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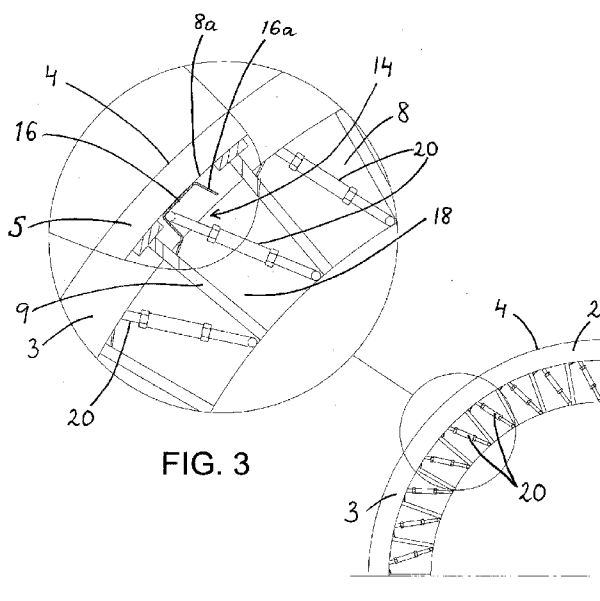
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(54) Title: DEVICE IN A WASH PRESS FOR COUNTERACTING REWETTING



(57) Abstract: Device for counteracting rewetting in a wash press for pulp, which comprises at least one insert unit (14) including a filtrate barrier (16) having an axial extension length (L) corresponding to an important part of the length of the filtrate channel and is arranged to obstruct a filtrate flow out from a rear part (18) of the filtrate channel with reference to the rotational direction. A first and second tightening screw (20) are arranged at the respective ends of the filtrate channel, such that the filtrate barrier is strained against the outer wall (8a) of the filtrate channel, and a plurality of springs (22) are pivotally connected to the filtrate barrier and arranged to support the filtrate barrier.

DEVICE IN A WASH PRESS FOR COUNTERACTING REWETTING

TECHNICAL FIELD

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The invention relates to a device for counteracting rewetting in an apparatus for washing cellulose pulp.

BACKGROUND

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Washing of pulp is a key process in the fiber line. There are a number of different types of washers on the market, of which some are based on press washing and comprises means for pressing the pulp such that liquid is removed. After pressing, the pulp may be diluted to a desired consistency, if needed.

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A well known type of wash press, partly illustrated in Fig. 1, has two co-operating cylindrical press rolls 2, arranged with their center of rotation in the same horizontal plane. The outer surface 4 of each press roll is perforated and, in operation, pulp is fed into a confined space between the perforated roll surface and a limiting means, such as a vat, wherein a pulp web is formed on the perforated roll surface. The press rolls are arranged to rotate in opposite directions and to transport the two separate pulp webs along their individual rotational direction, the webs being pressed in a so called pinch 6, where the distance between the press rolls is the smallest.

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The liquid that is removed from the pulp, i.e. the filtrate, passes through the perforated roll surface in a direction radially inwards and is transported to the ends (or alternatively to one end) of the press roll 2 by means of axial filtrate channels 8. Conventionally, there is a filtrate tank arranged in connection to a wash press for collection of filtrate resulting from the washing. Often, wash liquid is added to a wash press and in such a case, since the wash liquid displaces the liquid in the pulp, the washing principle will be a combination of dewatering, displacement and pressing.

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A wash press of the known general type described above is for example disclosed in the American patent US 3,980,518.

5 Large quantities of filtrate are not unusual, especially in rolls of great length. These quantities lead to the apparition of undesired rewetting after the pinch, as illustrated in Fig. 1. After the pinch 6 the pressure in the pulp 10 falls and a part of the filtrate 12 that has not yet been drained from the rolls 2 returns to the pulp. This rewetting is illustrated in figure 1 by the dashed arrows from the roll's inside to zone A (the rewetting zone) above the pinch. The pulp has a maximal dryness B before it reaches the rewetting zone, whereas the pulp coming out
10 from the press instead has a lower dryness C.

The American patent US 4,581,139 discloses an insert unit placed in a filtrate compartment of a drum washer in order to obstruct filtrate from flowing back. In the American patent US 5,470,471 it is suggested that plates should be inserted into the filtrate channels, permanently
15 or detachably, in order to prevent rewetting of the pulp in a press roll.

SUMMARY

20 An object of the invention is to provide an improved device for counteracting rewetting during washing of pulp. This object is achieved in accordance with the claims.

A device for counteracting rewetting in a wash press for pulp is provided. The wash press comprises two press rolls, arranged to rotate in opposite directions during operation, whereof at least one has a perforated outer surface, inside which a plurality of longitudinal filtrate
25 channels are arranged, wherein pulp that in operation is fed into the wash press is transported on the perforated outer surface in the rotational direction and is pressed in a pinch between the press rolls, while filtrate passes through the perforated outer surface into the filtrate channels. The device for counteracting rewetting comprises at least one insert unit adapted to be mounted in a respective filtrate channel and comprising a filtrate barrier, which has an axial
30 extension length corresponding to a considerable part of the length of the filtrate channel and, when the insert unit is mounted, is arranged to obstruct a filtrate flow out from a rear part of the filtrate channel with respect to the rotational direction, a first and second tightening screw that, when the insert unit is mounted, are arranged at the respective ends of the filtrate

channels such that the filtrate barrier is strained against the outer wall of the filtrate channels, and a plurality of springs pivotally mounted on the filtrate barrier and arranged to support the filtrate barrier.

5 According to one embodiment, the tightening screw comprises a center part and at least one outer part, wherein at least one of the outer parts is screwably arranged with respect to the center part. According to one embodiment, the tightening screw comprises two outer parts which are arranged to co-operate with the center part such that the outer parts may be screwed onto the center part in opposite directions. Preferably, the outer part of the tightening screw
10 may be provided with an end part, which is extended in an orthogonal direction with respect to the axis of the tightening screw.

According to one embodiment, the springs of the insert units are axially distributed along an inner part, preferably the center part, of the filtrate barrier, such that the springs, when the
15 insert unit is mounted in the filtrate channel, are arranged within the tightening screws.

According to one embodiment, the springs of the insert units are pivotally mounted on the filtrate barrier through a respective link in the area at the rear outer corner of the filtrate channels, viewed in the rotational direction.
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According to one embodiment, the filtrate barrier is arranged to substantially bear against the outer wall of the filtrate channels and has a projective part inwardly bent into the filtrate channel.

25 A wash press of the above described type is also provided, comprising a device for counteracting rewetting of the pulp.

SHORT DESCRIPTION OF THE DRAWINGS

30 The invention, and further objects and advantages of it, is best understood from the following description with reference to the appended drawings, of which:

Fig. 1 is a schematic illustration (partial view) of a cross section of a conventional press roll in operation;

Fig. 2 is a schematic illustration (partial view) of a cross section of a press roll in operation,
5 according to one embodiment of the invention;

Fig. 3 is a schematic illustration (partial view and detailed enlargement) of the end of a press roll according to one embodiment of the invention;

10 Fig. 4A shows a tightening screw in accordance with the embodiment in Fig. 3;

Fig. 4B shows an alternative embodiment of a tightening screw;

Fig. 5 is a schematic illustration (partial view) of an inner cross section of a press roll
15 according to one embodiment of the invention;

Fig. 6 shows a filtrate barrier with a spring in accordance with the embodiment in Fig. 5 in two positions; and

20 Fig. 7 shows a simplified axial view of a filtrate barrier with a spring in accordance with an embodiment of the invention.

DETAILED DESCRIPTION

25 In the drawings, corresponding parts are denoted with the same reference numerals.

As has been described above, undesired rewetting often occurs after the pinch of a press roll, see Fig. 1 where the rewetting is illustrated by the dashed arrows from the roll's 2 inside to the pulp 10 in the area A above the pinch 6.

30 In accordance with the invention the rewetting is counteracted by the provision of a filtrate barrier 16, e.g. a plate, in the filtrate channel 8, as is illustrated in Fig. 2. The plate 16 functions as a filtrate barrier in the manner that it is arranged to obstruct a filtrate flow out

from a rear part 18 of the filtrate channel with respect to the rotational direction. Filtrate may enter through the opening above the plate before the pinch 6, but after the pinch 6, the plate 16 retains the liquid in the filtrate channel 8.

5 The plate 16 is held in place by means of tightening screws (20 in Fig. 3, 4A-4B), such as rigging screws, at the ends of the roll, and springs 22 within the rigging screws 20. Hence, the springs are arranged to support the plate 16 against the outer wall 8a of the filtrate channels in the inner/center part of the filtrate channel. An insert unit 14, each comprising a plate 16, rigging screws 20 and springs 22, is arranged in each filtrate channel 8 of the illustrated rolls
10 2 in order to counteract rewetting as efficiently as possible when the wash press is in operation.

The different parts of the insert unit will now be described in detail with reference to Figs. 3-7.

15 In the figures, a section of a part of a roll 2 with a perforated plate 4 is shown, upon which plate the pulp is located when the wash press is in operation. The perforated plate 4 is supported by a mantle section 5, and inside the plate 4 there are filtrate channels 8 with supporting walls 9. At the end of the roll there is an end ring 3, which in the enlargement of
20 Fig. 3 partly is removed in order to illustrate the invention.

The plate 16 is arranged to substantially bear against a rear part 18 of the filtrate channel's 8 outer wall 8a. "Rear" refers to the roll's rotational direction and implies that a rear part of the filtrate channel reaches the pinch later than an other, front part of the filtrate channel. Hence,
25 when the pulp reaches the pinch from below, the plate 16 is supported on a lower part of the outer wall 8a of the filtrate channel 8, see the figures. The plate 16 has an axial extension length L corresponding to a considerable part of the length of the filtrate channel and may advantageously have a projective part 16a that is inwardly bent into the filtrate channel 8. (The expression "considerable part" denotes a major part of the filtrate channel, preferably
30 substantially the whole filtrate channel.)

A rigging screw 20, see Figs. 3 and 4A-4B, holds up the plate 16 at both ends of the filtrate channel 8. The fact that rigging screws 20 are used at the ends implies that the number of springs 22 needed to keep the plate 16 on place is reduced. Further, a smaller number of

springs 22 implies that it is easier to install the plate 16 since less effort is needed to push it in. Due to the fact that springs 22 only are needed in the inner or center part of the filtrate channel the likelihood of the plate 16 getting stuck in the filtrate channel 8 at installation is diminished.

5

The rigging screw 20 illustrated in Fig 4A consists of a center part 20a, basically a big nut, that co-operates with two outer parts 20b of which the screw threads are opposed to each other. By twisting the nut 20a the rigging screw 20 is strained and keeps the plate 16 in place. The rigging screw 20 preferably has a certain degree of extension at its end (end part 20c), in a direction orthogonal to its axis, such that the load per unit area is diminished.

10

Fig 4B illustrates an alternative embodiment of the rigging screw 20, having only one outer threaded part 20b, and with a corresponding threaded part of the center part 20a. The function of the tightening screw remains the same.

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A certain number of springs 22 are placed in the middle of each plate 16 as support, see Fig. 5-7. The number of springs 22 depends on how long the plate is. (For simplicity reasons only one spring 22 is shown in Fig. 7.) The springs 22 are mounted on a link 22a that has been welded onto the plate 16. Due to the fact that the springs 22 are articulated it is possible to temporarily decrease the constructional height, see Fig. 6, which simplifies the installation and the transport of the plate 16. The respective link 22a of the springs are placed at the rear outer corner 8b (i.e. the lower in the figures) of the filtrate channel with respect to the rotational direction.

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The installation of the insert units 14 is preferably made on site where the wash press is to be used. The rolls 2 may still be located in the vat. A plate 16 is pushed into each filtrate channel 8. This is performed in the direction shown by the arrow in Fig. 7. The installation is facilitated in that the springs 22 are in the position that corresponds to the dashed line in Fig. 6 during the movement. Thereafter, the springs adjust themselves such that they strain the plate. The rigging screws 20 are tightened at the end parts. The rigging screws 20 are locked by welds between the center part 20a and the outer parts 20b such that they will not move, but instead at all times restrain the plate. Alternatively, the rigging screws may be locked in other ways, e.g. by means of a locking nut 20d, as illustrated in connection with the embodiment according to Fig 4B.

30

5 A device for counteracting rewetting according to the invention comprises at least one insert unit 14 of the type described above. The insert unit 14 is adapted to be arranged in a filtrate compartment, such as illustrated in Figs. 2-3 and 5. Preferably the device according to the invention comprises a plurality of insert units 14. In order to obtain best effect there are just as many insert units 14 as there are filtrate compartments 8 in the roll/rolls 2 available for the insert units 14.

10 Even though the invention has been described with reference to specific illustrated embodiments, it should be noted that the invention also comprises equivalents, alterations and alternatives that are obvious to the skilled person. The scope of the invention is only limited by the appended claims.

CLAIMS

1. Device for counteracting rewetting in a wash press for pulp, which wash press comprises two press rolls (2), arranged to rotate in opposite directions (R, R') in operation, of which at least one has a perforated outer surface (4) inside which a plurality of longitudinal filtrate channels (8) are arranged, wherein pulp that in operation is fed into the wash press is transported on the perforated outer surface in the rotational direction and is pressed in a pinch (6) between the press rolls while filtrate passes through the perforated outer surface into the filtrate channels, said device comprising at least one insert unit for counteracting rewetting, (14) the insert unit being adapted to be mounted in a respective filtrate channel and in itself comprising

a filtrate barrier (16) having an axial extension length (L) corresponding to a considerable part of the length of the filtrate channels and, when the insert unit is mounted, is arranged to obstruct a filtrate flow out from a rear part (18) of the filtrate channel with respect to the rotational direction,

characterised in a first and second tightening screw (20), which, when the insert unit is mounted, are arranged at the respective ends of the filtrate channel such that the filtrate barrier is strained against the outer wall (8a) of the filtrate channel; and

a plurality of springs (22) pivotally connected to the filtrate barrier and arranged to support the filtrate barrier.

2. Device according to claim 1, where the tightening screw (20) comprises a center part (20a) and at least one outer part (20b) and where at least one of the outer parts is screwably arranged with respect to the center part.

3. Device according to claim 2, where the device comprises two outer parts (20b) which are arranged to co-operate with the center part (20a) such that the outer parts may be screwed onto the center part in opposite directions.

4. Device according to claim 2 or 3, where at least one outer part (20b) of the tightening screws (20) is provided with an end part (20c) extended in a direction orthogonal to the axis of the tightening screw.

5. Device according to anyone of the preceding claims, where the springs (22) are axially distributed along an inner part of the filtrate barrier (16), such that the springs, when the insert unit (14) is mounted in the filtrate channel (8), are arranged within the tightening screws (20).

5 6. Device according to anyone of the preceding claims, where the springs (22) of the insert unit (14) are pivotally connected to the filtrate barrier through a respective link (22a) in the area of the rear outer corner (8b) of the filtrate channel with respect to the rotational direction.

10 7. Device according to anyone of the preceding claims, where the filtrate barrier (16) is arranged to substantially bear against the outer wall (8a) of the filtrate channel and has a projective part (16a) inwardly bent into the filtrate channel.

15 8. Wash press for pulp comprising two press rolls (2), arranged to rotate in opposite directions in operation, of which at least one has a perforated outer surface (4) inside which a plurality of longitudinal filtrate channels (8) are arranged, wherein pulp that in operation is fed into the wash press is transported on the perforated outer surface in the rotational direction and is pressed in a pinch (6) between the press rolls, while filtrate passes through the perforated outer surface and into the filtrate channels, the wash press further comprising a device for counteracting rewetting according to anyone of claims 1-7.

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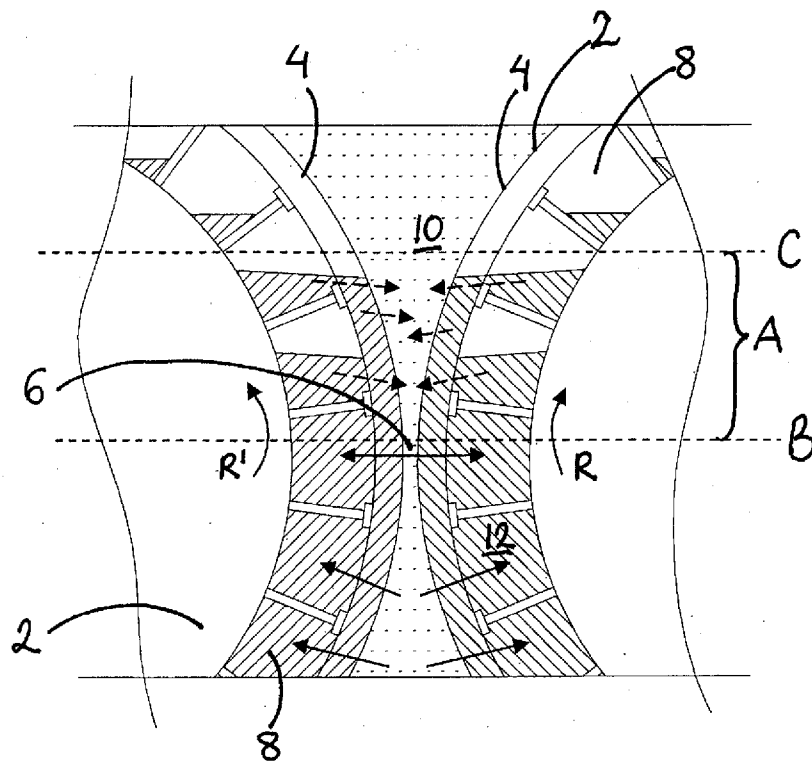


FIG. 1

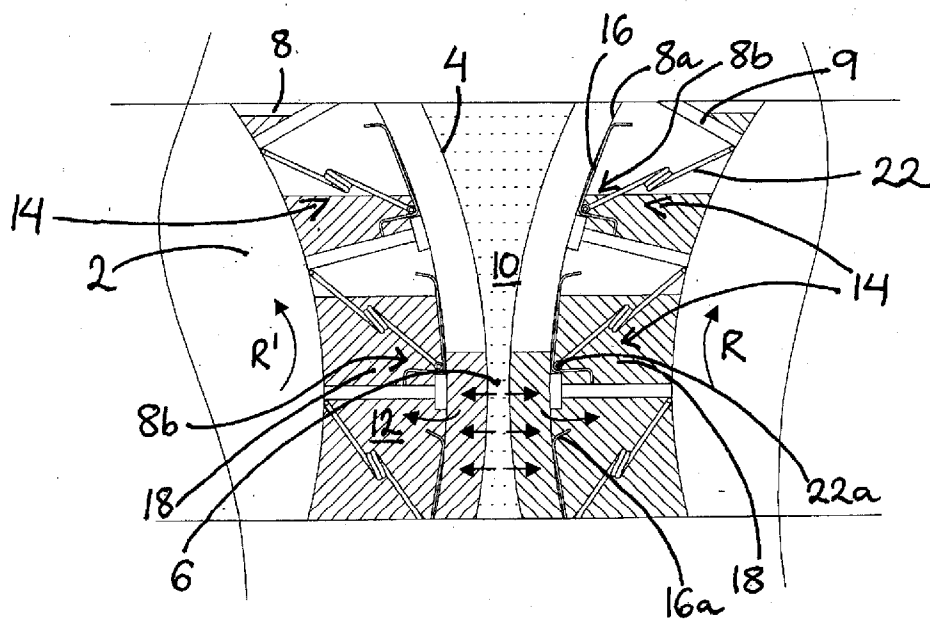
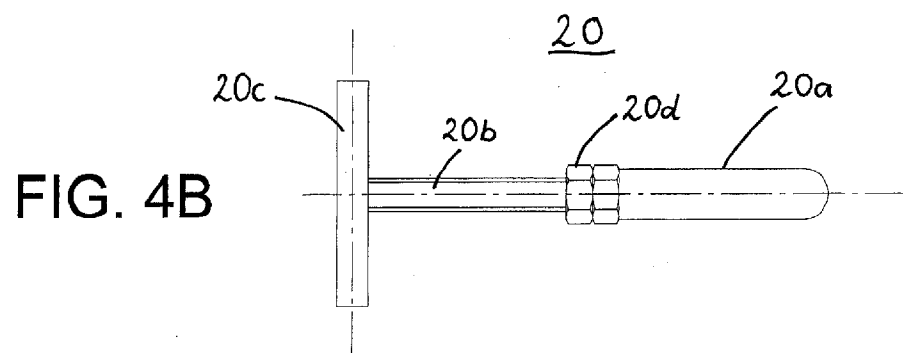
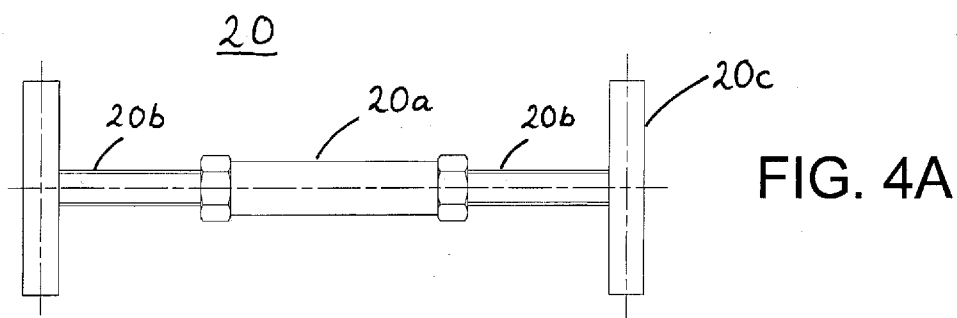
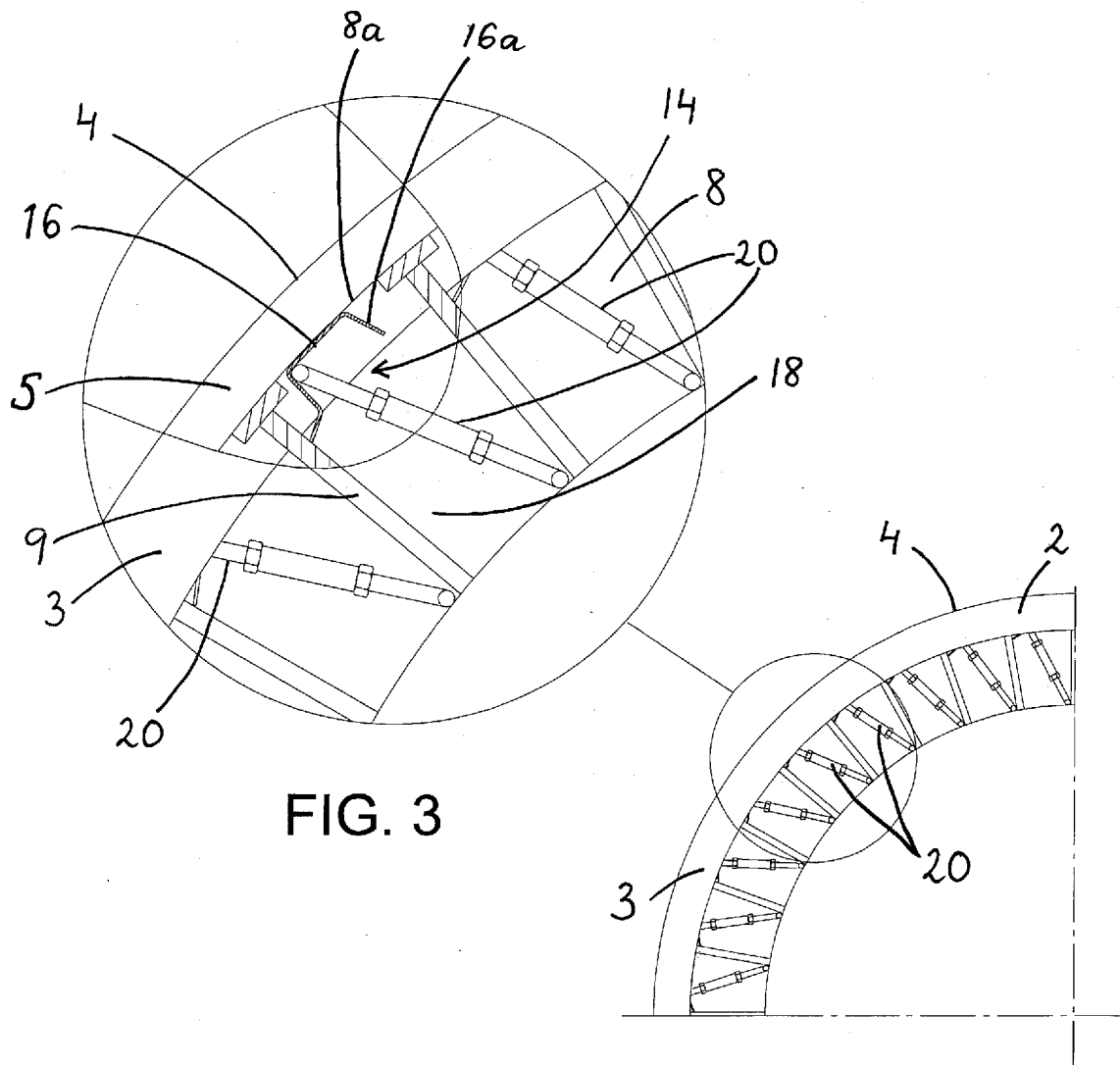


FIG. 2

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3/3

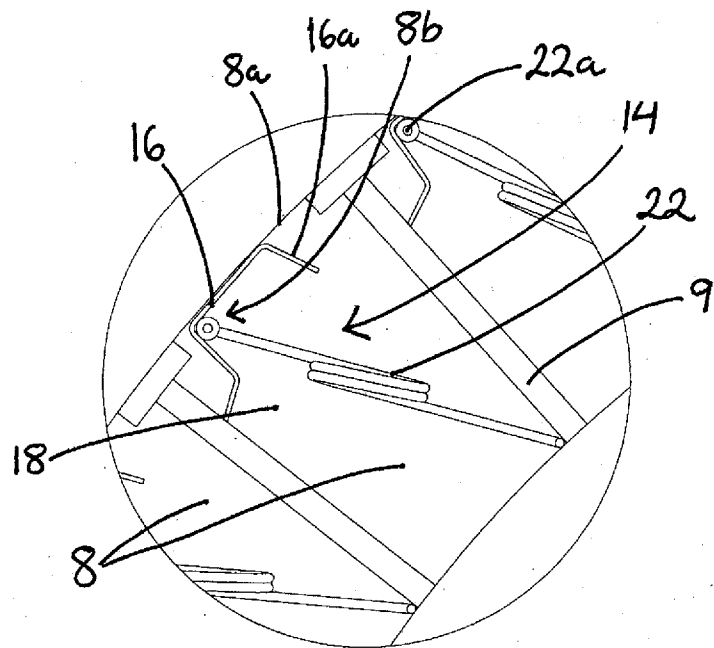


FIG. 5

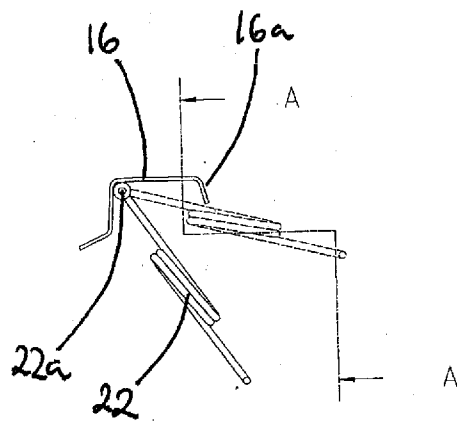


FIG. 6

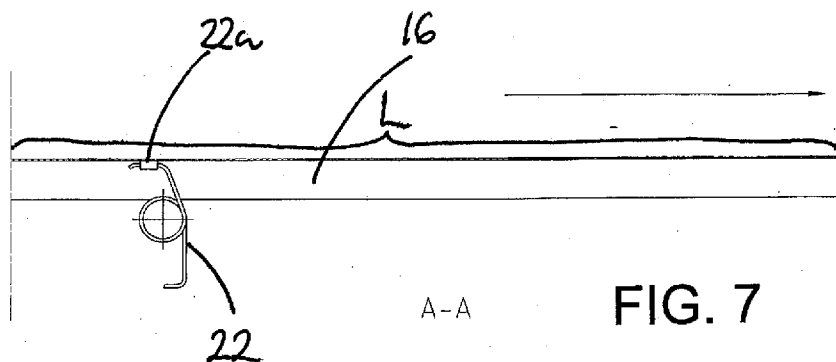


FIG. 7

INTERNATIONAL SEARCH REPORT

International application No.

PCT/SE2010/050237

A. CLASSIFICATION OF SUBJECT MATTER

IPC: see extra sheet

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC: D21C, D21D, B30B, B01D, D21F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-INTERNAL, WPI DATA, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 9426388 A1 (INGERSOLL-RAND COMPANY), 24 November 1994 (24.11.1994), page 6, line 22 - page 7, line 23, figures 5A,5B,5C,5D, abstract --	1-8
A	US 4581139 A (KOSONEN V.J.), 8 April 1986 (08.04.1986), column 3, line 14 - line 27, figures 2,3, abstract -- -----	1-8

☐ Further documents are listed in the continuation of Box C.☒ See patent family annex.

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Date of the actual completion of the international search

27 May 2010

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Cited literature, if any, will be enclosed in paper form.

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/SE2010/050237

WO	9426388	A1	24/11/1994	BR	9406297 A	26/12/1995
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				EP	0697909 A	12/03/1997
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US	4581139	A	08/04/1986	NONE		
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