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(54) **DISPERGER**

(57) A disperger (1) and a method for dispersing pulp. The disperger (1) comprises at least one stationary dispersing element (4) and at least one rotatable dispersing element (6) arranged substantially opposite to each other for forming a dispersing zone (10) between each oppositely positioned stationary (4) and rotatable (6) dispersing elements. The disperger (1) further comprises a rotatable shaft (11) coupled to the at least one rotatable

dispersing element (6), a rotating motor (12) coupled to the rotatable shaft (11) for rotating the at least one rotatable dispersing element (6), and at least one feed connection (14) for feeding the pulp to be dispersed into the disperger (1). The at least one feed connection (14) is arranged in the disperger (1) at least partly between the dispersing elements (4, 6) and the rotating motor (12).

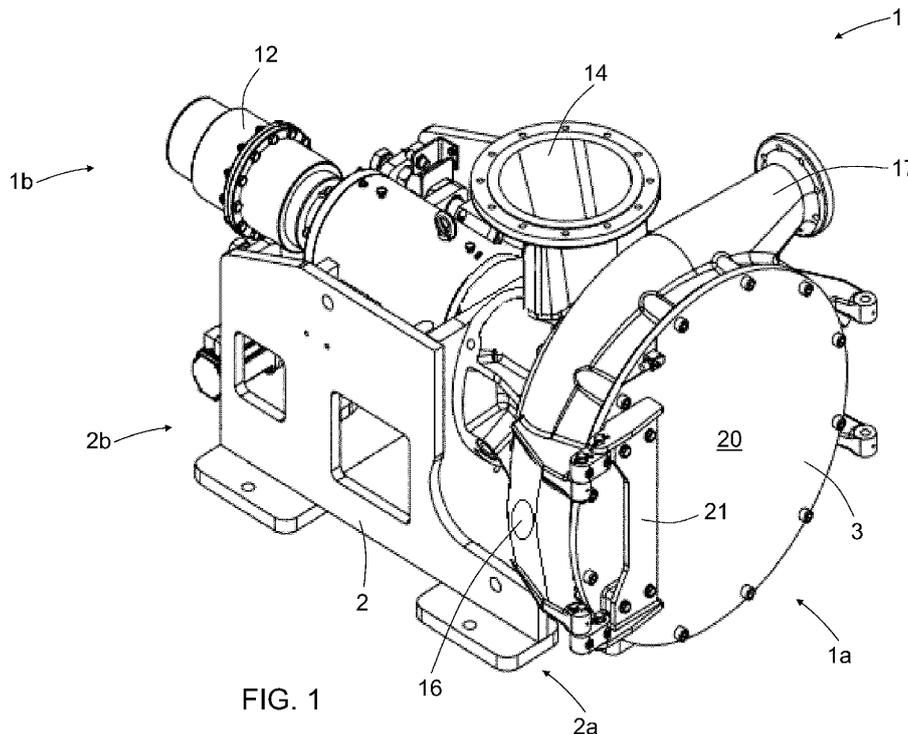


FIG. 1

Description

FIELD OF THE INVENTION

[0001] The invention relates to a disperger and a method for dispersing pulp.

BACKGROUND OF THE INVENTION

[0002] Recycling of wastepaper and packaging material as a source of raw material to new fibre-based products has long traditions, and its importance has increased in these days in terms of environment, energy, and sustainability.

[0003] When paper or paperboard is manufactured from pulp, and especially from pulp containing recycled fibres originating for example from wastepaper, recycled paperboard or packing board, or waste pulp, it is an intention to process different contaminants in the pulp before a formation of a paper web or a board web so that negative effects of the contaminants to the pulp as well as to a web forming in a paper or board machine are reduced. Said contaminants include for example printing inks and surface coating agents, such as different stickies, waxes, adhesives, and pastes, remaining in the wastepaper, recycled cardboard or packing board, or waste pulp.

[0004] Dispersing is one way to process different contaminants in the pulp to reduce the negative effects of the contaminants to the pulp and to the web forming in the paper or board machine. Dispersing of the pulp does not actually remove the contaminants from the pulp but in the dispersing the pulp is slushed or treated to diminish negative effects of the contaminants to a quality and a runnability of the pulp or to facilitate a removal of the contaminants in process stages following the dispersing. In the dispersing, among other things, contaminants such as printing ink particles attached to the fibres are detached from the fibres and made smaller so that they can be easily removed from the pulp in a flotation stage following the dispersing or, alternatively, to prevent them being visible in a finished paper or board web at least by visual examination. In the dispersing also sticky particles remaining in the pulp are broken up to prevent a formation of different contaminant aggregates which may have negative effects on the runnability of the pulp during the formation of the paper or board web and on the runnability of the formed paper or board web in the paper or board machine. Dispersing is not intended to cut or break the fibres but only to release fibres from the contaminants and to reduce particulate size of the contaminants.

[0005] Some dispergers of prior art comprise coaxial oppositely positioned disperger elements having either disc-like or conical forms and having a stationary dispersing element, i.e., a stator, and a rotatable dispersing element, i.e., rotor, the rotor being arranged to be rotated relative to the fixed stator. The stator and the rotor comprise dispersing surfaces configured to subject a dispers-

ing effect to the pulp to be dispersed. The pulp to be dispersed is fed into the disperger through a feed connection located on a front side of the disperger, the feed connection comprising a feed screw therein for intensifying the feed of the pulp into the disperger.

BRIEF DESCRIPTION OF THE INVENTION

[0006] An object of the present invention is to provide a novel disperger and a novel method for dispersing pulp.

[0007] The invention is characterized by the features of the independent claims.

[0008] The invention is based on the idea of arranging a feed connection of the disperger, or two or more feed connections of the disperger in case of the disperger comprising at least two feed connections, at least partly between the dispersing elements and the rotating motor of the disperger.

[0009] An advantage of the invention is a compact structure of the disperger with reduced length of the disperger when compared to prior art dispergers, thereby decreasing a space needed for the disperger. A further advantage is that a free space may be provided on a front-end side of the disperger, making it possible to arrange an easy access to the dispersing elements of the disperger.

[0010] Some embodiments of the invention are disclosed in the dependent claims.

BRIEF DESCRIPTION OF THE DRAWINGS

[0011] In the following the invention will be described in greater detail by means of preferred embodiments with reference to the accompanying drawings, in which

Figure 1 shows schematically a disc-like disperger as seen obliquely from above, and

Figure 2 is a schematic partial cross-sectional side view of the disc-like disperger of Figure 1.

[0012] For the sake of clarity, the figures show some embodiments of the invention in a simplified manner. Like reference signs identify like elements in the figures.

DETAILED DESCRIPTION OF THE INVENTION

[0013] Figure 1 is a schematic view of a disc-like disperger 1 as seen obliquely from above, the disperger 1 having a first end 1a, i.e., a front end 1a, and a second end 1b, i.e., a rear end 1b. Figure 2 is a schematic partial cross sectional side view of the disc-like disperger 1 of Figure 1. The disperger 1 may be used for dispersing fibrous material, i.e., pulp, and typically pulp containing recycled fibres originating for example from wastepaper, recycled paperboard or packing board, or waste pulp. An intention of the dispersing is to treat the pulp so that contaminants are released from the fibres so that the contaminants can be easily removed from the pulp in a flo-

tation stage following the dispersing or, alternatively, to prevent the contaminants being visible at least by visual examination in a finished paper or paperboard or other fibre product. Said contaminants include for example printing inks and surface coating agents, such as different stickies, waxes, adhesives, and pastes, remaining in the wastepaper, recycled paperboard or packing board, or waste pulp.

[0014] The disperger 1 comprises a disperger frame 2, having a first end 2a, i.e., a front end 2a, on a side of the first end 1a of the disperger 1, and a second end 2b, i.e., a rear end 2b, on a side of the second end 1 of the disperger 1. At the first end 2a of the frame 2 there is a disperger housing 3 contributing to define a dispersing chamber 3' that is intended to accommodate dispersing elements that will subject a dispersing effect to the pulp to be dispersed. The disperger housing 3, and consequently the dispersing chamber 3', has a first end 3a, i.e., a front end 3a, on the side of the first end 2a of the frame 2 and a second end 3b, i.e., a rear end 3b, on the side of the second end 2b of the frame 2.

[0015] The disperger 1 further comprises, in the dispersing chamber 3', a stationary, fixed disc-like dispersing element 4, i.e., a disc-like stator 4. The stator 4 comprises a number of, i.e., one or more, dispersing plates 5 for the stator 4. The dispersing plate/plates 5 is/are attached to the disperger frame 2 in the dispersing chamber 3', either directly or indirectly by an appropriate connecting piece. The disperger plate/plates 5 is/are detachable for replacing a worn or broken plate 5 with a new one.

[0016] The disperger 1 further comprises, in the dispersing chamber 3', a rotatable disc-like dispersing element 6, i.e., a disc-like rotor 6. The rotor 6 comprises a hub 7 and a rotor disc 8 attached to the hub 7, the hub 7 and the rotor disc 8 together forming a frame of the rotor 6. The rotor 6 further comprises a number of, i.e., one or more, dispersing plates 9 for the rotor 6. The dispersing plate/plates 9 is/are attached to the rotor disc 8. The disperger plate/plates 9 is/are detachable for replacing a worn or broken plate 9 with a new one.

[0017] The stator 4 and the rotor 6 are arranged in the dispersing chamber 3' substantially opposite to each other such that there is a small gap between the stator 4 and the rotor 6. This small gap between the stator 4 and the rotor 6 forms a dispersing zone 10 of the disperger 1, wherein the dispersing effect subjected to the pulp to be dispersed takes place when the disperger 1 is in operation and the rotor 6 is rotated relative to the stator 4.

[0018] The disperger plates 5, 9 comprise dispersing surfaces facing towards each other, i.e., facing towards the dispersing zone 10. The dispersing surfaces typically comprise projecting parts, such as teeth or the like, as well as cavities between the projecting parts. The cavities may be grooves but most often they are planar areas between the projecting parts. When the rotor 6 is rotated relative to the stator 4, the projecting parts in the dispersing surfaces of the stator 4 and the rotor 6 cause impacts to the pulp to be dispersed, these impacts causing, to-

gether with effects of internal friction in the pulp, the contaminant particles to detach from the fibres and break down into smaller pieces. Various implementations of the dispersing surfaces are well known for a person skilled in the art and therefore they are not considered in more detail herein.

[0019] The disperger 1 further comprises a rotatable shaft 11 coupled to the rotor 6, in practice to the hub 7 of the rotor 6, and a rotating motor 12 coupled to the rotatable shaft 11 at the second end 1b of the disperger 1, the rotating motor 12 thus being coupled to the rotor 6 by the rotatable shaft 11. The rotating motor 12 is intended to rotate the rotor 6 relative to the stator 4 in a direction of arrow R, for instance, the arrow R thus indicating an intended rotation direction R of the rotor 6. In response to the rotation of the rotor 6 the dispersing surface in the rotor 6 rotates relative to the dispersing surface in the stator 4 and the dispersing effect is subjected to the pulp to be dispersed in the dispersing zone 10 as discussed above.

[0020] The disperger 1 may further comprise at least one loading device 13 that is coupled to the rotatable shaft 11. The at least one loading device 13 is arranged to move the rotatable shaft 11 in an axial direction thereof back and forth, as schematically shown by arrow A, for moving back and forth the rotor 6 attached to the shaft 11, i.e., by moving the rotor 6 either away from the stator 4 or towards the stator 4, for adjusting a size of the dispersing zone 10 between the stator 4 and the rotor 6. The axial direction of the rotatable shaft 11 may also be considered to disclose an axial direction of the disperger 1.

[0021] The disperger 1 further comprises a feed connection 14 for feeding the pulp to be dispersed into the disperger 1. The feed connection 14 has a first end 14a for receiving the pulp to be dispersed, the first end 14a being intended to be connected to a pipeline (not shown) carrying the pulp to the disperger 1. The feed connection 14 has a second end 14b fitted inside the disperger 1 for feeding the received pulp into the disperger 1. A consistency of the pulp to be supplied into the disperger 1 is usually quite high, such as about 15 to 45%, preferably about 20 to 40%. The dispersing of the pulp is preferably carried out in high consistencies, because in low consistencies a freeness of the pulp decreases, leading to a decrease in an applicable running speed of the paper or board machine. The pulp already dispersed in the disperger 1 is discharged out of the disperger 1 through a discharge outlet 15.

[0022] The shaft 11 has a first end 11a coupled to the rotor 6 and a second end 11b coupled to the rotating motor 12. The shaft 11 is supported with bearings 22 at its central part on the side rotating motor 12 relative to the feed connection 14. The shaft 11 is, however, at least from the feed connection 14 up to the first end 11a of the shaft 11 free from bearings, i.e., without comprising supporting bearings, or floating, so to speak, which simplifies the adjustment or control of the size of the dispersing

zone 10 between the stator 4 and the rotor 6 by moving the rotor 6 either away from the stator 4 or towards the stator 4. The placement of the rotor 6 at the one end, i.e., the first end 11a, of the shaft 11 has also the effect of minimizing the length of the shaft 11 and the length of the disperger 1, correspondingly.

[0023] In the embodiment of the Figures, there is also a dilution water inlet 16 for supplying dilution water into the dispersing chamber 3' for decreasing the consistency of the pulp, for example to the consistency of about 4 to 10%, preferably to the consistency of about 6 to 8% and a discharge connection 17 for discharging the pulp dispersed in this lower consistency out the disperger 1. When the pulp dispersed in the lower consistency is discharged out of the disperger 1, the discharge outlet 15 for discharging the pulp dispersed in the higher consistency is closed.

[0024] In the embodiment of the Figures, the feed connection 14 is arranged between the dispersing elements 4, 6 and the rotating motor 12 of the disperger 1 such that both the first end 14a and the second end 14b of the feed connection 14 is located between the disperger elements 4, 6 and the rotating motor 12 in the direction from the first end 1a and the second end 1b of the disperger 1, i.e., in the axial direction of the disperger 1. Other arrangements, wherein at least the second end 14b of the feed connection 14 is in the disperger 1 between the dispersing elements 4, 6 and the rotating motor 12 so that the pulp received through the first end 14b of the feed connection 14 is discharged into the disperger 14 between the disperger elements 4, 6 and the rotating motor 12 through the second end 14 the feed connection 14, are possible.

[0025] The disclosed solution makes the structure of the disperger compact by decreasing the length of the disperger in view of prior art dispergers, thereby decreasing a space requirement for the disperger. The length of the disperger decreases because the feed screw and a drive thereof remaining on the front-end side of the prior art dispergers may be omitted. The disclosed disperger is simpler, cheaper and easier to maintain than the prior art dispergers.

[0026] A further advantage of arranging the feed connection 14 between the dispersing elements 4, 6 and the rotating motor 12 is that a free space may easily be provided on the front-end side of the disperger 1, whereby an openable front-end plate 20 of the disperger housing 3 may be arranged at the front end 3a of the disperger housing 3 to allow an easy access into an interior of the dispersing chamber 3' for carrying out maintenance operations subjected to the stator 4 and the rotor 6, as discussed in more detail below.

[0027] The pulp fed into the disperger 1 through the feed connection 14 is further fed towards the dispersing zone 10 in an axial direction of the rotatable shaft 11 through an opening 18 extending through the second end 3b of the disperger housing 3 and a centre part of the dispersing element remaining on the side of the second

end 3b of the disperger housing 3, i.e., on the side of the second end 14b of the feed connection 14, that dispersing element being, in the embodiment of the Figures the stator 4 of the disperger 1. According to an embodiment the pulp may be fed towards the dispersing zone 10 by an effect of pressure affecting in a piping that conveys the pulp to the disperger 1 but a feed screw 19 may be applied to intensify the feed of pulp towards the dispersing zone 10, as discussed in more detail below.

[0028] According to the embodiment of the Figures, the disperger 1 further comprises a feed screw 19 at the second end 14b of the feed connection 14. The feed screw 19 is arranged to extend from the feed connection 14 towards the dispersing zone 10 to intensify the flow of the pulp to be dispersed towards the dispersing zone 10 in the axial direction of the rotatable shaft 11 through the opening 18 extending through the second end 3b of the disperger housing 3 and the centre part of the stator 4. The feed screw 19 is coaxial with the rotatable shaft 11 and, in the embodiment of the Figures, the feed screw 19 is coupled to the rotor 6, and to be more exact, to the hub 7 of the rotor 6. Alternatively, or additionally, the feed screw 19 may be coupled to the rotatable shaft 11. When the feed screw 19 is coupled to the rotor 6 and/or to the rotatable shaft 11, the feed screw 19 is arranged to rotate in response to the rotation of the rotor 6 and the rotatable shaft 11, whereby the feed screw 19 intensifies the feed of the pulp received from the feed connection 14 towards the dispersing zone 10 through the opening 18. Because the feed screw 19 is coupled to the rotor 6 and/or to the rotatable shaft 11, a separate motor needed in prior art for operating the feed screw may now be omitted, which reduces the costs of the disperger. Further, to intensify the flow of the pulp into the dispersing zone 10, the hub 7 of the rotor 6 may be provided with a number of feeder plates 7' that assist in directing the flow of the pulp into the dispersing zone 10.

[0029] In the embodiment of the Figures the stator 4 is arranged in the dispersing chamber 3' on the side of the feed connection, or in other words, on the side of the second end 3b of the disperger housing 3, and the dispersing plates 6 of the stator 4 are attached to an inner surface of the disperger housing 3 at the second end 3b thereof. The rotor 6 is arranged, in turn, on an opposite side of the dispersing chamber 3', or in other words, on the side of the first end 3a of the disperger housing 3. The feed screw 19 extends through the centre part of the stator 4 from the location of the second end 14b of the feed connection 14 substantially up to the dispersing zone 10 for feeding the pulp to be dispersed towards the dispersing zone 10. Generally, in the embodiment disclosed herein, of all the dispersing elements of the disperger the stationary dispersing element is arranged to be closest to the at least one feed connection. When a stationary dispersing element is arranged on the side of the second end 3b of the disperger housing 3, a sealing of the dispersing chamber 3' is simpler than in an embodiment disclosed below, wherein a rotatable dispers-

ing element is arranged on the side of the second end 3b of the disperger housing 3.

[0030] During the maintenance operation of the disperger 1 of the Figures, and especially during the maintenance operations subjected to the stator 4 and the rotor 6 in the dispersing chamber 3', the front-end plate 20 is opened, allowing the access into the dispersing chamber 3'. Thereafter the rotor 6 may be detached from the shaft 11 and removed outside from the dispersing chamber 3', thereby allowing an easy access to the dispersing plates 5, 9 of the stator 4 and the rotor 6. A special tool that may be integrated with or coupled to the disperger housing 3 may be applied for detaching the rotor 6 from the shaft 11 for removing the rotor 6 away from the front of the stator 4. The said tool is intended to be attached to the rotor 6 before detaching the rotor 6 from the shaft 11 and thereafter to support the rotor 6 detached from the shaft 11 until the rotor 6 is attached back to the shaft 11. One possible tool for that purpose is shown schematically in the Figures and denoted with reference sign 21.

[0031] According to another embodiment that is not disclosed in the drawings, the rotor 6 is arranged in the dispersing chamber 3' on the side of the feed connection 14 or in other words, on the side of the second end 3b of the disperger housing 3. The stator 4 is arranged, in turn, on an opposite side of the dispersing chamber 3', or in other words, on the side of the first end 3a of the disperger housing 3, whereby the dispersing plates 5 of the stator 4 may be attached to an inner surface of the openable front-end plate 20 of the disperger housing 3. In this embodiment the feed screw 19 extends from the location of the second end 14b of the feed connection 14 substantially up to the dispersing zone 10 for feeding the pulp to be dispersed towards the dispersing zone 10. Generally, in the embodiment disclosed herein, of all the dispersing elements of the disperger the stationary dispersing element is arranged to be farthest away from the at least one feed connection. In this embodiment, the feed screw 19 thus extends through the centre part of the rotor 6 from the location of the second end 14b of the feed connection 14 substantially up to the dispersing zone 10 for feeding the pulp to be dispersed towards the dispersing zone 10.

[0032] During the maintenance operation of the disperger of that kind of embodiment, and especially during the maintenance operations subjected to the stator 4 and the rotor 6 in the dispersing chamber 3', the front-end plate 20 is opened, allowing the access into the dispersing chamber 3'. If the dispersing plates 5 of the stator 4 are attached to the inner surface of the openable front-end plate 20 of the disperger housing 3, the opening of the front-end plate 20 allows an immediate access to the dispersing plates 5 of the stator 4 as well as to the dispersing plates 9 of the rotor 6 without a need for any tool 21 or other arrangements or actions for removing the stator 4 away from the front of the rotor 6.

[0033] In the disperger 1 disclosed above there is only one single stationary dispersing element 4, i.e., the stator

4, and only one single rotatable dispersing element 6, i.e., a rotor 6, and thereby only one single dispersing zone 10 between the single stator 4 and the single rotor 6. However, the disclosed solution may also be applied in dispergers with two or more stators 4 and/or with two or more rotors 6, and therefore, consequently, in dispergers with two or more dispersing zones 10. Furthermore, in the disperger 1 disclosed above, there is only a single feed connection 14 but the disperger may also comprise two or more feed connections 14. Thus, generally, the disclosed solution may be applied in a disperger comprising at least one stationary dispersing element and at least one rotatable dispersing element arranged substantially opposite to each other for forming a dispersing zone between each oppositely positioned stationary and rotatable dispersing elements, whereby the pulp may be subjected to the dispersing effect in one or more dispersing zones, depending on the number of the stators and the rotors in the disperger. In the dispergers like that, the at least one feed connection is arranged in the disperger at least partly between the dispersing elements and the rotating motor, in the direction between the first end of the disperger and the second end of the dipserger, i.e., at least the second end of the at least one feed connection is between the dispersing elements and the rotating motor in the direction from the first end of the disperger towards the second end of the disperger.

[0034] Furthermore, in the description above, the solution and its embodiments are presented in a disc-like disperger comprising disc-like dispersing elements. However, the solution and its various embodiments disclosed above, by possibly for example replacing the attachment of the stationary dispersing element to the end structures of the disperger housing with the attachment of the stationary dispersing element to an inner circumference of the disperger housing, may be applied correspondingly also in a conical disperger comprising conical dispersing elements.

[0035] It will be obvious to a person skilled in the art that, as the technology advances, the inventive concept can be implemented in various ways. The invention and its embodiments are not limited to the examples described above but may vary within the scope of the claims.

Claims

1. A disc-like disperger (1) for dispersing pulp, the disperger (1) comprising

at least one stationary disc-like dispersing element (4) and at least one rotatable disc-like dispersing element (6) arranged substantially opposite to each other for forming a dispersing zone (10) between each oppositely positioned stationary (4) and rotatable (6) dispersing elements, in which dispersing zone (10) a dispers-

- ing effect is subjected to the pulp to be dispersed,
 a rotatable shaft (11) coupled to the at least one rotatable dispersing element (6) and a rotating motor (12) coupled to the rotatable shaft (11) for rotating the at least one rotatable dispersing element (6),
 at least one feed connection (14) for feeding the pulp to be dispersed into the disperger (1),
characterized in that
 the at least one feed connection (14) is arranged in the disperger (1) at least partly between the dispersing elements (4, 6) and the rotating motor (12), and
 the disperger (1) comprises a feed screw (19) arranged to extend from the at least one feed connection (14) towards the at least one dispersing zone (10).
2. A disperger as claimed in claim 1, **characterized in that**
 the at least one feed connection (14) comprises a first end (14a) for receiving the pulp to be dispersed and a second end (14b) for discharging the pulp into the disperger (1), and that at least the second end (14b) of the at least one feed connection (14) is in the disperger (1) between the dispersing elements (4, 6) and the rotating motor (12).
3. A disperger as claimed in claim 1 or 2, **characterized in that**
 the feed screw (19) is coaxial with the rotatable shaft (11) and arranged around at least one of the following: a hub (7) of the at least one rotatable dispersing element (6) and the rotatable shaft (11).
4. A disperger as claimed in claim 3, **characterized in that**
 the feed screw (19) is coupled to the at least one of the following: the hub (7) of the at least one rotatable dispersing element (6) and the rotatable shaft (11), whereby the feed screw (19) is arranged to rotate in response to a rotation of the at least one rotatable dispersing element (6) and to feed the pulp received from the at least one feed connection (14) towards the at least one dispersing zone (10).
5. The disperger as claimed in any one of the preceding claims, **characterized in that**
 the disperger (1) comprises a disperger housing (3) contributing to define a dispersing chamber (3') arranged to accommodate the dispersing elements (4, 6), the disperger housing (3) comprising a first end (3a) facing away from the at least one feed connection (14) and a second end (3b) facing towards the at least one feed connection (14), and that the first end (3a) of the disperger housing (3) comprises an openable front-end plate (20) allowing an access into the disperger housing (3).
6. A disperger as claimed in any one of the preceding claims, **characterized in that**
 of all the dispersing elements (4, 6) of the disperger (1) a stationary dispersing element (4) is arranged to be closest to the at least one feed connection (14).
7. A disperger as claimed in claims 5 or 6, **characterized in that**
 the said stationary dispersing element (4) is arranged in the dispersing chamber (3') at the second end (3b) of the disperger housing (3).
8. A disperger as claimed in any one of claims 1 to 5, **characterized in that**
 of all the dispersing elements (4, 6) a stationary dispersing element (4) is arranged to be farthest away from the at least one feed connection (14).
9. A disperger as claimed in claims 5 and 8, **characterized in that**
 the said stationary dispersing element (4) is arranged in the dispersing chamber (3') at the openable front-end plate (20) of the disperger housing (3).
10. A method for dispersing pulp in a disc-like disperger (1) that comprises
 at least one stationary disc-like dispersing element (4) and at least one rotatable disc-like dispersing element (6) arranged substantially opposite to each other for forming a dispersing zone (10) between each oppositely positioned stationary (4) and rotatable (6) dispersing elements, in which dispersing zone (10) a dispersing effect is subjected to the pulp to be dispersed,
 a rotatable shaft (11) coupled to the at least one rotatable dispersing element (6) and a rotating motor (12) coupled to the rotatable shaft (11) for rotating the at least one rotatable dispersing element (6),
 at least one feed connection (14) for feeding the pulp to be dispersed into the disperger (1),
characterized by
 feeding the pulp to be dispersed into the disperger (1) between the dispersing elements (4, 6) and the rotating motor (12), and by feeding the pulp fed into the disperger (1) towards the at least one dispersing zone (10) in an axial direction of the rotatable shaft (11) by a feed screw (19) arranged to extend from the at least one feed connection (14) towards the at least one dispersing zone (10).

11. A method as claimed in claim 10, **characterized by** feeding the pulp fed into the disperger (1) towards the at least one dispersing zone (10) by a feed screw (19) coupled to the at least one of the following: a hub (7) of the at least one rotatable dispersing element (6) and the rotatable shaft (11), whereby the feed screw (19) is arranged to rotate in response to a rotation of the at least one rotatable dispersing element (6) and to feed the pulp received from the at least one feed connection (14) towards the at least one dispersing zone (10).
12. A method as claimed in claim 10 or 11, **characterized by** a consistency of the pulp to be fed into the disperger (1) being about 15 to 45%, preferably about 20 to 40%.

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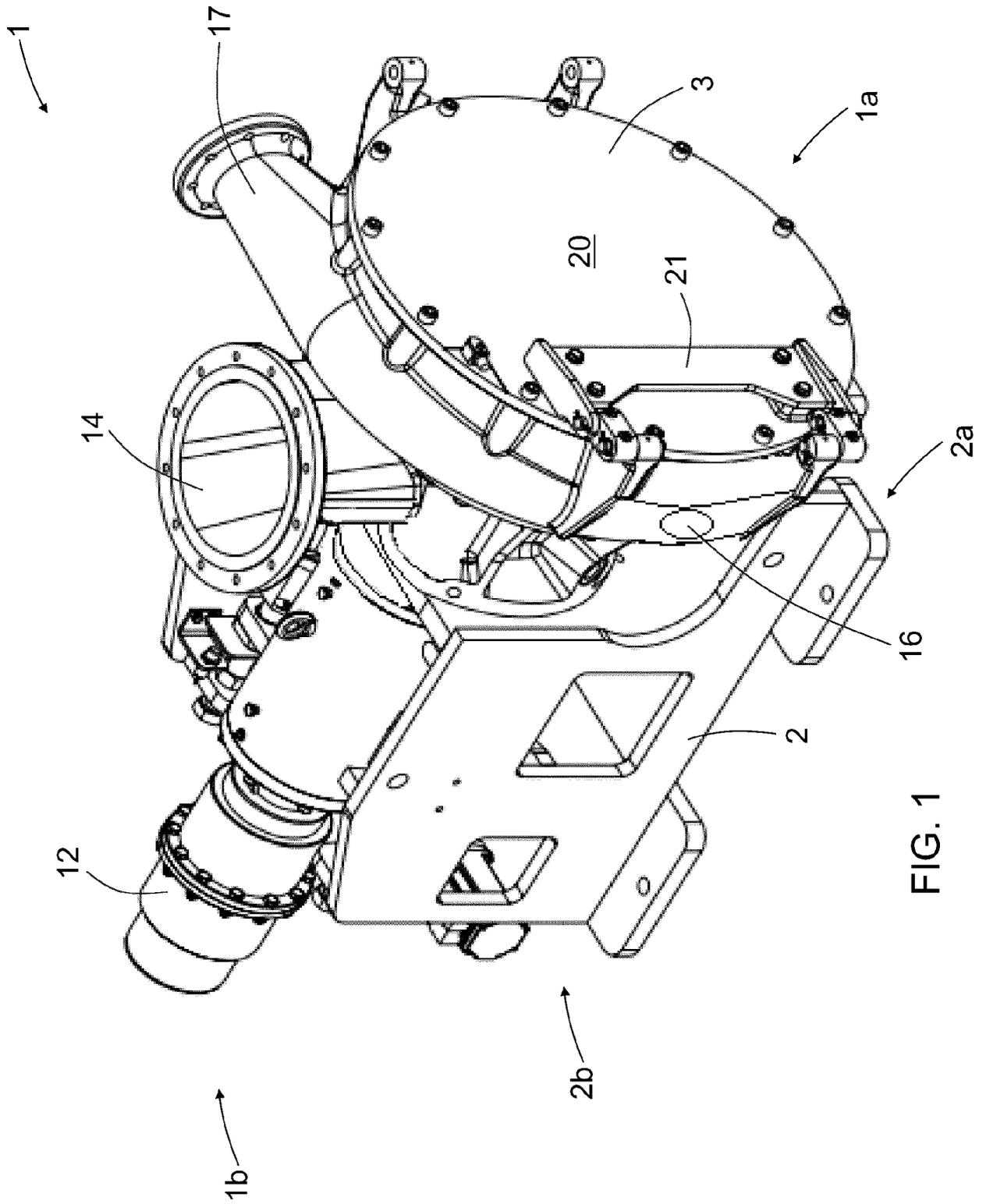


FIG. 1

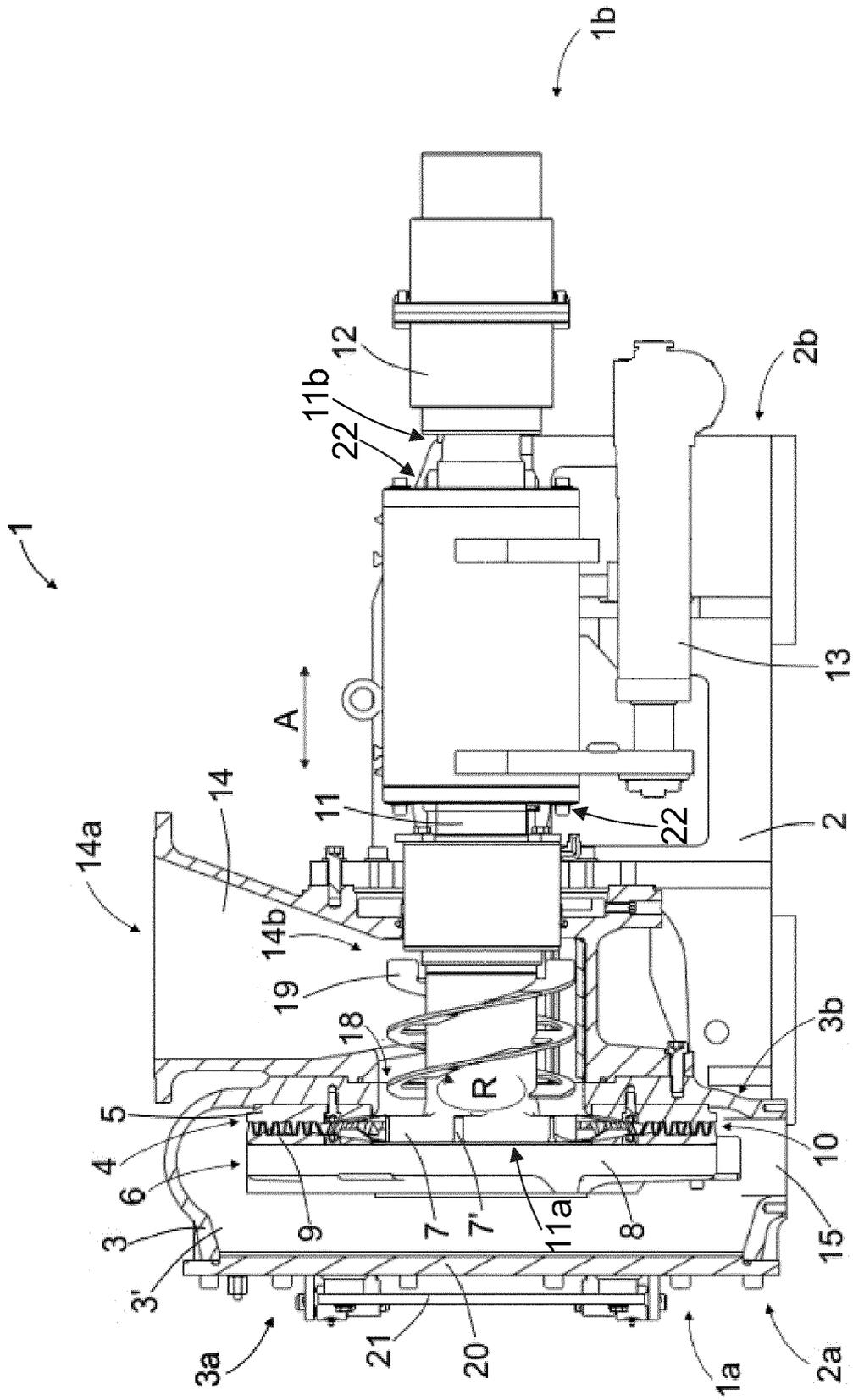


FIG. 2



EUROPEAN SEARCH REPORT

Application Number
EP 23 19 7874

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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)
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The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 8 February 2024	Examiner Swiderski, Piotr
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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EPO FORM 1503 03:82 (P04C01)

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

EP 23 19 7874

5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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