Abstract:
The invention relates to sector part of a filtering, preferably rotating disk. The sector part includes a centrally located, relatively stiff and rigid support 1; 12 for transport of liquid therethrough and a substantially sealing edge with the exception of one or more fluid discharges 6. The sector part further comprises on both sides of sector support 1; 12 applied, filtering set ups of fine meshed nets, or made of other finely perforated materials performed or equivalent separating means 3, 4; 32, 42 for capturing and separating of fibres and/or particles from a mixture of fibres and/or particles and fluid. The aims of the invention are to capture and separate the fibres and/or particles from a mixture of fibres and/or particles and fluid. One important aspect of the invention characteristic is that each of said separating means 3, 4; 32, 4 is applied loosely and is movable held relative the support 1; 12 and relative to the sealing edge 2; 22. The separating means are fixed essentially perpendicular to its main plane by holding means 5; 52; 32a.

Title: SECTOR PART OF A FILTERING, PREFERABLY ROTATING DISK
Sector part of a filtering, preferably rotating disk

The invention relates to a sector part of a filtering, preferably rotating disk. Said sector part includes a centrally therein located, relatively stiff and rigid support for transport of liquid therethrough. Said sector part has a substantially sealing edge with the exception of one or more fluid discharges. Said sector part has also on either side of a sector support applied, filtering set ups of nets made of small meshes or of otherwise finely perforated materials having equivalent designed functionality means for capturing and separating of fibres and/or of particles from a mixture of fibres and/or particles and fluid.

For example, when nets having small meshes or made of finely perforated steel plates are used at or on the sector parts for filtering purposes, they have hitherto been fixed relative the sector part in various ways, for example by means of welding, clamping, gluing, and so on.

The disadvantages with such fixed or stationary attachments of nets having small meshes and of finely perforated materials, respectively, relative to a sector part are many, for example, they can change shape and/or size due to the pressure, weight, temperature, rotation and/or other variations in working conditions occurring during filtration and removal of such aggregated fibres and/or particles from the liquid permeable means. The costs for all attachments, such as the generation of a large number of welding spots, will be relatively high, fatigue problems will often and quickly occur between each attachment point for the net or for the finely perforated steel plate and the adjacent sector part - especially if thin nets having fine meshes or finely perforated plates of stainless steel are used -, tolerance problems will occur during application of replacement parts on older, existing sector parts, since they may have or have acquired dimensions deviating from assumed dimensions, and so on.

The aim of the present invention is to reduce or completely eliminate the above specified disadvantages at the sector part as described in the preamble of the specification and has been solved according to the invention in such a way that each of said capturing and separating means is applied loosely and movably relative to the support and relative to the sealing edge of the main plane of the capturing and separating means parallel to a main part of the sector part to such an extent that when exposed to different working conditions and to potentially generated movements will not be repressed in motion in any significant degree but is fixed essentially perpendicular to its main plane by means of adapted holding means.

Further and closer details of the invention are disclosed partly by the description below together with or separated from the accompanying drawings, and partly also by the subsequent patent claims.
The Figure 1 drawing shows in a perspective view a first embodiment of a sector part as seen with separated details from above and below said details is shown a composed sector part and the Figure 2 drawing shows a second embodiment of a sector part also seen from above with separated details and below thereof a composed sector part.

The sector part according to Fig 1 includes for example a sealing edge, here shown as an essentially U-shaped edge 2, with one or more liquid discharges 6, only one is, however, shown in the drawing. Between the two shanks of the U-shaped edge 2 and centrally in the sector part is a support 1 located, which as an example may constitute of one net 1, permitting a central fluid transfer, which net is made of coarse meshes and stiff, which net is preferably pleated or folded, as shown especially at the top of Figure 1. On either side of the coarse meshed support 1, two nets 3, 4, composed of fine meshes, or two finely perforated plates are located in order to intercept or capture fibres and/or particles from a liquid solution that is administered from the outside of the respective finely meshed nets 3, 4 or the respective perforated sheet materials. These nets 3, 4 composed of small or fine meshes and the net 1 with coarse meshes, the support net, are also mutually kept with help of an appropriate number of holding means 5a-5c. Said last mentioned holding means 5a-5c, which are running through the nets 3, 4 or through the finely perforated plates and through the support net 1, are designed so small compared to the small meshed nets 3, 4 or the finely perforated plates that they can move somewhat either together or individually, and in relation to the relatively coarse meshed support net 1 and in relation to and relative to the sealing edge 2 at the working and/or temperature variations which they are expected to be exposed to, for example, about 15 to 100 degrees Celsius.

In the lower part of Figure 1, the sector part is shown with its constituent parts 1, 2, 3, 4, 5, and 6 according to the upper portion of Figure 1 aggregated to a complete sector part. Support net 1 is here matched in size essentially corresponding to the size of the plane between the bottomed insides of the U-shaped edge 2 while the small or fine meshed nets 3 and 4 or the finely perforated steel plates in size are adapted to have a certain required clearance for example a few millimetres in relation to the size of the plane between the bottomed insides of the U-shaped edge 2. Furthermore, the internal distance between the two shanks of the U-shaped edge 2 is adapted to essentially equals the total distance from the fine meshed net 3 or from the outer surface of the finely perforated plate via support net 1 to the fine meshed net 4 or to the outer surface of the finely perforated plate so that only a low clamping force is possibly achieved by the two internal shank surfaces of the U-shaped edge 2 against said fine meshed nets 3, 4 and against said finely perforated steel sheets, respectively, i.e. the shanks do not inhibit the movement of each plane of the small meshed nets 3 and 4 or of the finely perforated plates in
any significant amount on the part of the sector in question at the actual operating temperatures or other working conditions.

In such a way, each of said small or fine meshed nets 3, 4 or each of the finely perforated steel plates is each adapted and held mainly loose and movable relative to the coarse meshed support 1 and relative to the essentially U-shaped edge 2 of the main plane of the net or steel plate parallel to a main plane of said sector part. Said movability is adapted to be permitted to such a degree that the respective small meshed nets 3 or 4 or each finely perforated plates is not restricted in movement and/or is not changing shape in a significant degree by different working temperatures or by exposed conditions. In contrast thereto, the respective fine meshed nets 3 or 4 or each finely perforated plate is attached or fixed mainly perpendicular to its main plane by means of holding means 5, the number and configurations of which can vary greatly, for example, three of them according to the Figure 1. It should be noted here that the part of each holding means 5a and so on which passes through the nets or the perforated plates 3, 1 and 4 is adapted appropriate in size in relation to at least the mesh size of support net 1 such that a movement is permitted in relation to said support net but preferably also in relation to the small meshed nets 3 and 4 or the finely perforated steel sheets by providing slightly larger holes than actually required for the through running parts of the holding means 5a and so on.

The above specified embodiment results in that the fine meshed nets 3, 4 and the finely perforated steel plates or those means designed with equivalent functionality, providing capturing and separating, are held in place in the sector part and in that they can move in the main plane of the sector part in relation to the U-shaped edges 2 without creating any bubbles or equivalent deformations or variations in the fine meshed nets 3, 4 or in the capturing and separating means due to fixed or welded anchoring thereof. Even the sizes of the small meshed nets 3, 4 or the sizes of the capturing and separating means - manufacturing tolerances - will be less significant in relation to existing supports of previously known sector parts due to that the shanks of the U-shaped edge 2 allow relatively large variations in size.

The U-shaped edge 2 indicated may consist of one single detail or can be composed of, for example, two mutually mirrored and L-shaped profiles, which can be located at a mutual distance, tight against each end edges or could be localized overlapping. The curved shape of the sector portion on one side as indicated in Figure 1 can relatively easy be achieved by a number of slits cut out in the U-shaped profiles such as those indicated with lines in Figure 1 or in the L shaped profiles such that they can be bent on site to accommodate to an existing, arched edge of the sector part.

The fine meshed nets 3, 4, the finely perforated steel plates or the capturing and separating means can be made of e.g. stainless
steel, aluminium, other metals or of a perforated sheet material or of other suitable plastic material. The U- or L-shaped profiles can be made of various metals or of suitable plastic material and of adapted plastic materials.

Figure 2 shows a second embodiment of the invention in which the U-shaped fluid sealing edge profile 2 as shown in Figure 1 has been replaced by a W-like sealing edge profile 22 with spaces for one, two or more turned over or folded edges, see, for example 32a, of the small meshed nets 32, 42 or of the capturing and separating means for adapting to movements generated by potentially changing working conditions and/or temperatures. Thereby is attained that the small meshed nets 32 and 42 or the capturing and separating means are kept reasonably in position relative to the W-shaped edge profile 22 permitting certain material movement by the fine meshed nets 32 and 42 respectively by the capturing and separating means. Here, rods located at right angles and in different levels are instead indicated as a sector support and fluid permeable structure 12. Holding means 52a-52f have been organized in a larger number, sex, relative to the embodiment shown in Fig. 1 and two or more edges - turned over preferably about ninety degrees -, of which edges only 32a is shown in Figure 2, can solely and/or together with other holding means 52a-52f also act as detention means for the fine meshed nets 32 and 42 respectively for the said finely perforated steel plates or the capturing and separating means.

It is also within the scope of the invention to expose the sector parts of the invention for simulated working conditions prior to use them and that said holding means 5, 52, 32a and/or parts thereof in connection with said simulation are fixed relative to the sector part and/or relative to said fine meshed nets 3; 4; 32, 42 and said perforated plates, respectively.

The invention is described above utilized substantially with fine meshed nets, but it can also use other kinds of separating, finely perforated materials, for example shaped from punched steel plates or from cut and stretched metal sheets. These separating means can also be flat or pleated or may consist of combinations thereof.
Claim

1. Sector part of a filtering, preferably rotating disk, which sector part includes a centrally therein located, relatively stiff and rigid support (1; 12) for transport of liquid therethrough, a substantially sealing edge (2; 22) with the exception of one or more fluid discharges (6) and on either side of a sector support (1; 12) applied, filtering set ups of nets made of small meshes or of otherwise finely perforated materials having equivalent designed functionality means (3, 4; 32, 42) for capturing and separating of fibres and/ or of particles from a mixture of fibres and/ or particles and fluid, characterized in that each of said capturing and separating means (3, 4; 32, 42) is applied loosely and movably relative to the support (1; 12) and relative to the sealing edge (2; 22) in the main plane of the capturing and separating means parallel to a main plane of the sector part to such an extent that when exposed to different working conditions and to potentially generated movements will not be repressed in any significant degree but is fixed essentially perpendicular to its main plane by means of adapted holding means (5; 52; 32a).

2. Sector part according to claim 1, characterized in that the capturing and separating means (3, 4; 32, 42) partly are movable relative to the sealing edge (2; 22).

3. Sector part according to claim 1 or 2, characterized in that said support comprises or consists of a pleated net (1, Fig 1) with coarse mesh openings.

4. Sector part according to any of claims 1-3 with said sealing edge designed essentially as an inwards, towards the sector part targeted U, characterized in that the distance between the shanks of the essentially U-shaped edge (2; 22) corresponds essentially to the distribution or thickness of said respective capturing and separating means (3, 4; 32, 42), seen at right angles to its main plane.

5. Sector part according to any of the previous claims, characterized in that each of said capturing and separating means (3, 4; 32, 42) in its main plane has a smaller area than the propagation of the sector part in a plane substantially parallel to the main plane of the capturing and separating means (3, 4; 32, 42).

6. Sector part according to claim 5, characterized in that the said smaller area is generated, in whole or in part, by components thereof folded away and in that the sealing edge (22) is shaped with spaces, which allow escape of such folded away parts, without preventing or inhibiting movements of the capturing and separating means (32, 42) except where necessary in an adapted limit position (32a) against the support (12).

7. Sector part according to any of the previous claims, characterized in that the said holding means (5; 52; 32a) are so located and dimensioned to permit said movements.
8. Sector part according to any of claims 1-6, characterized in that the working conditions of the sector part are so presimulated that said holding means (5; 52; 32a) or parts thereof are allowed to be fixed relative to said sector part and relatively to said capturing and separating means (3, 4; 32, 42) prior actual use.

9. Sector part according to any of the preceding claims 4-8, characterized in that the essentially U-shaped sealing edge includes two mutually mirrored L-shaped profiles located at a mutual distance, tightly against each other at end edges or located with overlapping end edges.

10. Sector part according to any of previous claims, characterized in that said capturing and separating means are pleated.
INTERNATIONAL SEARCH REPORT  

International application No.  PCT/SE2011/000207

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: B01 D

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, PAJ, WPI data

C.  DOCUMENTS CONSIDERED TO BE RELEVANT

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Date of the actual completion of the international search  17-01-2012
Date of mailing of the international search report  15-02-2012

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International Patent Classification (IPC)

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