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(54) KIT FOR TIGHT-SEALING CLOSURE OF A SELF-CLEANING KITCHEN HOOD

(57) Kit (40) for tight-sealing closure of a self-cleaning kitchen hood provided with a lower suction mouth (102) comprising a frame (42) mountable to the kitchen hood, a tight-sealing fabric (46), movable on the frame (42) in at least one closing configuration to seal close the lower suction mouth (102) of the kitchen hood; wherein the frame (42) comprises two opposite brackets (44L, 44R) having a wedge body, wherein each bracket can be associated with seal closure to a respective edge portion of the lower suction mouth (102); the frame comprises a drainage (43) that extends between the two opposite brackets (44L, 44R); at least one bracket of said two opposite brackets with wedge body defining a guiding element (47) for the tight-sealing fabric (46) directed towards the drainage (43), so that the tight-sealing fabric (46) when in said at least one seal-closing configuration, creates a surface that slopes towards the drainage (43) of the frame.

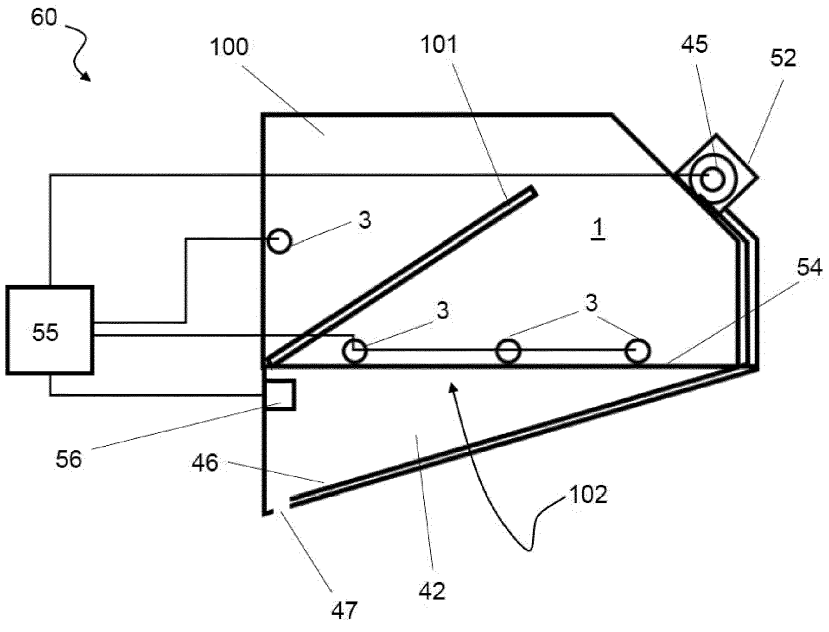


FIG.7

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Description

TECHNICAL FIELD

[0001] . The present invention relates to a solution for the tight-sealing closure of a kitchen hood.

[0002] . In particular, the present invention refers to a kit for obtaining a tight-sealing closure of a self-cleaning kitchen hood.

[0003] . The present invention also refers to a self-cleaning kitchen hood for an industrial kitchen, such as a professional kitchen of a restaurant, trattoria, canteen, and the like, where meals are prepared for large numbers of people.

STATE OF THE ART

[0004] . In the well-known industrial kitchens, kitchen hoods that can extend for a few metres in width and are used to evacuate vapours and fumes released while cooking food from the environment are typically installed above the hobs.

[0005] . A kitchen hood usually comprises an external fairing made of metal, such as stainless steel metal, which opens at the bottom with a suction mouth turned towards the hob. Inside the internal volume of the fairing, members are housed for moving and filtering the air.

[0006] . Greases and other cooking residues contained in the fumes filtered by the kitchen hood tend to encrust the internal surfaces of the kitchen hood itself, as well as the parts used for moving the air. This requires a constant cleaning of the kitchen hood.

[0007] . Kitchen hoods of the self-cleaning type are generally known, i.e. comprising inside the fairing a hydraulic supply circuit for a series of nozzles, adapted to generate a jet of water and detergent for cleaning the surfaces of the internal volume of the kitchen hood.

[0008] . In these known solutions, the lower suction opening of the self-cleaning kitchen hood, which is turned towards the hob, is clamped tightly through the extension of a damper. The damper-like shutter element essentially consists in the known solutions of a folded sheet formed by rigid strips connected to each other that can be extended, that is, deployed to sealingly plug the lower opening of the self-cleaning kitchen hood.

[0009] . Once the internal volume is sealingly closed, jets of aqueous detergent solution can be dispensed through the nozzles to the inside of the self-cleaning kitchen hood.

[0010] . The known solutions, however, are by no means without drawbacks and are typically heavy and cumbersome. In fact, the body of the extendable shutter element in order to achieve the tight-sealing closure is itself heavy and cumbersome and requires an adequately robust movement system so as not to incur the need for constant and careful maintenance to avoid the formation of leaks through the shutter body when in operating conditions.

[0011] . The need is therefore felt to provide an improved solution for the tight-sealing closure of a self-cleaning kitchen hood.

SUMMARY OF THE INVENTION

[0012] . The object of the present invention is therefore to propose an improved device for the internal washing of kitchen hoods of professional kitchens.

[0013] . This and other objects are achieved with a kit according to claim 1, as well as with an assembly according to claim 8.

[0014] . Some advantageous embodiments are the object of the dependent claims.

BRIEF DESCRIPTION OF THE DRAWINGS

[0015] . Further features and advantages of the invention will appear from the following description of embodiments, given by way of non-limiting example, with reference to the accompanying figures, in which:

- figure 1 is a schematic sectional view of a self-cleaning kitchen hood assembly, according to an example of the prior art;
- figure 2 is a perspective view of a self-cleaning kitchen hood assembly, according to an embodiment of the invention;
- figure 3-A is a perspective view of a roller of a kit, according to an embodiment;
- figure 3-B is a perspective view of a frame of a kit, according to an embodiment;
- figure 4 is a perspective view of a frame of a kit, according to an embodiment;
- figure 5 is a perspective view of a self-cleaning kitchen hood assembly, according to an embodiment;
- figure 6 is a perspective view of a self-cleaning kitchen hood assembly, according to an embodiment;
- figure 7 is a schematic sectional view schematically illustrating a self-cleaning kitchen hood assembly, according to an embodiment.

DETAILED DESCRIPTION OF CERTAIN EMBODIMENTS

[0016] . According to a general embodiment, there is provided a kit 40 to seal close a kitchen hood 100.

[0017] . As shown for example in **figure 1,** the kitchen hood 100 is preferably a self-cleaning kitchen hood, of per se known type, comprising spray nozzles 3 mounted on a fluid supply system 30 for dispensing cleaning liquid L on the internal walls of the internal volume 1 of the self-cleaning kitchen hood 100. A filtering element supported by a support element 101 thereof may be provided. As mentioned above, in the self-cleaning kitchen hoods of a known type, the tight-sealing closure of the lower suction mouth 102 of the kitchen hood is made with a shutter element formed by rigid slats 25 or rigid strips 25 ar-

ranged side by side.

[0018] . With reference to **figures 2, 3A and 3B,** said kit 40 comprises a frame 42 mountable to the kitchen hood 100 and a tight-sealing fabric 46, movable on the frame 42 in at least one closing configuration to seal close the lower suction mouth 102 of the kitchen hood 100.

[0019] . The tight-sealing fabric 46 is preferably a flexible shutter element, with a prevalent bi-dimensional extension. Said tight-sealing fabric 46 can be made of a waterproof and fireproof material. Preferably, said tight-sealing fabric 46 is made of a fabric, for example by weaving fibres, or non-woven fabric.

[0020] . The frame 42 comprises two opposite brackets 44L, 44R. Each bracket of said two opposite brackets can be associated with seal closure to a respective edge portion of the lower suction mouth 102, creating a tight-sealing edge 54. For example, the brackets 44L, 44R have an upper surface that abuts against a margin of the lower mouth 102 of the kitchen hood 100, making fluid-sealing contact. For example, the brackets comprise a fixing portion which is fixed by fixing means to a wall placed behind the kitchen hood so as to make the fluid-sealing contact.

[0021] . Advantageously, said two opposite brackets 44L, 44R have a wedge body. In other words, each bracket 44L, 44R has a variable thickness along its extension and is preferably tapered.

[0022] . In accordance with one embodiment, the tapering of the lower surface of the bracket 44L, 44R results in the thickness of the bracket being greater at the rear and smaller frontally.

[0023] . With further advantage, the frame comprises a drainage 43 that extends between the two opposite brackets 44L, 44R. The drainage 43 is preferably made by means of a transverse bottom wall of the frame 42 that extends from one bracket 44L to the other bracket 44R and comprises a collection surface turned towards the internal volume 1 of the kitchen hood 100 (i.e. substantially upwards).

[0024] . Each bracket of said two opposite brackets 44L, 44R with wedge body defines a guiding element 47 for the tight-sealing fabric 46. For example, both brackets may comprise a track in which a margin of the tight-sealing fabric is inserted and which is intended to guide the movement of the fabric to reach the seal-closing configuration of the lower mouth 102 of the kitchen hood 100.

[0025] . The guiding element 47 is directed towards the drainage 43. In other words, the guiding element 47 of the bracket is oriented towards the drainage 43. For example, the guiding element 47 is provided near or at the lower tapered surface of the bracket 44L, 44R.

[0026] . In this way, the tight-sealing fabric 46, when in said at least one seal-closing configuration, creates a surface that slopes towards the drainage 43 of the frame.

[0027] . In accordance with a preferred embodiment, the kit further comprises fabric movement means for moving the tight-sealing fabric 46.

[0028] . The fabric movement means preferably comprises at least one roller 45 to which the tight-sealing fabric 46 is mounted (wound). The roller 45 is preferably a motorized roller, manually operable by an operator and/or automatically operable under the control of an electronic control system 55 (Figure 7). A fabric tensioning device to keep the tight-sealing fabric 46 taut may be provided, and for example the fabric tensioning device comprises an elastic element mounted on the roller 45.

[0029] . When in operating conditions, the roller 45 rotating around its own axis of rotation cause the winding and/or unwinding (unfolding) of the fabric 46, which preferably has its own margin fixed to the roller 45.

[0030] . The roller 45 is preferably controlled by the control system 55 to perform a coordinated action with the spray nozzles 3.

[0031] . A sensor 56 (Figure 7) may be provided to detect information on the state of closure of the lower mouth 102. In this way, the control system 55 can control the actuation of the roller 45 and/or of the spray nozzles 3 based on the information acquired by the sensor 56.

[0032] . The frame 42 preferably comprises a box-shaped body 52 that receives said roller 45. Unlike what is shown in the other figures, in the embodiment variant of **figure 4** the box-shaped body 52 extends substantially downwards with respect to the frame, i.e. towards the frame itself instead of outwards, so as to result, when the kit 40 is mounted to the kitchen hood 100, housed in the encumbrance of the kitchen hood itself, i.e. inside the internal volume 1. For example, the front surface of the box-shaped body 52 may be flush with the front surface of the casing or fairing of the kitchen hood 100.

[0033] . The guiding element 47 extends from the box-shaped body 52 to the drainage 43 to seal guide the edges of the tight-sealing fabric 46 between an outlet mouth provided in the box-shaped body 52 up to the drainage 43 itself. In addition to the guiding elements associated with the brackets 44L, 44R, it can be provided for further guiding elements extended between the box-shaped body 52 and the drainage 43 located in intermediate positions between the brackets 44L, 44. The presence of the further guiding elements is particularly advantageous for supporting the tight-sealing fabric 46 in the event that the distance between the brackets 44L, 44R is high.

[0034] . Referring to **figure 5,** the fabric movement means may further comprise at least one pulling device to pull the tight-sealing fabric 46 towards its seal-closing configuration. For example, the pulling device comprises an elastic element, such as for example a gas spring 49. The pulling device preferably comprises an extendable element, for example telescopically extendable. The pulling device may be operable under the control of the control system 55 to perform a coordinated action with the roller 45.

[0035] . With reference to **figure 6,** the fabric movement means may further comprise a second roller 48, opposite to the roller 45 with respect to the tight-sealing fabric 46. For example, the second roller 48 is arranged

near the drainage 43, and for example it is housed in a box-shaped body thereof that extends from the bracket 44L to the bracket 44R. Said second roller 48 is provided with elastic means suitable to bring it into rotation and/or is motorized and therefore advantageously also realizes said pulling device.

[0036] . The provision of said frame 42 allows the kit 40 to be mounted on pre-existing kitchen hoods, allowing retrofitting on kitchen hoods of various types.

[0037] . In accordance with one aspect of the invention, a self-cleaning kitchen hood assembly 60 for professional kitchens is provided.

[0038] . With reference to **figure 7,** the self-cleaning kitchen hood assembly 60 comprises a kitchen hood 100 and a plurality of spray nozzles 3 arranged inside the internal volume 1 of the kitchen hood. Preferably, the spray nozzles 3 are mounted on a fluid supply system 30 which supplies the nozzles 3 with cleaning liquid L.

[0039] . The self-cleaning kitchen hood assembly 60 comprises at least one kit 40 for tight-sealing closure of a self-cleaning kitchen hood according to any one of the embodiments described above.

[0040] . The frame 42 of the at least one kit 40 is mounted to the kitchen hood 100, preferably frontally.

[0041] . The frame 42 preferably comprises a structure such as to leave the lower hood suction mouth 102 open, i.e. not blocked, while defining with its wedge brackets 44L, 44R an inclined sloping path for the tight-sealing fabric 46.

[0042] . In accordance with one embodiment, the assembly further comprises an electronic control device 55 configured to drive the spray nozzles 3 and/or the roller 45 to move the tight-sealing fabric 46 based on information acquired by a sensor 56.

[0043] . It is understood, however, that the foregoing is of exemplary and non-limiting value, therefore any variations of detail which may become necessary for technical and/or functional reasons, are considered from now on to fall within the same protective scope defined by the following claims.

Claims

1. Kit (40) for tight-sealing closure of a self-cleaning kitchen hood, provided with a lower suction mouth (102) comprising:

- a frame (42) that can be mounted to the kitchen hood,
- a tight-sealing fabric (46), movable on the frame (42) in at least one closing configuration to seal close the lower suction mouth (102) of the kitchen hood;

wherein:

- the frame (42) comprises two opposite brackets (44L, 44R) having a wedge body, wherein each bracket can be associated with seal closure to a respective edge portion of the lower suction mouth (102);
- the frame comprises a drainage (43) that extends between the two opposite brackets (44L, 44R);
- at least one bracket of said two opposite brackets with wedge body defining a guiding element (47) for the tight-sealing fabric (46) directed towards the drainage (43), in such a way that the tight-sealing fabric (46) when in said at least one seal-closing configuration, creates a surface that slopes towards the drainage (43) of the frame;
- there are provided fabric movement means for moving the tight-sealing fabric, comprising at least one roller (45) to which the tight-sealing fabric is mounted;
- there is provided a motor to drive the roller (45) in rotation.

2. Kit according to claim 1, wherein the tight-sealing fabric (46) is made of a waterproof and fireproof material, is flexible, has a bi-dimensional extension, and is preferably made of a woven or non-woven fabric.

3. Kit according to claim 4 or 5, wherein the fabric movement means further comprise a second roller (48), arranged opposite to the roller (45) with respect to the tight-sealing fabric (46) and/or at least one pulling device (49) for pulling the tight-sealing fabric.

4. Kit according to any one of the preceding claims, further comprising a detecting device (54) suitable for detecting information on the configuration of the tight-sealing fabric to assess whether the tight-sealing fabric is in the closing configuration of the lower suction mouth (102).

5. Kit according to any one of the preceding claims, wherein the at least one roller (45) is housed in a box-shaped body (52) that extends substantially downwards with respect to the frame (42), i.e. towards the frame (42) itself instead of outwards, so as to result, when the kit (40) is mounted to the kitchen hood (100), housed in the encumbrance of the kitchen hood itself, i.e. inside the internal volume (1) of the kitchen hood (100).

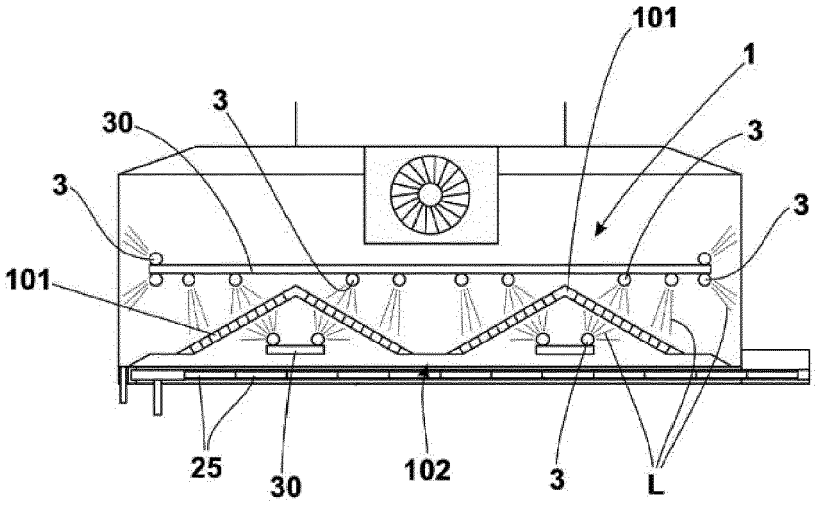
6. Self-cleaning kitchen hood assembly (60) comprising:

- a kitchen hood (100) with its own internal volume (1),
- a plurality of spray nozzles (3) arranged within the internal volume (1),
- at least one kit (40) for tight-sealing closure of

a kitchen hood according to any one of the preceding claims.

7. Assembly according to claim 8, further comprising an electronic control device (55) configured to drive the spray nozzles (3) and/or the roller (45) based on information detected by a detecting device (56).

8. Assembly according to claim 8 or 9, wherein the frame (42) of the at least one kit is mounted to the kitchen hood (100) frontally.



(PRIOR ART)

FIG.1

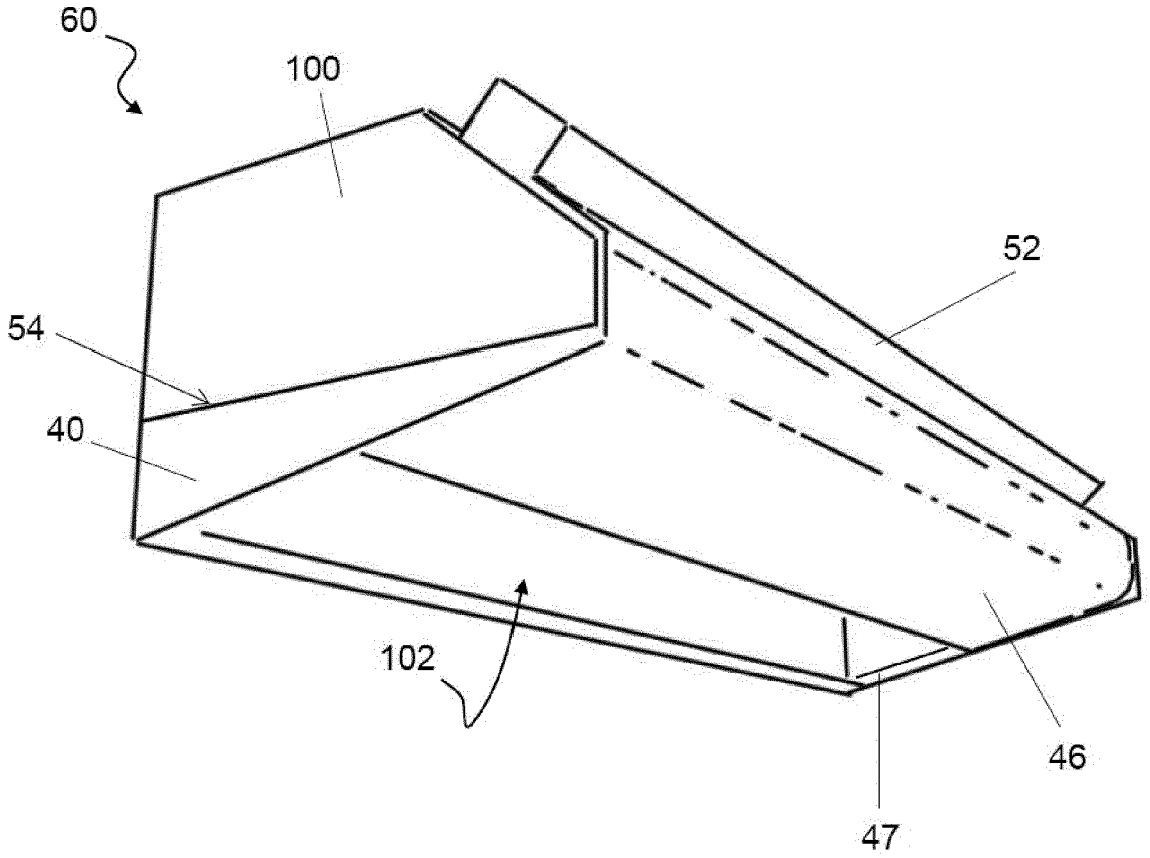


FIG.2

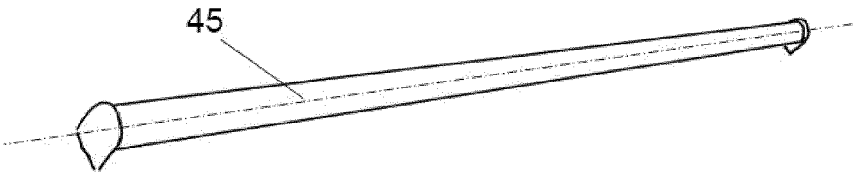


FIG.3A

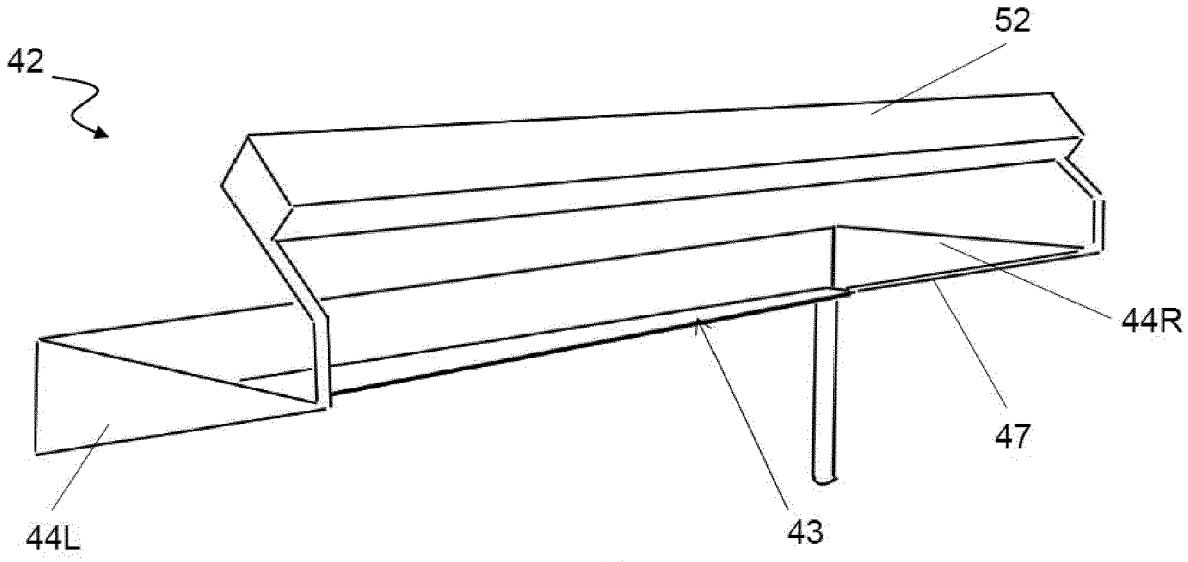


FIG.3B

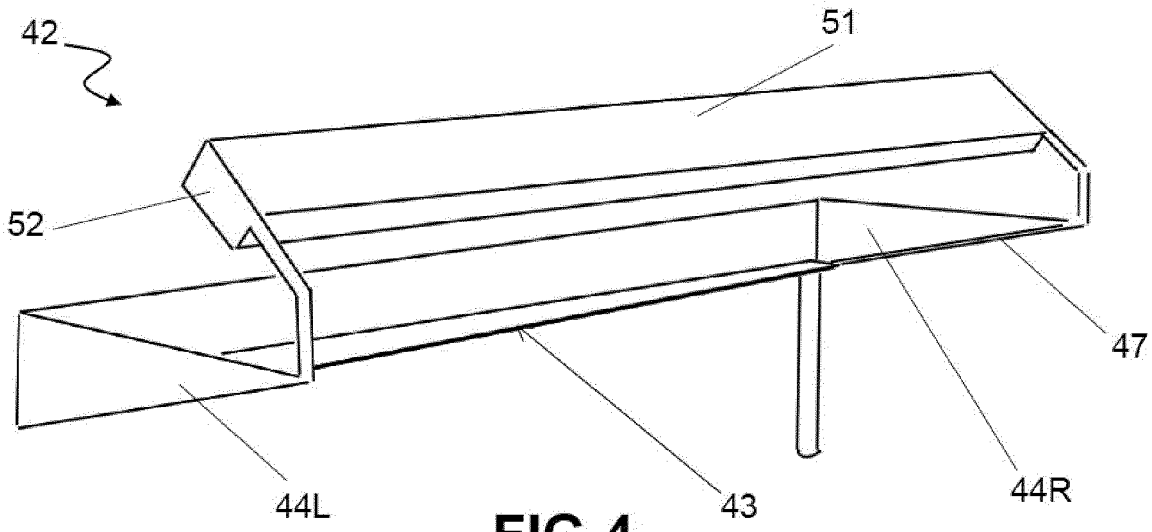


FIG.4

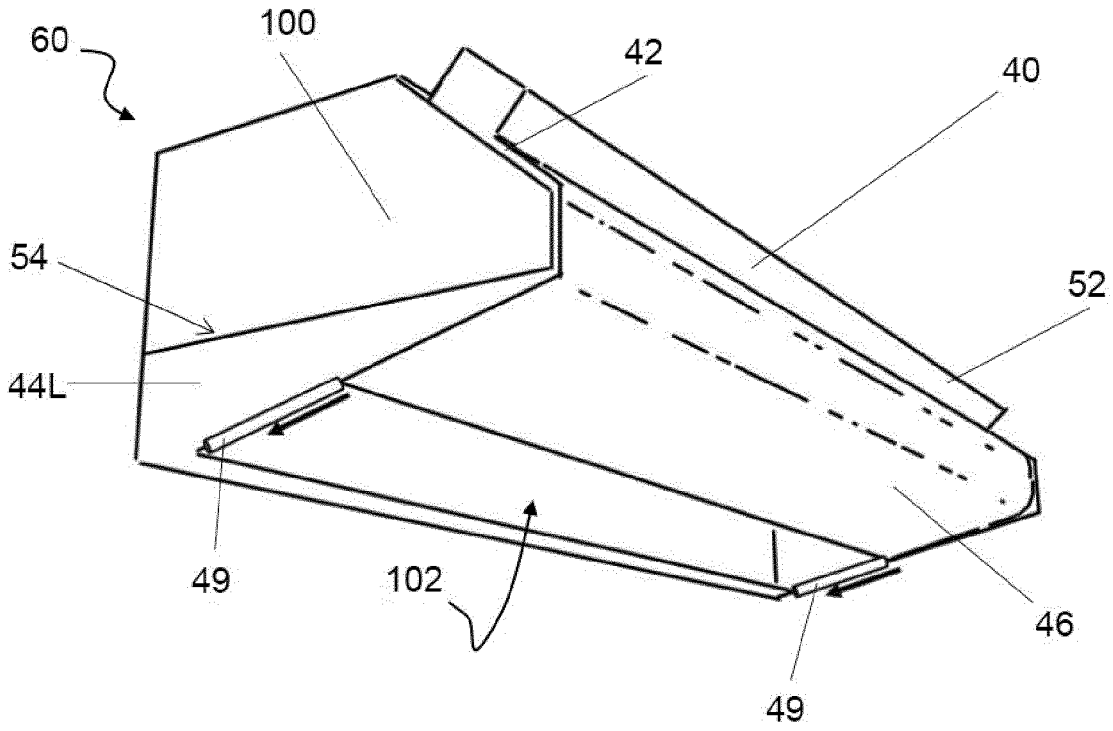


FIG.5

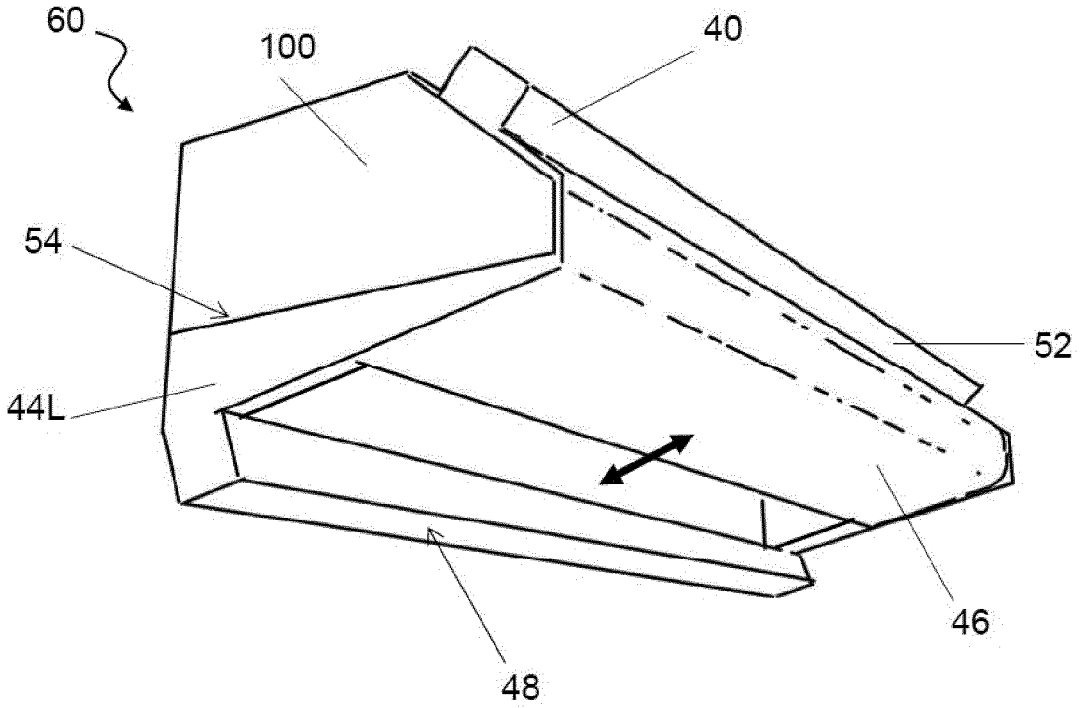


FIG.6

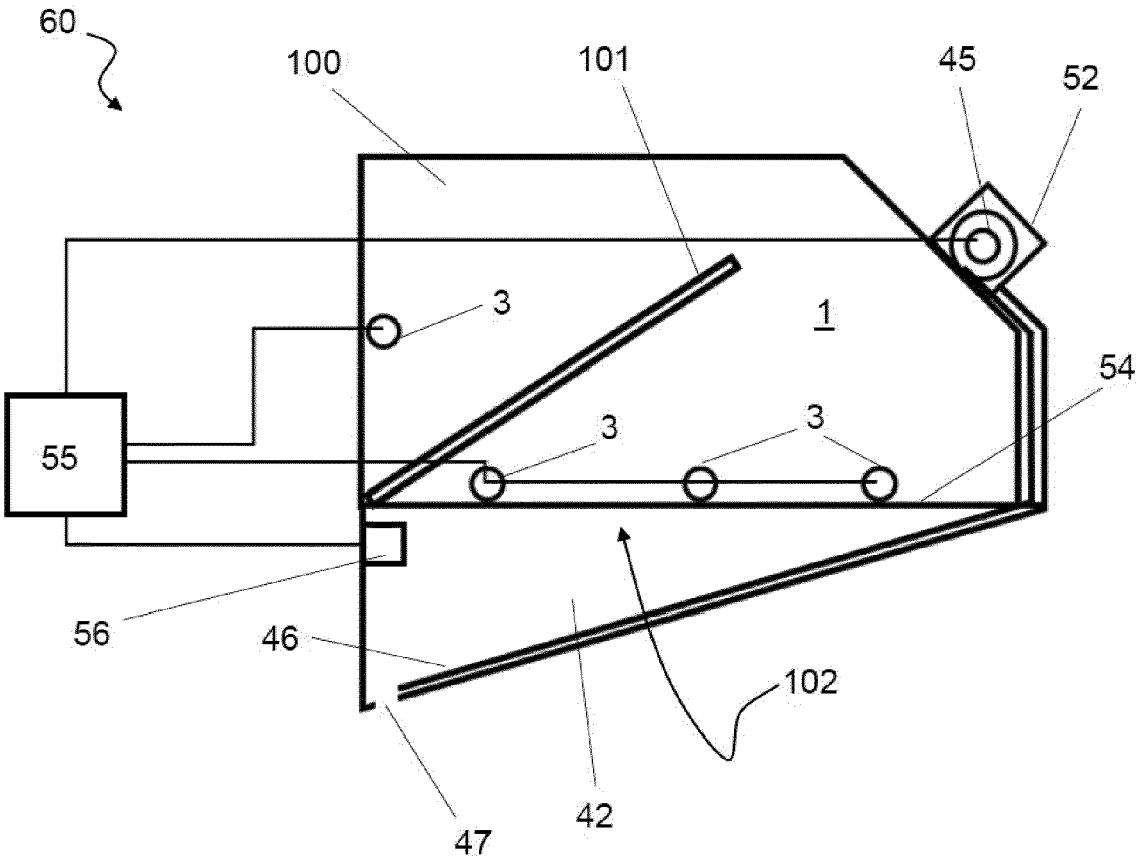


FIG.7

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EUROPEAN SEARCH REPORT

Application Number
EP 24 16 7947

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	DE 10 2008 014283 A1 (BLANCO CS GMBH & CO KG [DE]) 10 September 2009 (2009-09-10) * paragraphs [0080], [0086], [0087], [0106], [0145], [0146]; figures 2, 7-12, 18 *	1-8	INV. F24C15/20 B08B15/02
A	DE 94 15 799 U1 (BUERCHER FRIEDRICH [DE]) 22 December 1994 (1994-12-22) * the whole document *	1-8	
A	US 4 397 226 A (LIND LEIF I [SE]) 9 August 1983 (1983-08-09) * the whole document *	1-8	
A	IT 2019 0002 1825 A1 (DONZELLA ANDREA [IT]) 21 May 2021 (2021-05-21) * paragraphs [0049], [0051], [0056]; figures 1, 4, 5 *	1-8	
			TECHNICAL FIELDS SEARCHED (IPC)
			F24C B08B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	16 August 2024	Jalal, Rashwan

CATEGORY OF CITED DOCUMENTS

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16-08-2024

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE 102008014283 A1	10-09-2009	DE 102008014283 A1	10-09-2009
		DE 202009019117 U1	05-08-2016
		EP 2247896 A2	10-11-2010
		RU 2010140439 A	20-04-2012
		US 2011028079 A1	03-02-2011
		WO 2009109612 A2	11-09-2009
DE 9415799 U1	22-12-1994	NONE	
US 4397226 A	09-08-1983	AU 543962 B2	09-05-1985
		DE 3045299 A1	18-02-1982
		DK 23481 A	20-01-1981
		GB 2071528 A	23-09-1981
		NO 155090 B	03-11-1986
		SE 419830 B	31-08-1981
		US 4397226 A	09-08-1983
		WO 8002518 A1	27-11-1980
IT 201900021825 A1	21-05-2021	NONE	

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