known flue.

30 [0021] However, since the height of the opening was reduced, it is no longer possible to introduce a hand or tool therein.

35 [0022] Thereby, the shape itself of the opening meets the safety requirements without requiring the installation of a grid, which therefore may be omitted. The noise of the flue is therefore significantly reduced.

LIST OF DRAWINGS

40 [0023] Further features and advantages of the present invention shall be more apparent from the indicative, and therefore non-limiting, description of a preferred, but not exclusive, embodiment of a flue for evacuating fumes from rooms, in particular for evacuating cooking fumes, as illustrated in the accompanying drawings, in which:

- Figure 1 is a perspective view of a first embodiment of a flue for evacuating fumes from rooms, in particular for evacuating cooking fumes, according to the present invention; and
- 50 - Figure 2 is a side section view of a second embodiment of a flue for evacuating fumes from rooms, in particular for evacuating cooking fumes, according to the present invention.

55 DETAILED DESCRIPTION

[0024] Even when not expressly indicated, the individual characteristics described in reference to the specific

embodiments shall be intended as accessories and/or interchangeable with other characteristics described in reference to other embodiments.

[0025] Moreover, the numeric values indicated in the present description and in the appended claims are to be intended preceded by the term about and are to be intended with a tolerance range of $\pm 10\%$.

[0026] With reference to the accompanying drawings, 1 indicates a flue for evacuating fumes from rooms, in particular for evacuating cooking fumes, according to the present invention.

[0027] Flue 1 comprises a first stretch 2 which develops along a vertical direction "A".

[0028] Such stretch is defined at least partly by a substantially cylindrical conduit 3, in which the central axis coincides with the mentioned vertical direction "A".

[0029] An inlet section 2a of the first stretch 2 is placed at the base of the conduit 3.

[0030] The cooking fumes that are evacuated from the flue 1 are sucked by a hood (not illustrated) placed in fluid communication with the conduit 3, even if it is not necessarily connected directly thereto.

[0031] The first stretch 2 also has an entrance zone 2b placed close to the inlet section 2a. Such entrance zone 2b has a constant section along the vertical direction "A".

[0032] The flue 1 also has at least one outlet opening 4 for discharging the fumes.

[0033] In particular, the fumes are discharged along a substantially horizontal direction.

[0034] In other words, the opening 4 is defined on a vertical plane, that is to say parallel to the vertical direction "A".

[0035] Preferably, the flue 1 has a pair of openings 4.

[0036] Such openings 4 are symmetrical in shape and arrangement with respect to a centreline plane of the flue 1.

[0037] The centreline plane is arranged along said vertical direction "A".

[0038] In other words, the central axis of the conduit 3 lies on the centreline plane.

[0039] In greater detail, the outlet openings 4 are rectangular-shaped.

[0040] The outlet openings 4 each have a height along the vertical direction "A" and a width along a direction orthogonal to the vertical direction "A".

[0041] According to a preferred embodiment of the invention, the height is less than 40 mm, preferably less than or equal to 35 mm.

[0042] Preferably, the area of each outlet opening 4, that is to say the product between the height and the width, is comprised between 48 and 56 cm², more preferably equal to 52 cm².

[0043] The flue 1 also comprises a second joining stretch 5 between the first stretch 2 and the outlet opening 4.

[0044] Preferably, the flue 1 comprises a pair of second stretches 5.

[0045] Each second stretch 5 connects the first stretch

2 to a respective opening 4.

[0046] In other words, the flue 1 branches off from the first stretch 2 to the second stretches 5.

[0047] The second stretches 5 have an upper surface 6. Such upper surface 6 is continuous between the two openings 4.

[0048] It is worth noting that the upper surface 6 has a constant development along a horizontal direction parallel to the centreline plane. Contrarily, the upper surface 6 is inclined towards the centreline plane. In greater detail, the upper surface 6 is curved in the direction of the centreline plane.

[0049] It is worth noting that a nose 7 of the flue 1 is defined at the junction of the two second stretches 5 from the first stretch 2, that is to say at the centreline plane that defines the plane of symmetry of the flue 1. Such nose 7 in particular is defined by an intersection line between the centreline plane in the upper surface 6.

[0050] The upper surface 5 has a first connection 8 at the nose 7.

[0051] With reference to figure 2, the upper surface 5 also has a pair of second connections 9, each placed between the first connection 7 and the outlet opening 4.

[0052] The conduit 3 also has a side surface 10. Such side surface 10 substantially is cylindrical along the entrance zone 2b of the first stretch 2.

[0053] The side surface 10 of each second stretch 5 has a connection portion 10b with the outlet opening 4. Such connection portion 10b is opposite to the upper surface 5 and has a third connection 11 at the second connection 9. Such connection portion 10b has a development which substantially follows the upper surface 5.

[0054] The side surface 10 also has a portion 10c that is transverse to the upper surface 5. Such transverse portion 10c substantially is arranged vertically.

[0055] In the continuation of the present description as well as the appended claims, reference will be made to adimensionalized measurements, in particular length and surface measurements.

[0056] Indeed, as is known to the expert in the field of fluid dynamics, the behaviour of a fluid current within a conduit is characterized on the basis of non-dimensional parameters, that is to say compared to a reference parameter of the same type. Within the context of the present description, the linear lengths are adimensionalized with respect to a distance "L1" between the outlet opening 4 and the centreline plane of the flue 1. With regards to the surfaces, they are adimensionalized with respect to the area "S" of the outlet opening 4.

[0057] In greater detail, the adimensionalized distance between the inlet section 2a and the nose 7 is comprised between 0.7 and 0.75.

[0058] An adimensionalized radius of the mentioned first connection 8 is comprised between 0.03 and 0.06.

[0059] The adimensionalized length of the entrance zone 2b is less than 0.3.

[0060] In greater detail, it is worth noting that the second stretch 5 has a plurality of transverse sections each

defined by a respective vertical plane. Each transverse section has an adimensionalized surface calculated as a function of an adimensionalized curvilinear abscissa. Such function is $y = -9.391x^3 + 8.2704x^2 - 0.0105x + 0.9894$.

[0061] Clearly, in order to meet contingent and specific needs, those skilled in the art may make several modifications and variants to the configurations described above. Such variants and modifications moreover are all contained within the scope of protection of the invention as defined by the following claims.

Claims

1. A household hood of the filtering type comprising a flue (1) for evacuating fumes from rooms, in particular for evacuating cooking fumes, comprising:

- a first stretch (2) developing along a vertical direction (A) from an inlet section (2a);
- a pair of outlet openings (4) for discharging said fumes along a substantially horizontal direction, each outlet opening (4) having a height along said vertical direction (A) and a width along a direction orthogonal to said vertical direction (A), the outlet openings (4) are symmetrical with respect to a centreline plane arranged along said vertical direction (A);
- a pair of second stretches (5), each second stretch (5) connects the first stretch (2) to a respective outlet opening (4), the second stretches (5) having an upper surface (6), an intersection line between said centreline plane and said upper surface (6) defining a nose (7) of said flue (1);

characterized in that said height of each outlet opening (4) is equal to $35 \text{ mm} \pm 10\%$ **and in that** the area of each outlet opening (4) is comprised between 48 and 56 cm^2 **and in that** each outlet opening (4) does not comprise any grid.

2. Household hood according to claim 1, **characterized in that** the area of each outlet opening (4) is equal to 52 cm^2 .

3. Household hood according to the preceding claim, **characterized in that** an adimensionalized distance between said inlet section (2a) and said nose (7) is comprised between 0.7 and 0.75 , said adimensionalized distance being calculated with respect to a distance (L1) between said outlet opening (4) and a centreline plane of said flue (1).

4. Household hood according to claim 2 or 3, **characterized in that** said upper surface (6) has a first connection (8) placed at said nose (7), an adimension-

alized radius of said first connection (8) being comprised between 0.03 and 0.06 , said adimensionalized radius being calculated with respect to a distance (L1) between said outlet opening (4) and a centreline plane of said flue (1).

5. Household hood according to any one of the preceding claims, **characterized in that** said first stretch (2) comprises an entrance zone (2b) close to said inlet section (2a), said entrance zone (2b) having constant section along said vertical direction (A), said entrance zone (2b) having an adimensionalized length less than 0.3 , said adimensionalized length of said entrance zone (2b) being calculated with respect to a distance (L1) between said outlet opening (4) and a centreline plane of said flue (1).

Patentansprüche

1. Haushaltsabzugshaube vom Filtertyp, die einen Abzug (1) zum Ableiten von Dämpfen aus Räumen umfasst, insbesondere zum Ableiten von Kochdämpfen, umfassend:

- eine erste Strecke (2), die sich entlang einer vertikalen Richtung (A) von einem Einlassabschnitt (2a) aus entwickelt;
- ein Paar Auslassöffnungen (4) zum Ablassen der Dämpfe entlang einer im Wesentlichen horizontalen Richtung, wobei jede Auslassöffnung (4) eine Höhe entlang der vertikalen Richtung (A) und eine Breite entlang einer Richtung orthogonal zu der vertikalen Richtung (A) aufweist, die Auslassöffnungen (4) in Bezug auf eine Mittellinienebene, die entlang der vertikalen Richtung (A) eingerichtet ist, symmetrisch sind;
- ein Paar zweiter Strecken (5), wobei jede zweite Strecke (5) die erste Strecke (2) mit einer jeweiligen Auslassöffnung (4) verbindet, wobei die zweiten Strecken (5) eine obere Oberfläche (6) aufweisen, wobei eine Schnittlinie zwischen der Mittellinienebene und der oberen Oberfläche (6) eine Nase (7) des Abzugs (1) definiert;

dadurch gekennzeichnet, dass die Höhe jeder Auslassöffnung (4) $35 \text{ mm} \pm 10\%$ beträgt, **und dass** die Fläche jeder Auslassöffnung (4) zwischen 48 und 56 cm^2 beträgt, **und dass** jede Auslassöffnung (4) kein Gitter umfasst.

2. Haushaltsabzugshaube nach Anspruch 1, **dadurch gekennzeichnet, dass** die Fläche jeder Auslassöffnung (4) gleich 52 cm^2 ist.

3. Haushaltsabzugshaube nach dem vorstehenden Anspruch, **dadurch gekennzeichnet, dass** ein adimensionalisierter Abstand zwischen dem Einlass-

abschnitt (2a) und der Nase (7) zwischen 0,7 und 0,75 liegt, wobei der entdimensionalisierte Abstand in Bezug auf einen Abstand (L1) zwischen der Auslassöffnung (4) und einer Mittellinienebene des Abzugs (1) berechnet ist.

4. Haushaltsabzugshaube nach Anspruch 2 oder 3, **dadurch gekennzeichnet, dass** die obere Oberfläche (6) einen ersten Anschluss (8) aufweist, der an der Nase (7) platziert ist, wobei ein entdimensionalisierter Radius des ersten Anschlusses (8) zwischen 0,03 und 0,06 liegt, wobei der entdimensionalisierte Radius in Bezug auf einen Abstand (L1) zwischen der Auslassöffnung (4) und einer Mittellinienebene des Abzugs (1) berechnet ist.
5. Haushaltsabzugshaube nach einem der vorstehenden Ansprüche, **dadurch gekennzeichnet, dass** die erste Strecke (2) eine Eingangszone (2b) nahe dem Einlassabschnitt (2a) umfasst, wobei die Eingangszone (2b) einen konstanten Querschnitt entlang der vertikalen Richtung (A) aufweist, wobei die Eingangszone (2b) eine entdimensionalisierte Länge von weniger als 0,3 aufweist, wobei die entdimensionalisierte Länge der Eingangszone (2b) in Bezug auf einen Abstand (L1) zwischen der Auslassöffnung (4) und einer Mittellinienebene des Abzugs (1) berechnet ist.

Revendications

1. Hotte ménagère du type filtrant comprenant un conduit (1) pour évacuer les fumées des pièces, en particulier pour évacuer les fumées de cuisson, comprenant :
 - un premier tronçon (2) se développant le long d'une direction verticale (A) à partir d'une section d'entrée (2a) ;
 - une paire d'ouvertures de sortie (4) pour éliminer lesdites fumées le long d'une direction sensiblement horizontale, chaque ouverture de sortie (4) ayant une hauteur le long de ladite direction verticale (A) et une largeur le long d'une direction orthogonale à ladite direction verticale (A), les ouvertures de sortie (4) sont symétriques par rapport à un plan médian agencé le long de ladite direction verticale (A) ;
 - une paire de deuxièmes tronçons (5), chaque deuxième tronçon (5) reliant le premier tronçon (2) à une ouverture de sortie respective (4), les deuxièmes tronçons (5) ayant une surface supérieure (6), une ligne d'intersection entre ledit plan médian et ladite surface supérieure (6) définissant un nez (7) dudit conduit (1) ;

caractérisée en ce que ladite hauteur de chaque

ouverture de sortie (4) est égale à $35 \text{ mm} \pm 10\%$ **et en ce que** la surface de chaque ouverture de sortie (4) est comprise entre 48 et 56 cm^2 **et en ce que** chaque ouverture de sortie (4) ne comprend aucune grille.

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2. Hotte ménagère selon la revendication 1, **caractérisée en ce que** la surface de chaque ouverture de sortie (4) est égale à 52 cm^2 .
3. Hotte ménagère selon la revendication précédente, **caractérisée en ce qu'**une distance adimensionnée entre ladite section d'entrée (2a) et ledit nez (7) est comprise entre 0,7 et 0,75, ladite distance adimensionnée étant calculée par rapport à une distance (L1) entre ladite ouverture de sortie (4) et un plan médian dudit conduit (1).
4. Hotte ménagère selon la revendication 2 ou 3, **caractérisée en ce que** ladite surface supérieure (6) a une première connexion (8) placée au niveau dudit nez (7), un rayon adimensionné de ladite première connexion (8) étant compris entre 0,03 et 0,06, ledit rayon adimensionné étant calculé par rapport à une distance (L1) entre ladite ouverture de sortie (4) et un plan médian dudit conduit (1).
5. Hotte ménagère selon l'une quelconque des revendications précédentes, **caractérisée en ce que** ledit premier tronçon (2) comprend une zone d'admission (2b) proche de ladite section d'entrée (2a), ladite zone d'admission (2b) ayant une section constante le long de ladite direction verticale (A), ladite zone d'admission (2b) ayant une longueur adimensionnée inférieure à 0,3, ladite longueur adimensionnée de ladite zone d'admission (2b) étant calculée par rapport à une distance (L1) entre ladite ouverture de sortie (4) et un plan médian central dudit conduit (1).

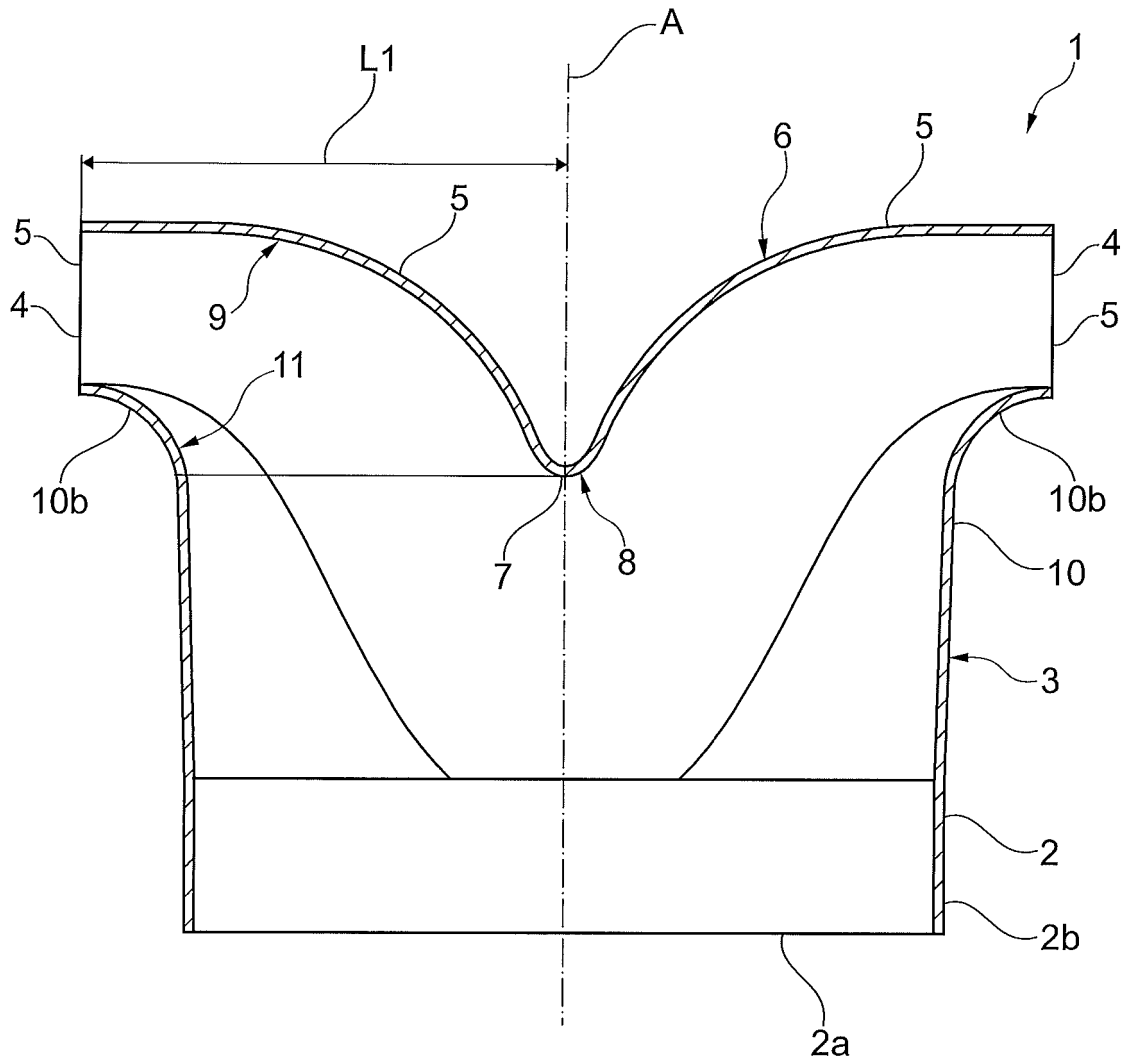


Fig. 2

REFERENCES CITED IN THE DESCRIPTION

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