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(54) **Hood extractor**

Dunstabzugshaube

Hotte aspirante

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Description

[0001] The invention relates to a hood extractor for extracting contaminated air from appliances.

[0002] In commercial kitchens contaminated air produced by cooking appliances is extracted by a hood extractor mounted above the appliances. The hood extractor comprises a grease filter, which collects grease and dust from the air. Additionally, the hood extractor may comprise a UV light source emitting UV light, which breaks the grease molecules into small particles, which are removed from the hood extractor with the air flow.

[0003] Despite the use of the grease filter and the UV light, the extractor surfaces collect grease and dust, which has to be removed periodically. This is done by spraying washing agent mixed with water into the extractor through nozzles. Typically the spraying system is realized by fitting nozzles to pipes arranged inside the extractor. This construction, however, needs a lot of space inside the extractor, which in turn increases the dimensions of the extractor and air pressure drop caused by the extractor. Further, there is a gap between the pipe and the extractor wall, which collects grease and dust, which is difficult to remove by washing. Also the spraying angle of the nozzles is not always optimal, which weakens the washing result.

[0004] Documents US 5 359 990 A, CN 201 196 445 Y, CN 101 850 206 B, US 5 662 097 A and US 2013/074823 A1 disclose hood extractors according to the preamble of claim 1.

[0005] Document US 2008/135041 A1 discloses a ventilator assembly for removing contaminants in cooking exhaust including a hood portion having a hood plenum and a duct portion in fluid communication with the hood portion. The duct portion has an inside cross-sectional area that is less than half of an average inside cross-sectional area of the hood plenum. A fan is in fluid communication with the duct portion for drawing the cooking exhaust through the hood portion to the duct portion. At least one ultra-violet lamp is disposed in the duct portion, where the ultra-violet radiation from the lamp reacts with the cooking exhaust to generate ozone for oxidizing contaminants in the cooking exhaust. The object of the present invention is to provide an improved hood extractor.

[0006] This object can be achieved by a hood extractor according to independent claim 1.

[0007] The hood extractor according to the invention comprises a housing through which air to be extracted is arranged to flow, an air inlet for conducting air into the housing, an air outlet for removing air from the housing, a grease filter arranged in the housing between the air inlet and the air outlet and an arrangement for spraying washing agent into the housing. The arrangement for spraying washing agent comprises at least one duct and nozzles for spraying washing agent from the duct into the housing. The nozzles are formed in a wall of the duct. The nozzle comprises a nozzle opening in the wall of the

duct, a spin plate having an S-shaped opening and arranged against an inner surface of the wall of the duct so that the nozzle opening and the S-shaped opening are facing each other, and a block plate arranged against the spin plate so that both ends of the S-shaped opening are uncovered.

[0008] The hood extractor according to the invention causes a low air pressure drop, since the nozzles are formed in the wall of the duct and therefore do not extend outwards from surface of the duct.

[0009] According to an embodiment of the invention the duct is attached to or integrated into the wall of the housing or installed with a small gap between it and the wall of the housing. This further reduces the air pressure drop in the extractor. If the duct is attached or integrated into the wall of the housing, there is no gap between the duct and the wall of the housing and no grease and dust can go therebetween. This makes it easier to wash the surfaces of the hood extractor efficiently.

[0010] In the following the invention will be described by way of examples with reference to the accompanying drawings, in which:

Fig. 1 is a cross-sectional view of a hood extractor according to an embodiment of the invention,

Fig. 2 is a cross-sectional view of a duct that can be used in the hood extractor of fig. 1.

Fig. 3 is a cross-sectional view of a nozzle that can be used for injecting washing agent from the duct into the interior of the hood extractor.

Fig. 4 shows from above a spin plate of the nozzle of fig. 3.

[0011] Fig. 1 shows a hood extractor 1 according to an embodiment of the invention. In kitchens contaminated air from cooking appliance(s) is extracted by the hood extractor 1, which is mounted above the cooking appliance(s). The hood extractor 1 can be used in ship kitchens, restaurants, hotels and other commercial kitchens.

[0012] The hood extractor 1 comprises a housing 2, through which air to be extracted is arranged to flow. The housing 2 is provided with an air inlet 3 for conducting air into the housing 2 and an air outlet 4 for removing air from the housing 2. The air outlet 4 is connected to an exhaust duct, which conducts air to the atmosphere. Air is sucked through the housing 2 by a fan installed downstream of the air outlet 4. The hood extractor 1 comprises a hood 18, which prevents contaminated air from escaping to the kitchen and directs air toward the air inlet 3. The front wall 15 of the housing comprises a baffle 12 having a front surface 13, which directs the air flow downwards after passing through the air inlet 3.

[0013] A grease filter 7 for collecting grease from the air flow is arranged in the housing 2 between the air inlet 3 and the air outlet 4. The grease filter 7 can be a mesh

or baffle filter or a hybrid of mesh filter and baffle filter. The grease filter 7 is installed between a front wall 15 and a rear wall 19 of the housing 2 so that all the air flowing from the air inlet 3 to air outlet 4 passes through the grease filter 7.

[0014] The hood extractor 1 further comprises a UV light source 20, which emits UV light. UV light breaks the grease molecules into small particles, which are removed from the hood extractor 1 with the air flow. The UV light source 20 is installed in the housing 2 downstream of the grease filter 7.

[0015] In use the housing 2 surfaces collect grease and dust, which has to be removed periodically. For this purpose the hood extractor 1 comprises an arrangement for spraying washing agent into housing 2. Washing agent can be water, pure washing agent or mixture of water and washing agent. The arrangement for spraying washing agent comprises at least one duct 5 attached to or integrated into a wall of the housing 2 and nozzles 6 for spraying washing agent from the duct 5 into the housing 2. The duct 5 is arranged in the housing 2. The duct 5 can be attached directly to the wall of the housing 2 or installed with a gap between it and the wall of the housing 2. The width of the gap is less than 50 mm, typically less than 20 mm. Also this gap can be washed with nozzles 6, for example the nozzles 6 can be formed in a wall of the duct 5, which faces the wall of the housing 2. Washing agent is conducted into housing 2 along the duct 5 and sprayed by nozzles 6 into the housing 2.

[0016] The duct 5 can be attached to or integrated into the wall of the housing 2 upstream of the grease filter 7. A front wall 15 of the housing 2 comprises a baffle 12 having a front surface 13 for directing the air flow downwards after passing through the air inlet 3. The duct 5 can be attached to or integrated into or arranged on a rear surface 14 of the baffle 12. Additionally or alternatively, the duct 5 can be attached to or integrated into or arranged on an inner corner between a bottom wall 21 and the rear wall 19 of the housing 2. Additionally or alternatively, the duct 5 can be attached to or integrated into or arranged on the wall of the housing 2 downstream of the grease filter 7. For example, the duct 5 can be attached to or integrated into or arranged on an inner corner between the front wall 15 or rear wall 19 and a top wall 16 of the housing 2.

[0017] The duct 5 has an angular cross-section. The duct 5 comprises a rear wall 22, which is arranged against the wall of the housing 2. Alternatively, the wall of the housing 2 may form the rear wall of the duct 5. The duct 5 comprises at least three walls, typically 4-6 walls, which are arranged at an angle with respect to each other. The angle between the walls can be selected so that washing agent can be sprayed at an optimal angle from the nozzles 6. The walls of the duct 5 are flat. At least two of the walls are provided with nozzles 6 for spraying washing agent into the housing 2. Typically, the walls, which are directed towards the interior of the housing 2, are provided nozzles 6 for spraying washing agent into the housing

2.

[0018] According to an embodiment of the invention shown in figs. 3 and 4, the nozzles 6 are formed in the wall or walls of the duct 5. The nozzle 6 comprises a nozzle opening 8 in the wall of the duct 5. The washing agent is sprayed from the nozzle opening 8 into the housing 2. The diameter of the nozzle opening 8 is 0.7-1 mm. The shape and/or the diameter of nozzle opening 8 affect the droplet size and/or the shape of the spraying pattern. The nozzle 6 further comprises a spin plate 9 having an S-shaped opening 10. The spin plate 9 is arranged against the inner surface of the wall of the duct 5 so that the nozzle opening 8 and the S-shaped opening 10 are facing each other. The nozzle 6 further comprises a block plate 11 arranged against the spin plate 8 so that both ends of the S-shaped opening 10 are uncovered. With this type of nozzle a swirl of washing agent can be formed in the housing 2. Additionally or alternatively, other types of nozzles can be used, for example conventional spray nozzles, which are mounted to the wall of the duct 5 and extend outwards from the duct 5.

[0019] The distance between adjacent nozzles 6 in the wall of the duct 5, as measured in the longitudinal direction of the duct 5, is 100-200 mm, typically 130-170 mm. The pressure of the washing agent in the duct 5 is below 15 bar, typically 8-10 bar.

[0020] The hood extractor 1 further comprises a filter nozzle 17 for injecting washing agent directly into the grease filter 7. The filter nozzle 17 is arranged to inject washing agent into the grease filter 7 from a filter end which faces the wall of the housing 2. By means of the filter nozzle 17 the grease filter 7 can be cleaned efficiently.

[0021] The hood extractor is also provided with a drain opening 23, through which washing agent is removed from the housing 2. The drain opening 23 is formed in the bottom wall 21 of the housing 2.

Claims

1. A hood extractor (1) for extracting contaminated air from appliances, the hood extractor (1) comprising:
 - a housing (2) through which air to be extracted is arranged to flow,
 - an air inlet (3) for conducting air into the housing (2),
 - an air outlet (4) for removing air from the housing (2),
 - a grease filter (7) arranged in the housing (2) between the air inlet (3) and the air outlet (4), and
 - an arrangement for spraying washing agent into the housing (2), which arrangement comprises at least one duct (5) and nozzles (6) for spraying washing agent from the duct (5) into the housing (2), which nozzles (6) are formed in a wall of the duct (5),

- characterized in that** the nozzle (6) comprises a nozzle opening (8) in the wall of the duct (5), a spin plate (9) having an S-shaped opening (10) and arranged against an inner surface of the wall of the duct (5) so that the nozzle opening (8) and the S-shaped opening (10) are facing each other, and a block plate (11) arranged against the spin plate (9) so that both ends of the S-shaped opening (10) are uncovered.
2. The hood extractor (1) according to claim 1, **characterized in that** the duct (5) has an angular cross-section.
3. The hood extractor (1) according to claim 1 or 2, **characterized in that** the duct (5) comprises a rear wall arranged against the wall of the housing (2).
4. The hood extractor (1) according to claim 1 or 2, **characterized in that** the wall of the housing (2) forms the rear wall of the duct (5).
5. The hood extractor (1) according to claim 1, **characterized in that** the duct (5) is attached to or integrated into the wall of the housing (2).
6. The hood extractor (1) according to claim 1, **characterized in that** the duct (5) is arranged in the housing (2) upstream of the grease filter (7).
7. The hood extractor (1) according to claim 1, **characterized in that** the extractor (1) comprises a filter nozzle (17) for spraying washing agent directly into the grease filter (7).
8. The hood extractor (1) according to claim 7, **characterized in that** the filter nozzle (17) is arranged to spray washing agent into the grease filter (7) from a filter end, which faces the wall of the housing (2).
9. The hood extractor (1) according to any of the claims 1-5, **characterized in that** the duct (5) comprises at least three walls, which are arranged at an angle with respect to each other.
10. The hood extractor (1) according to claim 9, **characterized in that** the walls of the duct (5), which are directed towards the interior of the housing (2), are provided with nozzles (6).
11. The hood extractor (1) according to claim 1, **characterized in that** a front wall of the housing (2) comprises a baffle (12) having a front surface (13) for directing the air flow downwards after passing through the air inlet (3), and that the duct (5) is attached to or integrated into a rear surface (14) of the baffle (12).

12. The hood extractor (1) according to claim 1 or 11, **characterized in that** the duct (5) is attached to or integrated into an inner corner between the front wall (15) and a top wall (16) of the housing (2).
13. The hood extractor (1) according to claim 1, **characterized in that** a UV light source (16) is arranged in the housing (2) downstream of the grease filter (7).

Patentansprüche

1. Dunstabzugshaube (1) zum Absaugen verunreinigter Luft von Geräten, wobei die Dunstabzugshaube (1) aufweist:
- ein Gehäuse (2), durch das abzusaugende Luft zum Strömen eingerichtet ist,
 - einen Lufteinlass (3) zur Leitung von Luft in das Gehäuse (2) hinein,
 - einen Luftauslass (4) zum Abführen von Luft aus dem Gehäuse (2),
 - einen Fettfilter (7), der in dem Gehäuse (2) zwischen dem Lufteinlass (3) und dem Luftauslass (4) angeordnet ist, und
 - eine Anordnung zum Einsprühen eines Waschmediums in das Gehäuse (2), wobei die Anordnung wenigstens einen Kanal (5) und Düsen (6) zum Einsprühen eines Waschmediums aus dem Kanal (5) in das Gehäuse (2) aufweist, wobei die Düsen (6) in einer Wand des Kanals (5) ausgebildet sind,
- dadurch gekennzeichnet, dass** die Düse (6) eine Düsenöffnung (8) in der Wand des Kanals (5), eine Drallplatte (9), die eine S-förmige Öffnung (10) aufweist und an einer inneren Oberfläche der Wand des Kanals (5) derart angeordnet ist, dass die Düsenöffnung (8) und die S-förmige Öffnung (10) einander gegenüberliegen, und eine Sperrplatte (11) aufweist, die an der Drallplatte (9) derart angeordnet ist, dass beide Enden der S-förmigen Öffnung (10) nicht abgedeckt sind.
2. Dunstabzugshaube (1) nach Anspruch 1, **dadurch gekennzeichnet, dass** der Kanal (5) einen eckigen Querschnitt aufweist.
3. Dunstabzugshaube (1) nach Anspruch 1 oder 2, **dadurch gekennzeichnet, dass** der Kanal (5) eine Hinterwand aufweist, die an der Wand des Gehäuses (2) angeordnet ist.
4. Dunstabzugshaube (1) nach Anspruch 1 oder 2, **dadurch gekennzeichnet, dass** die Wand des Gehäuses (2) die Hinterwand des Kanals (5) bildet.
5. Dunstabzugshaube (1) nach Anspruch 1, **dadurch**

gekennzeichnet, dass der Kanal (5) an der Wand des Gehäuses (2) angebracht oder in diese integriert ist.

6. Dunstabzugshaube (1) nach Anspruch 1, **dadurch gekennzeichnet, dass** der Kanal (5) in dem Gehäuse (2) stromaufwärts von dem Fettfilter (7) angeordnet ist. 5
7. Dunstabzugshaube (1) nach Anspruch 1, **dadurch gekennzeichnet, dass** die Dunstabzugshaube (1) eine Filterdüse (17) zum Einsprühen eines Waschmediums unmittelbar in den Fettfilter (7) aufweist. 10
8. Dunstabzugshaube (1) nach Anspruch 7, **dadurch gekennzeichnet, dass** die Filterdüse (17) angeordnet ist, um ein Waschmedium in den Fettfilter (7) hinein von einem Filterende aus einzusprühen, das der Wand des Gehäuses (2) zugewandt ist. 15
9. Dunstabzugshaube (1) nach einem beliebigen der Ansprüche 1-5, **dadurch gekennzeichnet, dass** der Kanal 5 wenigstens drei Wände aufweist, die unter einem Winkel in Bezug aufeinander angeordnet sind. 20
10. Dunstabzugshaube (1) nach Anspruch 9, **dadurch gekennzeichnet, dass** die Wände des Kanals (5), die zu dem Innenraum des Gehäuses (2) hin gerichtet sind, mit Düsen (6) versehen sind. 25
11. Dunstabzugshaube (1) nach Anspruch 1, **dadurch gekennzeichnet, dass** eine Vorderwand des Gehäuses (2) eine Ablenkplatte (12) aufweist, die eine Frontfläche (13) aufweist, um die Luftströmung stromabwärts zu leiten, nachdem diese den Lufteinlass (3) durchströmt hat, und dass der Kanal (5) an einer Rückseitenfläche (14) der Ablenkplatte (12) angebracht oder in diese integriert ist. 30
12. Dunstabzugshaube (1) nach Anspruch 1 oder 11, **dadurch gekennzeichnet, dass** der Kanal (5) an einer inneren Ecke zwischen der Vorderwand (15) und einer oberen Wand (16) des Gehäuses (12) angebracht oder in diese integriert ist. 35
13. Dunstabzugshaube (1) nach Anspruch 1, **dadurch gekennzeichnet, dass** eine UV-Lichtquelle (16) in dem Gehäuse (2) stromabwärts von dem Fettfilter (7) angeordnet ist. 40

Revendications

1. Hotte aspirante (1) pour extraire l'air contaminé des appareils, la hotte aspirante (1) comprenant : 45
- un logement (2) à travers lequel l'air à extraire

est agencé pour s'écouler,

- une entrée d'air (3) pour amener l'air dans le logement (2),
- une sortie d'air (4) pour retirer l'air du logement (2),
- un filtre à graisses (7) agencé dans le logement (2) entre l'entrée d'air (3) et la sortie d'air (4), et
- un agencement pour pulvériser un agent lavant dans le logement (2), lequel agencement comprend au moins un conduit (5) et des buses (6) pour pulvériser l'agent lavant du conduit (5) dans le logement (2), lesquelles buses (6) sont formées dans une paroi du conduit (5),

caractérisée en ce que la buse (6) comprend une ouverture de buse (8) dans la paroi du conduit (5), une plaque tournante (9) ayant une ouverture en forme de S (10) et agencée contre une surface interne de la paroi du conduit (5) de sorte que l'ouverture de buse (8) et l'ouverture en forme de S (10) se font face, et une plaque de blocage (11) agencée contre la plaque tournante (9) de sorte que les deux extrémités de l'ouverture en forme de S (10) sont découpées.

2. Hotte aspirante (1) selon la revendication 1, **caractérisée en ce que** le conduit (5) a une section transversale angulaire. 20
3. Hotte aspirante (1) selon la revendication 1 ou 2, **caractérisée en ce que** le conduit (5) comprend une paroi arrière agencée contre la paroi du logement (2). 25
4. Hotte aspirante (1) selon la revendication 1 ou 2, **caractérisée en ce que** la paroi du logement (2) forme la paroi arrière du conduit (5). 30
5. Hotte aspirante (1) selon la revendication 1, **caractérisée en ce que** le conduit (5) est fixé ou intégré dans la paroi du logement (2). 35
6. Hotte aspirante (1) selon la revendication 1, **caractérisée en ce que** le conduit (5) est agencé dans le logement (2) en amont du filtre à graisses (7). 40
7. Hotte aspirante (1) selon la revendication 1, **caractérisée en ce que** la hotte (1) comprend une buse de filtre (17) pour pulvériser l'agent lavant directement dans le filtre à graisses (7). 45
8. Hotte aspirante (1) selon la revendication 7, **caractérisée en ce que** la buse de filtre (17) est agencée pour pulvériser l'agent lavant dans le filtre à graisses (7) à partir d'une extrémité de filtre, qui fait face à la paroi du logement (2). 50
9. Hotte aspirante (1) selon l'une quelconque des re-

vendications 1 à 5, **caractérisée en ce que** le conduit (5) comprend au moins trois parois, qui sont agencées à un angle les unes par rapport aux autres.

10. Hotte aspirante (1) selon la revendication 9, **carac-** 5
térisée en ce que les parois du conduit (5), qui sont dirigées vers l'intérieur du logement (2), sont prévues avec des buses (6).
11. Hotte aspirante (1) selon la revendication 1, **carac-** 10
térisée en ce qu'une paroi avant du logement (2) comprend un déflecteur (12) ayant une surface avant (13) pour diriger l'écoulement d'air vers le bas après être passé par l'entrée d'air (3) et **en ce que** le conduit (5) est fixé ou intégré dans une surface arrière 15
(14) du déflecteur (12).
12. Hotte aspirante (1) selon la revendication 1 ou 11, **caractérisée en ce que** le conduit (5) est fixé ou intégré dans un coin interne entre la paroi avant (15) 20
et une paroi supérieure (16) du logement (2).
13. Hotte aspirante (1) selon la revendication 1, **carac-**
térisée en ce qu'une source de lumière UV (16) est agencée dans le logement (2) en aval du filtre à graisses (7). 25

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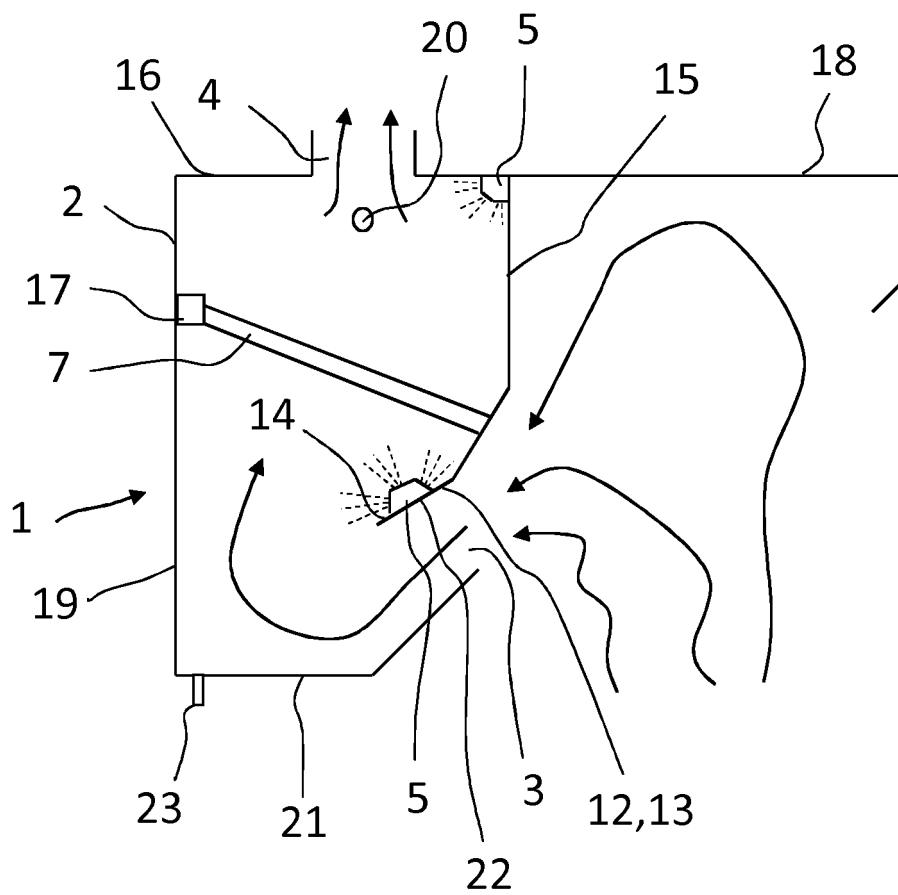


Fig. 1

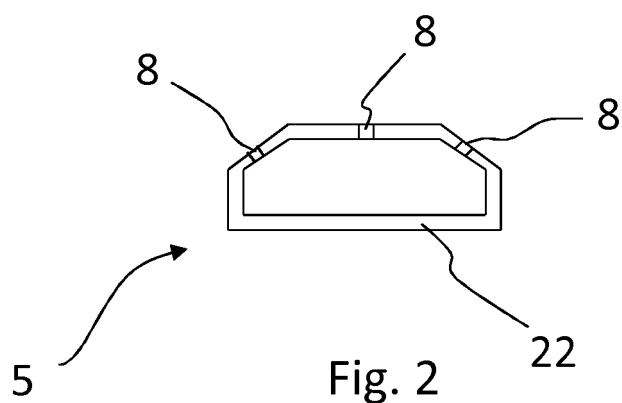


Fig. 2

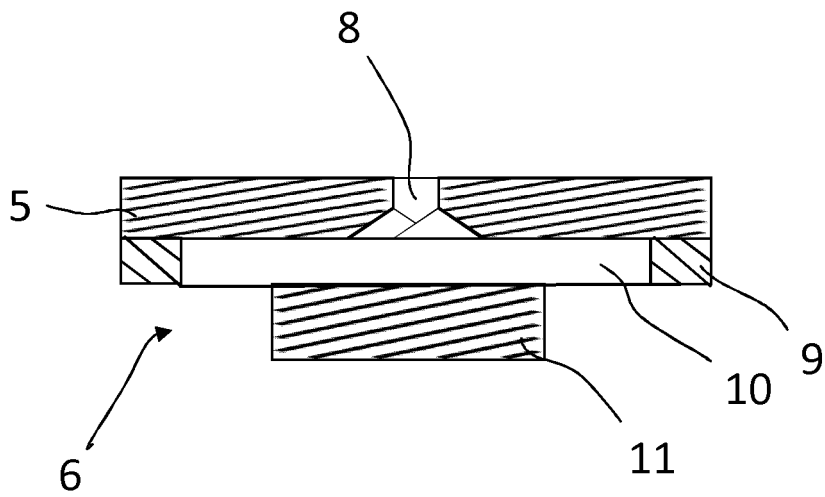


Fig. 3

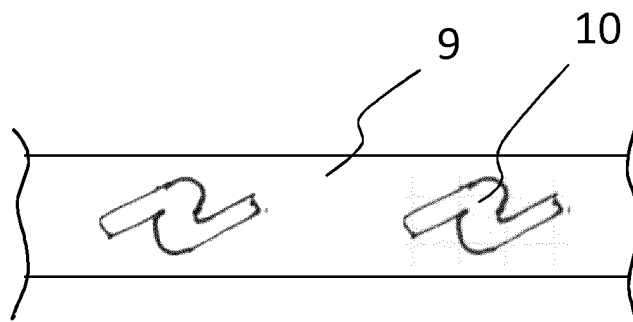


Fig. 4

REFERENCES CITED IN THE DESCRIPTION

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