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(72) Feltalálók(k):

STÖCKL, Paul, Wismar 23966 (DE)

(73) Jogosult(ak):

**Fritz Egger GmbH & Co. OG, 6380 St. Johann
in Tirol (AT)**

(74) Képviselő:

**Mészárosné Dónusz Katalin, SBGK
Szabadalmi Ügyvivői Iroda, Budapest**

(54)

Berendezés és eljárás farészecskék nedvesítésére

Az európai szabadalom ellen, megadásának az Európai Szabadalmi Közlönyben való meghirdetésétől számított kilenc hónapon belül, felszólalást lehet benyújtani az Európai Szabadalmi Hivatalnál. (Európai Szabadalmi Egyezmény 99. cikk(1))

A fordítást a szabadalmas az 1995. évi XXXIII. törvény 84/H. §-a szerint nyújtotta be. A fordítás tartalmi helyességét a Szellemi Tulajdon Nemzeti Hivatala nem vizsgálta.

The invention relates to a device according to claim 1 for wetting wood particles with a medium, containing a drop shaft that exhibits at least one inner wall and allows the wood particles to fall freely in a running direction, and at least one nozzle, wherein the at least one nozzle is connected by a supply line with a reservoir for the medium.

The invention further relates to a method according to claim 13 for wetting wood particles with a medium, in particular using a device of the kind described above, in which the following steps are performed: generating a wood particle stream in a drop shaft and spraying the medium onto the wood particles of the wood particle stream.

Within the meaning of the invention, wood particles are understood to be any form of small-sized material made from the material wood, i.e., in particular chips, OSB strands, fibers and/or powder.

For example, such wood particles are wetted in order to glue the latter, wherein the wood particles are sprayed with a binding agent in this case. Wetting can additionally or alternatively take place with an additive or an emulsion. The medium used for wetting can here be a powder or liquid.

For example, wetting wood particles with a binding agent for gluing purposes is known from DE 203 17 633 U1. The wood particles are here transported in a drop shaft, in which they fall freely due to gravitational forces. Within the meaning of the invention, free falling means that the movement of the wood particles in the drop shaft in the

running direction is caused solely by the weight of the wood particles, but not by an air stream, which is introduced for purposes of transportation into the drop shaft. With the assistance of a broom roller pair, the free fall makes it possible to generate a relatively narrow particle curtain that trickles down between the inner walls of the drop shaft in roughly the middle. While still in a free fall, this particle stream, and especially the particle curtain, is then sprayed with the aforesaid medium, in particular the binding agent, i.e., atomized from nozzles. The nozzles required for this purpose are arranged laterally on the inner walls of the drop shaft, wherein the atomizing direction runs essentially transverse to the dropping direction or wood particle stream direction, and hence transverse to the running direction of the drop shaft. In this way, the wood particle stream or particle curtain is sprayed from two opposing sides.

US 4,323,314 describes the internal and external wetting of wood particles with a binding agent.

When gluing during OSB manufacture (oriented strand board manufacture), it is known to atomize and mix the wood particles, here the large-area strands, in large-volume, slow-running drums (20 to 25 RPM) having a diameter of 3 m, for example, with a binding agent. Gluing takes place through atomization with several nozzles, which within the meaning of the invention are also understood as so-called atomizers (spray nozzles), which are situated one behind the other, for example along the longitudinal axis of the mixing drum, and atomize the binding agent on the strand curtain generated by drum rotation. When gluing

with powdered glue, the powder is blown into the rotating drum. Such drums have a capacity of 25 t/h, for example, wherein the drums are inclined so as to transport the wood particles along the drum axis.

The wetted wood particles are compressed into wood based material, for example into an OSB plate, in following manufacturing steps.

The problem with the wetting or gluing devices described above is that the in part highly glued wood particles adhere to the interior sides of the system parts, and clumps come about that must be routinely removed. This is associated with costly system downtimes and complex maintenance operations.

Therefore, the object of the present invention is to indicate a device and method for wetting wood particles that reduce the risk of clumping.

The object derived and specified above is achieved in a first teaching of the present invention by a device for wetting wood particles with a medium, in particular a powder or liquid medium, preferably a binding agent, an additive and/or an emulsion, comprising a drop shaft, which exhibits at least one inner wall and allows the wood particles to fall freely in a running direction (corresponding to the dropping direction of the wood particles or the wood particle stream direction), and at least one, preferably several, nozzle(s), wherein the at least one nozzle is connected by a supply line with a reservoir for the medium, wherein the device exhibits a first component projecting into the interior of the drop

shaft in an operating position, wherein at least one nozzle is arranged on the first component, and wherein all nozzles arranged on the first component are spaced apart from each inner wall of the drop shaft in the operating position. In particular, the inner walls of the drop shaft are free of other nozzles connected with a reservoir for the powder or liquid medium, so that the powder or liquid medium is not sprayed onto the wood particle stream from the inner walls.

Having a first component with one or more nozzles project into the drop shaft according to the invention, wherein the nozzles are all spaced apart from the drop shaft with the first component in the operating position, causes the nozzles not to be arranged to the side of the particle stream with the device in operation, but rather in the particle stream. The distance between each inner wall and each nozzle here preferably measures at least 10%, preferably at least 20%, especially preferably at least 30%, of the distance between respectively opposing inner walls of the drop shaft, i.e., the inner clearance in a radial direction of the drop shaft. This yields an especially simple wetting of the wood particles, specifically already at a relatively low spraying pressure, since the nozzles are arranged significantly closer to the particles of the particle stream by comparison to prior art. It has here proven to be especially advantageous for one or more nozzles, in particular the majority of nozzles, preferably each nozzle of the aforesaid component, to exhibit a spraying direction that runs at an angle of at most 60°, preferably of at most 30°, specially preferably of at most 15°, relative to the running direction of the drop

shaft. The spraying direction preferably runs parallel to the running direction of the drop shaft.

It was surprisingly found that the structural design described above tangibly reduces the clumping of wood particles and binding agent on the inner walls of the drop shaft in comparison to prior art. Among other things, this can be attributed to the fact that the nozzles, due to their arrangement inside the drop shaft, for example in the middle between the inner walls, and hence due to their arrangement in the wood particle stream, wet the wood particles especially well, and due to a comparatively low nozzle pressure, also do not deflect them as strongly in the direction of the inner walls of the drop shaft. In particular given a spraying direction within the aforementioned angular ranges and precisely given a spraying direction parallel to the inner walls of the drop shaft, the risk of wetted wood particles being diverted in the direction of the inner walls is reduced even further.

Within the meaning of the invention, the spraying direction is intended to mean the nozzle axis, and hence the central axis of the atomized spray exiting the nozzle, i.e., the primary exiting direction. Since the atomized spray does not exit as a parallel jet, but rather fans out, the at least one nozzle according to the present invention also exhibits a so-called spraying angle, for example a spraying angle of at most 45° , preferably of at most 30° , especially preferably of at most 15° .

Provided in addition to the first component in an embodiment of the device according to the invention is an additional component, in particular a component structurally identical to the first component, which in the operating position can be moved into the interior of the drop shaft, and on which is arranged at least one nozzle spaced apart from each inner wall of the drop shaft when the respective additional component is in its operating position. As a result, e.g., for maintenance purposes, the first component can be moved out of its operating position into a maintenance position, wherein the additional component can subsequently or simultaneously be moved from a maintenance position into an operating position. The respective maintenance position is here preferably arranged outside of the drop shaft. The respective operating position is arranged in the interior of the drop shaft, preferably in such a way that the nozzles are arranged in the particle stream, especially preferably in the middle of the particle stream, in the operating position of the respective component during the operation of the device. In the manner described above, the component in its respective operating position can be quickly replaced with the additional component for maintenance purposes, eliminating the need to interrupt plate production, for example the production of OSB plates, which takes place subsequent to the device according to the invention and method according to the invention. The time it takes to change out the first and additional component is ideally so short that any bunkers present anyway can withstand a brief stoppage of the wetting device.

In another embodiment of the device according to the invention, the first and/or additional component is a nozzle bar. Within the meaning of the invention, the nozzle bar is understood as an oblong component. This component is designed like a bar or sword (wing). In this case, the nozzles are preferably arranged on the component along its longitudinal extension, in particular spaced uniformly apart from each other. Instead of an oblong component in the form of a bar or sword, it is also conceivable to design the first and/or additional component as a plate or ring, wherein the nozzles can be circularly arranged in this case. Regardless of the component shape, it is here preferred that the nozzles be arranged on the lower side of the component, and in particular that the component have a larger width (meaning the dimension transverse to the running direction of the drop shaft) than the nozzles, so that the nozzles themselves do not come into contact with the wood particle stream, but are rather covered from the wood particle stream by the component.

The component, for example the nozzle bar, then projects into the drop shaft in its respective operating position, and here in particular is spaced equally apart from both opposing inner walls of the drop shaft. If the component has an oblong shape, i.e., its longitudinal extension is greater than its width and height, the component preferably runs parallel to two opposing inner walls of the drop shaft.

In yet another embodiment of the device according to the invention, as stated one or more of the nozzles, in particular the majority of the nozzles, preferably each

nozzle, of the first and/or additional component are arranged on the lower side of the component pointing in the running direction. In this way, the nozzles are ideally protected against coming into contact with the wood particle stream. The wood particle stream, which in particular can also be a particle curtain, is in this way easily sprayed from the inside out with the medium, for example the binding agent.

The angular ranges mentioned above for the first component between the spraying direction and running direction also apply in particular to the additional component, which as stated is preferably structurally identical to the first component. Therefore, it can also be provided that one or more of the nozzles, in particular the majority of nozzles, preferably each nozzle, of the additional component exhibit a spraying direction that runs at an angle of at most 60° , preferably at most 30° , especially preferably at most 15° , relative to the running direction of the drop shaft. In particular, a parallel progression of the spraying direction and running direction is advantageous here as well.

In yet another embodiment of the device according to the invention, the first and/or second component has a cross section that expands sectionally in the running direction of the drop shaft. It is also conceivable that the first and/or second component have a cross section that initially expands and then tapers in the running direction of the drop shaft, i.e., has a wing profile, wherein the cross section is selected in particular from the group comprised of an elliptical, oval, oculiform,

and drop-shaped cross section. These cross sections share in common that they gradually expand or taper while avoiding edges, which prevents wood particles from clumping on the component. Given an egg-shaped or drop-shaped cross section, the wider part of the component is here pointed against the dropping direction of the wood particle stream, i.e., the running direction of the drop shaft. The cross sectional shapes described above are advantageous in particular if the component, for example the nozzle bar, is arranged in the wood particle stream, and essentially divides the latter in the middle. Such a profile also does not noticeably deflect the individual wood particles in the direction of the inner walls of the drop shaft.

As already mentioned previously, the first component in yet another embodiment of the device according to the invention is movably mounted, and in particular can be moved at least sectionally out of the drop shaft. The position outside the drop shaft here corresponds to the mentioned maintenance position. Given an oblong component, i.e., in particular a nozzle bar or sword, the latter can preferably be longitudinally displaced. In a case where an additional component is provided, it is here conceivable that the first component and additional component be arranged longitudinally one in back of the other, and in particular be joined together. This makes it possible to achieve a construction in which the additional component can be moved into the interior of the drop shaft when the first component is moved out of the drop shaft. This facilitates maintenance on the one hand, and prevents a relatively long downtime for the aforesaid wetting device on the other. When using a buffer downstream from the

nozzles, which can also be realized by a mixing screw or drum, a pressing device for pressing the wetted wood particles situated downstream from the wetting device does not have to be stopped.

In yet another embodiment of the device according to the invention, one or more of the nozzles, in particular the majority of the nozzles, preferably each nozzle, of the first and/or additional component can be activated and deactivated. On the one hand, this makes it possible for the nozzles of the respective component that happens to be in the maintenance position at the time to be deactivated, while the nozzles of the component in its operating position are activated. However, one or more nozzles can basically individually activate or deactivate one and the same component, for example to set the quantity of exiting medium to the characteristics of the wood particle stream, for example to the material, particle size, wood particle stream density, etc. For the latter purpose, one or more of the nozzles, in particular the majority of the nozzles, preferably each nozzle, of the first and/or additional component can be pivoted.

As defined above, the at least one nozzle is connected with the reservoir via a supply line. At least one pump is here preferably arranged between the reservoir and nozzle(s), which pumps or siphons the medium through the supply line, i.e., the medium is pressurized via the pump.

Another embodiment of the device according to the invention provides several supply lines, which connect the nozzles with the reservoir, wherein each supply line

supplies at least one of the nozzles. Each supply line can here be connected with its own pump, with which the medium can be pumped or siphoned through the supply line. As a consequence, closing one of several supply lines and/or stopping a pump also makes it possible to automatically deactivate the nozzles connected with this supply line. The nozzles are then activated when the supply line is opened. As a result, the quantity of medium to be used in wetting the wood particles can be controlled, preferably automatically. In this way, it is basically also conceivable to supply a further medium, for example an additive or emulsion. Additional supply lines can also be used for cleaning purposes. One or more of the supply lines can basically also be connected with another reservoir for corresponding other media, such as additives, emulsions or cleaning liquids.

In another embodiment of the device according to the invention, the at least one supply line, and preferably all supply lines, run(s) through the interior of the first and/or additional component. On the one hand, the supply lines are especially well protected in this way. On the other hand, the risk of wood particle clumping is further reduced.

Finally, in another embodiment of the device according to the invention, at least one guiding device, in particular at least one guide plate and/or air nozzle (a nozzle that is connected with the air reservoir or blows out air), is arranged in front of, next to and/or in back of the at least one nozzle, specifically in the running direction, and is configured in particular so as to deflect and/or reshape the wood particle stream as a result. The air

nozzles are not connected with the reservoir for the medium used to wet the wood particles of the wood particle stream. The guiding device is preferably arranged in or on at least one of the inner walls of the drop shaft. This type of guiding device optimally aligns the wood particle stream relative to the nozzles, and gives it the optimal shape, in particular that of a particle curtain, i.e., a particle stream that is comparatively wide in relation to its relatively small thickness.

According to a second teaching of the present invention, this object is further achieved by a method for wetting wood particles with a medium, in particular using a device of the kind describe above, in which the following steps are performed:

- generating a wood particle stream in a drop shaft, wherein the wood particles in the drop shaft in particular fall freely, i.e., are not exposed to an additional stream of air,
- spraying the medium onto the wood particles of the wood particle stream, which wets the wood particles, wherein the medium is sprayed from one site, meaning a location in the drop shaft, spaced apart from each inner wall of the drop shaft. Spraying here takes place via the nozzles.

In an embodiment of the method according to the invention, the medium is sprayed in a spraying direction that runs at an angle of at most 60°, preferably of at most 30°, especially preferably of at most 15°, relative to the running direction of the drop shaft. In particular,

the spraying direction and running direction are parallel.

In yet another embodiment of the method according to the invention, the quantity, spraying direction and/or spraying angle of the sprayed medium is set as a function of the properties of the wood particle stream, in particular as a function of the material, particle size and/or density of the particle stream. In particular, the adjustment takes place automatically. To this end, the device described above can exhibit a controller.

There are now a plurality of ways to configure and further develop the device according to the invention and method according to the invention. In this regard, let reference be made to the claims following claim 1 on the one hand, and to the description of exemplary embodiments in conjunction with the drawing on the other. The drawing shows:

- Fig. 1 a schematic side view of a device for wetting wood particles,
- Fig. 2 a component for use in the device on Fig. 1,
- Fig. 3a) to d) various cross sectional shapes of a component according to Fig. 2,
- Fig. 4 another side view of the device from Fig. 1, and

Fig. 5 a schematic depiction of the spraying direction and spraying angle of the component from Fig. 2.

Fig. 1 shows a device 1 for wetting wood particles 2 with a medium 3. The wood particles 2 are strands for OSB plate manufacture. The medium 3 is a liquid binding agent.

The device 1 exhibits a drop shaft 4, which has two opposing inner walls 4.1 and allows the wood particles 2 to fall freely in a running direction X that corresponds to the direction of the wood particle stream 2.1 or dropping direction of the wood particles. In the view shown on Fig. 1, the wood particles 2 are gathered in a container 11, which is arranged vertically above the drop shaft 4, and from which the individual wood particles 2 get into the drop shaft.

Two opposing broom rollers 12 shape the wood particle stream 2.1 into a curtain-shaped wood particle stream, also referred to as particle curtain, which in the further progression of the drop shaft 4 is sprayed as follows with the medium 3, here the binding agent.

The device 1 exhibits a plurality of nozzles 5, wherein the nozzles 5 are connected with a reservoir 7 for the medium 3 by means of supply lines 6, which are provided with a pump 6.1. The nozzles 5 are arranged on a first component 8.1 in the form of a nozzle bar 9, which projects into the interior of the drop shaft 4 in an operating position depicted on Fig. 1 and 4. As evident from the view on Fig. 1, the bar- or sword-shaped component 8.1 is situated in such a way that all nozzles

5 of this component are spaced apart from the inner walls 4.1 of the drop shaft 4 in the operating position. The drop shaft 4 is otherwise, i.e., except for the component 8.1, free of other components with nozzles, and also free of other nozzles, meaning that no nozzles are arranged in the inner walls or on the inner walls 4.1 of the drop shaft.

The curtain-shaped wood particle stream 2.1 in back of the broom rollers 12 runs in a vertical direction X past the nozzle bar 9, wherein the wood particle stream 2.1 is divided by the shape of the nozzle bar 9, and thereby sprayed from the inside out by the nozzles 5 arranged on the lower side 8a of the nozzle bar 9. In this way, the wood particles 2 are already at least partially wetted with the medium 3.

Located at the lower end of the drop shaft 4 in the present case is a mixing drum or screw 11, which by rotating mixes the wood particles 2 and medium 3, and also serves as a buffer. The mixed wood particle stream is then relayed from this mixing drum 11 to a continued production, which is no longer shown here. For example, continued production can involve a pressing device for manufacturing an OSB plate.

Fig. 4 shows a side view turned by 90° by comparison to Fig. 1. As visible here, a structurally identical additional component 8.2 is provided along with the first sword-shaped component 8.1. As denoted by an arrow, the first component 8.1 and the second component 8.2 joined thereto can be run parallel to the inner walls 4.1 of the drop shaft 4, specifically from an operating position

into a maintenance position. Component 8.1 is in its operating position on Fig. 4, and can be moved to the left into a maintenance position shown with a dashed line. At the same time, the component 8.2 is moved to the left out of the maintenance position shown on Fig. 4 into its operating position, and thereby replaces component 8.1.

As further shown on Fig. 4, several supply lines 6 are provided, which connect all nozzles 5 of both components 8.1 and 8.2 with the reservoir 7. The supply lines 6 here run through the interior of components 8.1 and 8.2. The latter is also depicted on Fig. 2, wherein it may be discerned here as well that each supply line 6 is connected with other nozzles 5.

As stated, the component shown on Fig. 2 is designed as a nozzle bar 9. According to the invention, however, a plate-shaped or ring-shaped component can be provided in place of such an oblong component.

Fig. 3 shows different cross sectional shapes for a component, in particular an oblong nozzle bar 9 or a ring-shaped component. The nozzles 5 are here each arranged on the lower side 8a. The respective component, i.e., the nozzle bar 9 in this case, here has a cross section that first expands and then tapers in the running direction X of the drop shaft 4, and thus forms a wing profile. The cross section of the nozzle bar 9 on Fig. 3a) is here oculiform. The cross section of the nozzle bar 9 on Fig. 3b) is elliptical. The cross section of the nozzle bar 9 on Fig. 3c) is oval, and the cross section of the nozzle bar 9 on Fig. 3d) is drop-shaped, wherein the

wider part of the profile points against the running direction X in the two last mentioned cross sections. As further evident from Fig. 3a) and d), the width (dimension transverse to the running direction X) of all shown alternatives of the component or nozzle bar 9 is wider than that of the nozzles 5, as a result of which the nozzles 5 cannot come into direct contact with the wood particle stream 2.1.

In the exemplary embodiments on Fig. 1 and 3a) to d), the spraying direction S of the nozzles 5 runs parallel to the running direction X of the drop shaft 4. However, the nozzles 5 can basically have a spraying direction S that runs at an angle to the running direction X, as depicted on Fig. 5. As a result, for example, the spraying direction S runs at an angle α of at most 60° , preferably of at most 30° , especially preferably of at most 15° , relative to the running direction X of the drop shaft 4. The spraying angle β of the nozzles 5 can here measure at most 45° , preferably at most 30° , especially preferably at most 15° .

In the method according to the invention shown on Fig. 1 to 5, a wood particle stream 2.1 is initially generated in a drop shaft 4, wherein the wood particles 2 fall freely in the drop shaft 4. Broom rollers 12 shape the wood particle stream 2.1 into a curtain, which is directed toward a nozzle bar-shaped component 8.1, whose lower side 8a accommodates several nozzles 5 that spray a binding agent as the medium 3 onto the wood particles 2 from a location spaced apart from each side wall 4.1 of the drop shaft. A controller 13 can here be used to in particular automatically set the quantity, spraying

direction θ and spraying angle β of the sprayed medium 3 as a function of the properties of the wood particle stream 2.1. Such properties can be the material, particle size, density, etc. of the wood particle stream 2.1.

BERENDEZÉS ÉS ELJÁRÁS FARÉSZECSKÉK NEDVESÍTÉSÉRE

SZABADALMI IGÉNYPONTOK

1. Berendezés (1) farészecskék (2) közeggel (3) való nedvesítésére, amely tartalmaz:
 - egy ejtőaknát (4), amely legalább egy belső fallal (4.1) rendelkezik és egy lefolyási irányban (X) a farészecskék (2) szabad esését engedi, és
 - legalább egy szórófejet (5), ahol a legalább egy szórófej (5) egy tápvezetéken (6) keresztül, a közeg (3) számára kialakított, tárolóval (7) van összekötve, ahol a berendezés (1) tartalmaz egy, üzemi pozícióban az ejtőakna (4) belsejébe benyúló első alkatrészt (8.1), **azzal jellemezve, hogy** az első alkatrész (8.1) egy szórófej tartó gerenda (9), ahol több szórófej (5) van elrendezve az első alkatrészen (8.1) és ahol minden, az első alkatrészen (8.1) elrendezett szórófej (5) üzemi pozícióban az ejtőakna (4) belső falaitól (4.1) adott távolságra van elhelyezve.
2. Az 1. igénypont szerinti berendezés (1), **azzal jellemezve, hogy** el van látva egy, az első alkatrészhez (8.1) csatlakozó további alkatrésszel (8.2), különösképp az első alkatrésszel (8.1) azonos kialakítású alkatrésszel (8.2), amely az ejtőakna (4) belsejében üzemi pozícióba mozgatható és legalább egy szórófej (5) van rajta elrendezve, amely az ejtőakna (4) belső falaitól (4.1) adott távolságra van, amikor a további alkatrész (8.2) az üzemi pozíciójában van.
3. Az 1. vagy a 2. igénypont szerinti berendezés (1), **azzal jellemezve, hogy** a távolság a belső falak (4.1) és a szórófejek (5) között az ejtőakna (4) egymással szemközt elhelyezkedő belső falai (4.1) közötti távolságának legalább 10%-a, előnyösebben legalább 20%-a, még előnyösebben legalább 30%-a.
4. A 2. vagy a 3. igénypont szerinti berendezés (1), **azzal jellemezve, hogy** a további alkatrész (8.2) egy szórófej tartó gerenda (9).
5. Az előző igénypontok egyike szerinti berendezés (1), **azzal jellemezve, hogy** az első és/vagy további alkatrészhez (8.1, 8.2) tartozó, egy vagy több szórófej (5) különösképp a szórófejek (5) többsége, előnyösen minden szórófej (5), az alkatrész (8.1, 8.2) lefolyási irányába (X) mutató alsó oldalán (8a) van elrendezve.

6. Az előző igénypontok egyike szerinti berendezés (1), **azzal jellemezve, hogy** az első és/vagy további alkatrészhez (8.1, 8.2) tartozó, egy vagy több szórófej (5) különösképp a szórófejek (5) többsége, előnyösen minden szórófej (5), rendelkezik egy permetezési iránnyal (S), amelynek szöge (α) az ejtőakna (4) lefolyási irányához (X) képest legfeljebb 60° , előnyösebben legfeljebb 30° , még előnyösebben legfeljebb 15° .
7. Az előző igénypontok egyike szerinti berendezés (1), **azzal jellemezve, hogy** az első és/vagy további alkatrésznek (8.1, 8.2) az ejtőakna (4) lefolyási irányában (X) szakaszonként vastagodó keresztmetszetük és/vagy a lefolyási irányában (X) eleinte szélesedő majd elvékonyodó keresztmetszetük van, ahol a keresztmetszet különösképp az elliptikus, tojás, szem és csepp keresztmetszet csoportból választott.
8. Az előző igénypontok egyike szerinti berendezés (1), **azzal jellemezve, hogy** az első alkatrész (8.1) mozgathatóan van rögzítve, előnyösen legalább szakaszonként a csúszdából eltávolítható.
9. A 2-8. igénypontok egyike szerinti berendezés (1), **azzal jellemezve, hogy** a további alkatrész (8.2) az ejtőakna (4) belsejébe mozgatható, ha az első alkatrészt (8.1) az ejtőaknából (4) kivesszük.
10. Az előző igénypontok egyike szerinti berendezés (1), **azzal jellemezve, hogy** az első és/vagy további alkatrészhez (8.1, 8.2) tartozó, egy vagy több szórófej (5) különösképp a szórófejek (5) többsége, előnyösen minden szórófej (5) aktiválható és deaktiválható és/vagy elfordítható.
11. Az előző igénypontok egyike szerinti berendezés (1), **azzal jellemezve, hogy** több tápvezetékekkel (6) rendelkezik, melyek összekötik a szórófejeket (5) a tárolóval (7), ahol minden tápvezeték (6) legalább egy szórófejet (5) táplál.
12. Az előző igénypontok egyike szerinti berendezés (1), **azzal jellemezve, hogy** legalább egy tápvezeték (6) az első és/vagy további alkatrész (8.1, 8.2) belsejében fut.
13. Eljárás farészecskék (2) közeggel (3) való nedvesítésére, különösképp az előző igénypontok alapján készült berendezés alkalmazásával, amelynek során a következő lépéseket hajtjuk végre:
 - farészecske áram (2.1) létrehozása egy ejtőaknában (4) és
 - közeg (3) permetezése a farészecske áram (2.1) farészecskéire (2)

ahol a közeg (3) egy olyan helyről (10) van permetezve, amely az ejtőakna (4) minden belső falától (4.1) adott távolságra van, **azzal jellemezve, hogy** a farészecske áram (2.1) függőleges irányban (X) egy szórófej tartó gerenda (9) mellett fut el, ahol a farészecske áramot (2.1) a szórófej tartó gerenda (9) formája által elosztja és a szórófej tartó gerenda (9) több szórófejével (5) belülről kifelé lepermetezi.

14. A 13. igénypont szerinti eljárás, **azzal jellemezve, hogy** a közeget (3) egy permetezési irányban (S) permetezzük, amelynek szöge (α), az ejtőakna (4) lefolyási irányához (X) képest legfeljebb 60° , előnyösen legfeljebb 30° , különösen előnyösen legfeljebb 15° .
15. A 13. vagy a14. igénypont szerinti eljárás, **azzal jellemezve, hogy** a mennyiséget, permetezési irányt (S) és/vagy a permetezési szöget (β) a farészecske áram (2.1) tulajdonságainak függvényében állítjuk be.

A meghatalmazott:

Mészárosné Dónusz Katalin
szabadalmi ügyvéd
SOGK Szabadalmi Ügyvédi Iroda
H-1067 Budapest, Andrássy út 133.
Telefon: +361-3400 Fax: +361-3400
Email: szk@szk.hu

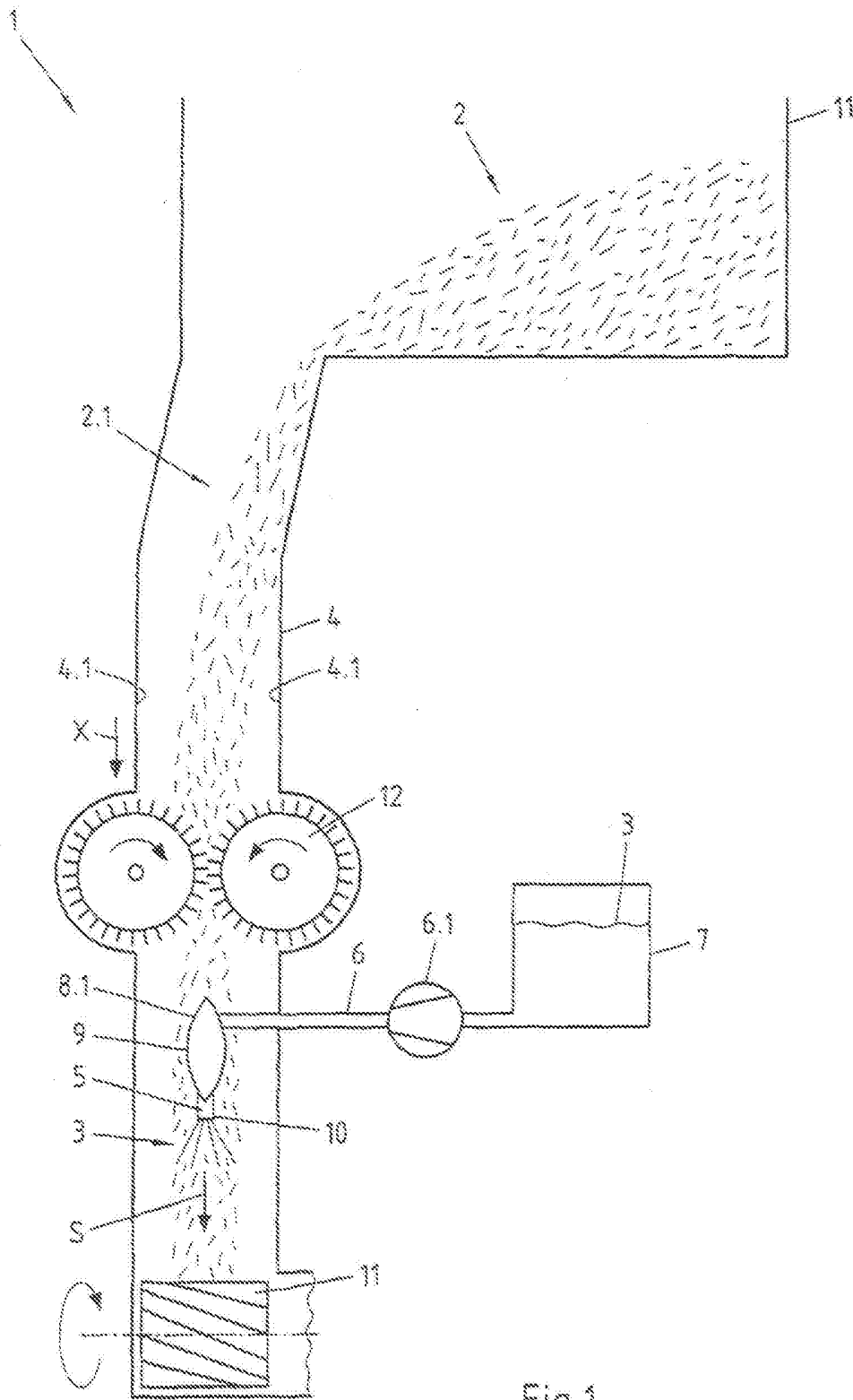


Fig.1

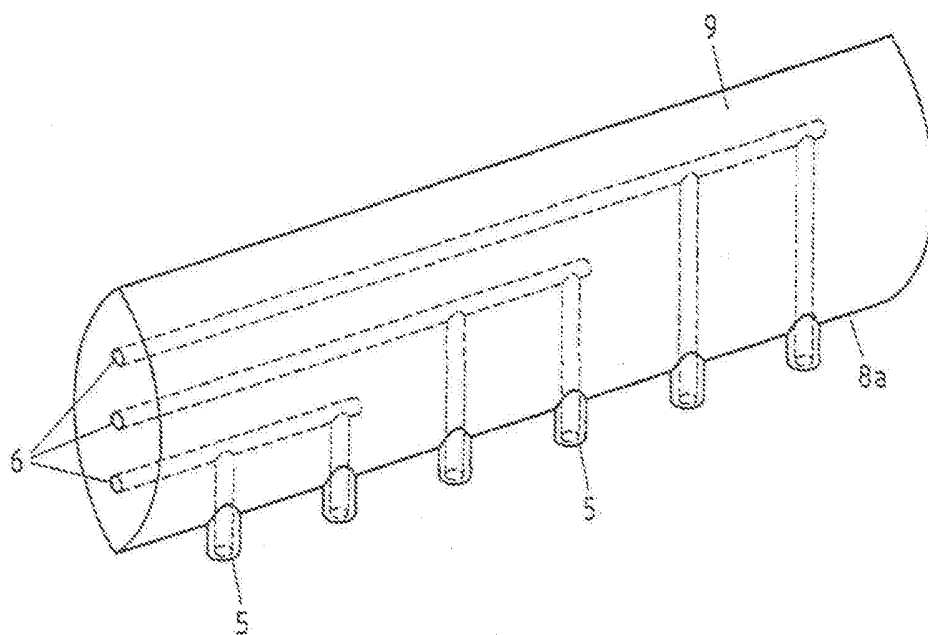


Fig. 2

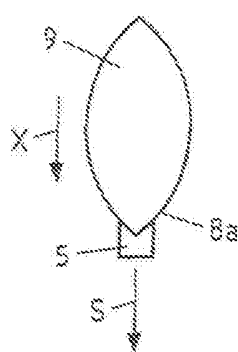


Fig. 3a

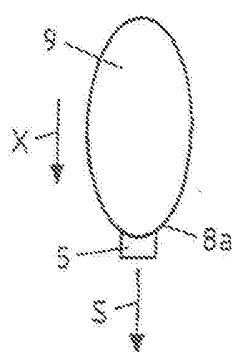


Fig. 3b

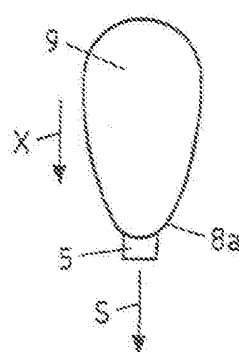


Fig. 3c

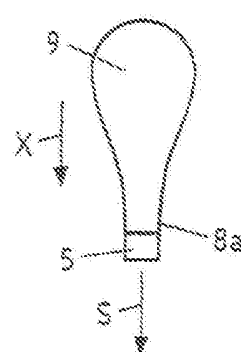


Fig. 3d

