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Feeder channel for diluting fluid
Zuführkanal für Verdünnungsfluid
Canal de distribution pour fluide de dilution

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Description

Background of the invention

[0001] The object of the invention is a feeder channel for diluting fluid, such as for diluting water, as defined in the preamble of claim 1, which feeder channel is fitted in connection with the headbox of a paper machine for feeding diluting water into the stock flow.

[0002] Some solutions are known in the art for feeder channels for diluting fluid, such as for diluting water, which feeder channels are in connection with the headbox of a paper machine and have the purpose of supplying diluting water to the stock flow. One such solution is described in publication FI 112260 B, which publication presents a proportioning device for the headbox of a paper machine, which proportioning device is used, inter alia, to feed fluids into the stock flow (to the input point of the stock) of the paper machine. The solution presented in the publication comprises at least one chamber, which functions as a receiving space for flowing medium, and in connection with the chamber are proportioning apertures in connection with which are throttling devices with which the passage of a flowing substance, i.e. the diluting water of a paper machine, into that space of the headbox in which the stock suspension flows can be adjusted. In the solution according to the publication a throttling device comprises a conical seating means, which is in connection with the proportioning aperture such that the flow can be adjusted (or, if desired, the flow can be prevented completely) by moving the seating means in the proportioning aperture.

[0003] Solutions according to prior art have certain drawbacks. A problem in solutions according to prior art is that by means of them a precisely and reliably adjusted passage of diluting fluid into the stock flow space is not obtained, because the throttling device in them is usually conical and impurities that are in the diluting water can remain between the conical throttling means and the proportioning aperture. Especially if retention is used, i.e. a fluid that can contain particles is used as the diluting water, this might cause a gap to remain between the throttling means and the edges of the proportioning aperture, in which case the passage of diluting fluid into the stock flow cannot be prevented or adjusted accurately.

[0004] Another drawback of prior art is the sensitivity to vibration of the seating of the proportioning device (or in other words of the shut-off/adjustment means) for diluting fluid as presented in the aforementioned publication, and of its arm (at the end of which arm the seating is). The seating presented in the publication is a conical seating that is at the end of a long protrusion, i.e. an arm. The seating does not receive support from its proportioning aperture (from the edges of the proportioning aperture) in the lateral medium flow produced as a result of the flow passing via the aperture (the flow produces excitations), and the seating is then, owing to that, extremely sensitive in relation to lateral vibration. For eliminating vibration the arm of the seating should be thick in cross-section and the arm should be short and/or the support of the arm should be rigid, and this is very undesirable.

[0005] In addition, in prior-art solutions the diluting fluid is conducted from the storage space for diluting fluid into the stock flow space containing stock suspension via some intermediate piece, and owing to this additional parts, such as piping et cetera are needed in it.

[0006] Document EP 0674042 A1 discloses a dosing apparatus for addition or removal of fluids to or from a paper machine applicator. The dosing apparatus has at least two openings with a transverse spacing connected to at least one applicator chamber into which the paper pulp flows during operation. The dosing apparatus has at least one fluid reception chamber containing dosage openings equipped with adjustable throttle devices to control the dosage of the added or removed fluid.

[0007] US 2004/011412 A1 discloses a skirt guided control valve providing streamlined flow and minimum resistance to flow in flow up and flow down conditions when the valve is open. The skirt guided control valve has a fluid inlet, a fluid outlet, a passageway disposed between the fluid inlet and fluid outlet, a valve seat and a valve plug with a skirt. The valve seat and the skirt portion of the valve plug include blended edges and contoured surfaces to provide for streamlined flow.

[0008] The aim of the present invention is to achieve a new type of solution for a feeder channel for diluting water, with which the problems occurring in prior-art solutions can be avoided.

Brief description of the invention

[0009] The solution according to the invention is characterized by what is disclosed in the characterization part of the independent claim 1. Additionally, the solution according to the invention is characterized by what is disclosed in the dependent claims 2-17.

[0010] The solution according to the invention now being presented has some significant advantages when it is compared to solutions that are known and used.

[0011] With the solution now presented such a solution for a feeder channel for diluting fluid, such as for diluting water, is achieved that with it diluting fluid can be precisely, reliably and in a simple manner fed directly into the stock flow by means of the feeder channel.

[0012] In the solution according to the invention the shut-off/adjustment means fitted into the feeder channel for diluting fluid, with which means the flow of diluting fluid into the stock flow space is adjusted, is shaped such that with it the flow of diluting fluid can be rather accurately and effectively adjusted.

[0013] In the solution according to the invention the shut-off/adjustment means fitted into the feeder channel, with which means the flow of diluting fluid into the stock flow space is adjusted, is also insensitive in relation to vibration, i.e. it is possible in it to effectively prevent very detrimental and undesirable vibration of the shut-off/adj-
justment means.

[0014] In the solution according to the invention the shut-off/adjustment means receives support from the inside surface/inside surfaces of the aperture that is in the wall of the feeder channel and lateral and detrimental movement of the arm of the shut-off/adjustment means, and at the same time of the shut-off/adjustment means, is prevented and detrimental vibration of the adjustment means is not able to initiate. In the solution according to the invention support on the inside surfaces of the aperture occurs at least always during operation of the shut-off/adjustment means, i.e. when the diluting fluid flows from the diluting fluid space into the stock flow space. In addition, the diluting fluid in the gap that is between the adjustment means and the side surface/side surfaces of the aperture brings about hydrodynamic damping, i.e. this also prevents vibration of the shut-off/adjustment means and of the arm of same.

[0015] Another advantage of the invention is that it is durable, operationally reliable, and wholly or at least partly service-free. Another advantage of the invention is that it is easy to implement.

Brief description of the figures

[0016] In the following, the invention will be described in more detail by the aid of some examples of its embodiment with reference to the drawings 1-9b, wherein,

Figs. 1a and 1b present a side view of a feeder channel for diluting fluid according to the invention.

Fig. 1c presents a side view of a feeder channel for diluting fluid according to the invention when fitted to a headbox.

Fig. 1d presents an embodiment of a feeder channel for diluting fluid according to the invention, fitted to a headbox.

Figs. 2a-2d present an embodiment of a shut-off/adjustment means, with which the passage of diluting fluid is adjusted, in a feeder channel for diluting fluid according to the invention, and the figures also present the support of the shut-off/adjustment means on the edges of the aperture that is in the feeder channel.

Figs. 3a-9b present from different perspectives some possible shapes of a shut-off/adjustment means fitted into a feeder channel.

Detailed description of the invention

[0017] The feeder channel 1 according to the invention for diluting fluid, such as for diluting water, presented by Figs. 1a and 1b, which feeder channel is in connection with the headbox 10 (headbox 10 presented in Figs. 1c and 1d) of a paper machine, comprises one or more reservoir-type spaces 7, such as a chamber, for receiving diluting fluid, such as water, and one or more walls 4, 8 forming the space 7. An aperture 13 is formed in the reservoir-type space 7, via which aperture the diluting fluid can be conducted into the stock flow space 9 of the headbox. The stock flow space 9 comprises a number of individual flow channels, such as e.g. pipes, i.e. it is not usually an open flow space, however a type of stock flow space that contains only one flow channel is also conceivable (the stock flow space 9 is not presented in the figures in more detail).

[0018] One or more shut-off/adjustment means 5, with which the flow of diluting fluid via the aforementioned aperture 13 can be adjusted and/or the flow can be prevented, is fitted into the feeder channel 1, as is presented in the situation of Fig. 1a.

[0019] The shut-off/adjustment means 5 is a movable (shut-off/adjustment means being partly or wholly inside the aperture) shut-off/adjustment means 5 that is in connection with the aperture 13 formed in the wall 4 (preferably the base of same) of the reservoir-type space, which shut-off/adjustment means comprises one or more cavities and/or recesses 6, 14 (Figs 2a and 2b) via which cavity/cavities/recess/recesses the flow of diluting fluid from the reservoir-type space 7 either directly or indirectly (via an intermediate piece 11, as presented in Fig. 1d) into the stock flow space 9 can be adjusted by moving the shut-off/adjustment means in the aperture 13, in which case the diluting fluid 12 is able to flow into the stock flow space via a cavity/recess 6, 14, such as is presented as a sectioned side view in Fig. 1b.

[0020] According to Figs. 1a and 1b, the shut-off/adjustment means is connected with a connector part 16 to an actuator 3 for moving the shut-off/adjustment means, and the connector parts 16 and 17, such as tubular or rod-shaped members, can be wholly or partly fitted inside the reservoir-type space 7. The sealing in the wall 8, which seals the lead-in of the connector part 17 to the reservoir-type space 7, is not presented in the figures, but the sealing can be from some prior-art solutions already in use, such as e.g. an O-ring seal, etcetera.

[0021] In the solution according to the invention, according to Fig. 1b the shut-off/adjustment means 5 receives support from the inside surface/inside surfaces 13' (Fig. 2a) of the aperture 13, from which aforementioned aperture 13 the diluting fluid is proportioned into the stock flow space 9. Since the shut-off/adjustment means receives support from the inside surface/inside surfaces 13' of the aperture 13, lateral movement of the shut-off/adjustment means 5 is in this case prevented, and in this case detrimental vibration of the connector part 16, and of the shut-off/adjustment means connected to it, is not able to initiate. The support of the shut-off/adjustment means 5 on the inside surfaces 13' is presented in more detail in Fig. 2a.

[0022] With the actuator means 3, which is fitted directly or indirectly to the wall 4, a linear movement of the
shut-off/adjustment means 5 is such that it is possible to detach it from the connector part 16, it can contain e.g. threads (not shown in figure), with which it is screwed onto the end of the connector part 16. The shut-off/adjustment means 5 can, however, also be fastened in a fixed manner to the connector part 16. In Figs. 1a and 1b there is connector part described with the reference number 2, with which the connector part 16 is fixed to a second connector part 17 that is on the actuator. [0024] Fig. 1c presents a side view of a feeder channel for diluting fluid according to the invention when fitted to a headbox 10 and in the figure it is seen how the feeder channel 1 is connected to the headbox 10 such that it is placed on top of the stock flow space 9 of the headbox, wherein the flowing stock suspension is described with the reference number 15. In the situation presented by Fig. 1c the shut-off/adjustment means is in such a position (bottom position, extreme position) that it prevents the flow of diluting fluid from the reservoir-type space 7 into the stock flow space 9, i.e. the shut-off/adjustment device 5 "blocks" the aperture 13 (see Fig. 1b), in which case the aforementioned flow is prevented. If the shut-off/adjustment means were lifted upwards, then the flow of diluting fluid from the reservoir-type space 7 into the stock flow space 9 would be enabled, as is presented in Fig. 1b. [0025] Fig. 1d presents one embodiment of the invention, in which an intermediate piece 11, such as e.g. a hose, a line or a pipe, along which diluting fluid 12 is able to flow into the stock flow space, is fitted to the aperture 13 in the wall 4, for conducting the diluting fluid from the reservoir-type space 7 into the stock flow space 9. The intermediate piece 11 can be fixed to the aperture 13 and to the stock flow space 9 directly or indirectly, either in a fixed manner or detachably. [0026] According to what is presented by Fig. 2a, the shut-off/adjustment means 5 is movably fitted into the aperture 13 in the wall 4, and by moving the shut-off/adjustment means the cross-sectional area of flow forming between the wall 4 and the shut-off/adjustment means 5 can be reduced or increased (i.e. that cross-sectional area that remains visible of the cavity or recess 6 above the wall 4 when the shut-off/adjustment means is lifted in Fig. 2a upwards from the aperture 13). [0027] The necks 5' remaining between the cavities and/or recesses 6 in the shut-off/adjustment means 5 comprise support surfaces 6" (the side surface/side surfaces of the shut-off/adjustment means) that can rest on the inside surface 13' of the aperture 13 and prevent vibration of the adjustment means 5 (and of the connector part 16), which vibration is caused by the flow of diluting fluid (lateral forces and displacements, i.e. bending, in the adjustment means 5 and in the connector part 16 are caused by the transverse fluid flow, and this in turn produces vibration). [0028] The support surface or support surfaces 6' thus function as countersurfaces to the inside surface/surfaces 13' (of the aperture 13). However, in order for the shut-off/adjustment means to be able to move in the longitudinal direction of the aperture, such as is described with an arrow in Fig. 2a, the diameter of the aperture 13 must be slightly larger than the diameter of the shut-off/adjustment means (the diameter of that part of the shut-off/adjustment means that goes inside the aperture). A gap 18 remains between the inside surface/inside surfaces 13' of the aperture 13 and the support surface/support surfaces 6" on the shut-off/adjustment means (the gap can be e.g. 0.05 mm - 1 mm), and as a consequence the shutoff/adjustment means is able when it is in the aperture to move essentially vertically, i.e. in other words in the longitudinal direction of the aperture. If, however, the shut-off/adjustment means 5 tries to move in the lateral direction with respect to the aperture 13, i.e. in the direction of the diameter of the aperture, then the support surfaces 6" on the shut-off/adjustment means can touch the inside surface/surfaces 13', and in this way lateral movement is prevented, and detrimental vibration is not able to initiate. Furthermore, the gap 18 usually contains diluting fluid, such as diluting water, during operation (the aforementioned diluting fluid can be under pressure) and this also damps movement of the shut-off/adjustment means as so-called hydrodynamic damping, which term "hydrodynamic damping" refers to the damping caused by a diluting fluid, such as water, surrounding a structure, i.e. in this context surrounding the shut-off/adjustment means. [0029] According to the perspective figure presented by Fig. 2b, the necks 5' remaining between the cavities and/or recesses 6, 14 in the shut-off/adjustment means 5 comprise support surfaces 6" (the side surface/side surfaces of the shut-off/adjustment means) that can rest on the inside surface 13' of the aperture 13 (presented in Fig. 2a). The cavities and/or recesses 6, 14 in the shut-off/adjustment means 5 comprise one or more curved surfaces 6', 14'. The cavities and/or recesses 6, 14 can be concave in shape (e.g. possessing hyperboloid, paraboloid or other such shapes) but they can also be e.g. of triangular or rectangular, polygonal or other such shapes. The shapes are not per se limited. [0030] The cavities and/or recesses 6, 14 in the shut-off/adjustment means 5 can be formed in the shut-off/adjustment means such that they expand in the direction of the stock flow space 9, i.e. in other words their cross-sectional area increases in the direction of the stock flow space, and from Fig. 2b this becomes evident such that the cavity or recess 6 in the shut-off/adjustment means is curved at its top part, i.e. there are narrower points in
the top part than in the bottom part,

[0031] From what is presented by Fig. 2b it can be seen that the one or more cavities or recesses 6, 14 in the shut-off/adjustment means are made such that they are in connection with each other via the (edge) surface 14', in which case diluting fluid is able to flow between the cavities or recesses 6 and 14. It is also seen from the figure that the shut-off/adjustment means is wider at its top part than at its bottom part, and that the top part is rectangular in shape, but the shape can also be other than that presented by the figure.

[0032] Fig. 2b presents only one shape of the shut-off/adjustment means, but it is not in any way limiting, but instead the shape of it can be of another type such as e.g. a cylinder, ellipse, polygon, etc. The shut-off/adjustment means can thus also be of uniform cross-section, i.e. it then has a uniform cross-sectional shape, i.e. its diameter/diameters remain(s) the same all the time, and at the same time in can rest on the sides of the aperture, the aperture having a similar uniform cross-sectional shape (e.g. a circle).

[0033] Fig. 2c presents a side view of a shut-off/adjustment means 5, and Fig. 2d correspondingly the shut-off/adjustment means as viewed from the bottom of it. According to the figures, the shut-off/adjustment means 5 is cylindrical (i.e. a cylindrical sleeve piece), and the cavities and/or recesses 6, 14 in the shut-off/adjustment means 5 comprise one or more curved surfaces 6' and 14'.

[0034] From Fig. 2d it is seen that the cavities or recesses 6, 14 are formed symmetrically in the shut-off/adjustment means 5, but they do not necessarily have to be symmetrically formed in the shut-off/adjustment means. The cavities and/or recesses 6, 14 can be of the same shape as each other or different shapes, and they can be either of the same size as each other or different sizes, always depending on the need and on the target of application.

[0035] Without being limited to the shapes presented by Figs 3a-9b, there are however certain possible shapes of a shut-off/adjustment means, which shut-off/adjustment means comprises the different cavities and/or recesses presented in Figs. 3a-9b from different perspectives such that:

Fig. 3a presents a bottom view of an elliptical shut-off/adjustment means, in which the elliptical shape of the shut-off/adjustment means is seen, and Fig. 3b presents a perspective sketch of the shut-off/adjustment means at the end of a connector part 16, which shut-off/adjustment means comprises support surfaces 6'.

Fig. 4a presents a bottom view of a second elliptical shut-off/adjustment means 5, in which the elliptical shape of the shut-off/adjustment means is seen, and which shut-off/adjustment means comprises cavities/recesses 6, 14 of a semicircular type, and in Fig. 4b a perspective sketch is seen of the shut-off/adjustment means at the end of a connector part 16, which shut-off/adjustment means comprises support surfaces 6'.

Fig. 5a presents a bottom view of a quadratic shut-off/adjustment means comprising rounded corners, which shut-off/adjustment means comprises triangular cavities/recesses 14, and in Fig. 5b a perspective sketch is seen of the shut-off/adjustment means at the end of a connector part 16, which shut-off/adjustment means comprises support surfaces 6'.

Fig. 6a presents a bottom view of a second quadratic shut-off/adjustment means comprising rounded corners, which shut-off/adjustment means comprises triangular cavities/recesses 14, and in Fig. 6b a perspective sketch is seen of the shut-off/adjustment means at the end of a connector part 16, which shut-off/adjustment means comprises support surfaces 6'.

Fig. 7a presents a bottom view of a third quadratic shut-off/adjustment means comprising triangular cavities/recesses 14, and in Fig. 7b a perspective sketch is seen of the shut-off/adjustment means at the end of a connector part 16, which shut-off/adjustment means comprises support surfaces 6'.

Fig. 8a presents a bottom view of a fourth quadratic shut-off/adjustment means having rounded corners, which shut-off/adjustment means comprises triangular cavities/recesses, support surfaces 6' and in Fig. 8b a perspective sketch is seen of the shut-off/adjustment means at the end of a connector part 16, which shut-off/adjustment means comprises support surfaces 6'.

Fig. 9a presents a bottom view of a second circular shut-off/adjustment means comprising cavities/recesses 14 of a semi-circular type and in Fig. 9b a perspective sketch is seen of the shut-off/adjustment means at the end of a connector part 16, which shut-off/adjustment means has necks 5' remaining between the cavities/recesses, which necks comprise support surfaces 6'.

[0036] It is obvious to the person skilled in the art that the different embodiments of the invention are not limited solely to the examples described above, and that they may therefore be varied within the scope of the claims presented below.

[0037] The characteristic features possibly presented in the description in conjunction with other characteristic features can also, if necessary, be used separately to each other.

[0038] The solution according to the invention can possibly be implemented also such that one or more cavities
and/or recesses are formed in the edge or edges of the diluting aperture, instead of in the shutoff/adjustment means, and in this case there do not necessarily need to be any apertures or recesses at all in the shutoff/adjustment means.

[0039] In the solution according to the invention the shutoff/adjustment means can comprise various sealings.

[0040] In the solution according to the invention the shutoff/adjustment means can be of metal material, plastic material, composite material, or also of some other material suited for a shutoff/adjustment means.

[0041] In the solution according to the invention there can be one or more feeder channels in a headbox, when viewing the headbox as seen over its lateral direction, or correspondingly from the whole (effective) width of the headbox. The feeder channel can also be divided into zones, in which case one or more shut-off/adjustment means of the diluting fluid flow can be fitted into each zone. In the solution according to the invention there can be the desired number of feeder apertures for diluting water, their number or position is not in any way limited, but instead this is determined by each target of application.

Claims

1. Feeder channel for diluting fluid according to claim 1, characterized in that the support surface/support surfaces (6") of the shutoff/adjustment means (5) are the side surface/side surfaces of the shutoff/adjustment means (5).

2. Feeder channel for diluting fluid according to claim 1, characterized in that the support surface/support surfaces (6") of the shutoff/adjustment means (5) are the side surface/side surfaces of the shutoff/adjustment means (5).

3. Feeder channel for diluting fluid according to claim 1, characterized in that the necks (5') remaining between the cavities and/or recesses (6) comprise support surfaces (6") that can rest on the inside surface (13') of the aperture (3) for preventing vibration.

4. Feeder channel for diluting fluid according to claim 1, characterized in that the part comprising the support surface/support surfaces (6") of the shutoff/adjustment means (5), which part can rest on the inside surface (13') of the aperture (3), or alternatively the whole shutter/adjustment means (5), is smaller in diameter than the diameter of the aperture (13).

5. Feeder channel for diluting fluid according to claim 1, characterized in that by moving the shutoff/adjustment means the cross-sectional area of flow forming between the aperture (13) in the wall (4) and the shut-off/adjustment means (5) can be reduced or increased.

6. Feeder channel for diluting fluid according to claim 1, characterized in that the shutoff/adjustment means (5) is sleeve-shaped.

7. Feeder channel for diluting fluid according to claim 1, characterized in that the shutoff/adjustment means (5) is cylindrical, elliptical, polygonal or circular.

8. Feeder channel for diluting fluid according to claim 1, characterized in that the cavities and/or recesses (6, 14) in the shutoff/adjustment means (5) are formed in the shutoff/adjustment means such that they expand in the direction of the stock flow space (9), i.e. the cross-sectional area of them increases in the direction of the stock flow space.

9. Feeder channel for diluting fluid according to claim 1, characterized in that the cavities and/or recesses (6, 14) in the shutoff/adjustment means (5) comprise one or more straight and/or curved surfaces (6', 14').

10. Feeder channel for diluting fluid according to claim 1, characterized in that the cavities and/or recesses (6, 14) are concave in shape.
11. Feeder channel for diluting fluid according to claim 1, characterized in that the cavities and/or recesses (6, 14) are triangular or rectangular in shape.

12. Feeder channel for diluting fluid according to claim 1, characterized in that one or more cavity or recess (6, 14) are in connection with each other.

13. Feeder channel for diluting fluid according to claim 1, characterized in that the cavities or recesses (6, 14) are formed symmetrically in the shut-off/adjustment means (5).

14. Feeder channel for diluting fluid according to claim 1, characterized in that an intermediate piece (11), such as e.g. a hose, a line or a pipe, is fitted into the aperture (13), in the wall, for conducting the diluting fluid from the reservoir-type space into the stock flow space.

15. Feeder channel for diluting fluid according to claim 1, characterized in that an actuator (3) is connected to the shut-off/adjustment means with a connector part (16), for moving the shut-off/adjustment means (5).

16. Feeder channel for diluting fluid according to claim 15, characterized in that the connector part (16) is wholly or partially fitted inside the reservoir-type space (7).

17. Feeder channel for diluting fluid according to claim 15, characterized in that with the actuator (3) a linear movement of the shut-off/adjustment means (5) in the longitudinal direction of the aperture (13) is achieved.

Patentansprüche

1. Zuführkanal (1) für ein Verdünnungsfluid, wie beispielsweise für Verdünnungswasser, wobei der Zuführkanal mit dem Stoffauflauf (10) einer Papierschne in Verbindung steht und einen oder mehrere sammelbehälterartige Zwischenräume (7), wie beispielsweise eine Kammer, zur Aufnahme des Verdünnungsfluids aufweist, wobei der Zwischenraum eine oder mehrere Wände (4) aufweist, und wobei in dem sammelbehälterartigen Zwischenraum (7) eine Öffnung (13) ausgebildet ist, über die das Verdünnungsfluid zu dem Stoffauflauf (9) des Stoffauflaufs geleitet werden kann, und wobei eine oder mehrere Absperr-/Einstelleinrichtungen (5), mit der bzw. denen die Strömung des Verdünnungsfluids durch die vorerwähnte Öffnung (13) eingestellt werden kann, in den Zuführkanal (1) eingesetzt ist bzw. sind, und wobei die Absperr-/Einstelleinrichtung (5) eine Absperr-/Einstelleinrichtung ist, die in der Längsrichtung der Öffnung (13), die in der Wand (4) des sammelbehälterartigen Zwischenraums ausgebildet ist, bewegt werden kann, dadurch gekennzeichnet, dass in der Absperr-/Einstelleinrichtung (5), die sich zum Teil oder vollständig innerhalb der Öffnung (13) befindet, eingeschaltet sind, oder die Absperr-/Einstelleinrichtung (5) in der Öffnung (13) so eingeschaltet sind, dass die Absperr-/Einstelleinrichtung (5) in der Öffnung (13) die Strömung des Verdünnungsfluids aus dem sammelbehälterartigen Zwischenraum (7) entweder direkt oder über den Zwischenstück (11) in den Stoffauflaufszwischenraum (9) durch Bewegung der Absperr-/Einstelleinrichtung (5) in der Öffnung (13) insofern eingestellt werden kann, als die Absperr-/Einstelleinrichtung (5) eine Abstützfläche oder Abstützflächen (5) aufweist, die sich an der Innenfläche (13) der Öffnung (13) abstützen kann bzw. können, um eine durch die Strömung des Verdünnungsfluids wenigstens während eines Betriebs der Absperr-/Einstelleinrichtung vorgetragene Schwingung der Einstelleinrichtung (5) zu verhindern, und insofern als zwischen der Abstützfläche und/oder den Abstützflächen (5) der Absperr-/Einstelleinrichtung und der Innenfläche (13) der Öffnung (13) in der Wand (4) ein Spalt (18) vorhanden ist, der 0,05 mm - 1 mm beträgt.

2. Zuführkanal für ein Verdünnungsfluid nach Anspruch 1, dadurch gekennzeichnet, dass die Abstützfläche/Abstützflächen (6) der Absperr-/Einstelleinrichtung (5) die Seitenfläche/Seitenflächen der Absperr-/Einstelleinrichtung (5) ist/sind.

3. Zuführkanal für ein Verdünnungsfluid nach Anspruch 1, dadurch gekennzeichnet, dass die Halsstücke (5), die zwischen den Hohlräumen und/oder Aussparungen (6) verbleiben, Abstützflächen (6') aufweisen, die sich an der Innenfläche (13) der Öffnung (3) abstützen können, um eine Schwingung zu verhindern.

4. Zuführkanal für ein Verdünnungsfluid nach Anspruch 1, dadurch gekennzeichnet, dass das Teil, das die Abstützfläche/Abstützflächen (6') der Absperr-/Einstelleinrichtung (5) aufweist, das sich an der Innenfläche (13) der Öffnung (13) abstützen kann, oder alternativ die gesamte Absperr-/Einstelleinrichtung (5) einen kleineren Durchmesser als der Durchmesser der Öffnung (13) aufweist.

5. Zuführkanal für ein Verdünnungsfluid nach Anspruch 1, dadurch gekennzeichnet, dass durch eine Bewegung der Absperr-/Einstelleinrichtung der Durchflussquerschnittsbereich, der sich zwischen der Öffnung (13) in der Wand (4) und der Absperr-/Einstelleinrichtung (5) ausbildet, verringert oder vergrößert werden kann.

6. Zuführkanal für ein Verdünnungsfluid nach An-
spruch 1, dadurch gekennzeichnet, dass die Absperr-/Einstelleinrichtung (5) hülsenförmig ist.

7. Zuführkanal für ein Verdünnungsfluid nach An spruch 1, dadurch gekennzeichnet, dass die Absperr-/Einstelleinrichtung (5) zylindrisch, elliptisch, polygonal oder kreisförmig ist.

8. Zuführkanal für ein Verdünnungsfluid nach An spruch 1, dadurch gekennzeichnet, dass die Hohl räume und/oder Aussparungen (6, 14) in der Ab sperr-/Einstelleinrichtung (5) derart in der Ab sperr-/Einstelleinrichtung ausgebildet sind, dass sie sich in der Richtung des Stoffflusszwischenraumes (9) erweitern, d.h., dass sich der Querschnittsb reich von ihnen in der Richtung des Stoffflusswi schenraumes vergrößert.

9. Zuführkanal für ein Verdünnungsfluid nach An spruch 1, dadurch gekennzeichnet, dass die Hohl räume und/oder Aussparungen (6, 14) in der Ab sperr-/Einstelleinrichtung (5) eine oder mehrere ge rade oder gekrümmte Oberflächen (6', 14') aufwei sen.

10. Zuführkanal für ein Verdünnungsfluid nach An spruch 1, dadurch gekennzeichnet, dass die Hohl räume und/oder Aussparungen (6, 14) eine konkave Gestalt aufweisen.

11. Zuführkanal für ein Verdünnungsfluid nach An spruch 1, dadurch gekennzeichnet, dass die Hohl räume und/oder Aussparungen (6, 14) eine dreieckige oder rechteckige Gestalt aufweisen.

12. Zuführkanal für ein Verdünnungsfluid nach An spruch 1, dadurch gekennzeichnet, dass ein(e) oder mehrere Hohlräume oder Aussparungen (6, 14) in Verbindung miteinander stehen.

13. Zuführkanal für ein Verdünnungsfluid nach An spruch 1, dadurch gekennzeichnet, dass die Hohl räume oder Aussparungen (6, 14) in der Ab sperr-/Einstelleinrichtung (5) symmetrisch ausgebil det sind.

14. Zuführkanal für ein Verdünnungsfluid nach An spruch 1, dadurch gekennzeichnet, dass ein Zwi schenstück (11), wie beispielsweise ein Schlauch, eine Leitung oder ein Rohr, in die Öffnung (13) in der Wand eingesetzt ist, um das Verdünnungsfluid aus dem sammelbehälterartigen Zwischenraum in den Stoffflussraum zu leiten.

15. Zuführkanal für ein Verdünnungsfluid nach An spruch 1, dadurch gekennzeichnet, dass ein Ak tuator (3) mit der Absperr-/Einstelleinrichtung über ein Verbindungsteil (16) zur Bewegung der Ab sperr-/Einstelleinrichtung (5) verbunden ist.


17. Zuführkanal für ein Verdünnungsfluid nach An spruch 15, dadurch gekennzeichnet, dass mit dem Aktuator (3) eine lineare Bewegung der Absperr-/Einstelleinrichtung (5) in der Längsrichtung der Öffnung (13) erreicht wird.

Revendications

1. Canal d’alimentation (1) pour du fluide de dilution, tel que de l’eau de dilution, lequel canal d’alimentation est en liaison avec la caisse de tête (10) d’une machine à papier et comporte un ou plusieurs espaces de type réservoir (7), tels qu’une chambre, destiné à recevoir le fluide de dilution, lequel espace comporte une ou plusieurs parois (4), et dans lequel une ouverture (13) est formée dans l’espace de type réservoir (7), par l’intermédiaire de laquelle ouverture le fluide de dilution peut être conduit dans l’espace d’écoulement de matière première (9) de la caisse de tête, et un ou plusieurs moyens de fermeture/ajustement (5), avec lesquels l’écoulement du fluide de dilution par l’intermédiaire de l’ouverture mentionnée ci-dessus (13) peut être ajusté, sont montés dans le canal d’alimentation (1), et les moyens de fermeture/ajustement (5) sont des moyens de fermeture/ajustement qui peuvent être déplacés dans la direction longitudinale de l’ouverture (13) formée dans la paroi (4) de l’espace de type réservoir, caractérisé en ce que, dans les moyens de fermeture/ajustement (5) qui sont partiellement ou totalement à l’intérieur de l’ouverture (13), il y a une ou plusieurs cavités et/ou des renflements (6, 14) par l’intermédiaire desquels l’écoulement du fluide de dilution depuis l’espace de type réservoir (7) directement ou par l’intermédiaire d’une pièce intermédiaire (11) dans l’espace d’écoulement de matière première (9) peut être ajusté en déplaçant les moyens de fermeture/ajustement (5) dans l’ouverture (13), en ce que les moyens de fermeture/ajustement (5) comportent une surface de support ou des surfaces de support (6°), qui peuvent reposer sur la surface intérieure (13') de l’ouverture (13) afin d’empêcher une vibration des moyens d’ajustement (5) provoquée par l’écoulement du fluide de dilution au moins pendant un fonctionnement des moyens de fermeture/ajustement, et en ce qu’il y a un espace (18) entre la surface de support et/ou les surfaces de support (6°) des moyens de fermeture/ajustement et la surface intérieure (13') de l’ouverture (13) dans
la paroi (4) qui est de 0,05 mm à 1 mm.

2. Canal d’alimentation pour du fluide de dilution selon la revendication 1, **caractérisé en ce que** la surface de support/les surfaces de support (6”) des moyens de fermeture/ajustement (5) sont la surface latérale/les surfaces latérales des moyens de fermeture/ajustement (5).

3. Canal d’alimentation pour du fluide de dilution selon la revendication 1, **caractérisé en ce que** les goulots (5’) restant entre les cavités et/ou les renfoncements (6) comportent des surfaces de support (6”) qui peuvent reposer sur la surface intérieure (13’) de l’ouverture (3) afin d’empêcher une vibration.

4. Canal d’alimentation pour du fluide de dilution selon la revendication 1, **caractérisé en ce que** la partie comportant la surface de support/les surfaces de support (6”) des moyens de fermeture/ajustement (5), laquelle partie peut reposer sur la surface intérieure (13’) de l’ouverture (13), ou en variante les moyens de fermeture/ajustement complets (5), est d’un diamètre plus petit que le diamètre de l’ouverture (13).

5. Canal d’alimentation pour du fluide de dilution selon la revendication 1, **caractérisé en ce que**, en déplaçant les moyens de fermeture/ajustement, la section transversale d’écoulement se formant entre l’ouverture (13) dans la paroi (4) et les moyens de fermeture/ajustement (5) peut être réduite ou augmentée.

6. Canal d’alimentation pour du fluide de dilution selon la revendication 1, **caractérisé en ce que** les moyens de fermeture/ajustement (5) sont en forme de douille.

7. Canal d’alimentation pour du fluide de dilution selon la revendication 1, **caractérisé en ce que** les moyens de fermeture/ajustement (5) sont cylindriques, elliptiques, polygonaux ou circulaires.

8. Canal d’alimentation pour du fluide de dilution selon la revendication 1, **caractérisé en ce que** les cavités et/ou les renfoncements (6, 14) dans les moyens de fermeture/ajustement (5) sont formés dans les moyens de fermeture/ajustement de telle sorte qu’ils s’agrandissent dans la direction de l’espace d’écoulement de matière première (9), c’est-à-dire que leur section transversale augmente dans la direction de l’espace d’écoulement de matière première.

9. Canal d’alimentation pour du fluide de dilution selon la revendication 1, **caractérisé en ce que** les cavités et/ou les renfoncements (6, 14) dans les moyens de fermeture/ajustement (5) comportent une ou plu-}

10. Canal d’alimentation pour du fluide de dilution selon la revendication 1, **caractérisé en ce que** les cavités et/ou les renfoncements (6, 14) sont de forme concave.

11. Canal d’alimentation pour du fluide de dilution selon la revendication 1, **caractérisé en ce que** les cavités et/ou les renfoncements (6, 14) sont de forme triangulaire ou rectangulaire.

12. Canal d’alimentation pour du fluide de dilution selon la revendication 1, **caractérisé en ce qu’un ou plusieurs des cavités ou des renfoncements (6, 14) sont en liaison l’un avec l’autre.**

13. Canal d’alimentation pour du fluide de dilution selon la revendication 1, **caractérisé en ce que** les cavités ou les renfoncements (6, 14) sont formés de manière symétrique dans les moyens de fermeture/ajustement (5).

14. Canal d’alimentation pour du fluide de dilution selon la revendication 1, **caractérisé en ce qu’une pièce intermédiaire (11), telle que par exemple un tuyau, une conduite ou un tube, est montée dans l’ouverture (13), dans la paroi, afin de conduire le fluide de dilution depuis l’espace de type réservoir dans l’espace d’écoulement de matière première.**

15. Canal d’alimentation pour du fluide de dilution selon la revendication 1, **caractérisé en ce qu’un dispositif d’actionnement (3) est relié aux moyens de fermeture/ajustement avec une partie de connecteur (16), afin de déplacer les moyens de fermeture/ajustement (5).**

16. Canal d’alimentation pour du fluide de dilution selon la revendication 15, **caractérisé en ce que** la partie de connecteur (16) est totalement ou partiellement montée à l’intérieur de l’espace de type réservoir (7).

17. Canal d’alimentation pour du fluide de dilution selon la revendication 15, **caractérisé en ce que**, avec le dispositif d’actionnement (3), un mouvement linéaire des moyens de fermeture/ajustement (5) dans la direction longitudinale de l’ouverture (13) est réalisé.
REFERENCES CITED IN THE DESCRIPTION

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