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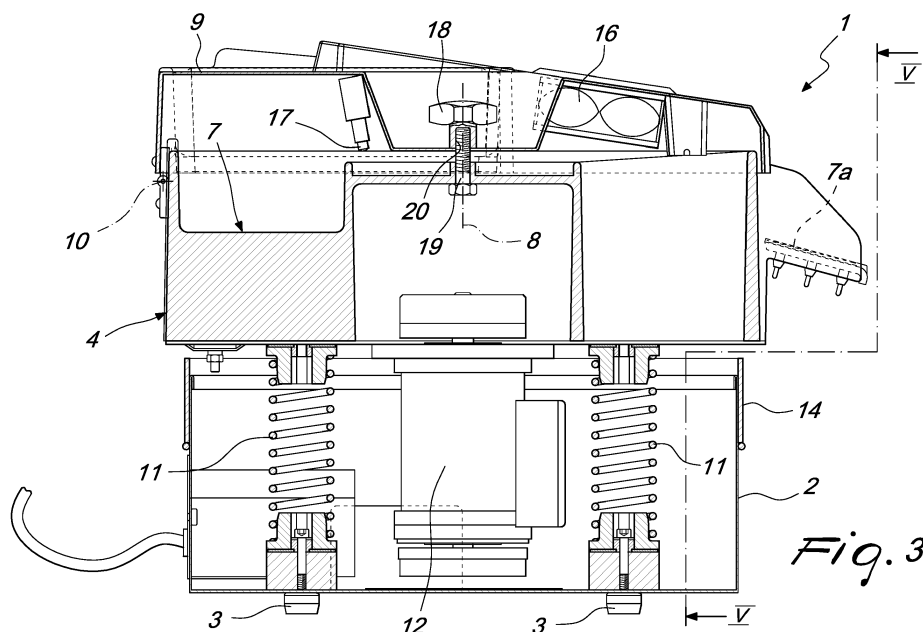
(54) VIBRATING TANK MACHINE FOR DRYING AND POLISHING CUTLERY

(57) A vibrating tank machine for drying and polishing cutlery, comprising:

- a footing (2) provided with resting feet (3) intended to rest, when the machine is in conditions for use, on a substantially horizontal supporting surface;
- a treatment tank (4), intended to contain a drying and polishing material, connected to an inlet (5) for loading the cutlery to be dried and polished and to an outlet (6) for unloading the dried and polished cutlery; the treatment tank (4) being open upwardly and the outlet (6) being defined in an upper region of its lateral walls;
- a rising channel (7), which is connected to the internal walls of the treatment tank (4) and is extended, with the

machine in conditions for use, around a substantially vertical axis (8), from the bottom of the treatment tank (4) to the unloading outlet (6);

- a lid (9), which is hinged to the treatment tank (4) and can rotate about the corresponding pivoting axis (10) with respect to the treatment tank (4) in order to open or close the treatment tank (4) in an upper region; the loading inlet (5) being defined in the lid (9);
- elastic suspensions (11), interposed between the footing (2) and the treatment tank (4);
- at least one motorized vibrating unit (12) connected to the treatment tank (4).

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Description

[0001] The present invention relates to a vibrating tank machine for drying and polishing cutlery.

[0002] Machines for drying and polishing cutlery after washing it are known. These machines are usually constituted by a box-like support and containment structure, which usually has substantially the shape of a parallelepiped and supports, by means of springs, a treatment tank intended to contain a drying and polishing material and the cutlery to be treated. A motorized vibrating unit, usually constituted by an electric motor with eccentric masses, is connected to the treatment tank and can be operated to vibrate the treatment tank so that as a consequence of this vibration the drying and polishing material interacts with the cutlery, drying and polishing it.

[0003] In these machines, the treatment tank is open upwardly and is provided internally with a rising channel that extends from the bottom of the treatment tank to an outlet that is defined proximate to the top of the treatment tank and is connected to an unloading outlet. The cutlery to be dried is introduced in the treatment tank through a loading inlet, which is usually defined in the upper part of the support and containment structure that lies above the treatment tank. As a consequence of the vibration to which the treatment tank is subjected, the cutlery, introduced in the treatment tank, advances progressively, together with the drying and polishing material, along the rising channel until it reaches the unloading outlet, through which the dried and polished cutlery is unloaded. The last portion of the rising channel is perforated so as to achieve separation of the drying and polishing material from the cutlery before it is unloaded outside the treatment tank.

[0004] These machines suffer the drawback of having a relatively bulky and heavy structure even in the case of machines intended for small users. The bulk arises mainly from the support and containment structure, which in addition to supporting the treatment tank accommodates the parts of the machine that are required for its operation.

[0005] The aim of the present invention is to provide a vibrating tank machine for drying and polishing cutlery having such a structure that, for an equal loading capacity, is less bulky and heavy than machines of the known type.

[0006] Within this aim, an object of the invention is to provide a machine that can be manufactured with costs that are lower than those of currently commercially available machines.

[0007] Another object of the invention is to provide a machine that offers the greatest assurances of safety and reliability in use.

[0008] This aim, as well as these and other objects that will become better apparent hereinafter, are achieved by a vibrating tank machine for drying and polishing cutlery, characterized in that it comprises:

- a footing provided with resting feet intended to rest, when the machine is in conditions for use, on a substantially horizontal supporting surface;
- a treatment tank, intended to contain a drying and polishing material, connected to an inlet for loading the cutlery to be dried and polished and to an outlet for unloading the dried and polished cutlery; said treatment tank being open upwardly and said outlet being defined in an upper region of the lateral walls of said treatment tank;
- a rising channel, which is connected to the internal walls of said treatment tank and is extended, with the machine in conditions for use, around a substantially vertical axis, from the bottom of said treatment tank to said unloading outlet;
- a lid, which is hinged to said treatment tank and can rotate about the corresponding pivoting axis with respect to said treatment tank in order to open or close said treatment tank in an upper region; said loading inlet being defined in said lid;
- elastic suspensions, interposed between said footing and said treatment tank;
- at least one motorized vibrating unit connected to said treatment tank.

[0009] Further characteristics and advantages will become better apparent from the detailed description of a machine according to the invention, illustrated by way of nonlimiting example in the accompanying drawings, wherein:

Figure 1 is a front elevation view of the machine;
 Figure 2 is a top plan view of the machine;
 Figure 3 is a schematic sectional view of Figure 2, taken along the line III-III;
 Figure 4 is an enlarged-scale sectional view of a detail of Figure 3, related to the pivoting of the lid to the treatment tank;
 Figure 5 is a schematic sectional view of Figure 3, taken along the line V-V;
 Figure 6 is a schematic sectional view of Figure 5, taken along the line VI-VI;
 Figure 7 is a schematic sectional view of Figure 5, taken along the line VII-VII;
 Figure 8 is a perspective view of the treatment tank alone.

[0010] With reference to the figures, the machine according to the invention, generally designated by the reference numeral 1, comprises a footing 2, which is provided with resting feet 3 that are intended to rest, when the machine is in the conditions for use, on a substantially horizontal supporting surface.

[0011] The footing 2 supports a treatment tank 4, which is intended to contain a drying and polishing material, of a known type, for example a material based on corn cobs. The treatment tank 4 is connected to an inlet 5 for loading the cutlery to be dried and polished and to an outlet 6 for

unloading the dried and polished cutlery. The treatment tank 4 preferably has a substantially cylindrical shape with a lateral expansion 4a that has a substantially trap-ezoidal shape and is open upwardly. The unloading outlet 6 is defined in an upper region of the lateral walls of the treatment tank 4.

[0012] A rising channel 7 is connected to the internal walls of the treatment tank 4 and is extended from the bottom of the treatment tank 4 to the unloading outlet 6 around an axis 8 which, with the machine in the conditions for use, is substantially vertical.

[0013] A lid 9 is hinged directly to the treatment tank 4 and can rotate about the corresponding pivoting axis 10 with respect to the treatment tank 4 in order to close in an upper region the treatment tank 4 during its normal operation or open it during cleaning or maintenance interventions.

[0014] The loading inlet 5 is defined in the lid 9 and, when the lid is closed, lies above the lateral expansion 4a of the treatment tank 4.

[0015] The footing 2 supports the treatment tank 4 by means of elastic suspensions 11, constituted by helical springs, which are interposed between the base of the footing 2 and the bottom of the treatment tank 4.

[0016] Moreover, a motorized vibrating unit 12 is fixed to the bottom of the treatment tank 4 and can be constituted, in a per se known manner, by an electric motor with eccentric masses, which can be operated to vibrate the treatment tank 4.

[0017] An electric resistance heater 13 is fixed to the bottom of the treatment tank 4 and can be supplied with power in order to heat the drying and polishing material introduced in the treatment tank 4.

[0018] Conveniently, on the outer side of the machine, between the footing 2 and the treatment tank 4, there is a protective band 14 made of elastically deformable material. The protective band 14 has the function of covering substantially completely the gap that exists between the treatment tank 4 and the footing 2, so as to prevent the user from inserting his/her fingers accidentally in this gap during use of the machine.

[0019] Conveniently, at least one part of the outer lateral surface of the treatment tank 4, in particular the part located proximate to the electric resistance heater 13, is covered by means of a thermal protection and heat dissipation band 15. The band 15 is conveniently perforated in order to allow adequate heat dissipation.

[0020] Preferably, the rising channel 7 is extended along a cylindrical helix around the axis 8 and can have a stepped bottom in order to contrast the descent of the drying and polishing material and of the cutlery.

[0021] The rising channel 7 has an initial segment that is extended from the bottom of the treatment tank 4 and an end segment 7a which, proximate to the unloading outlet 6, is extended on a plane that is substantially perpendicular to the axis 8 and is at least partly perforated, with holes the dimensions of which are greater than those of the drying and polishing material but smaller than those

of the cutlery, so as to allow the fall in a downward region of the drying and polishing material alone upstream of the unloading outlet 6.

[0022] The end portion of the end segment 7a of the rising channel 7 protrudes from the unloading outlet 6 outside the treatment tank 4 and is shaped like a chute that is inclined downwardly, i.e., toward the footing 2.

[0023] Advantageously, proximate to the end segment 7a of the rising channel 7, the lid 9 supports, on its lower face, a fan 16, which is oriented so that when it is activated it strikes with a stream of air, oriented in the opposite direction with respect to the unloading outlet 6, the cutlery and the drying and polishing material that are arranged on the end segment 7a of the rising channel 7, thus preventing the drying and polishing material from escaping from the unloading outlet 6 together with the dried and polished cutlery.

[0024] Conveniently, the parts of the treatment tank 4 that are intended to make contact with the cutlery are made and/or lined with material suitable for contact with food products. In particular, the treatment tank 4 is preferably made with a stainless steel base and with the remaining part, as well as the rising channel 7, made of polypropylene.

[0025] Advantageously, a safety microswitch 17 is connected to the lid 9 and prevents the operation of the machine if the lid 9 is not closed correctly.

[0026] The lid 9 can be locked in the closed position by means of a nut 18 that engages a screw 19, which protrudes upwardly from the treatment tank 4 at the axis 8, passing through a hole 20 provided for this purpose at the center of the lid 9.

[0027] The loading inlet 5 is conveniently provided like a hopper so as to facilitate the loading of the cutlery into the treatment tank 4.

[0028] For the sake of completeness in description, it should be noted that on the front side of the footing 2 there is a button 21 for turning the machine on or off.

[0029] Operation of the machine according to the invention is as follows.

[0030] The cutlery is loaded into the treatment tank 4 through the loading inlet 5.

[0031] The cutlery rests in the drying and polishing material introduced beforehand in the treatment tank 4. The activation of the treatment tank 4 with a vibrating motion, caused by the activation of the motorized vibrating unit 12, causes the rubbing of the drying and polishing material against the cutlery and simultaneously the cutlery and such material advance along the rising channel 7 from the bottom of the treatment tank 4 toward the unloading outlet 6.

[0032] Moving along the end segment 7a of the rising channel 7, the drying and polishing material passes through the holes of the end segment 7a and falls in a lower region, thus remaining within the treatment tank 4, while the cutlery, by now dried and polished, continues its advancement toward the unloading outlet 6, through which it is progressively poured outside the machine. It

should be noted that along the end segment 7a of the rising channel 7 the air stream emitted by the fan 16 prevents any drying and polishing material that might remain on the rising channel 7 from reaching the unloading outlet 6.

[0033] Due to the fact that the machine according to the invention does not have a box-like support and containment structure, since the treatment tank 4 is supported directly by the footing 2 and the lid 9 is hinged directly to the treatment tank 4, it is possible to achieve, for the machine according to the invention, an extremely limited space occupation and weight.

[0034] Furthermore, thanks to this particular structure, the machine according to the invention has a reduced number of components and can be manufactured and assembled with lower costs than those of machines of the known type.

[0035] In practice it has been found that the machine according to the invention achieves fully the intended aim and objects, since for an equal loading capacity it can have a reduced space occupation and weight with respect to machines of the known type.

[0036] Furthermore, thanks to its structural simplicity, it can be manufactured with reduced costs without reducing the degree of safety and reliability in use.

[0037] In practice, the materials used, as long as they are compatible with the specific use, as well as the dimensions, may be any according to requirements and to the state of the art.

[0038] The disclosures in Italian Utility Model Application no. MI2014U000389 (202014902317317), from which this application claims priority, are incorporated herein by reference.

Claims

1. A vibrating tank machine for drying and polishing cutlery, **characterized in that** it comprises:

- a footing (2) provided with resting feet (3) intended to rest, when the machine is in conditions for use, on a substantially horizontal supporting surface;
- a treatment tank (4), intended to contain a drying and polishing material, connected to an inlet (5) for loading the cutlery to be dried and polished and to an outlet (6) for unloading the dried and polished cutlery; said treatment tank (4) being open upwardly and said outlet (6) being defined in an upper region of the lateral walls of said treatment tank (4);
- a rising channel (7), which is connected to the internal walls of said treatment tank (4) and is extended, with the machine in conditions for use, around a substantially vertical axis (8), from the bottom of said treatment tank (4) to said unloading outlet (6);

- a lid (9), which is hinged to said treatment tank (4) and can rotate about the corresponding pivoting axis (10) with respect to said treatment tank (4) in order to open or close said treatment tank (4) in an upper region; said loading inlet (5) being defined in said lid (9);
- elastic suspensions (11), interposed between said footing (2) and said treatment tank (4);
- at least one motorized vibrating unit (12) connected to said treatment tank (4).

2. The machine according to claim 1, **characterized in that** on its outer side, between said footing (2) and said treatment tank (4), there is a protective band (14) made of elastically deformable material.
3. The machine according to claim 1, **characterized in that** at least part of the outer lateral surface of said treatment tank (4) is covered with a thermal protection and heat dissipation band (15).
4. The machine according to one or more of the preceding claims, **characterized in that** said rising channel (7) is extended along a cylindrical helix around said axis (8).
5. The machine according to one or more of the preceding claims, **characterized in that** the end segment (7a) of said rising channel (7), proximate to said unloading outlet (6), is extended on a plane that is substantially perpendicular to said axis (8) and is at least partially perforated in order to allow the fall, in a lower region, of the drying and polishing material upstream of said unloading outlet (6).
6. The machine according to one or more of the preceding claims, **characterized in that** proximate to said end segment (7a) of the rising channel (7) said lid (9) supports a fan (16) that can be operated to strike with an air stream, oriented in the opposite direction with respect to said unloading outlet (6), the cutlery and the drying and polishing material arranged on said end segment (7a) of the rising channel (7).
7. The machine according to one or more of the preceding claims, **characterized in that** it comprises an electric resistance heater (13) that is connected to said treatment tank (4) in order to heat said drying and polishing material.
8. The machine according to one or more of the preceding claims, **characterized in that** the end portion of said end segment (7a) of the rising channel (7) protrudes from said unloading outlet (6) outside said treatment tank (4) and is shaped like a chute that is inclined toward said footing (2).

9. The machine according to one or more of the preceding claims, **characterized in that** said motorized vibrating unit (12) is accommodated in said footing (2) and is connected to the bottom of said treatment tank (4). 5
10. The machine according to one or more of the preceding claims, **characterized in that** the parts intended to make contact with the cutlery are made of and/or covered with material suitable for contact with food products. 10

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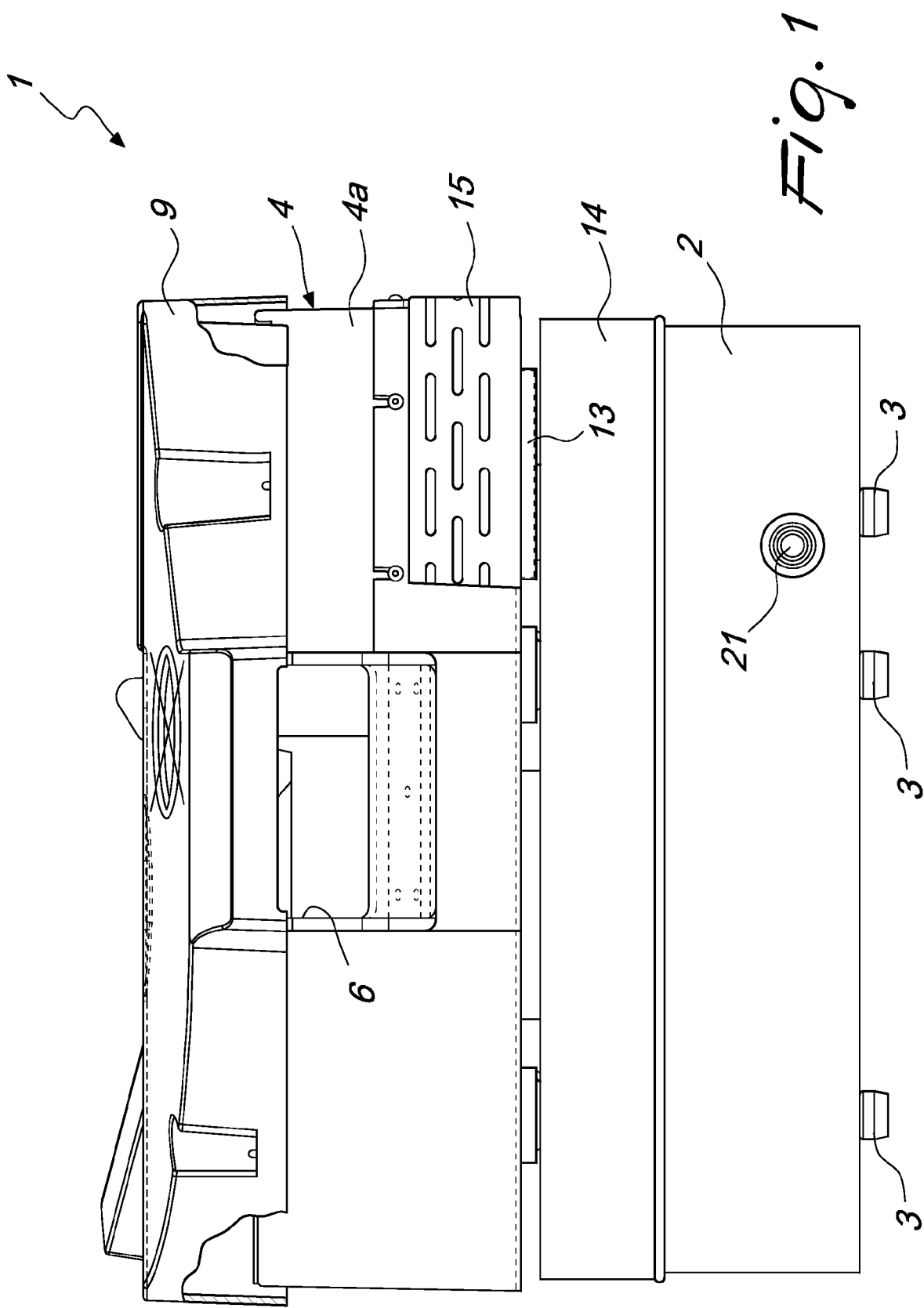
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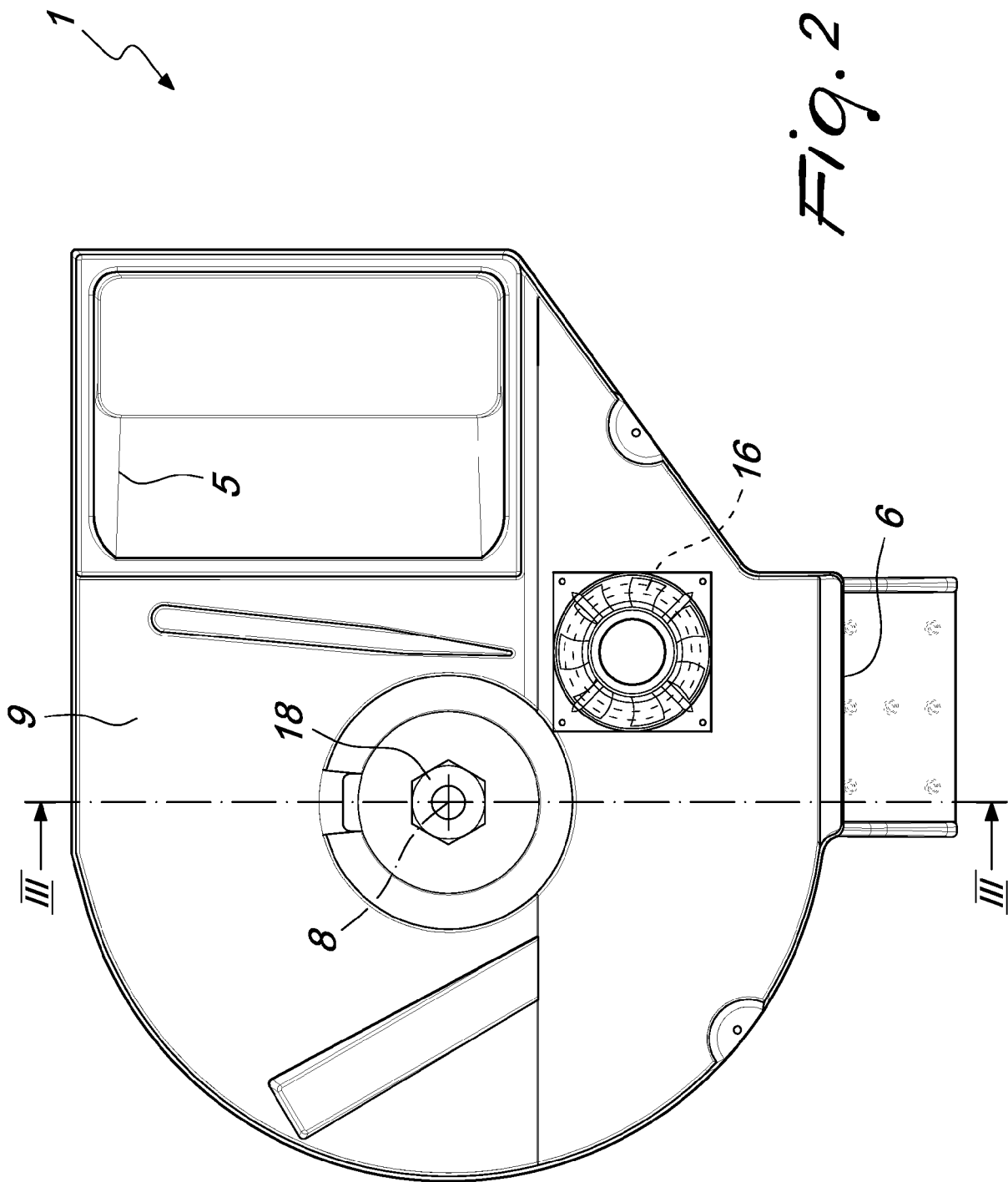
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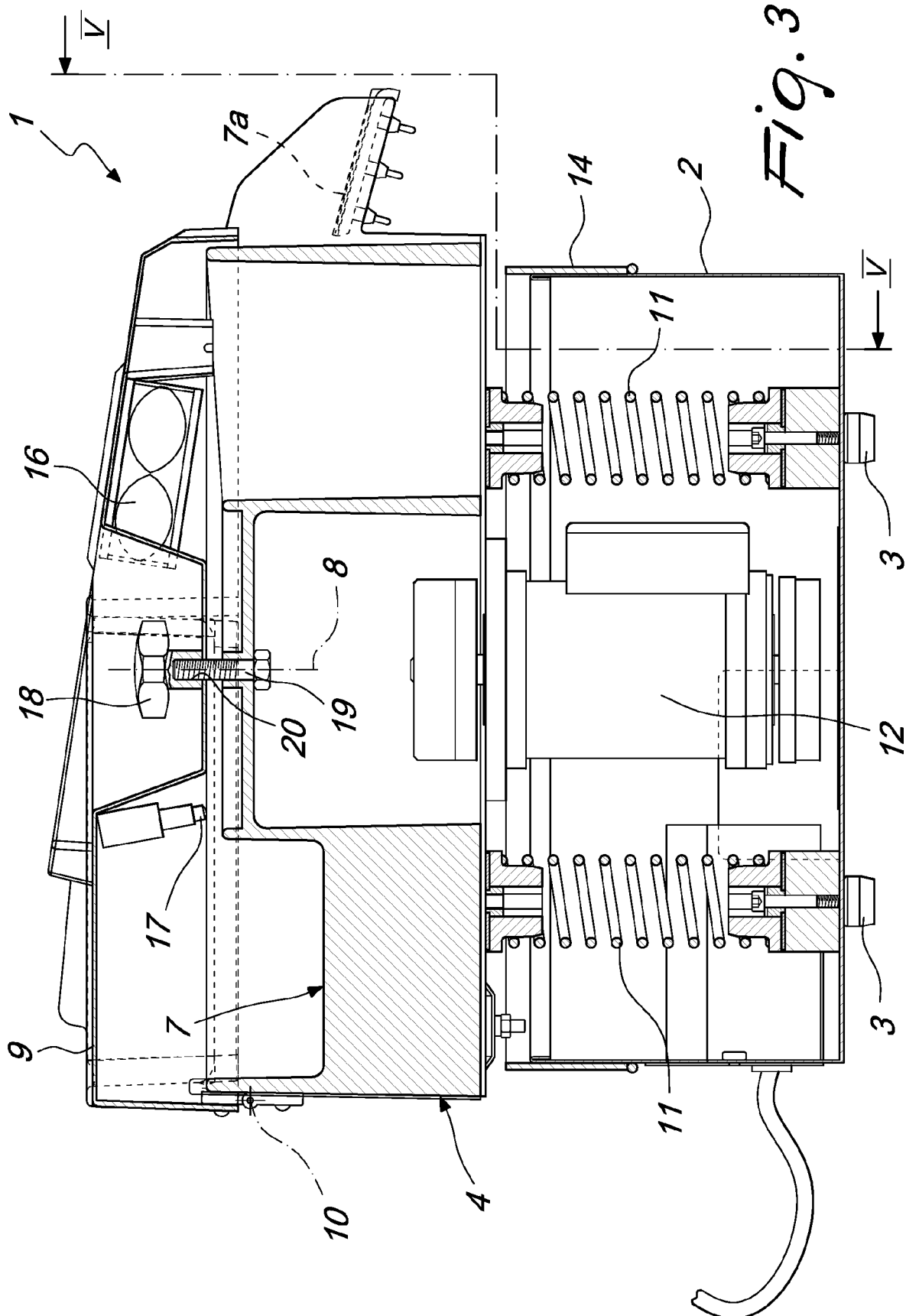
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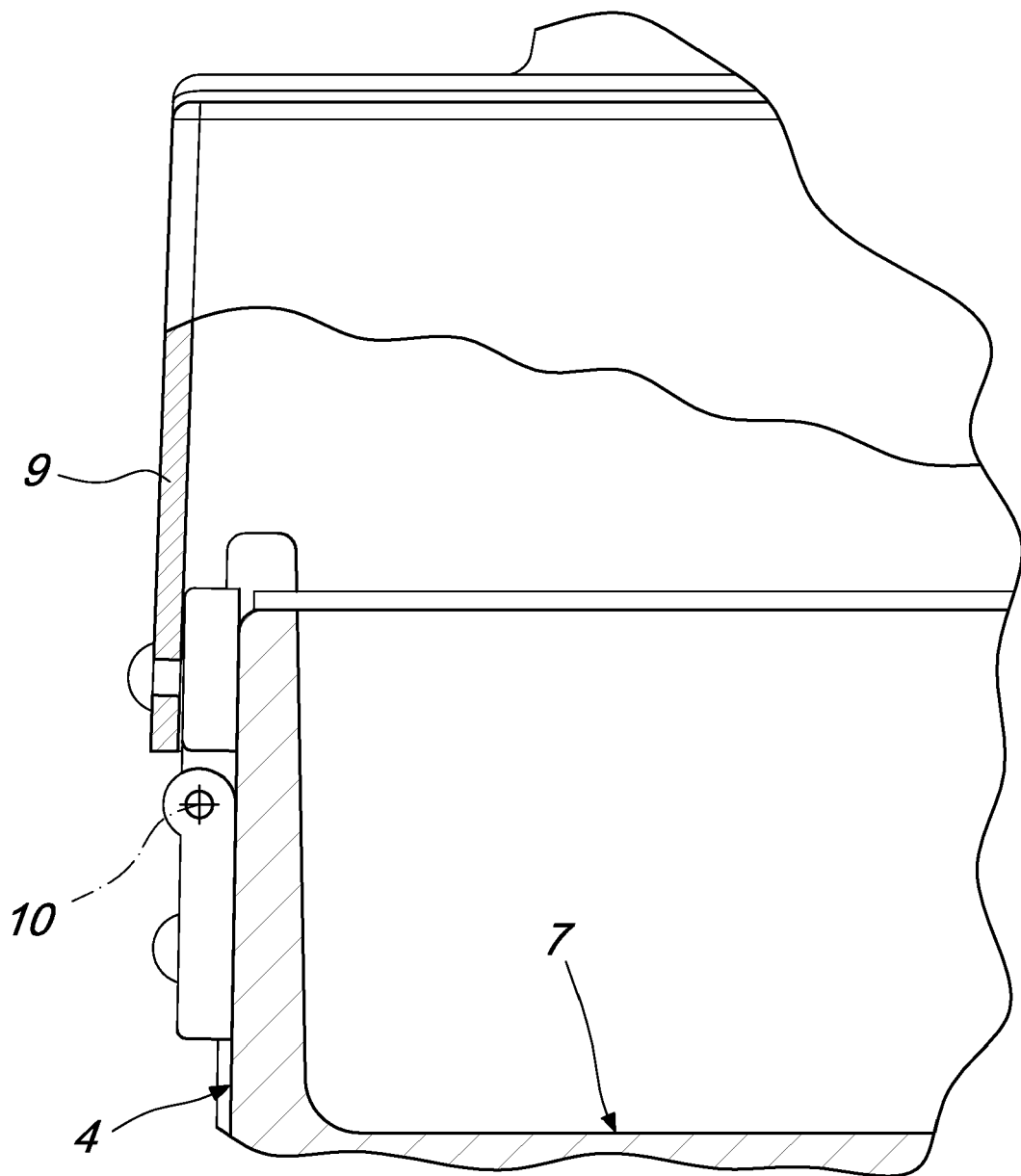
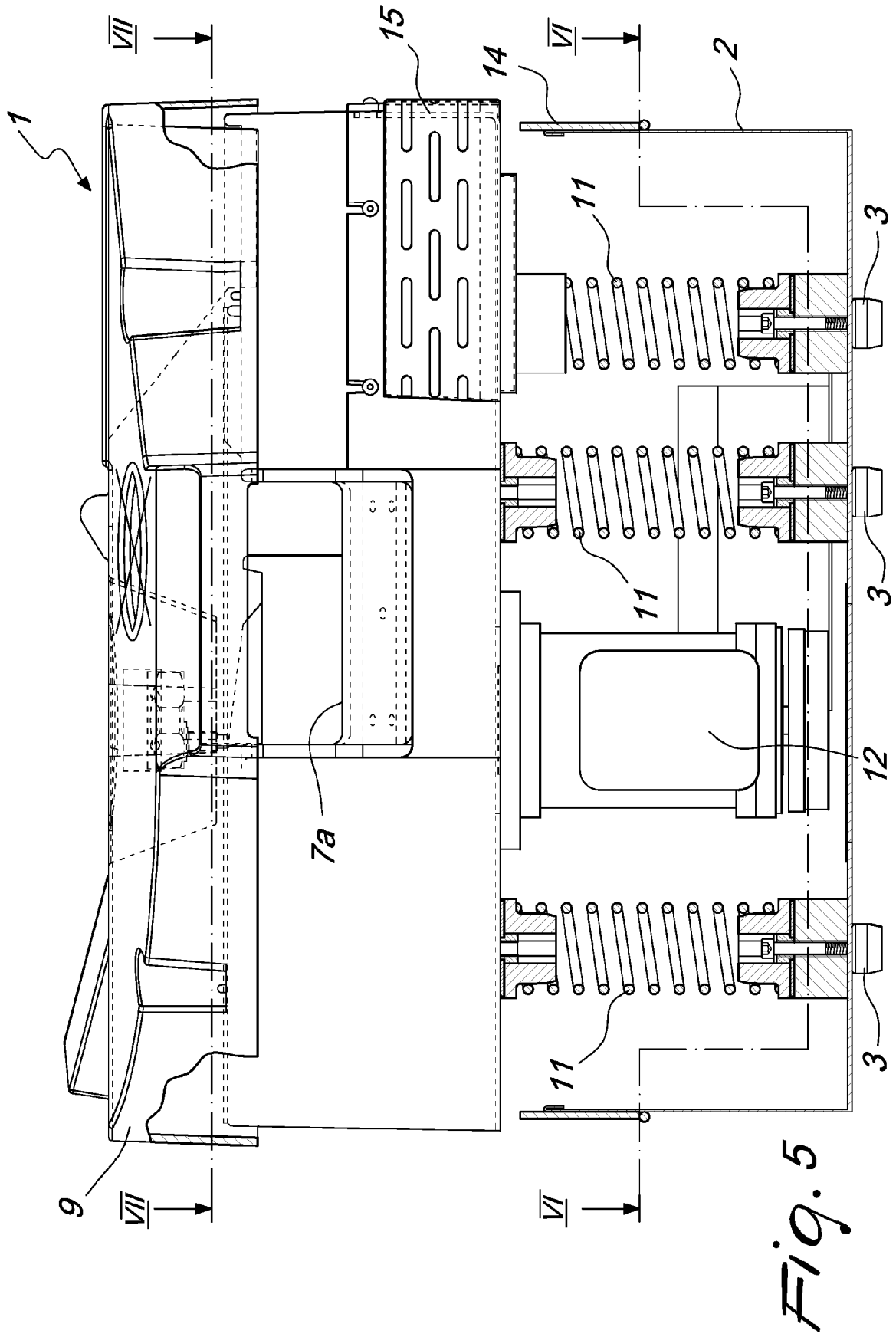
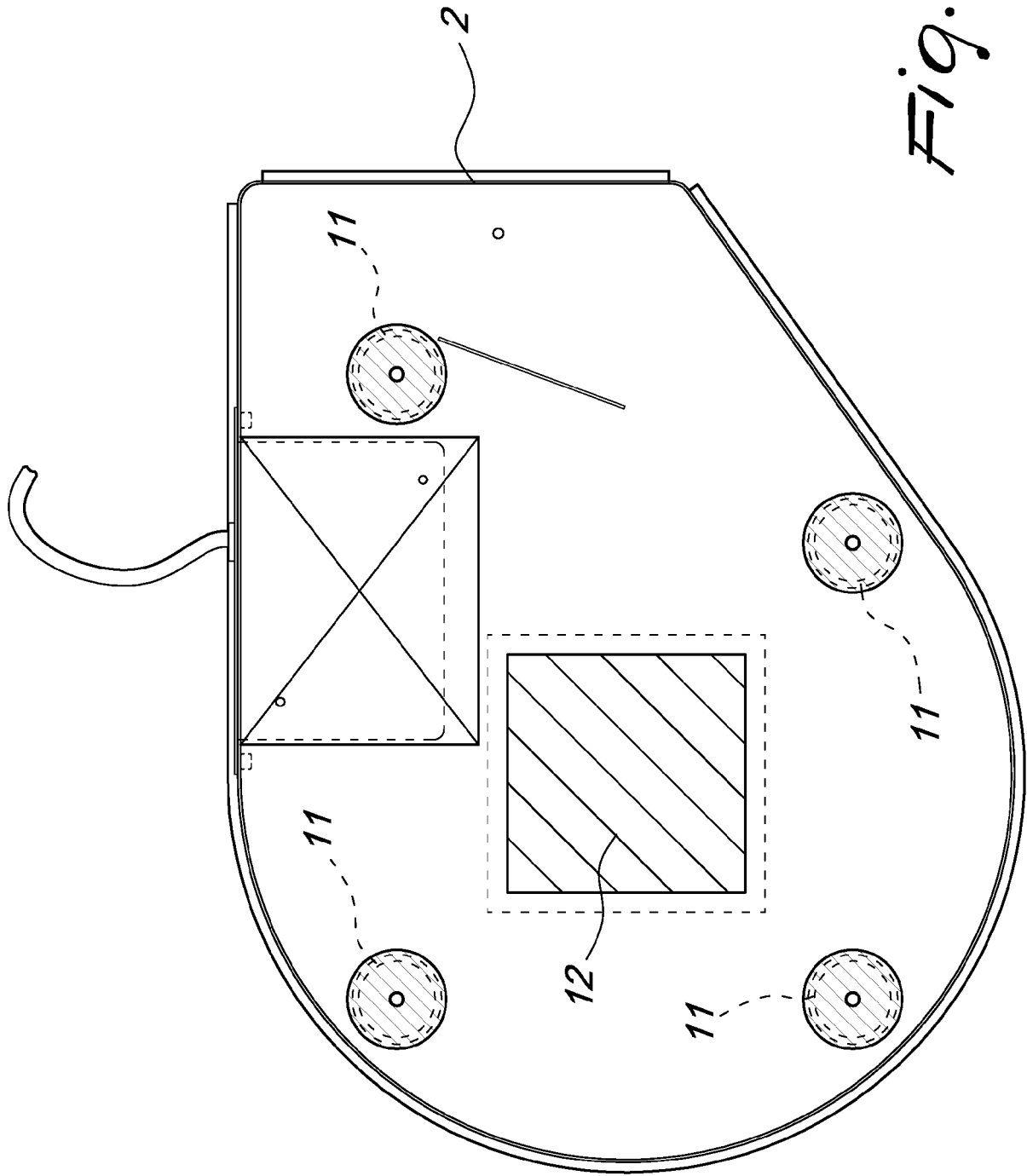
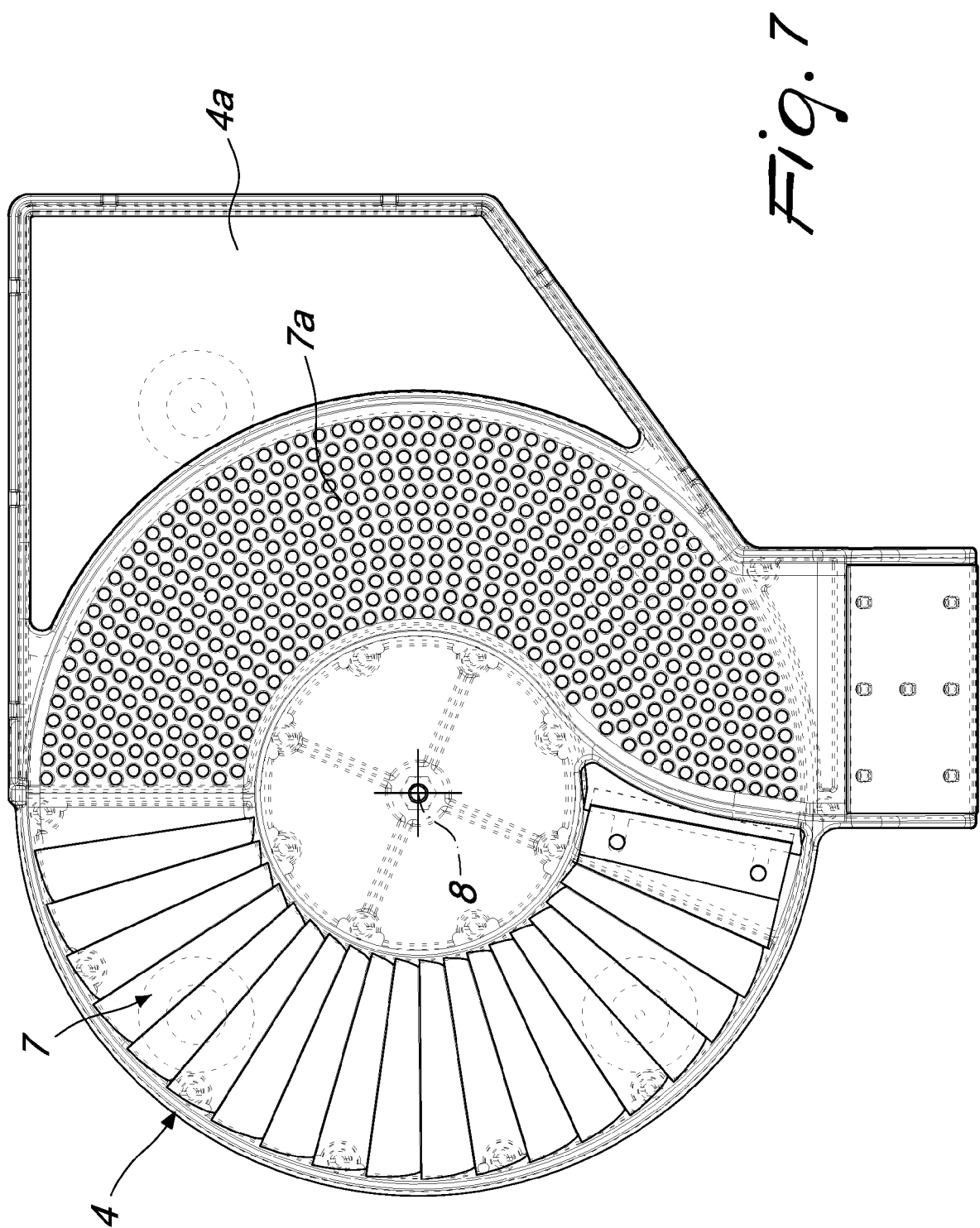


Fig. 4







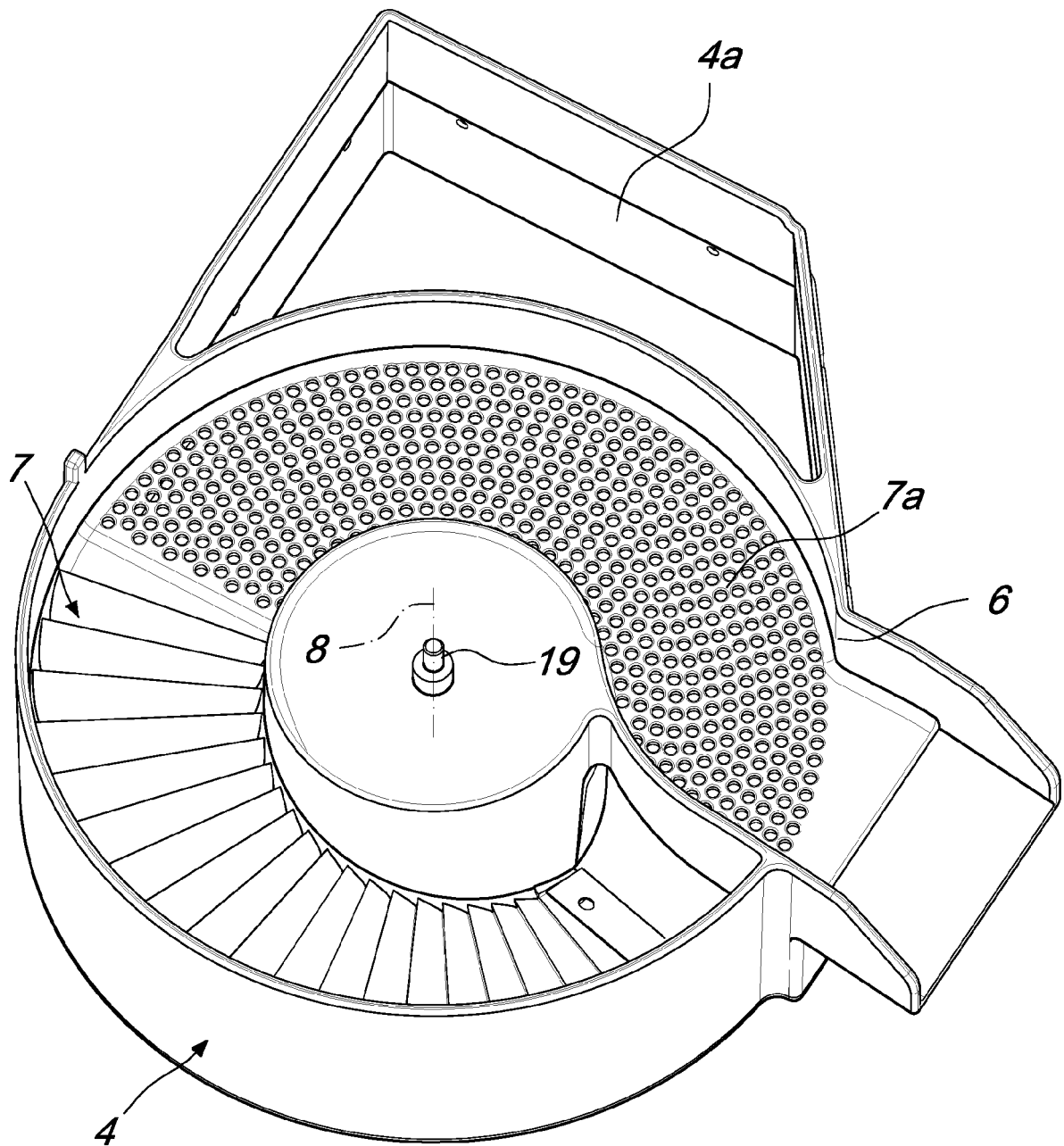


Fig. 8



EUROPEAN SEARCH REPORT

 Application Number
 EP 15 20 0556

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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 3 777 770 A (CUNNINGHAM SMITH D) 11 December 1973 (1973-12-11)	1,4,5, 8-10	INV. A47L21/02
Y	* columns 1,2,5 *	1,4-10	
Y	EP 1 523 931 A1 (NICEM SPA [IT]) 20 April 2005 (2005-04-20) * paragraphs [0012] - [0043] *	1,4-10	
A	DE 20 2008 003260 U1 (DOERR THOMAS [DE]) 15 May 2008 (2008-05-15) * paragraphs [0045] - [0067] *	1-10	
A	ES 2 221 762 A1 (COM FRUCOSOL S A [ES]) 1 January 2005 (2005-01-01) * the whole document *	1-10	
			TECHNICAL FIELDS SEARCHED (IPC)
			A47L
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 25 April 2016	Examiner Martin Gonzalez, G
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 15 20 0556

5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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25-04-2016

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 3777770 A	11-12-1973	AT 332809 B	25-10-1976
		BE 769466 A1	16-11-1971
		CH 547130 A	29-03-1974
		DE 2132746 A1	03-02-1972
		ES 392849 A1	16-07-1974
		FR 2100098 A5	17-03-1972
		GB 1354117 A	05-06-1974
		IT 951580 B	10-07-1973
		NL 7109167 A	04-01-1972
		US 3777770 A	11-12-1973

EP 1523931 A1	20-04-2005	AT 365020 T	15-07-2007
		BR PI0405176 A	14-06-2005
		DE 602004007081 T2	21-02-2008
		EP 1523931 A1	20-04-2005
		ES 2289405 T3	01-02-2008
		US 2005091868 A1	05-05-2005

DE 202008003260 U1	15-05-2008	DE 202008003260 U1	15-05-2008
		EP 2098155 A2	09-09-2009

ES 2221762 A1	01-01-2005	ES 2221762 A1	01-01-2005
		ES 2317783 A1	16-04-2009

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- IT MI20140389 U [0038]