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(54) **ARRANGEMENT FOR WITHDRAWING TREATMENT LIQUORS IN A CONTINUOUS TREATMENT VESSEL SYSTEM, AND A CORRESPONDING CONTROL SYSTEM**

VORRICHTUNG ZUR ENTNAHME VON BEHANDLUNGSFLÜSSIGKEITEN IN EINEN KONTINUIERLICHEN BEHANDLUNGSBEHÄLTERSYSTEM UND ENTSPRECHENDES STEUERUNGSSYSTEM

AGENCEMENT POUR RETIRER DES LIQUIDES DE TRAITEMENT DANS UN SYSTÈME DE RÉCIPIENT DE TRAITEMENT CONTINU, ET SYSTÈME DE COMMANDE CORRESPONDANT

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(56) References cited:

WO-A1-2010/044732	WO-A1-2011/096857
WO-A1-2017/099654	JP-A- H07 157 991
US-A- 3 711 367	US-A- 4 547 264
US-A- 6 120 647	US-A- 6 123 808
US-A1- 2002 069 986	

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Description

TECHNICAL FIELD

[0001] The present invention relates generally to an arrangement for withdrawing treatment liquors from a treatment vessel in a continuous treatment vessel system and to a control system for controlling such an arrangement, wherein the arrangement comprises a plurality of screens in at least two screen rows, at least one withdrawal compartment and at least one header connected to the withdrawal compartment via a throttle hole. The preferable field of application is the withdrawal or extraction of impregnation or cooking liquors when producing chemical paper pulp in a continuous digester or impregnation vessel.

BACKGROUND

[0002] In treatment vessels for cooking or impregnating paper pulp, cooking liquors need to be continuously supplied and withdrawn to optimize the treatment process. The withdrawal is performed through a plurality of screens arranged in a chamber wall of the treatment vessel, and withdrawal compartments are arranged to receive the withdrawn liquor and transport it through throttle holes into headers for removal and subsequent treatment. Throttle holes allow the withdrawal to be performed symmetrically around the circumference of the treatment vessel, allowing for a uniform cooking or impregnation process inside the treatment chamber.

[0003] US6120647A discloses a vertical pulp treatment vessel having a top and bottom, such as a continuous or batch digester, has at least a first substantially annular screen assembly disposed within the vessel between the top and bottom. A first substantially annular header is associated with the first screen assembly and first and second withdrawal conduits extend outwardly from the header and are in fluid communication with it. A barrier, such as a radially extending plate, is disposed in the header between the withdrawal conduits, the withdrawal conduits being adjacent each other (typically spaced from each other between about 2-30 DEG, e.g. between about 10-20 DEG). A small, compared to the prior art, platform is provided for allowing access to the withdrawal conduits, and automatically controlled valves or like structures in or associated with the conduits, the platform having an arcuate extent of less than 180 DEG, typically less than about 110 DEG (e.g. about 90 DEG or less). Typically, a second annular screen assembly, like the first screen assembly, with third and fourth withdrawal conduits circumferentially spaced from each other between about 2-30 DEG, and have a centerline that is circumferentially spaced from the first and second withdrawal conduit centerline less than about 110 DEG (e.g. about 80-110 DEG, typically about 90 DEG), so that on the single platform the four withdrawal conduits, and the automatically operated valves associated

therewith, may be accessed.

[0004] US4547264A discloses a method and apparatus for selectively withdrawing liquor from digester cooking screens for controlling the temperature in continuous digesters. First and second pairs of screens, with cooperating headers, are provided, and first and second outlets spaced circumferentially around the digester are associated with each header. Each header provides a circumferential cavity free of dividing members. Within each pair of screens withdrawal is practiced so that each header is rested during each ultimate withdrawal step, and the side from which the liquor is drawn each successive withdrawal step that the same header is used is alternated. In practicing the invention, header blockage caused by deposited debris and scale is minimized and increased uniformity and improved product quality result.

[0005] US3711367A discloses a filtrate chamber back of a cylindrical screen girdle inserted in a cellulose digester that is divided by vertical partitions into compartments. An internal manifold or header located axially adjacent and coaxial to said filtrate chamber communicates with said compartments through narrow apertures. A second similar manifold may be provided on the other side of the screen girdle, the filtrate chamber compartments being alternately connected to the lower and the upper manifold.

[0006] One problem commonly associated with the withdrawal of treatment liquors is that withdrawal arrangements are blocked by different kinds of precipitations, making removal of liquors inefficient and requiring costly cleaning procedures during service time shut downs. Some cleaning can take place during operation by closing a header temporarily to allow the screens to self-clean according to known cleaning procedures, but throttle holes that have been filled with or blocked by matter preventing the passing of liquor can normally only be unblocked through a reverse action through the withdrawal system where liquor is pressed back into the withdrawal compartments, leaving the blocking matter inside the withdrawal compartment and risking a renewed blocking of the same throttle holes shortly after.

[0007] The closing of a header will generally result in a significant loss in efficiency of the impregnation or cooking process and will therefore also be costly since any slowing or hindering of the process will result in significant loss of revenue for the digester or impregnation vessel as a whole.

[0008] There is therefore clearly a need for improvements to the withdrawal of liquor from treatment vessels in continuous treatment vessel systems.

SUMMARY OF THE INVENTION

[0009] The object of the present invention is to eliminate or at least to minimize the problems mentioned above. This is achieved through an arrangement for withdrawing treatment liquors, a system comprising at least two such arrangements and a control system for

controlling operation of such an arrangement according to the appended independent claims.

[0010] Thus, according to the invention an arrangement for withdrawing treatment liquors from a treatment vessel in a continuous treatment vessel system is provided, said treatment vessel comprising a chamber wall of a treatment chamber and the arrangement comprising a plurality of screens arranged in the chamber wall for withdrawing liquor from the treatment chamber, said screens being arranged in at least two screen rows, one above the other; at least one withdrawal compartment for each screen row for receiving liquor from the screens, and at least one header for receiving liquor from the withdrawal compartments via a throttle hole for each withdrawal compartment, wherein the header is connected to at least one withdrawal compartment on at least two screen rows. Thereby, the problems associated with blocking of the header can be solved and the cleaning and maintenance of the header and the arrangement as a whole be significantly improved.

[0011] According to the invention, the header is arranged at an angle to a vertical direction, said angle being smaller than 5° , preferably smaller than 2° , wherein the header more preferably is arranged essentially vertically or is arranged vertically. Thus, the angle to the vertical direction is such that $0^\circ \leq \text{angle} < 5^\circ$, and more preferably $0^\circ \leq \text{angle} < 2^\circ$. Thereby, the cleaning and maintenance of the header is improved and the need for interrupting the treatment process for cleaning is decreased.

[0012] According to another aspect of the invention, the header further comprises a hatch for cleaning, said hatch being arranged above the screen rows. Thereby a cleaning fluid can be supplied through the hatch and the header thoroughly cleaned in an improved and more time efficient way.

[0013] According to yet another aspect of the invention, the at least one withdrawal compartment is arranged to receive liquor from at least four screens. Also, the treatment vessel may comprise at least three screen rows and the header can be connected to at least one withdrawal compartment on each screen row. This also improves the withdrawing of liquors and allows the header to collect liquor from screens not immediately bordering on the header. In this way, subsections of the screen rows are created and serviced by one header each, so that one header collects treatment liquors from one sector of the circumference of the treatment vessel. By supplying at least two arrangements with headers in different sectors of the circumference of the treatment vessel, a system for withdrawing treatment liquors is created.

[0014] According to the invention a control system is also provided for controlling operation of an arrangement for withdrawing treatment liquors from a treatment vessel in a continuous treatment vessel system, said treatment vessel comprising a chamber wall of a treatment chamber. The control system comprises at least one sensor for detecting at least one operation parameter in a header,

means for interrupting operation of the header, and a control unit configured to communicate with said at least one sensor and to receive a signal corresponding to said at least one operation parameter, and further also configured to control the means for interrupting operation of the header. Thereby, the arrangements can be monitored and the operation of each header be interrupted when a detected operation parameter signals that the arrangement is not functioning as desired, for instance due to blocking. The operation parameter is preferably a pressure or a flow inside the header.

[0015] According to an aspect of the invention, the control unit is configured to compare said at least one operation parameter detected by the sensor with another detected operation parameter or with a reference parameter and to control the means for interrupting operation of the header in response to said comparison. Thereby, the operation of two different arrangements around the circumference of the treatment vessel can be compared with each other and the operation of one of them interrupted if a pressure or flow inside the header is significantly lower than a corresponding pressure or flow inside the header of the other arrangement. Alternatively, the operation parameter of one arrangement can be compared with another operation parameter detected in the same arrangement or with a reference parameter stored by the control system so that operation of the arrangement can be interrupted if the two detected parameters in the arrangement differ from each other or if the detected parameter is similar to or different from the reference parameter in a way that indicates that the operation of the arrangement needs to be improved.

[0016] According to another aspect of the invention, the another detected operation parameter is detected by the same sensor, or wherein the another detected operation parameter is detected by a sensor arranged to detect an operation parameter in another header. Thereby, the operation parameters can be detected at different points in time to indicate a difference over time or the operation of two different headers can be compared.

[0017] According to yet another aspect of the invention, the control system further comprises input means and output means configured to transmit signals to and receive signals from the control unit, wherein the control system is preferably configured to communicate the detected at least one operation parameter to a user through the output means and wherein the control system is preferably configured to control the means for interrupting operation of the header in response to input given by a user. Thereby, a user of the system can receive information regarding the detected operation parameters and can also communicate with the control system in order to manually control the operation of the system, either in response to output given by the system itself or in response to other factors determined by the user.

[0018] Many additional benefits and advantages of the invention will become readily apparent to the person skilled in the art in view of the detailed description below.

DRAWINGS

[0019] The invention will now be described in more detail with reference to the appended drawings, wherein:

Fig. 1 discloses a treatment vessel with a plurality of screen rows;

Fig. 2 discloses a chamber wall with an arrangement for withdrawing treatment liquors according to the prior art;

Fig. 3 discloses the chamber wall of Fig. 2 without some of the screens removed;

Fig. 4 discloses a chamber wall with an arrangement for withdrawing treatment liquors according to a preferred embodiment of the present invention;

Fig. 5 discloses the chamber wall of Fig. 4 with outer covers for some of the headers removed to show an interior of the headers;

Fig. 6 discloses the chamber wall of Fig. 4 and Fig. 5 with outer covers for some of the headers and with some screens removed; and

Fig. 7 discloses a schematic view of the control system according to a preferred embodiment of the invention.

DETAILED DESCRIPTION

[0020] Fig. 1 discloses a treatment vessel 1 that forms part of a continuous treatment vessel system, such as a digester or an impregnation vessel for use when treating wood chips in a pulping process. Typically, wood chips are fed to the treatment vessel 1 through a top 4, cooked or impregnated inside the vessel 1 and removed through a bottom 5 after treatment and transferred to subsequent treatment in the pulping process. Treatment liquor is supplied through the top 4 and/or bottom or through separate liquor inlets (not shown).

[0021] Also provided on the treatment vessel 1 are a plurality of screens 2, 3 through which treatment liquor can be removed. In Fig. 1 a first screen section 2 comprising a plurality of screen rows 2a, 2b, 3c, 2d, 2e is provided for withdrawal of treatment liquor at the middle of the cooking process and a second screen section 3 comprising a plurality of screen rows 3a, 3b, 3c, 3d, 3e, 3f is provided for withdrawal of treatment liquor at the end of the cooking process, according to a cooking profiling used. In other treatment vessels, only one screen section could be provided or alternatively more than two screen sections could be used. It is also to be noted that the number of screen rows in each screen section can differ from only one and up to 10-15 or even more screen rows. The configuration shown in Fig. 1 with two screen sec-

tions and five or six screen rows in each section thus merely serves as an example.

[0022] Fig. 2-3 disclose an arrangement for withdrawing treatment liquor according to a prior art technology, where a plurality of screen rows 2a-d are each provided with a header 7 for collecting treatment liquor from a plurality of screens 6 in a chamber wall 11. Behind the screens 6 are withdrawal compartments 8 that are connected to the header 7 via throttle holes 9, so that liquor withdrawn from the treatment vessel 1 can flow through one of the screens 6, be collected in the withdrawal compartment 8 and reach the header 7 through the throttle hole 9. The header 7 runs along a circumference of the treatment vessel 1 in an essentially horizontal orientation and collects treatment liquor from each withdrawal compartment 8 connected to one of the screen rows 2a-2d, before allowing the treatment liquor to flow from the header 7 through an outlet 10. Due to the high pressure generally required inside the treatment vessel 1 for the cooking of the wood chips, the throttle holes 9 serve an important function in creating a pressure drop to the header 7, so that the withdrawal of treatment liquor is evenly performed around the circumference of the treatment vessel 1 even though only one outlet 10 is typically provided. Without the throttle holes 9, the withdrawal would be more efficient near the outlet 10 and inefficient at other points of the circumference, but there is also a problem associated with the prior art of throttle holes being blocked by substance withdrawn from the cooking inside the treatment vessel 1 and thereby preventing withdrawal from those screens that are connected with blocked throttle holes 9.

[0023] Fig. 5-6 disclose an arrangement for withdrawing treatment liquor according to a preferred embodiment of the present invention, where components that are similar to the prior art solution of Fig. 2-3 are given the same reference numerals. The present invention differs from the prior art solutions through the configuration of the header 7 that is connected to at least one withdrawal compartment 8 on at least two different screen rows 2a, 2b, 2c, 2d. Thereby, the header has a substantially vertical orientation and is able to transport treatment liquors more efficiently towards an outlet 10. The throttle holes 9 are preferably provided in a wall 12 of the withdrawal compartments 8 that borders on the header 7 and differ from the prior art in that the throttle holes 9 can be provided along the wall 12 on a distance from a bottom 13 of the withdrawal compartment 8. This allows precipitations from the treatment chamber of the treatment vessel 1 to sink to the bottom 13 of the withdrawal compartment 8 and remain there while keeping the throttle hole 9 unblocked to allow treatment liquors to flow freely.

[0024] In this preferred embodiment the header 7 is arranged essentially vertically along the chamber wall 11 of the treatment vessel 1, but in some embodiments the header 7 could also be arranged at an angle to a vertical direction, said angle preferably being smaller than 5°,

more preferably smaller than 2° . The advantage of keeping the angle small is that the header 7 can be connected to withdrawal compartments 8 of a plurality of the screen rows 2a-e, 3a-f and that the treatment liquors can flow down towards the outlet 10 in an efficient way while minimizing the risk of liquor remaining inside the header 7 and blocking or clogging the header 7 so that the transportation of treatment liquor is prevented.

[0025] Thus, in this preferred embodiment, the header 7 extends in the vertical direction along the chamber wall 11 between screens and is connected via throttle holes 9 to withdrawal compartments 8 on either side of the header 7 for each screen row 2a-e so that treatment liquor from at least one screen 6 on each screen row 2a-2e in a screen section 2, 3 can proceed through a withdrawal compartment 8 and a throttle hole 9 into the header 7 and proceed onwards to the outlet 10. In this preferred embodiment, two screens 6 are connected to each withdrawal compartment 8 as shown in Fig. 4-6 but in other embodiments only one or more than two screens 6 could be connected to a withdrawal compartment 8. It is advantageous to connect as many as four screens 6 to one withdrawal compartment 8, in order to collect treatment liquor from a larger part of the circumference of the treatment vessel 1.

[0026] Each header 7 has a hatch 14 provided in an upper part of the header 7 to facilitate cleaning. It is advantageous to provide the hatch 14 above the screen rows 2a-e, 3a-f so that cleaning fluid can be inserted through the hatch 14 and be allowed to flow along the header 7 towards the outlet 10 in order to remove any remaining treatment liquor or precipitations from the treatment vessel. The screens 6 may conventionally be cleaned through the supply of a cleaning fluid into the treatment chamber of the treatment vessel 1 after the cooking has been interrupted and any remaining contents of the treatment chamber removed; during such cleaning operations the cleaning fluid may flow through or around the screens and the adjoining withdrawal compartments and pass through the throttle holes 9 into the headers 7. Thanks to the improvement relating to the location and orientation of the headers 7 and the throttle holes 9, the cleaning of the screens can be performed without needing to remove the screens from the chamber wall 11, which is a significant advantage compared to prior art cleaning methods and save considerable time and cost. When self-cleaning screens 6 are used, individual screens 6 can be cleaned without interrupting the cooking process simply through the interruption of operation of the header 7 connected to those screens 6, as will be described in more detail further below.

[0027] As is explained above, it is advantageous to connect one header 7 to withdrawal compartments 8 on each screen row 2a-e, 3a-f, since this allows for one single header 7 to receive treatment liquor from an entire sector of the circumference of the treatment vessel 1. In some embodiments, one header 7 could be arranged to receive treatment liquor from more than one screen

section 2, 3.

[0028] Thus, an arrangement 100 for withdrawing treatment liquors from a treatment vessel 1 comprises a plurality of screens 6, withdrawal compartments 8 connected to the screens 6 and throttle holes 9 connecting each withdrawal compartment 8 to a header 7 that serves to receive treatment liquor and transport it to an outlet 10. If the header 7 is connected to each screen row 2a-e, 3a-f of a screen section 2, 3 that header receives all treatment liquor withdrawn from a given circle sector of the circumference of the treatment vessel 1. When more than one arrangement 100 is provided on the chamber wall 11 of the treatment vessel 1, they can cooperate to form a system that each withdraw liquor from a circle sector of the treatment vessel 1, and in a preferred embodiment arrangements 100 are provided around the entire circumference of a treatment vessel 1.

[0029] The operation of an arrangement 100 according to the present invention is controlled by a control system 1000 as disclosed schematically in Fig. 7. The control system 1000 comprises a control unit 1010 that communicates with at least one sensor 15 in an arrangement 100 according to the present invention. The sensor 15 is preferably configured to detect a pressure of a flow in the header 7 and may be located inside the header 7 or at the outlet 10, or at any other suitable location within the arrangement 100. The sensor thus detects an operation parameter in the header, preferably a flow of treatment liquor or a pressure in the header 7, and transmits that operation parameter to the control unit 1010. The control unit 1010 is also configured to control operation of a means 16 for interruption operation of the header 7, said means 16 preferably being a hatch or valve at the outlet 10 for stopping the flow through the header 7.

[0030] The detected operation parameter will be received by the control unit 1010 and a decision will be made by the control unit 1010 as to whether operation of the header 7 should be interrupted. If the flow is too low or the pressure too high, this would indicate that at least some of the throttle holes 9 are blocked and need to be cleaned, and such a cleaning operation could be performed by interrupting operation of the header to allow blockage to sink to the bottom of the withdrawal compartments 8 so that the flow of treatment liquor through the throttle holes 9 can once again be performed in the desired manner. After a predetermined time, operation of the header 7 would be resumed by a renewed activation of the means 16 for interrupting operation, for instance by opening the hatch or valve at the outlet 10 to allow the flow of treatment liquor once again. The sensor 15 would once again detect the operation parameter and transmit the value to the control unit 1010 that would decide based on the value of the operation parameter whether the operation in the header 7 has been improved or if further cleaning operations would need to be performed. The same cleaning operation could be repeated until the operation parameter has reached a predetermined value or interval that indicates that operation is

sufficiently improved, or alternatively other cleaning measures such as reversing the flow of treatment liquor could be performed. If the operation is still not improved these and other cleaning procedures could be undertaken, or it could be decided by the control unit 1010 that one of the arrangements 100 should be shut down permanently by the means 16 for interrupting operation or that the entire cooking process should be interrupted for cleaning.

[0031] Preferably, the control unit 1010 is connected to input means 1020 and output means 1030 through which the system 1000 can communicate with a user. The user could receive information regarding the operation of the system 1000 and the detected operation parameter for each arrangement 100 connected to the system 1000, and could also control the operation of the system 1000 by using the input means to manually instruct the system to interrupt operation of any given arrangement 100 or to give instructions for the operation of the system 1000 or input or adjust reference parameters in the system 1000. Preferably, the control system 1000 is connected to a plurality of arrangements 100 according to the present invention, but it would also be possible to be connected to one arrangement 100 only.

[0032] In one embodiment, the control system 1000 would compare a detected operation parameter from a sensor 15 in one of the arrangements 100 with another detected operation parameter, either detected earlier by the same sensor 15 or detected simultaneously or earlier by a sensor 15 in another arrangement 100 connected to the control system 1000. Alternatively, the detected operation parameter could be compared to a reference parameter stored in the control unit 1010 or given by a user as input through the input means 1020. Depending on a result of the comparison, i.e. whether the operation parameter of a sensor indicates that operation in that arrangement 100 is satisfactory or unsatisfactory compared to predetermined values or detected values, the control unit 1010 decides whether a cleaning operation should take place. A number of operation criteria can be selected by a user and the control unit 1010 configured so that the means 16 for interrupting operation of the header 7 is activated if the detected operation parameter does not meet at least one of the operation criteria.

[0033] The control unit 1010 can also control the means 16 for interrupting operation of the header 7 in an arrangement 100 so that interruption takes place at predetermined times and can also control the arrangements 100 so that interruption of operation in one arrangement 100 does not coincide with interruption of operation in another arrangement 100 connected to the control system 1000.

[0034] The control unit 1010 can be any kind of data processing unit such as a computer, a processor or microprocessor or the like. Output means can be a display unit, a computer screen or similar and the input means can be a touchscreen, keyboard or any other kind of user interface.

Claims

1. Arrangement for withdrawing treatment liquors from a treatment vessel in a continuous treatment vessel system, said treatment vessel comprising a chamber wall of a treatment chamber, wherein the arrangement comprises:

a plurality of screens (6) arranged in the chamber wall (11) for withdrawing liquor from the treatment chamber, said screens (6) being arranged in at least two screen rows (2a, 2b, 2c, 2d), one above the other;

at least one withdrawal compartment (8) for each screen row (2a, 2b, 2c, 2d) for receiving liquor from the screens (6); and

at least one header (7) for receiving liquor from the withdrawal compartments (8) via a throttle hole (9) for each withdrawal compartment (8), and wherein each header (7) is connected to at least one withdrawal compartment (8) on at least two screen rows, wherein the header is arranged at an angle to a vertical direction, said angle being smaller than 5°, preferably smaller than 2°, or wherein the header (7) more preferably is arranged vertically.

2. Arrangement according to claim 1, wherein the header (7) further comprises a hatch (14) for cleaning, said hatch (14) being arranged above the screen rows (2a, 2b, 2c, 2d).

3. Arrangement according to any of claims 1-2, wherein the at least one withdrawal compartment (8) is arranged to receive liquor from at least four screens (6).

4. Arrangement according to any of claims 1-3, further comprising at least three screen rows (2a, 2b, 2c, 2d), and wherein each header (7) is connected to at least one withdrawal compartment (8) on each screen row (2a, 2b, 2c, 2d).

5. Arrangement according to any previous claim, further comprising a control system for controlling operation of said arrangement for withdrawing treatment liquors from a treatment vessel in a continuous treatment vessel system, wherein the arrangement comprises a plurality of withdrawal compartments (8) for receiving liquor from the screens (6), and at least two headers (7) for receiving liquor from the plurality of withdrawal compartment (8) via throttle holes (9), wherein each header (7) is connected to at least one withdrawal compartment (8) on at least two screen rows (2a, 2b, 2c, 2d), said headers (7) being arranged around a circumference of the chamber wall so that each header (7) is connected to screens (6) on a sector of the circumference, and wherein the

control system comprises:

at least one sensor (15) for detecting at least one operation parameter in a header (7),
means (16) for interrupting operation of the header (7), and
a control unit (1010) configured to communicate with said at least one sensor (15) and to receive a signal corresponding to said at least one operation parameter, and further also configured to control the means (16) for interrupting operation of the header.

6. Arrangement according to claim 5, wherein the control unit (1010) is configured to compare said at least one operation parameter detected by the sensor (15) with another detected operation parameter or with a reference parameter and to control the means (16) for interrupting operation of the header in response to said comparison.
7. Arrangement according to claim 6, wherein the another detected operation parameter is detected by the same sensor (15), or wherein the another detected operation parameter is detected by a sensor arranged to detect an operation parameter in another header.
8. Arrangement according to any of claims 5-7, further comprising input means (1020) and output means (1030) configured to transmit signals to and receive signals from the control unit (1010), wherein the control system is preferably configured to communicate the detected at least one operation parameter to a user through the output means (1030) and wherein the control system is preferably configured to control the means (16) for interrupting operation of the header in response to input given by a user.
9. Arrangement according to any of claims 5-8, wherein the control unit is further configured to compare the detected parameter of the header (7) with at least one detected parameter of at least one other header (7) or with a reference parameter to determine if operation in that header satisfies an operation criterion, and to perform a cleaning procedure of screens (6) connected via withdrawal compartments (8) to that header (6) if the operation criterion is not satisfied.
10. Arrangement according to any of claims 5-9, wherein the at least one operation parameter detected by the at least one sensor is a pressure or a flow.
11. System for withdrawing treatment liquors from a treatment vessel in a continuous treatment vessel system, comprising at least two arrangements according to any of claims 1-4 arranged around a

circumference of the chamber wall.

Patentansprüche

1. Anordnung zum Abziehen von Behandlungsflotten aus einem Behandlungsbehälter in einem kontinuierlichen Behandlungsbehältersystem, wobei der Behandlungsbehälter eine Kammerwand einer Behandlungskammer umfasst, wobei die Anordnung umfasst:

eine Vielzahl von in der Kammerwand (11) angeordnete Siebe (6) zum Abziehen von Flotte aus der Behandlungskammer, wobei die Siebe (6) in mindestens zwei Siebreihen (2a, 2b, 2c, 2d) übereinander angeordnet sind;
mindestens ein Abziehfach (8) pro Siebreihe (2a, 2b, 2c, 2d) zur Aufnahme von Flotte aus den Sieben (6); und
mindestens einen Sammler (7) zum Aufnehmen von Flotte aus den Abziehfächern (8) über eine Drosselöffnung (9) für jedes Abziehfach (8), und wobei jeder Sammler (7) mit mindestens einem Abziehfach (8) auf mindestens zwei Siebreihen verbunden ist, wobei der Sammler in einem Winkel zu einer vertikalen Richtung angeordnet ist, wobei der Winkel kleiner als 5°, vorzugsweise kleiner als 2° ist, oder wobei der Sammler (7) noch bevorzugter vertikal angeordnet ist.
2. Anordnung nach Anspruch 1, wobei der Sammler (7) außerdem eine Luke (14) zur Reinigung aufweist, wobei die Luke (14) oberhalb der Siebreihen (2a, 2b, 2c, 2d) angeordnet ist.
3. Anordnung nach einem der Ansprüche 1 bis 2, wobei die mindestens ein Abziehfach (8) dazu ausgelegt ist, Flotte von mindestens vier Sieben (6) aufzunehmen.
4. Anordnung nach einem der Ansprüche 1 bis 3, ferner umfassend mindestens drei Siebreihen (2a, 2b, 2c, 2d), und wobei jeder Sammler (7) mit mindestens einem Abziehfach (8) auf jeder Siebreihe (2a, 2b, 2c, 2d) verbunden ist.
5. Anordnung nach einem der vorhergehenden Ansprüche, ferner umfassend ein Steuersystem zum Steuern des Betriebs der Anordnung zum Abziehen von Behandlungsflotten aus einem Behandlungsbehälter in einem kontinuierlichen Behandlungsbehältersystem, wobei die Anordnung eine Vielzahl von Abziehkammern (8) zum Aufnehmen von Flotte von den Sieben (6) und mindestens zwei Sammlern (7) zum Aufnehmen von Flotte aus den mehreren Abziehkammern (8) über Drossellöcher (9) umfasst, wobei jeder Sammler (7) mit mindestens einer Ab-

ziehkammer (8) auf mindestens zwei Siebreihen (2a, 2b, 2c, 2d) verbunden ist, wobei die Sammler (7) um einen Umfang der Kammerwand herum angeordnet sind, sodass jeder Sammler (7) mit Sieben (6) auf einem Sektor des Umfangs verbunden ist, und wobei das Steuersystem umfasst:

mindestens einen Sensor (15) zum Erfassen mindestens eines Betriebsparameters in einem Sammler (7), Mittel (16) zum Unterbrechen des Betriebs des Sammlers (7) und eine Steuereinheit (1010), die konfiguriert ist, um mit dem mindestens einen Sensor (15) zu kommunizieren und ein Signal zu empfangen, das dem mindestens einen Betriebsparameter entspricht, und die ferner konfiguriert ist, um die Einrichtung (16) zum Unterbrechen des Betriebs des Sammlers zu steuern.

6. Anordnung nach Anspruch 5, wobei die Steuereinheit (1010) konfiguriert ist, um den mindestens einen vom Sensor (15) erfassten Betriebsparameter mit einem anderen erfassten Betriebsparameter oder mit einem Referenzparameter zu vergleichen und als Reaktion auf den Vergleich die Einrichtung (16) zum Unterbrechen des Betriebs des Sammlers zu steuern.
7. Anordnung nach Anspruch 6, wobei der andere erfasste Betriebsparameter durch denselben Sensor (15) erfasst wird oder wobei der andere erfasste Betriebsparameter durch einen Sensor erfasst wird, der zum Erfassen eines Betriebsparameters in einem anderen Sammler angeordnet ist.
8. Anordnung nach einem der Ansprüche 5 bis 7, ferner umfassend Eingabemittel (1020) und Ausgabemittel (1030), die konfiguriert sind, um Signale an die Steuereinheit (1010) zu senden und von dieser zu empfangen, wobei das Steuersystem vorzugsweise konfiguriert ist, um den erfassten mindestens einen Betriebsparameter über die Ausgabemittel (1030) an einen Benutzer weiterzuleiten, und wobei das Steuersystem vorzugsweise konfiguriert ist, um die Mittel (16) zum Unterbrechen des Betriebs des Sammlers als Reaktion auf eine Eingabe eines Benutzers zu steuern.
9. Anordnung nach einem der Ansprüche 5 bis 8, wobei die Steuereinheit ferner konfiguriert ist, um den erfassten Parameter des Sammlers (7) mit mindestens einem erfassten Parameter mindestens eines anderen Sammlers (7) oder mit einem Referenzparameter zu vergleichen, um zu bestimmen, ob der Betrieb in diesem Sammler ein Betriebskriterium erfüllt, und einen Reinigungsvorgang der über Abziehfächer (8) mit diesem Sammler (6) verbundenen Siebe (6) durchzuführen, wenn das Betriebskriterium nicht er-

füllt ist.

10. Anordnung nach einem der Ansprüche 5 bis 9, wobei der mindestens eine Betriebsparameter, der durch den mindestens einen Sensor erfasst wird, ein Druck oder ein Durchfluss ist.
11. System zum Abziehen von Behandlungsflotten aus einem Behandlungsbehälter in einem kontinuierlichen Behandlungsbehältersystem, das mindestens zwei Anordnungen nach einem der Ansprüche 1 bis 4 umfasst, die um einen Umfang der Kammerwand angeordnet sind.

Revendications

1. Dispositif d'agencement destiné à retirer les liquides de traitement d'une cuve de traitement dans un système de cuve de traitement continu, ladite cuve de traitement comprenant une paroi de chambre de traitement, dans lequel le dispositif d'agencement comprend :

une pluralité de tamis (6) agencés dans la paroi de chambre (11) pour extraire la liqueur de la chambre de traitement, lesdits tamis (6) étant agencés en au moins deux rangées de tamis (2a, 2b, 2c, 2d), l'une au-dessus de l'autre ;
au moins un compartiment de retrait (8) pour chaque rangée de tamis (2a, 2b, 2c, 2d) pour recevoir la liqueur des tamis (6) ; et
au moins un collecteur (7) pour recevoir la liqueur des compartiments de prélèvement (8) par l'intermédiaire d'un trou d'étranglement (9) pour chaque compartiment de prélèvement (8), et dans lequel chaque collecteur (7) est relié à au moins un compartiment de prélèvement (8) sur au moins deux rangées de tamis, dans lequel le collecteur est agencé à un angle par rapport à une direction verticale, ledit angle étant inférieur à 5°, de préférence inférieur à 2°, ou dans lequel le collecteur (7) est, de préférence, agencé verticalement.
2. Dispositif d'agencement selon la revendication 1, dans lequel le collecteur (7) comprend en outre une trappe (14) pour le nettoyage, ladite trappe (14) étant agencée au-dessus des rangées de tamis (2a, 2b, 2c, 2d).
3. Dispositif d'agencement selon l'une quelconque des revendications 1 à 2, dans lequel au moins un compartiment de retrait (8) est conçu pour recevoir la liqueur provenant d'au moins quatre tamis (6).
4. Dispositif d'agencement selon l'une quelconque des revendications 1 à 3, comprenant en outre au moins

trois rangées de tamis (2a, 2b, 2c, 2d), et dans lequel chaque collecteur (7) est relié à au moins un compartiment de retrait (8) sur chaque rangée de tamis (2a, 2b, 2c, 2d).

5. Dispositif d'agencement selon l'une quelconque revendication précédente, comprenant en outre un système de commande pour commander le fonctionnement dudit dispositif d'agencement afin de retirer les liqueurs de traitement d'une cuve de traitement continu, dans lequel le dispositif d'agencement comprend une pluralité de compartiments de retrait (8) pour recevoir la liqueur des tamis (6), et au moins deux collecteurs (7) pour recevoir la liqueur de la pluralité de compartiments de prélèvement (8) par l'intermédiaire des trous d'étranglement (9), dans lequel chaque collecteur (7) est relié à au moins un compartiment de prélèvement (8) sur au moins deux rangées de tamis (2a, 2b, 2c, 2d), lesdits collecteurs (7) étant agencés autour d'une circonférence de la paroi de la chambre de sorte que chaque collecteur (7) soit relié aux tamis (6) sur un secteur de la circonférence, et dans lequel le système de commande comprend :

au moins un capteur (15) pour détecter au moins un paramètre de fonctionnement dans un collecteur (7), un moyen (16) pour interrompre le fonctionnement du collecteur (7), et une unité de commande (1010) configurée pour communiquer avec ledit au moins un capteur (15) et pour recevoir un signal correspondant audit au moins un paramètre de fonctionnement, et également configurée pour commander les moyens (16) d'interruption du fonctionnement du collecteur.

6. Dispositif d'agencement selon la revendication 5, dans lequel l'unité de commande (1010) est configurée pour comparer ledit au moins un paramètre de fonctionnement détecté par le capteur (15) avec un autre paramètre de fonctionnement détecté ou avec un paramètre de référence et pour commander les moyens (16) d'interruption du fonctionnement du collecteur en réponse à ladite comparaison.
7. Dispositif d'agencement selon la revendication 6, dans lequel l'autre paramètre d'opération détecté est détecté par le même capteur (15), ou dans lequel l'autre paramètre d'opération détecté est détecté par un capteur conçu pour détecter un paramètre d'opération dans un autre en-tête.
8. Dispositif d'agencement selon l'une quelconque des revendications 5 à 7, comprenant en outre un moyen d'entrée (1020) et un moyen de sortie (1030) configurés pour transmettre des signaux à l'unité de

commande (1010) et recevoir des signaux de celle-ci, dans lequel le système de commande est de préférence configuré pour communiquer l'au moins un paramètre de fonctionnement détecté à un utilisateur par l'intermédiaire du moyen de sortie (1030) et le système de commande est de préférence configuré pour commander sur le moyen (16) permettant d'interrompre le fonctionnement du collecteur en réponse à l'entrée donnée par un utilisateur.

9. Dispositif d'agencement selon l'une quelconque des revendications 5 à 8, dans lequel l'unité de commande est en outre configurée pour comparer le paramètre détecté du collecteur (7) avec au moins un paramètre détecté d'au moins un autre collecteur (7) ou avec un paramètre de référence afin de déterminer si le fonctionnement dans ce collecteur satisfait à un critère de fonctionnement, et pour effectuer une procédure de nettoyage des écrans (6) reliés par l'intermédiaire des compartiments de prélèvement (8) à ce collecteur (6) si le critère de fonctionnement n'est pas satisfait.

10. Dispositif d'agencement selon l'une quelconque des revendications 5 à 9, dans lequel l'au moins un paramètre de fonctionnement détecté par l'au moins un capteur est une pression ou un débit.

11. Système de prélèvement des liquides de traitement d'une cuve de traitement dans un système de cuve de traitement continu, comprenant au moins deux dispositifs d'agencement selon l'une quelconque des revendications 1 à 4, agencés autour d'une circonférence de la paroi de chambre.

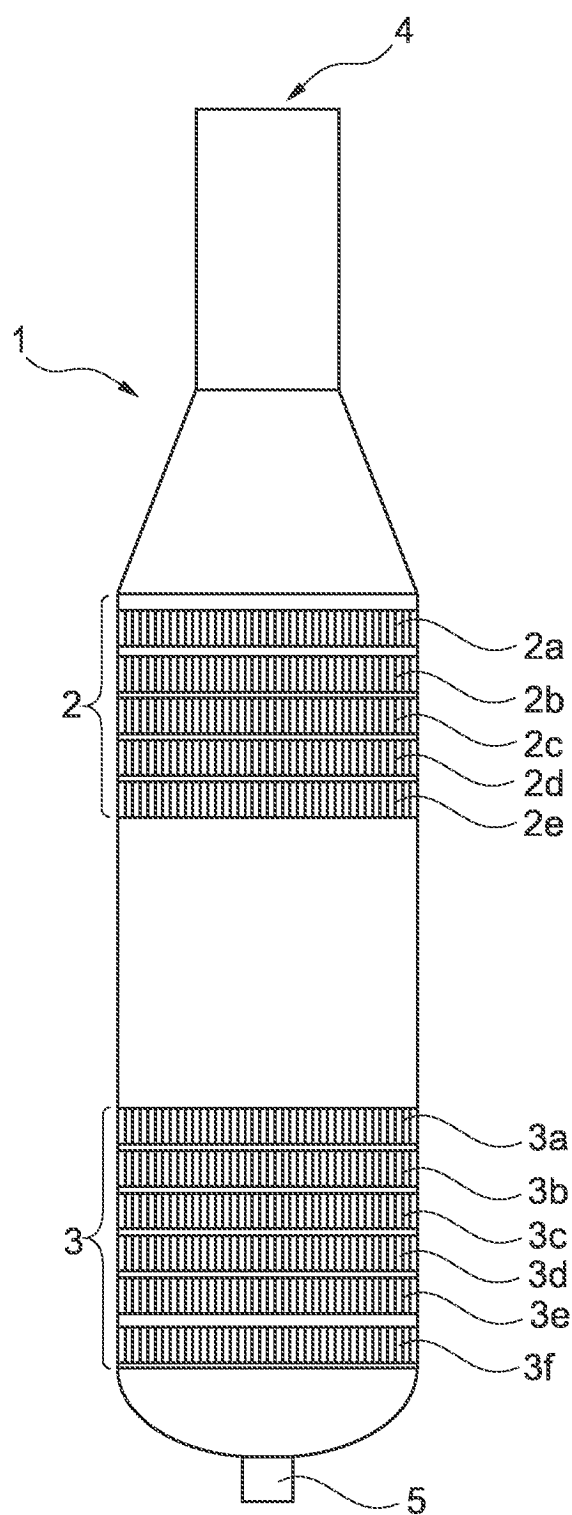


Fig. 1

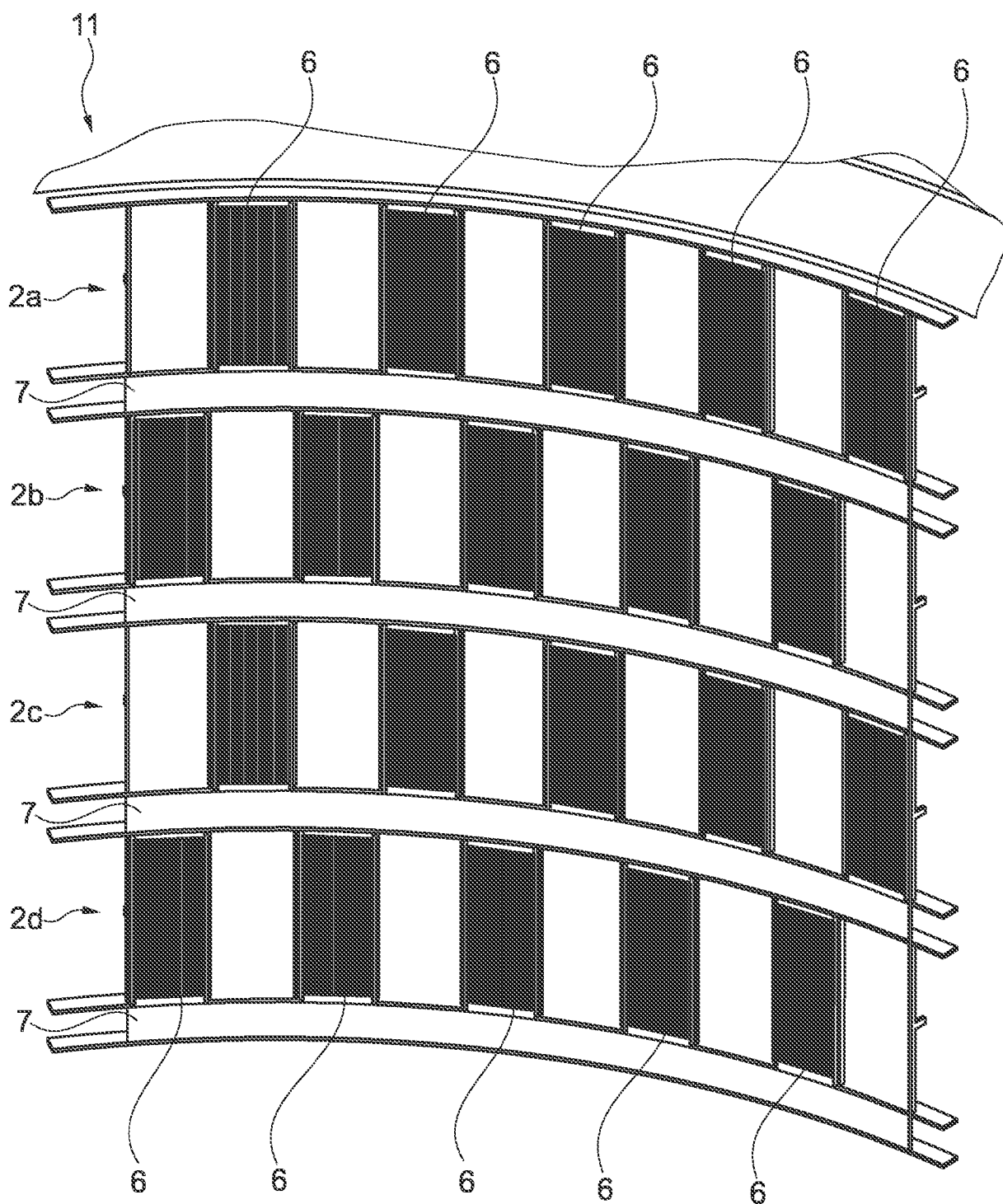


Fig. 2

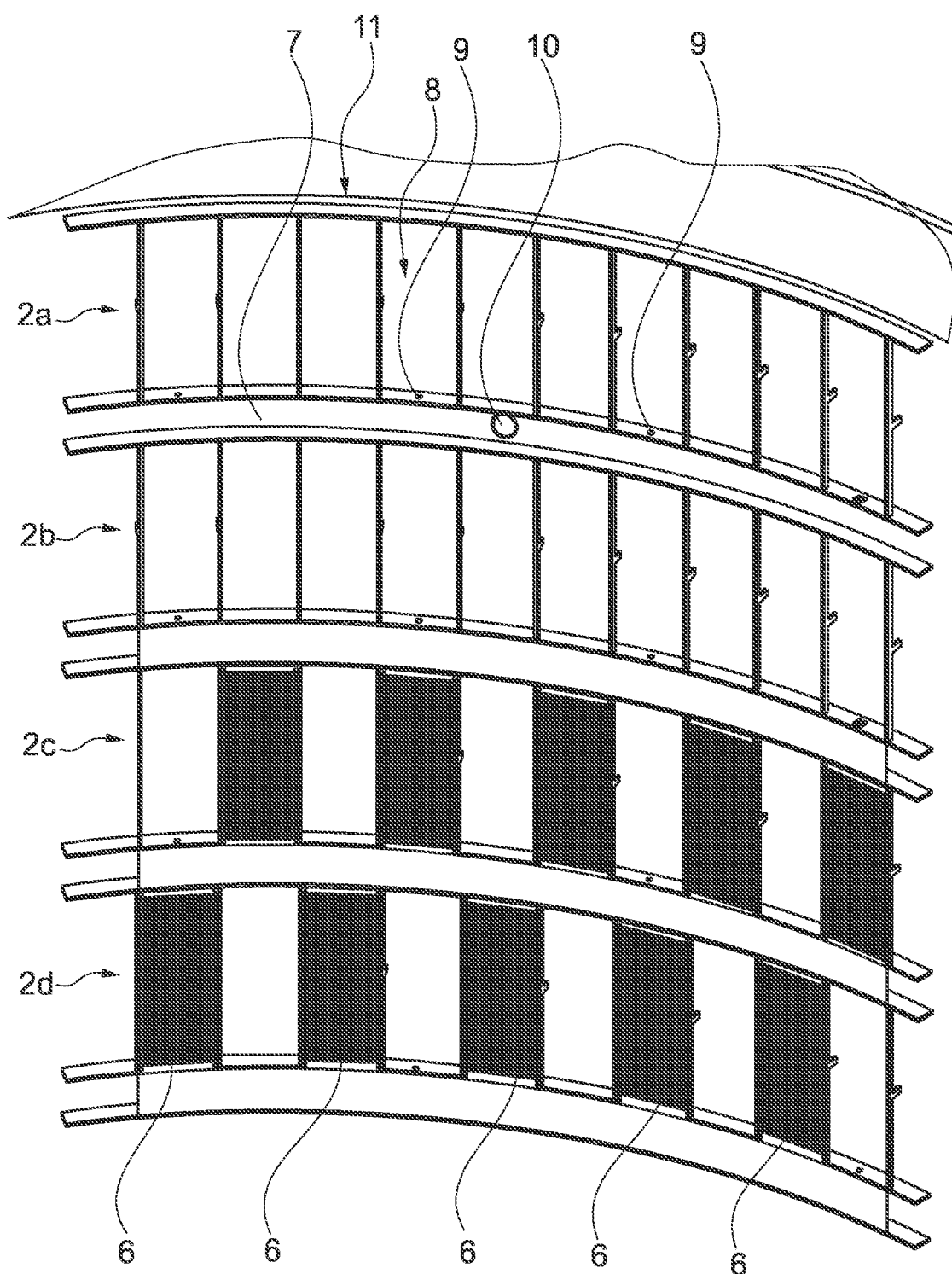


Fig. 3

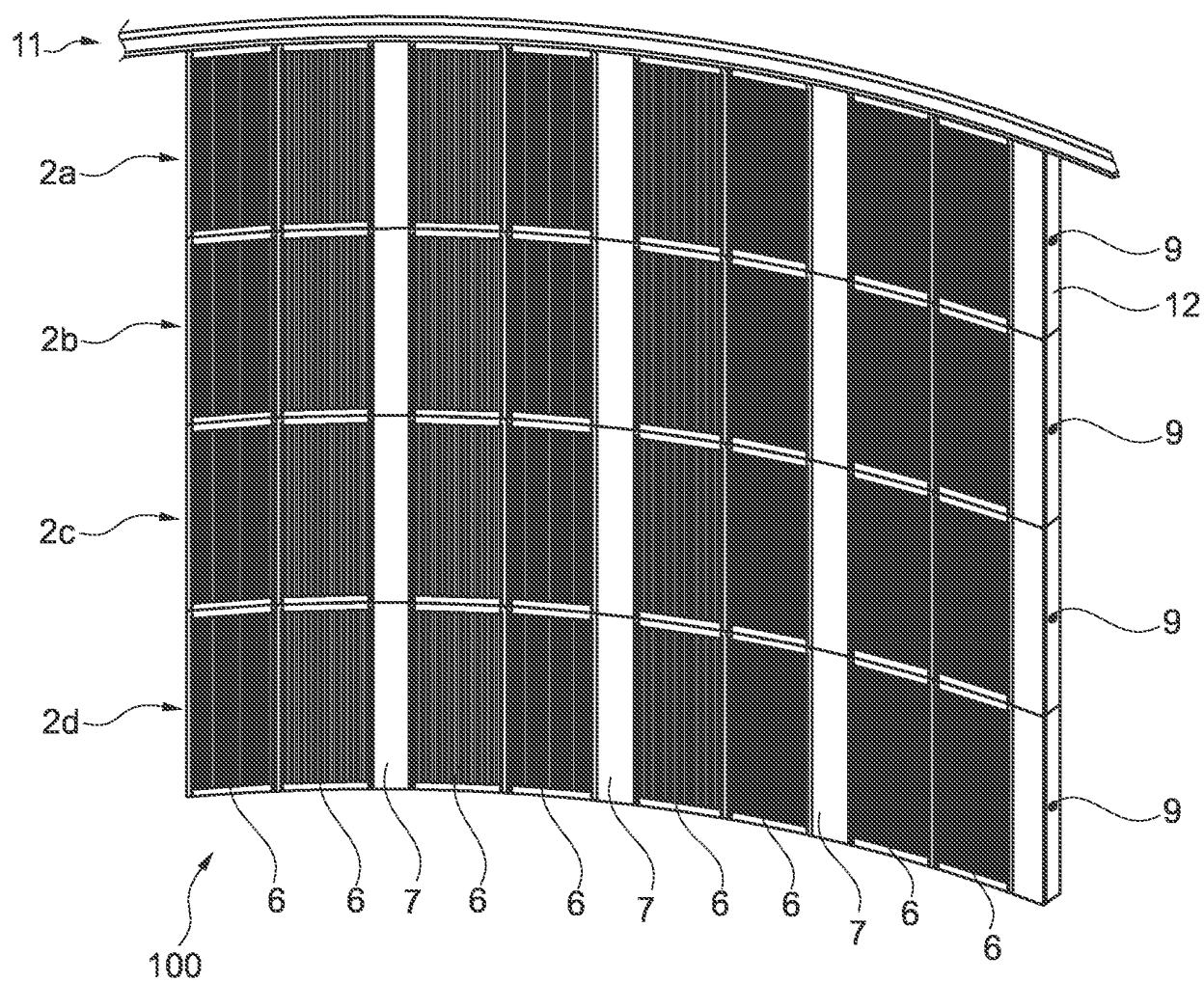


Fig. 4

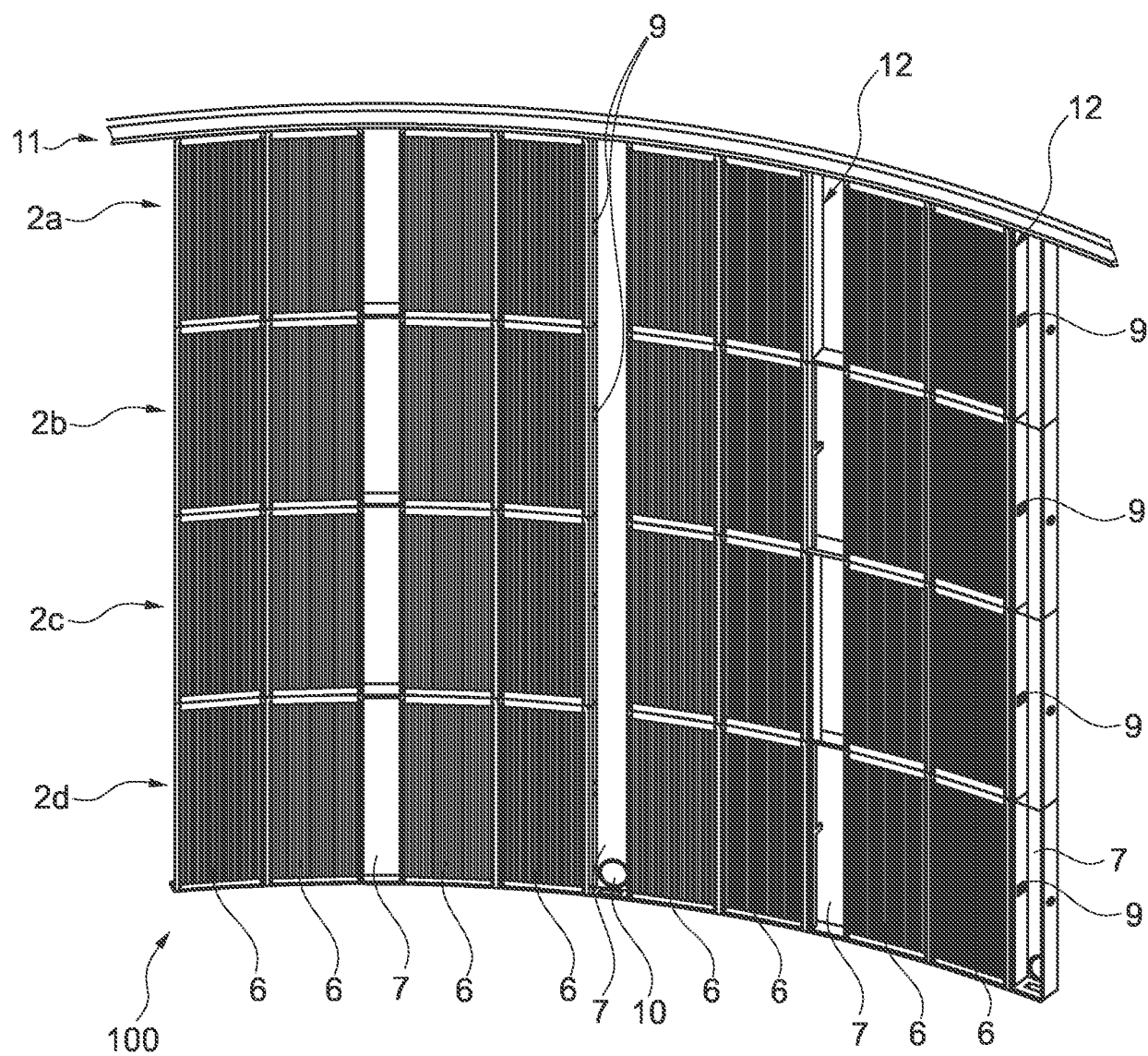


Fig. 5

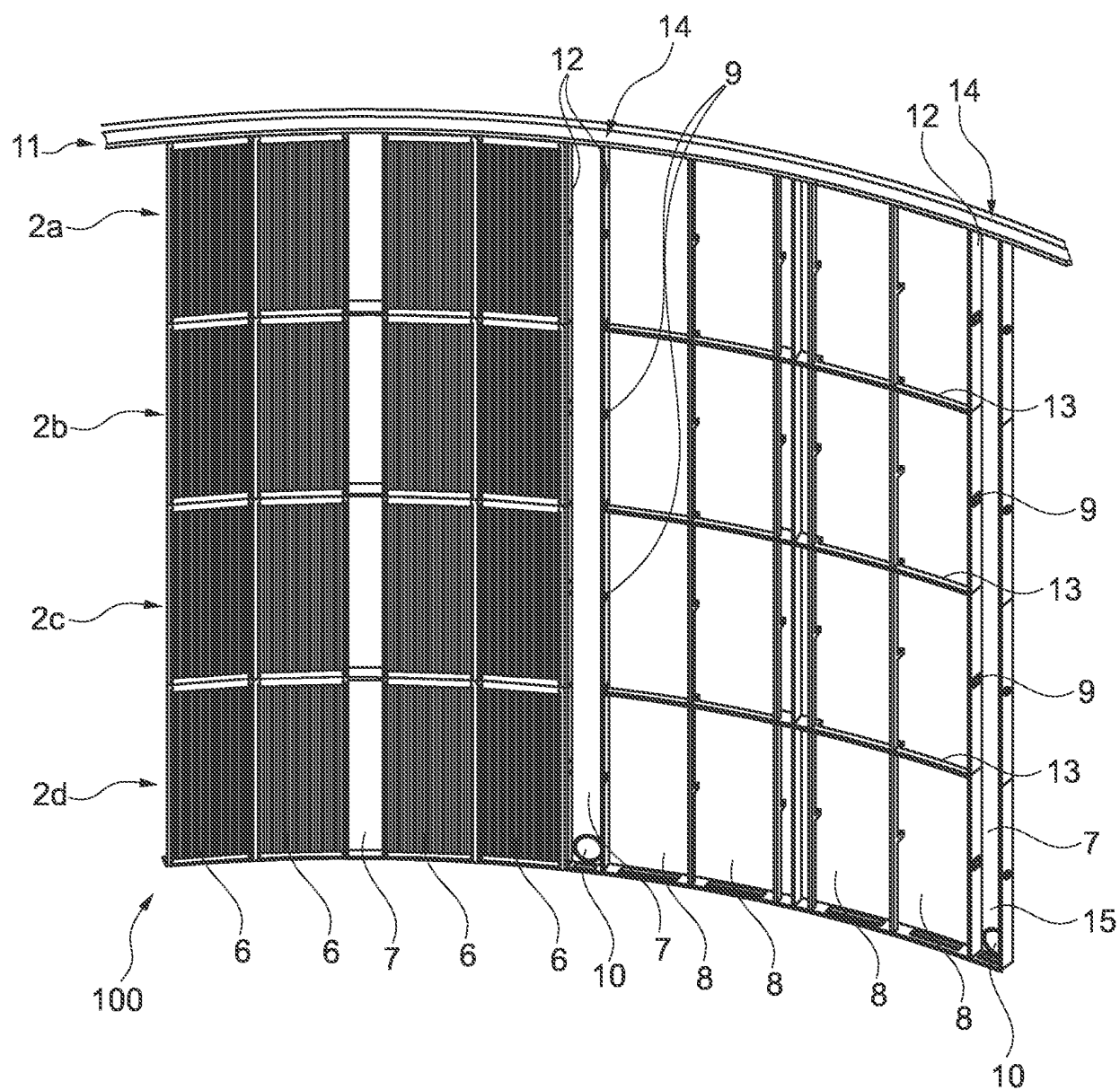


Fig. 6

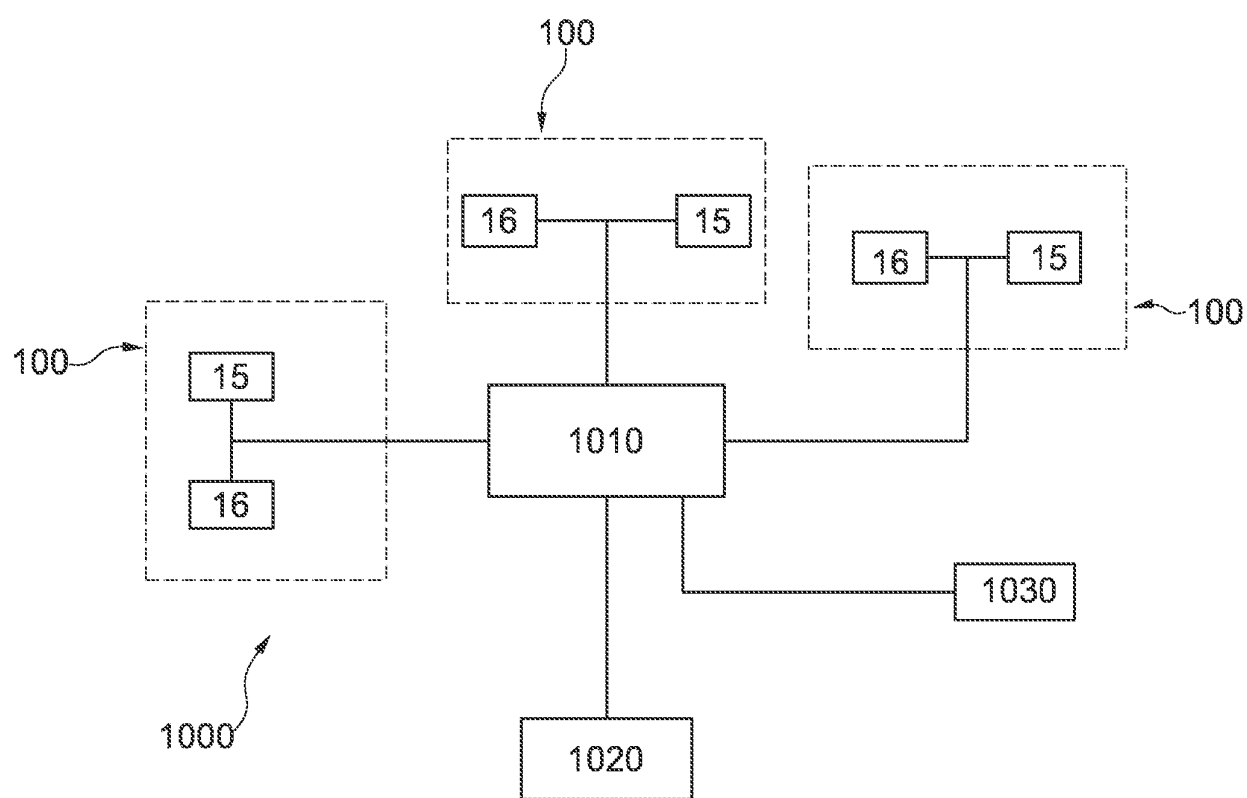


Fig. 7

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- US 6120647 A [0003]
- US 4547264 A [0004]
- US 3711367 A [0005]