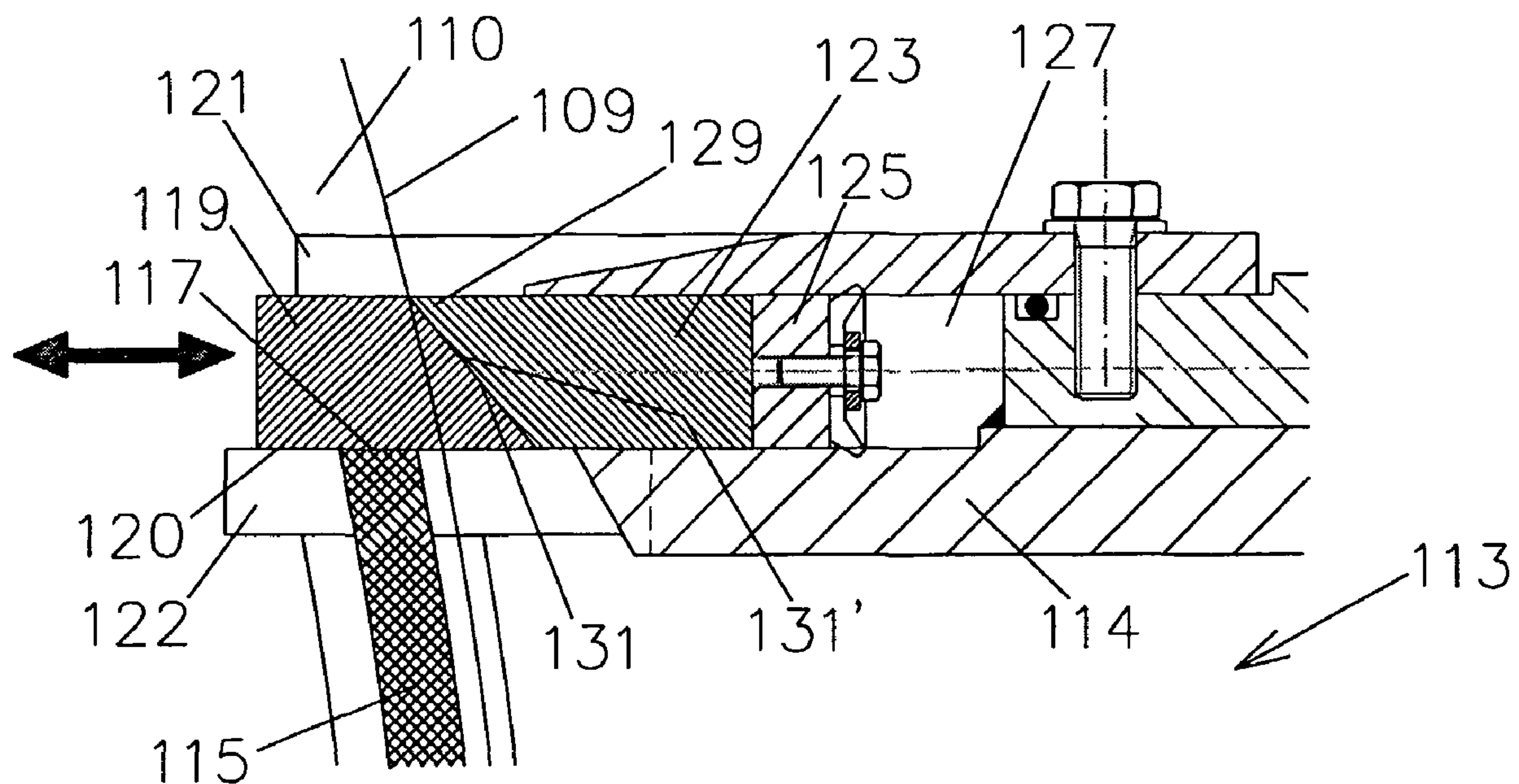




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(54) Titre : JOINTS POUR ROULEAUX PRESSEURS
(54) Title: SEAL AT PRESS ROLLERS



(57) Abrégé/Abstract:

The present invention relates to a seal arrangement for a cylindrical roll (110), for instance a press roll in a roll press that includes two co-acting press rolls for de-watering material suspension, wherein the seal arrangement is intended to seal the roll between a trough (114), which partially surrounds the roll, and the surroundings, and wherein said arrangement includes an end seal (119) applied to the end surface (137) of the roll, and a longitudinally extending seal (123) applied to the barrel surface (108) of said roll, wherein the sealing arrangement also includes an edge seal (119) which is force-actuated dynamically towards the end surface (137) of the roll (110) and also towards the longitudinally extending seal (123).

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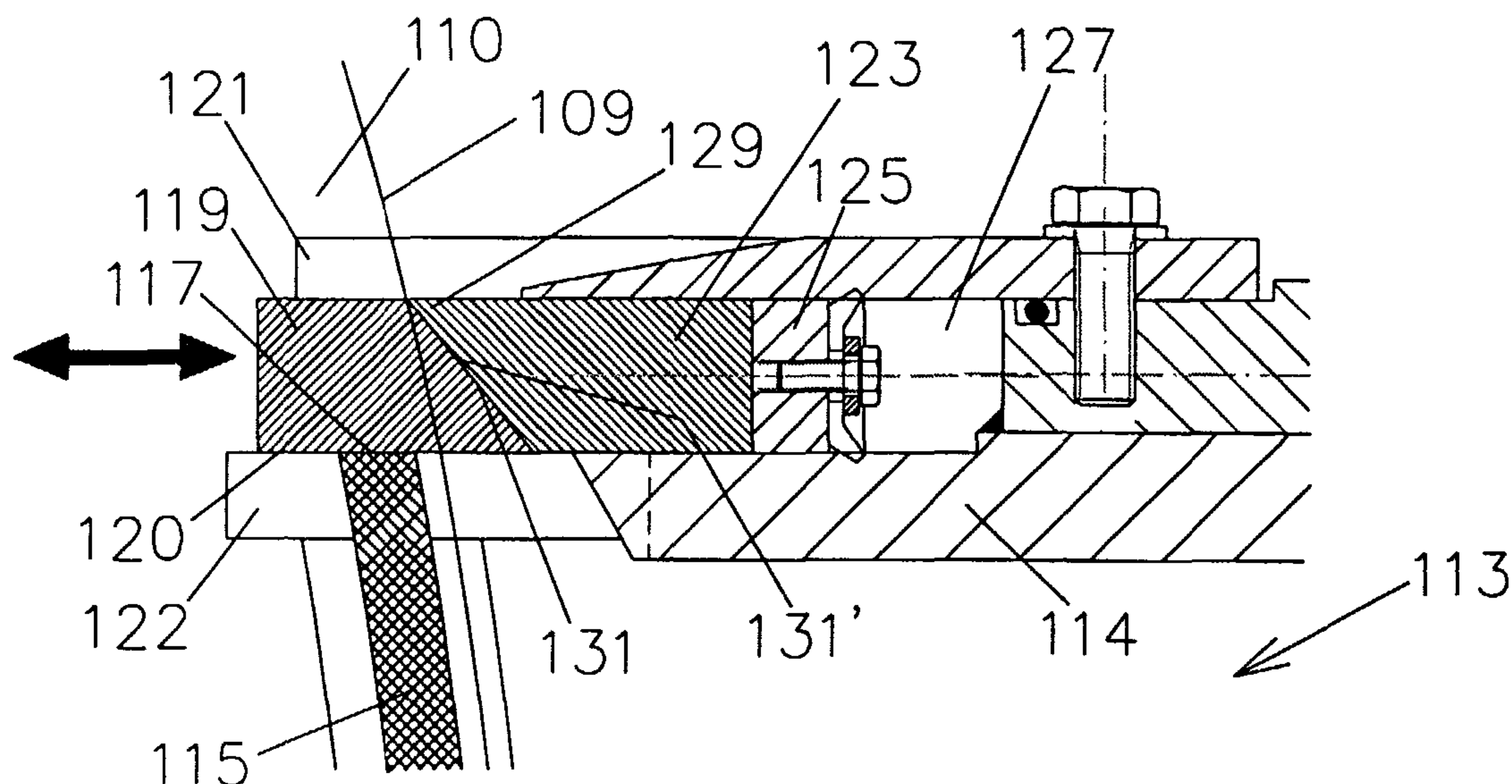
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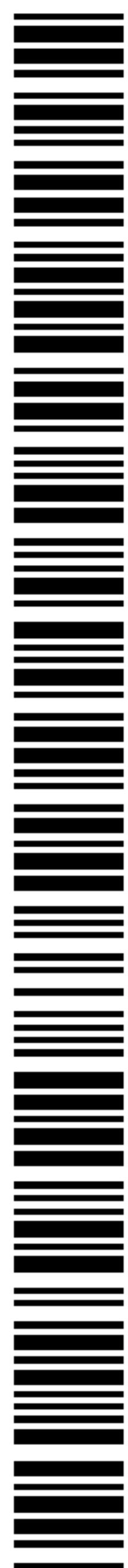
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(54) Title: SEAL AT PRESS ROLLERS



(57) Abstract: The present invention relates to a seal arrangement for a cylindrical roll (110), for instance a press roll in a roll press that includes two co-acting press rolls for de-watering material suspension, wherein the seal arrangement is intended to seal the roll between a trough (114), which partially surrounds the roll, and the surroundings, and wherein said arrangement includes an end seal (119) applied to the end surface (137) of the roll, and a longitudinally extending seal (123) applied to the barrel surface (108) of said roll, wherein the sealing arrangement also includes an edge seal (119) which is force-actuated dynamically towards the end surface (137) of the roll (110) and also towards the longitudinally extending seal (123).



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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

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SEAL AT PRESS ROLLERS**FIELD OF INVENTION**

The present invention relates to the field of de-watering material suspensions with the aid of press rolls, and more particularly to a sealing arrangement located between a press roll and a trough or pit that partially surrounds the roll.

Background of the invention

As will be apparent from SE 503 010 and SE 509 519, are at present sealed by means of an end seal that connects with the end surface of the roll, wherein a longitudinally extending seal in the form of a flexible element is pressed against the cylindrical surface of the roll.

It is generally difficult to seal around a corner of a rotating press roll, because the roll is moveable in two directions. Firstly the roll moves axially as a result of thermal expansion and secondly it moves radially as a result of variation in the clearance between rolls. Sealing against the roll end is achieved with the end seal and with the seal that extends longitudinally along the roll, both of said seals being pressurised and "floating" with the roll in a direction that is normal to the sealing surface. Sealing around the corner of a roll is effected with the aid of a static seal that seals against the longitudinally extending seal on the one hand and against the end seal on the other hand.

The static seal tends not to follow the sealing surface, and is therefore mounted with a given clearance in relation thereto. This clearance can result in leakage if excessively large and in wear of the sealing surface if excessively small.

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Object of the invention

The object of some embodiments of the present invention is to provide a seal at an edge of a moveable roll that will solve the aforesaid problem, and then in particular with regard to a roll of a roll press for de-watering material
5 suspensions.

Summary of the invention

According to an aspect of the invention there is provided a sealing arrangement for a cylindrical roll wherein the sealing arrangement seals the roll between a trough, which partially surrounds the roll, and the surroundings, and
10 wherein said arrangement includes an end seal applied to the end surface of the roll, and a longitudinally extending seal applied to the barrel surface of said roll, wherein the sealing arrangement also includes an edge seal which is force-actuated dynamically towards the end surface of the roll and also towards the longitudinally extending seal.

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An embodiment of the invention includes dynamically spring biased edge seal that follows the sealing surface in two directions and which seals against both the end seal and the longitudinally extending seal.

The edge seal includes an oblique surface against which a spring acts, wherein the slope of said surface can be chosen for appropriate force distribution of one force component acting on the sealing surface and the other force component acting on the longitudinal seal. For example, the spring may be caused to exert up to 60% of its force on the sealing surface and up to 40% of its force on the longitudinal seal.

The edge seal is adapted to lie flat against the end surface of the end seal and includes a wedge-shaped surface that co-acts with a corresponding wedge-shaped surface on the longitudinal seal.

Brief description of the drawings

The invention will now be described in more detail with reference to an exemplifying embodiment thereof and also with reference to the accompanying drawings, in which

Figure 1 is a cross-sectional view of a conventional roll press,

Figure 2 is a sectional view of an inventive seal, and

Figure 3 illustrates the seal according to the present invention from above.

Description of the invention

The conventional roll press illustrated in Fig. 1 includes two cylindrical rotatable, liquid permeable press rolls 10 whose barrel surfaces are comprised of perforated metal sheet welded to a roll body. The rolls are received partially in a trough 12 such as to form spaces 13 between the rolls and the inner surface of the pit. These spaces 13 communicate with pulp suspension inlets 14. The press rolls 10 form therebetween a press nip 15. The spaces 13 are sealed from the surroundings by means of seals 16 acting against the barrel surfaces of the rolls 10 and end seals which act against the end walls of the rolls. The pulp web present in the roll nip 15 functions as a seal between the rolls. Doctor arrangements 18 are positioned downstream of the nip for removing from the barrel surfaces of the rolls the pulp web ac-

companying the rolls from the roll nip 15. The seal 16 between the through 12 and the barrel surface of each roll 10 extends along the full length of the roll.

Figure 2 is a sectional view of the inventive sealing arrangement, where the barrel surface 109 of an imagined press roll 110 to be sealed is shown schemati-
cally with a peripheral line. The space 113 to be sealed comprises the internal vol-
ume of a trough 114 similar to that shown in Fig. 1. The sealing arrangement in-
cludes an end seal 115 which is placed in sealing abutment with the end wall of the
roll. The end seal 115 is terminated with a flat end surface 117 with which a flat side
120 of an edge seal 119 abuts.

The edge seal 119 is adapted to move in a plane at right angles to the end
wall of the roll and parallel with the end surface 117, as shown by the double-
headed arrow in said Figure. Movement of the edge seal to this plane is controlled
positively (forcibly guided) by virtue of the movement that takes place between a
guide plate 121 and a seating 122. Sealing of the space 113 against the roll periph-
ery is effected with the aid of a longitudinally extending seal 123 which is mounted in
the through 114 for movement into contact with the barrel surface 109 in the same
plane as that in which edge seal 119 moves. The longitudinally extending seal 123
is adapted to be pressed against said barrel surface with the aid of a piston-cylinder
device 125 which exerts pressure against the seal when a pressure medium is
pressurised in a limited volume 127 in which the piston is intended to move. That
part of the longitudinally extending seal 123 which faces towards said barrel surface
includes a lip 129 which is formed by a longitudinally extending wedge-like surface
131 on said seal. The oblique surface of the seal 123 abuts with a corresponding
wedge-like surface 131' on the edge seal 119.

Fig. 3 is a schematic view from above of the edge seal 119, the longitu-
dinally extending seal 123 and the end seal 115, indicated in broken lines beneath the
edge seal 119, and shows these sealing devices mutually co-act through the me-
dium of the possible directions of movements shown by the double headed arrows
in the Figure. In this regard, the edge seal 119 is provided with an oblique surface
133 against which a leaf spring 135 acts dynamically. The leaf spring is mounted on
the outside of the trough 114, so that the spring can be adjusted into optimal abut-
ment with and optimal tension against the edge seal and so that it can follow dy-
namically the longitudinal movements of the roll and the movements of the longitu-

dinally extending seal. As a result of the spring force acting on the oblique surface, the edge seal is pressed against the end wall 137 of the 110 and also against the longitudinally extending seal 123, as indicated by the two upper double-headed arrows in the figure. The longitudinally extending seal 123, with its lip 129, is move-
5 able towards and away from the roll 110 respectively, as indicated by the lowermost double-headed arrow in said figure. As will be seen from the figure, the longitudinally extending seal 123 extends along the full length of the roll 110 and slightly beyond the roll, so as to overlap the edge seal 119 and co-act with its wedge-like surface 131'.

10 The has been described above with reference to Figures 2 and 3 a sealing arrangement at one corner of a roll press. It will be understood, however, that in reality a roll press according to Figure 1 will require a sealing arrangement at all four corners of the press.

15 It will also be understood that the invention is not restricted to the described and illustrated embodiment thereof, since modifications can be made within the scope of the accompanying Claims with respect to the descriptive part of this specification.

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CLAIMS:

1. A sealing arrangement for a cylindrical roll wherein the sealing arrangement seals the roll between a trough, which partially surrounds the roll, and the surroundings, and wherein said arrangement includes an end seal applied
5 to the end surface of the roll, and a longitudinally extending seal applied to the barrel surface of said roll, wherein the sealing arrangement also includes an edge seal which is force-actuated dynamically towards the end surface of the roll and also towards the longitudinally extending seal.
2. A sealing arrangement according to Claim 1 wherein the cylindrical
10 roll is a press roll in a roll press that includes two co-acting rolls for dewatering material suspensions.
3. A sealing arrangement according to Claim 1 or 2, wherein the dynamic force applied to the end surface and to the longitudinally extending seal is exerted by a spring.
- 15 4. A sealing arrangement according to Claim 3, wherein the spring is a leaf spring that is applied to an oblique surface on the edge seal to achieve an intended force distribution between the end surface and the longitudinally extending seal.
5. A sealing arrangement according to any one of Claims 2 - 3, wherein
20 60% of the spring force is adapted to act against the end surface and wherein 40% of said spring force is adapted to act against the longitudinally extending seal.
6. A sealing arrangement according to any one of Claims 1 - 4, wherein the edge seal is guided for transversal movement in solely one plane, by a guide
25 plate and a seating.
7. A sealing arrangement according to Claim 6, wherein the edge seal and the longitudinally extending seal are both guided for movement in the same plane.

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8. A sealing arrangement according to Claim 7, wherein the edge seal includes a wedge-like surface which co-acts with a corresponding wedge-like surface on the longitudinally extending seal to form on said longitudinally extending seal a lip that faces out from the trough.

5 9. A sealing arrangement according to any one of Claims 1 - 7, wherein the longitudinally extending seal is adapted to be applied to the periphery of the roll by means of a piston-cylinder device.

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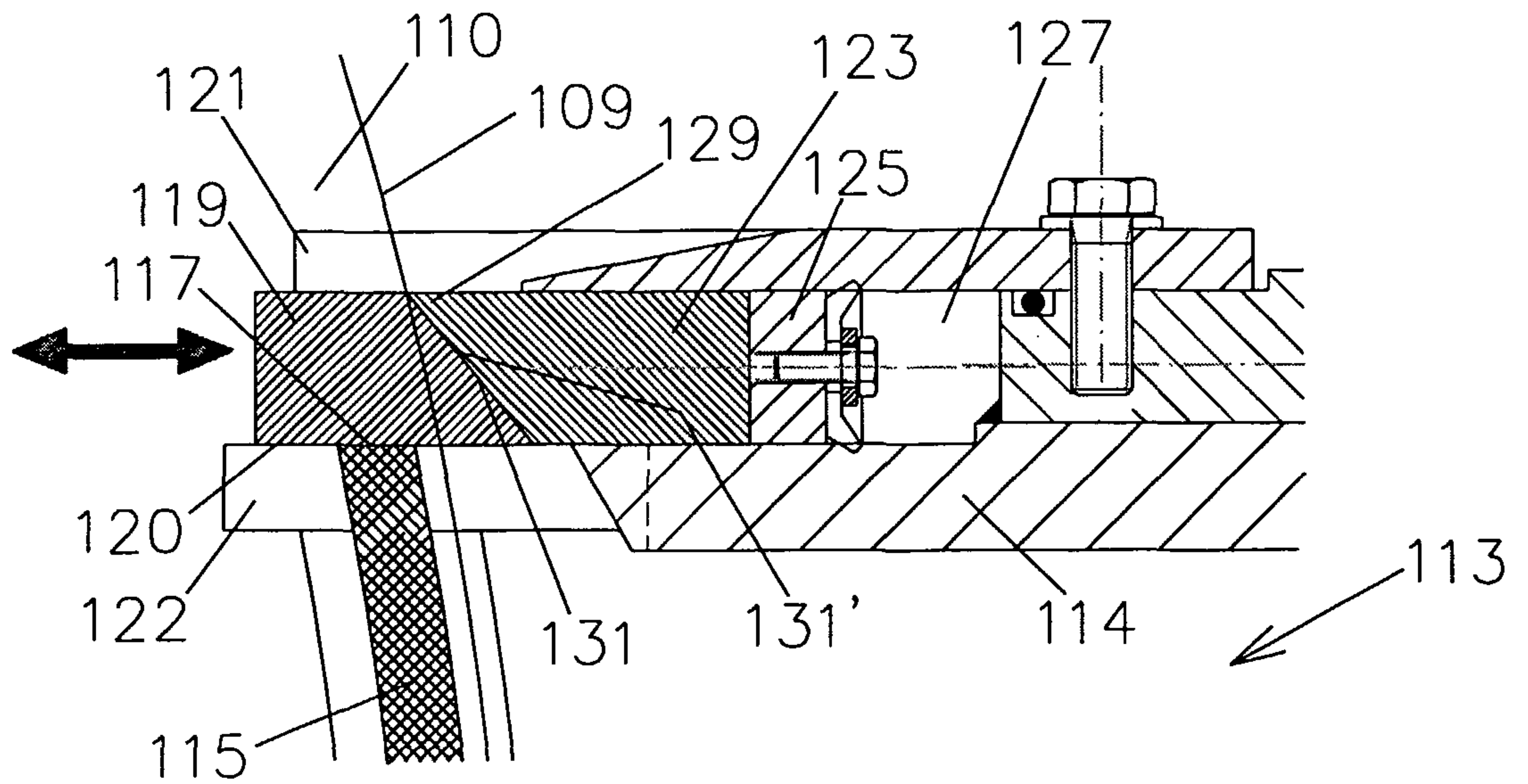


Fig 2

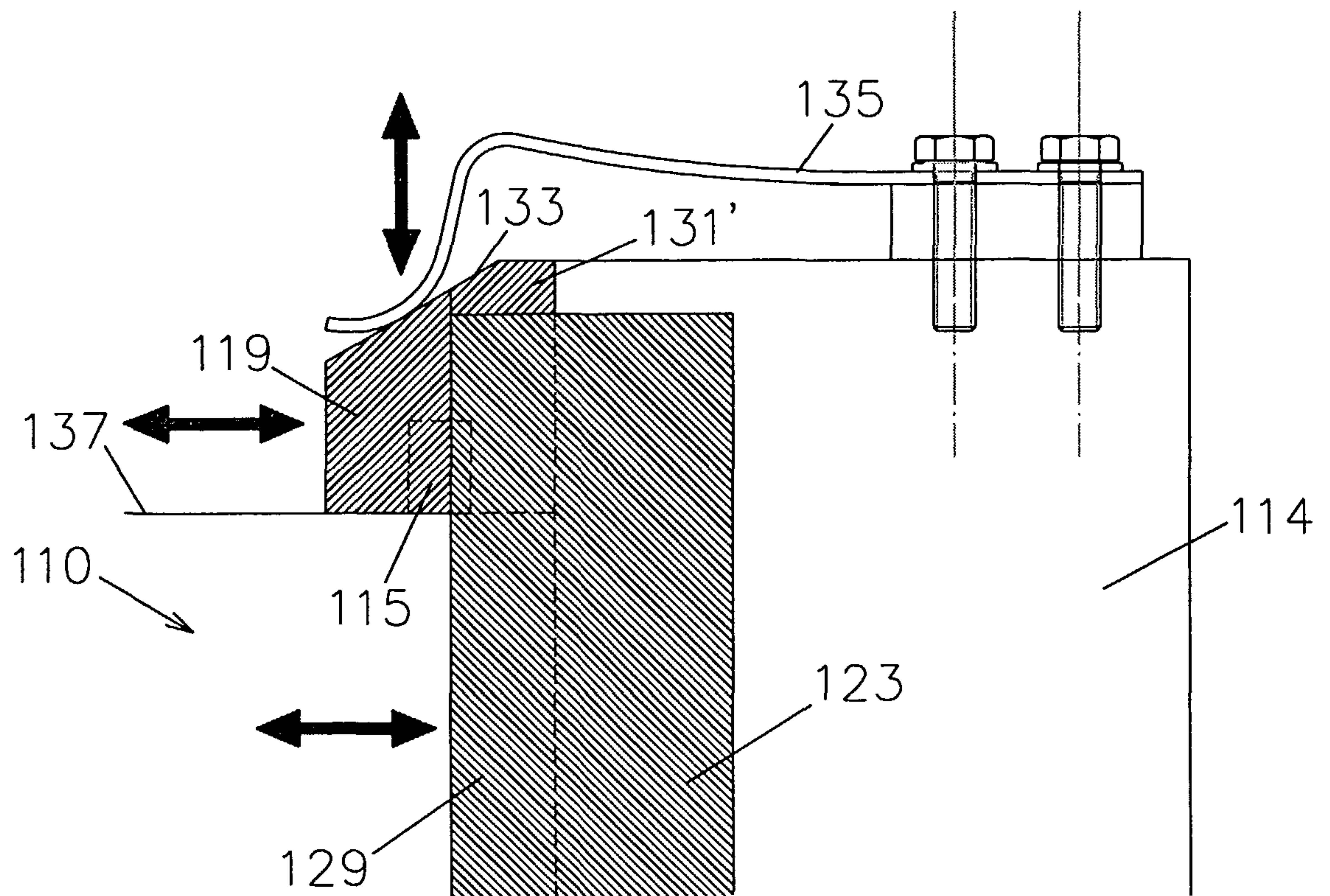


Fig 3

