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AT DE SE(71) Applicant: **A. Ahlström Corporation****SF-29600 Noormarkku(FI)**(72) Inventor: **Häkkinen, Seppo****Ilmarisenkatu 5****SF-57200 Savonlinna(FI)**Inventor: **Kohonen, Raimo****Päiväkummunkaari 3A****SF-57230 Savonlinna(FI)**Inventor: **Kyytsönen, Juhani****Braskintie 4 C****S-07910 Valko(FI)**(74) Representative: **Gilmour, David Cedric****Franklyn et al****POTTS, KERR & CO. 15 Hamilton Square****Birkenhead Merseyside L41 6BR(GB)**(54) **Belt for a filter press.**

(57) A filter press for removing excess water from a cake of slurry (3) running between two opposite cloths at endless wires (1, 2) in a paper or board making apparatus, the filter press comprising a pre-pressing section (4) and a post-pressing section (5) and a turning roll (6) disposed between said pressing sections in the transverse direction of the wires and extending substantially over the whole width of the wires, at which roll the direction of the wires is changed. One of the problems with known filter presses presently in use is that the velocity of the presses cannot be improved because of the sealing difficulties between the wires. The filter press according to the present invention avoids this problem as the construction of the edges (7) of at least one of the wires (2) are along the whole length of the wire stronger and inelastic.

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WIRE FOR A FILTER PRESS

The present invention relates to a filter press used for removing excess water from a slurry cake travelling between two opposite endless mesh belts or "wires" such as used for making paper or board. The filter press comprises a pre-pressing section and a post-pressing section, and between them a turning roll extending substantially over the whole width of the wires in a direction transverse to the direction of extension of the wires and disposed to change the running direction of the wires.

As a web is formed between the wires the longitudinal tensile stressing of the wire increases in the middle of the wire and the tensile stressing at the edges may even be negative which means that the wire slackens at the edges whereby slurry may flow over the edges, especially at the pre-pressing section. To prevent this, edge sealings and "doctors" are provided at the straight portion of the wire.

It is not possible to increase the speed of the machine and the speed of the wires unless the dry-solids content of the web after pre-pressing section is adequate. Also, defining the web is difficult because of the overflow of the slurry. Thus, the need to develop improved means for sealing the filter press exists.

The object of the invention is to provide a filter press which avoids or minimizes the problems discussed above and wherein the speed of the filter press can be substantially improved. A filter press according to the invention is characterised in that the construction of the edge regions of at least one of the wires is inelastic and stronger than the central portion of the said wire along the whole length of the wire.

In one embodiment of the invention the edges of the wire include reinforcing elements stitched into the wire.

In another embodiment of the invention the edges of the wire are reinforced by folding the edges twice or several times.

In a still further embodiment of the invention the edges of the wire have a greater density of longitudinal filaments than the central portion of the wire and/or the longitudinal filaments are thicker at the edge regions than in the central region.

The turning roll of a filter press according to the invention increases the wire tension at the edges of the wire which results in that the edges of the wire are pressed against each other at the curving wire portion and a sealing bag is formed at the edges which prevents the slurry from flowing out over the edges. It has been found out experimentally that the sealing effect of a turning roll according to the invention is particularly effective at

the pre-pressing section where the most difficult sealing problems occur today. Defining the web with a filter press according to the invention is remarkably easier than with the prior art devices. It is to be appreciated that the edge regions of said at least one wire should be such as to prevent deformation thereof out of the normal, unstressed plane of said wire.

The invention will be described further, by way of example, with reference to the accompanying drawing, in which:

Fig. 1 is a schematic illustration of a filter press with a pre-and a post-pressing section;

Fig. 2 is a section along line II-II of Fig. 1; and

Fig. 3 is a plan view of a section of a wire according to the invention.

Figure 1 illustrates a typical filter press, in which a web (3) of slurry is formed between two opposite rotary endless mesh belts or wires 1 and 2. In Figure 1 web 3 is fed between the oppositely rotating wires from the left-hand side of the drawing. The filter press comprises a pre-pressing section 4 and a post-pressing section 5 for removing excess water from the web. A turning roll 6, at which the webs are turned, is disposed between these sections.

Figure 2 illustrates a section in the region of the turning roll 6. The construction of the lower wire 2 is such as illustrated in Figure 3. The construction of the edge regions or edge 7 of the wire 2 is stronger than the construction of central portion 8 of the wire. In this way an even wire tension, as in Figure 2, over the whole cross section of the wire 2 is achieved and thus a cross sectional form sealing the edges of the wires 1 and 2 is created in the space between the wires. The web 3 runs in a closed envelope or bag-shaped space in which it is easy to define the width of the web.

Reinforcing of the edges 7 can be carried out in many different ways. One alternative is to stitch reinforcing elements to the edges of the wire 2. Further, reinforcing can be achieved by folding over the edges two or more times. A most important feature of the invention is, however, that the longitudinal elongation of the wire 2 is smaller at the edges 7 than at the central portion 8.

It will be apparent to persons skilled in the art that the invention is not limited by the embodiments disclosed here as examples, only, but it can be modified within the scope of protection defined by the appended patent claims. Thus, both wires can be reinforced, if needed, though experiments have proved that reinforcing the edges of the lower wire only is usually sufficient.

Claims

1. A filter press for removing excess water from a cake of slurry (3) when running between two opposite endless wires (1, 2), the filter press comprising two opposite endless wires (1,2), a pre-pressing section (4) and a post-pressing section (5), and a turning roll (6), at which the direction of the wires is changed, disposed between said pressing sections in the transverse direction of the wires and extending substantially over the whole width of the wires, characterized in that along the whole length of at least one wire (2) the regions of the edges (7) of said at least one wire (2) are inelastic and stronger than the central portion (8) of the wire. 5 10 15

2. A filter press as claimed in claim 1, characterized in that the edges (7) of the lower wire (2) have reinforcing elements stitched to the wire.

3. A filter press as claimed in claim 1, characterized in that the edges of the lower wire (2) are formed by folding over the edges two or more times. 20

4. A filter press as claimed in claim 1, characterized in that the material of the edges (7) of the wire (2) have a greater density of longitudinal filaments than the central portion (8) of the wire. 25

5. A filter press as claimed in claim 1, characterized in that the longitudinal filaments used in weaving the wire (2) are thicker at the edges than at the central portion (8) of the wire. 30

6. A filter press as claimed in claim 1, characterized in that the longitudinal filaments used in weaving the wire (2) are stronger and less tensile at the edges (7) than at the central portion (8) of the wire. 35

7. A web or wire for a filter press comprising an endless mesh band wherein the edge regions are adopted to have a substantially greater resistance to deformation away from a turning roll than the central region of the band. 40

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