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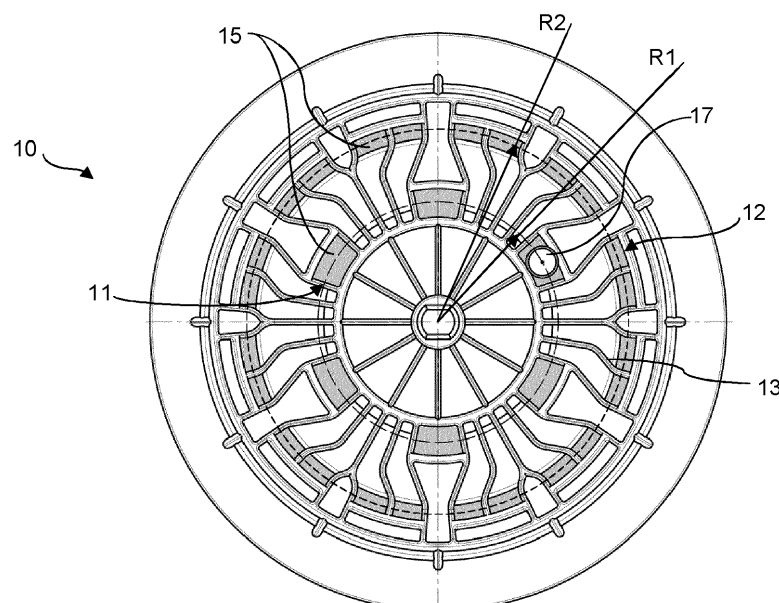
ROTATING PAD HOLDER FOR VACUUM CLEANER

(57) A rotating pad holder (10) adapted to hold a textile pad (20) and adapted to be engaged with a driving unit of a wet vacuum cleaner nozzle having a water supply unit (17), wherein the pad holder (10) comprises a first set (11) of openings (15) arranged in a circle, wherein the center of the circle coincides with a rotation axis of the pad holder (10) and an arrangement of ribs (13) for water distribution, wherein a second set (12) of openings (15) is arranged on a circle which radius (R1) is greater than the radius (R2) of the circle on which the first set

(11) of openings (15) is located, wherein outer walls (16) of openings (15) of the second set (12) are inclined towards the center of the pad holder (10).

The present invention enables a rotating pad holder for vacuum cleaner of construction which facilitates the evenness of water distribution and faster penetration of the water into the pad thanks to which the device is ready for operation very fast. The cleaning results of the device are improved with no production costs increase.

Fig. 2



Description

[0001] The present invention relates to a rotating pad holder adapted to hold a textile pad and adapted to be engaged with a driving unit of a wet vacuum cleaner nozzle having a water supply unit, wherein the pad holder comprises a first set of openings arranged in a circle, where the center of the circle coincides with a rotation axis of the pad holder and an arrangement of ribs for water distribution.

[0002] Vacuum cleaners with mopping function are well known from the state of the art. Vacuum cleaners of different types e.g. canister vacuum cleaners, hand held vacuum cleaners, upright vacuum cleaners or autonomous vacuum cleaners are often designed to be able not only vacuuming the dirt but also wiping the surface to make the cleaning effect enhanced. Wet vacuum cleaners allows the user to reduce the time spared for cleaning the floor in comparison to the standard devices like vacuum cleaner and mopping device.

[0003] The patent document WO 2021/ 020 908 A1 discloses mobile robot including a body, a mop module installed on the body and cleaning through using water, a water tank provided at the body to be able to be drawn out from the body and storing water supplied to the mop module, and a water-tank detachable module installed on the water tank. The water-tank detachable module includes a hook engaged with or coupled to the body and an operation button exposed at a surface of the water tank to operate the hook.

[0004] The patent document EP 3 741 281 A1 discloses a cleaner capable of autonomously traveling while performing a mopping task, the cleaner including: a body which defines an exterior appearance of the cleaner; at least one mop module which has at least one mop provided in contact with a floor, and which supports the body against the floor; and a tilt information acquisition unit configured to acquire tilt information of the body in relation to the floor. At least one specific part may comprise the at least one mop, may be a whole or part of the at least one mop module, and may be defined such that the at least one specific part is provided detachable from other parts of the cleaner except for the at least one specific part and that the body tilts in relation to the floor due to gravity while the at least one specific part is separated from the other parts. The cleaner may further comprises a controller which is configured to: based on at least the tilt information, determine satisfaction or unsatisfaction of a predetermined separated condition that is preset to be satisfied when the specific part is separated from the other parts; and, when the detachments condition is satisfied, control a predetermined mop separation error response operation.

[0005] The patent document WO 2021/ 233 055 A1 discloses a suction nozzle structure and a suction and mopping all-in-one machine, comprising a base assembly, the base assembly comprising a base support, and the base support comprising a suction nozzle mounting

groove and a hinge channel mounting position; a dust collection component, the dust collection component comprising a base dust collection channel and a suction nozzle assembly; and floor mopping components mounted on the base support, each of the floor mopping components comprising a driving part and a cleaning part, and the floor mopping components being symmetrically provided on two sides of the base dust collection channel; wherein the base dust collection channel comprises a hinge channel and an insertion pipe, the hinge channel being located at the hinge channel mounting position; the suction nozzle assembly comprises a suction cavity; the suction cavity has a bottom end attached to a surface to be cleaned, and a top end of which the central part is a mounting groove; the shape of the suction nozzle assembly coincides with the suction nozzle mounting groove; when the suction nozzle assembly and the suction nozzle mounting groove are fixedly mounted, the insertion pipe is sealedly mounted in the mounting groove. The suction nozzle is designed to be a floating/detachable type, so that when the suction nozzle performs dust collection, the cleaning efficiency is higher, and detaching and cleaning are also more convenient.

[0006] It is the object of the present invention to provide a rotating pad holder for vacuum cleaner which construction improves the evenness of water distribution and enhances the cleaning results.

[0007] The object of the present invention is solved by a rotating pad holder for vacuum cleaner having a first set and a second set of openings wherein the second set of openings is arranged on a circle which radius is greater than the radius of the circle on which the first set of openings is located. Outer walls of the second set of openings are inclined towards the center of the pad holder.

[0008] A pad holder is a disc shaped element which is adapted to hold a textile pad and adapted to be engaged with a driving unit of a wet vacuum cleaner nozzle. The driving unit rotates the pad holder with a textile pad and wipes the floor. The nozzle has a water supply unit. The water supply unit is a simple water outlet through which water is delivered from a water tank to the pad holder and then to the textile pad which wipes the cleaning surface. The pad holder has a first set of openings arranged in a circle wherein the center of the circle coincides with a rotation axis of the pad holder. The pad holder has also a second set of openings which are arranged on a circle which radius is greater than the radius of the circle on which the first set of openings is located. In other words, the first set of openings is located near the center of the pad holder and the second set of openings is an outer set in relation to the first set of openings. The water is fed by the water supply unit close to the rotation axis of the pad holder on the first set of openings. The pad holder has also an arrangement of ribs which helps the water distribution. Water is distributed by the ribs to the second set of openings. The outer walls of openings of the second set are inclined towards the center of the pad holder which limits the amount of water thrown out from the pad

holder by the centrifugal force. The positive effect is that the water is distributed to the pad evenly which positively influences the cleaning effect.

[0009] In a preferred embodiment of the invention the water supply unit is placed above the first set of openings. The water supply unit is a simple outlet connected with a water tank of a vacuum cleaner through which the water is fed into the pad holder. The water supply unit is placed above the first set of openings which are located close to the axis of rotation of the pad holder. Thanks to the centrifugal force, the water is delivered by the arrangements of ribs to the cleaning surface.

[0010] In another embodiment of the invention the ribs are grooved for water distribution. The ribs are responsible for delivering the water from first set of openings where the water is supplied by the water supply unit to the second set of openings which are an outer set located on exterior part of the pad holder. The water flows to the second set of openings through ribs which are grooved for better water channeling. The positive effect is that the water is distributed to the pad evenly which positively influences the quality of the cleaning process.

[0011] In the preferred embodiment of the invention each opening of the first set has a first supply zone. The first supply zone is an area under the water supply unit which position is constant. Each four openings of the second set has a second supply zone. The water from the second supply zone is delivered to each of four openings of the second set by grooved ribs. The size of the first supply zone differs from the size of the second supply zone as the water from the first supply zone feeds only one opening of the first set and the second supply zone is designed in such a way to feed four openings of the second set. The positive effect is that the water is distributed evenly which enhances the cleaning results.

[0012] In another embodiment of the invention the ratio between the radial dimension of the second supply zone to the radial dimension of the first supply zone is the same as the ratio between the radius on which the first set of openings is located to the radius on which the second set of openings is located. In order to ensure even water supply within the inner and outer openings, the size of the water supply zones has been varied. As the position of the feeding nozzle is constant, the angle of rotation of the pad holder during which the water flows to the openings depending on their position is differentiated. In order to maintain even distribution of water, the relationship described above should be kept.

[0013] The present invention enables a rotating pad holder for vacuum cleaner of construction which facilitates the evenness of water distribution and faster penetration of the water into the pad thanks to which the device is ready for operation very fast. The cleaning results of the device are improved with no production costs increase.

[0014] The construction of the invention, however, together with additional objects and corresponding advantages will be best understood from the following descrip-

tion of specific embodiments and in connection with the accompanying drawing.

[0015] In the drawing:

- 5 Fig. 1 shows a pad holder with a water supply unit in isometric view,
- Fig. 2 shows the pad holder top view with a first set and a second set of openings,
- Fig. 3 shows the pad holder top view,
- 10 Fig. 4 shows the cross section of the pad holder shown on Fig. 3,
- Fig. 5 shows the pad holder top view with first and second supply zones.

15 **[0016]** In cooperation with attached drawing, the technical contents and detailed description of the present invention are described thereafter according to a preferable embodiment being not used to limit its executing scope. Any equivalent variation and modification made according to appended claims is all covered by the claims claimed by the present invention.

20 **[0017]** In the following description of the preferred embodiments of the present invention, similar identical reference numbers designate identical or comparable components.

25 **[0018]** Fig. 1 shows a pad holder 10 with a water supply unit 17 in isometric view. The pad holder 10 is a disc shaped element which is designed to hold a textile pad (not shown on the figure) in order to clean the floor. The water supply unit 17 is a simple nozzle which provides a water to the pad holder 10. The position of the water supply unit 17 is constant and water is delivered in the point of the pad holder 10 in vicinity of the rotation axis of the pad holder 10.

30 **[0019]** Fig. 2 shows the pad holder 10 top view with a first set 11 and a second set 12 of openings 15. The first set 11 and the second set 12 of openings 15 were marked grey on the figure. The first set 11 of openings 15 is a set of six openings arranged on a circle in the vicinity of the rotation axis of the pad holder. The second set 12 of openings 15 is a set of twenty four openings arranged on a circle which radius R2 is greater than the radius R1 on which the first set 11 of openings 15 is arranged. The water supply unit 17 position is constant and water feeds all openings 15 thanks to the rotation of the pad holder 10. The water supply unit 17 is placed above the openings 15 of the first set 11 and thanks to the Coriolis force during rotation and the ribs 13 the water is delivered to the second set 12 of openings 15.

35 **[0020]** Fig. 3 shows the pad holder 10 top view with openings 15 and ribs 13. Ribs 13 are grooved in order to facilitate the water to be spread on the surface of the pad holder 10 and further on the cleaning surface i.e. floor. Ribs 13 and openings 15 are arranged in a pattern which allows the water to be distributed to the cleaning surface evenly.

40 **[0021]** Fig. 4 shows the cross section of the pad holder 10 shown on Fig. 3. The outer walls 16 of the openings

15 of the second set 12 are inclined at angle α towards the center of the pad holder 10 which limits the amount of water thrown out from the centrifugal force occurring during rotation of the pad holder 10. The inclination additionally facilitates the penetration of water into the textile pad as a result of the emergence of an additional force.

[0022] Fig. 5 shows the pad holder 10 top view with a first supply zone 18 and a second supply zone 19. The first supply zone 18 is an area in which the water is delivered to the first set of openings 15. The first supply zone 18 feeds one opening 15 which is positioned on the circle of radius R1. The second supply zone 12 feeds four openings 15 which are positioned on the circle of radius R2. The water is distributed over the surface of the pad holder 10 and further to the textile pad in order to clean the surface.

[0023] The present invention enables a rotating pad holder for vacuum cleaner of construction which facilitates the evenness of water distribution and faster penetration of the water into the pad thanks to which the device is ready for operation very fast. The cleaning results of the device are improved with no production costs increase.

[0024] It is the object of the present invention to provide a rotating pad holder for vacuum cleaner which construction improves the evenness of water distribution and thanks to the faster penetration the water into the pad the device is ready for operation. Faster and more even water distribution enhances the cleaning results.

REFERENCE SIGNS

[0025]

10	pad holder	
11	first set	
12	second set	
13	rib	
15	opening	
16	outer wall (of the opening)	
17	water supply unit	
18	first supply zone	
19	second supply zone	
α	outer wall inclination angle	
a	radial dimension of a first supply zone	
b	radial dimension of a second supply zone	
R1	radius on which a first set of openings is located	
R2	radius on which a second set of openings is located	

Claims

1. A rotating pad holder (10) adapted to hold a textile

pad (20) and adapted to be engaged with a driving unit of a wet vacuum cleaner nozzle having a water supply unit (17), wherein the pad holder (10) comprises a first set (11) of openings (15) arranged in a circle, wherein the center of the circle coincides with a rotation axis of the pad holder (10) and an arrangement of ribs (13) for water distribution, **characterized in that** a second set (12) of openings (15) is arranged on a circle which radius (R1) is greater than the radius (R2) of the circle on which the first set (11) of openings (15) is located, wherein outer walls (16) of openings (15) of the second set (12) are inclined towards the center of the pad holder (10).

2. The pad holder (10) according to claim 1, **characterized in that** the water supply unit (17) is placed above the first set (11) of openings (15).
3. The pad holder (10) according to any of the preceding claims, **characterized in that** the ribs (13) are grooved for water distribution.
4. The pad holder (10) according to any of the preceding claims, **characterized in that** each opening (15) of the first set (11) has a first supply zone (18).
5. The pad holder (10) according to any of the preceding claims, **characterized in that** each four openings (15) of the second set (12) has a second supply zone (19).
6. The pad holder (10) according to any of the preceding claims 4-5, **characterized in that** the ratio between the radial dimension (b) of the second supply zone (19) to the radial dimension (a) of the first supply zone (18) is the same as the ratio between the radius (R1) on which the first set (11) of openings (15) is located to the radius (R2) on which the second set (12) of openings (15) is located.

Fig. 1

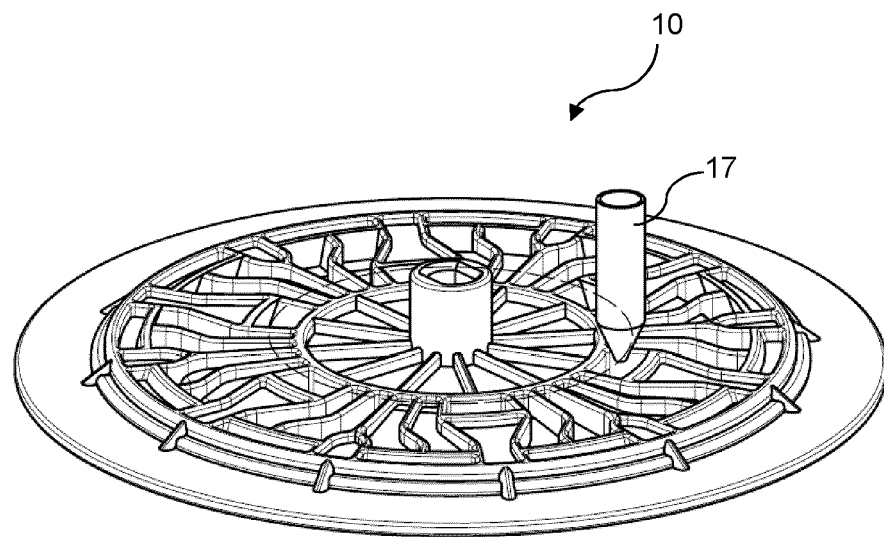


Fig. 2

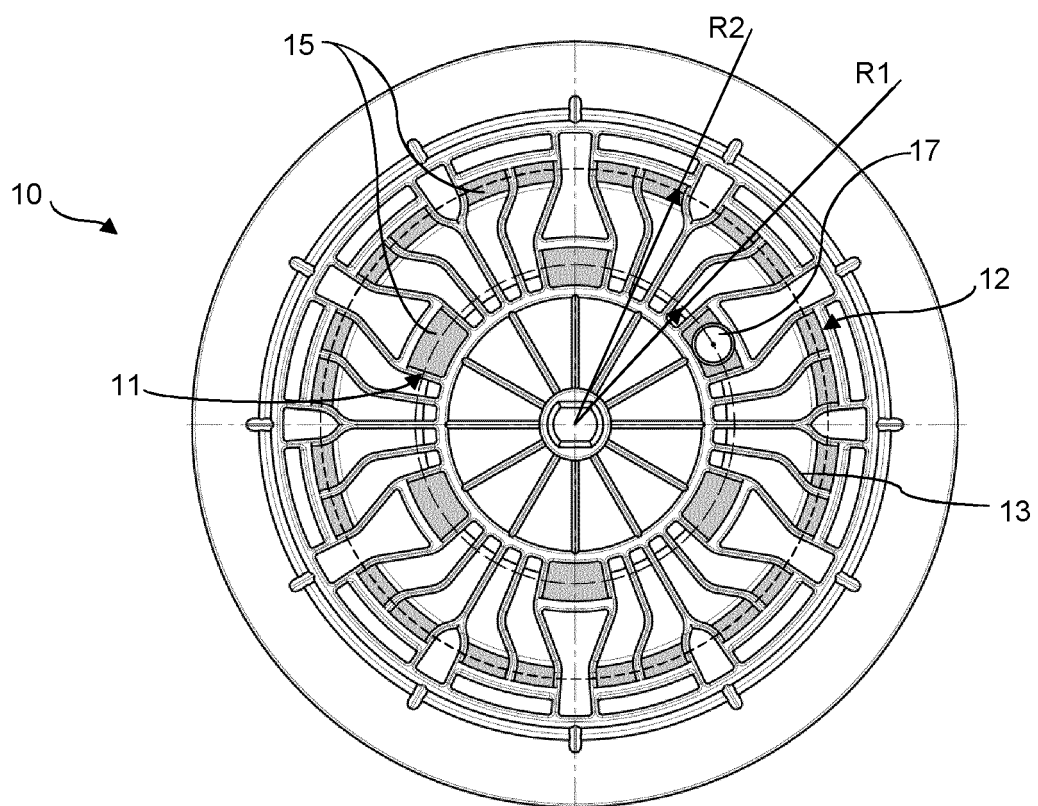


Fig.3

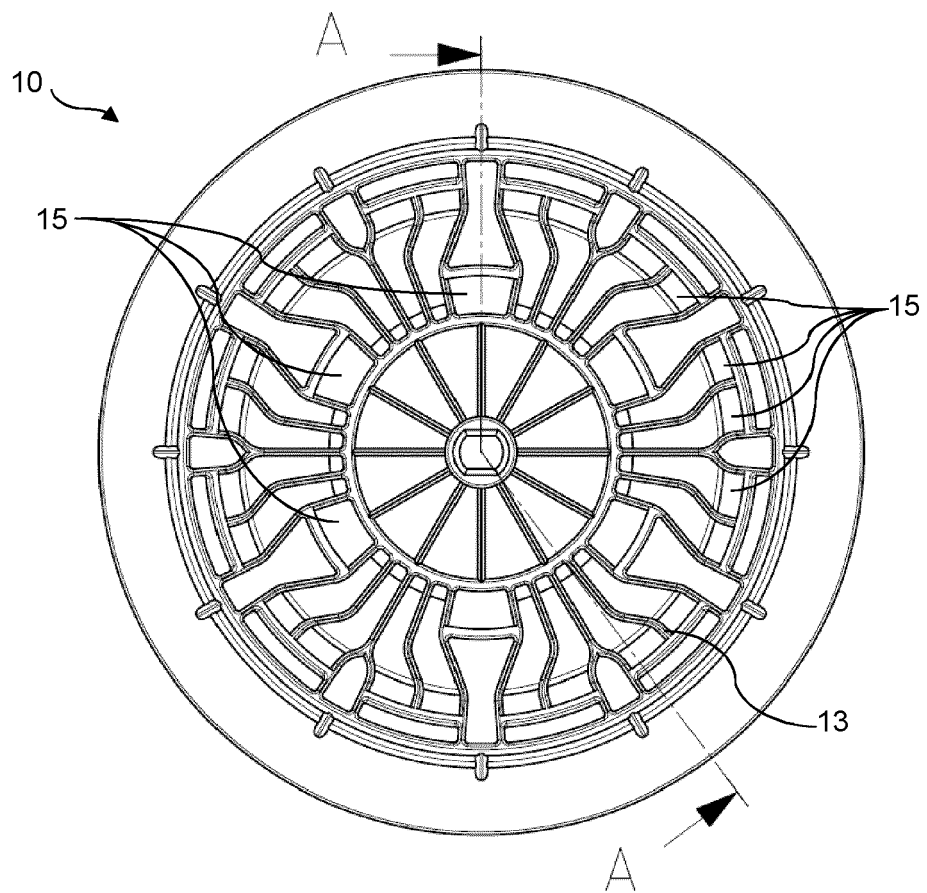


Fig. 4

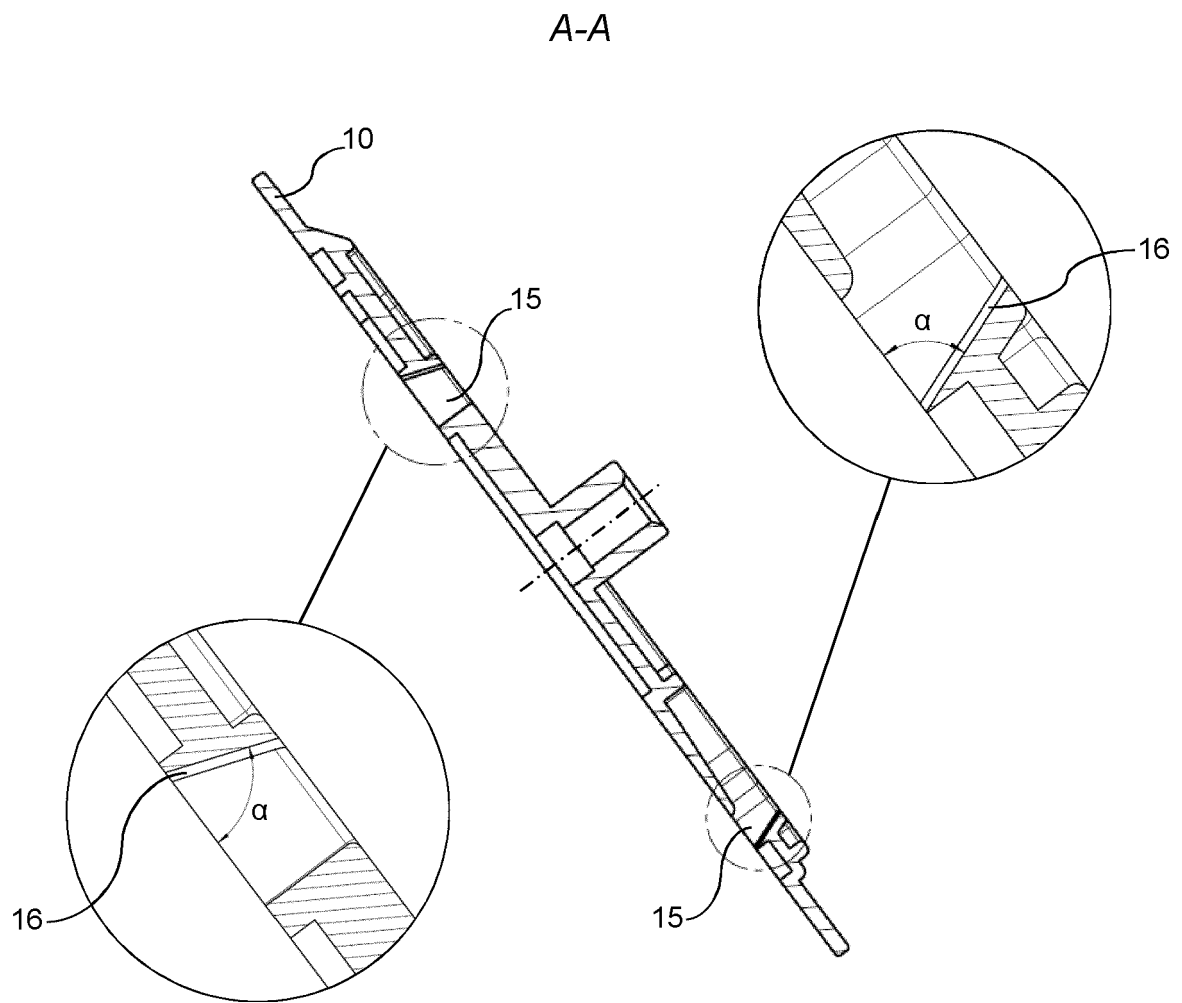
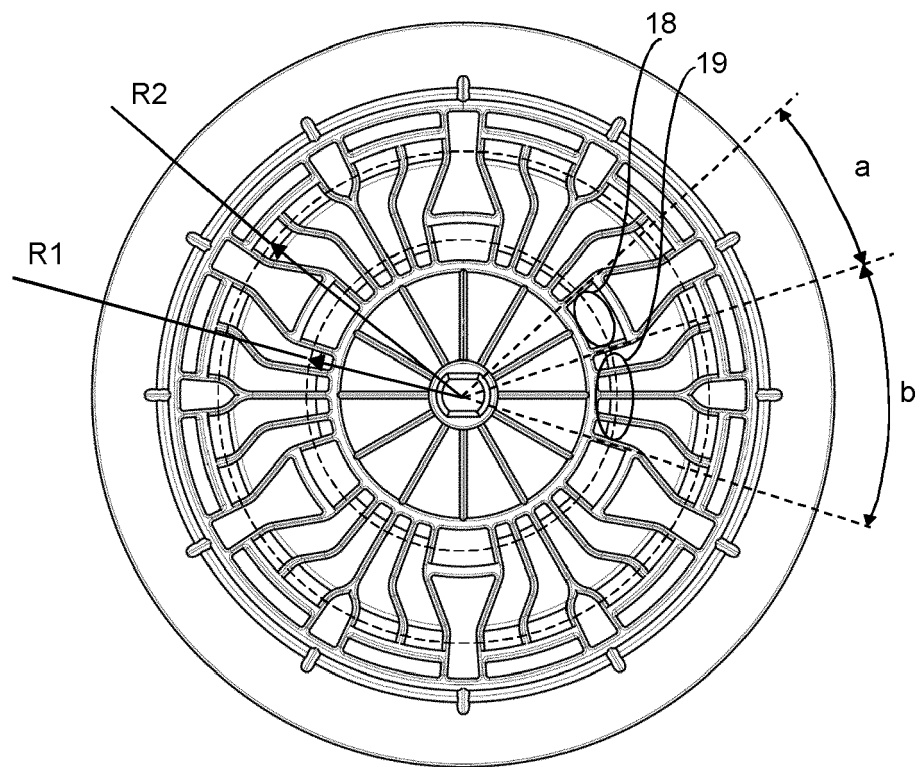


Fig. 5





EUROPEAN SEARCH REPORT

Application Number

EP 22 21 3880

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Place of search	Date of completion of the search	Examiner
Munich	16 May 2023	Jezierski, Krzysztof
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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