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Datasheet for the decision of 12 April 2019

Case Number: T 2366/16 - 3.3.06

Application Number: 09742187.9

Publication Number: 2300660

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Language of the proceedings: EN

Title of invention:
METHOD AND ARRANGEMENT FOR IMPROVING THE OPERATION OF SEALING ELEMENTS OF A DRUM WASHER

Patent Proprietor:
Andritz Oy

Opponent:
Valmet AB

Headword:
Improving sealing of a drum washer/Andritz Oy

Relevant legal provisions:
EPC Art. 52(1), 56
RPBA Art. 13(3)

Keyword:
final main request - admissible (yes) - filed in reaction to the decision under appeal, with the statement setting out the grounds of appeal
Inventive step - final main request (yes)

Decisions cited:

Catchword:

Europäisches Patentamt
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Beschwerdekammern

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Case Number: T 2366/16 - 3.3.06

D E C I S I O N
of Technical Board of Appeal 3.3.06
of 12 April 2019

Appellant: (Patent Proprietor)	Andritz Oy Tammasaarenkatu 1 00180 Helsinki (FI)
Representative:	Hoffmann Eitle Patent- und Rechtsanwälte PartmbB Arabellastraße 30 81925 München (DE)
Appellant: (Opponent)	Valmet AB 851 94 Sundsvall (SE)
Representative:	Loqvist, Gabriel Mathias Groth & Co. KB Box 6107 102 32 Stockholm (SE)
Decision under appeal:	**Interlocutory decision of the Opposition Division of the European Patent Office posted on 17 August 2016 maintaining European Patent No. 2300660 in amended form.**

Composition of the Board:

Chairman	J.-M. Schwaller
Members:	G. Santavicca
	R. Cramer

Summary of Facts and Submissions

I. The appeals of both the patent proprietor and the opponent lie from the interlocutory decision of the Opposition Division maintaining **European Patent No. 2 300 660** in amended form according to the second auxiliary request filed during the oral proceedings of 21 July 2016.

II. With its grounds of appeal dated 13 December 2016, the patent proprietor filed six sets of amended claims labelled 1st to 6th auxiliary requests.

III. The opponent objected to the above requests *inter alia* under lack of an inventive step over D1 (WO 2006/130109 A1) or D9 (US 2 741 369 A), taken alone or in combination.

It also submitted new items of evidence D10 to D14.

IV. In response to the preliminary opinion by the Board, the patent proprietor withdrew its then pending main and 1st auxiliary requests and renumbered the other requests accordingly.

V. At the oral proceedings, which took place on 12 April 2019, the patent proprietor withdrew the then pending main, first and second auxiliary requests, and made the third auxiliary request (filed as fifth auxiliary request with its grounds of appeal) its final main request. Against this latter request, the opponent maintained only Article 56 EPC objections.

VI. At the closure of the debate, the final request of the the **patent proprietor** was that the decision under appeal be set aside and that the patent be maintained

in amended form on the basis of the claims according to the new main request.

The appellant/**opponent** requested that the decision under appeal be set aside and that the patent be revoked.

VII. Independent claims 1 and 6 of the main request have the following wording (amendments over respective claims 1 and 7 as granted made apparent by the board):

"1. A method for improving the operation and/or adjustability of sealing elements (12) of a drum washer (1) for washing fiber suspension, which drum washer (1) comprises a cylindrical drum (2) arranged to be rotatable around its longitudinal axis and adapted inside a stationary housing construction (3), outside which drum pulp compartments (5) are arranged for the fiber suspension to be washed, where the pulp compartments (5) are formed on the outer surface of the drum (2) by means of wall members (7) arranged essentially circumferentially and intermediate walls (8) arranged essentially in the direction of the axis (9) of the drum (2), whereby the radial outer surfaces of said wall members (7) and intermediate walls (8) form a sealing surface (10) for the pulp compartments, in which drum washer (1) the pulp compartments (5) can be divided into sectorial zones separated from each other, said zones comprising at least one feed zone (40) for feeding the fiber suspension, one or more washing zones (60, 70) for washing the fiber suspension and at least one discharge zone (80) for discharging the fiber suspension,
in which drum washer (1) said sealing elements (12) are adapted in a space (6) formed between the housing part (3) and the drum (2) and extend essentially in the

direction of the longitudinal axis of the drum (2), for which sealing elements (12) supporting means (14) are arranged against which supporting means the sealing elements (12) can be supported, and which sealing elements (12) are arranged towards the sealing surface (10) for the pulp compartments so that said zones (40, 60, 70, 80) can be formed by means of the sealing elements (12), and
at least one adjustment member (16) is arranged between the sealing element (12) and the supporting means (14) for adapting the sealing element (12) in relation to the sealing surface (10) of the drum so that the distance (15) between the sealing element (12) and the sealing surface (10) is at least on a part of the sealing element's (12) area adaptable to a desired size,
characterized in that
the number of adjustment members (16, 16b) arranged for each sealing element (12) is two or more in the lateral direction of the drum, or the adjustment member (16) is arranged to operate as two or more parts (26) adjustable independently of each other in the lateral direction of the drum, so as to provide for an adjustment of the sealing element (12) in its lateral direction in relation to the drum (2),
wherein restricting members (17) are additionally arranged in connection with the supporting means (14), by means of which restricting members the maximum extension of the sealing element (12) towards the sealing surface (10) is adaptable to a desired size at least on a part of the sealing element's (12) area and which restricting members (17) are arranged to allow the motion of the sealing element (12) away from the drum (2)."

*"~~7~~**6.** An arrangement for improving the operation and/or adaptability of sealing elements (12) of a drum washer (1) for washing fiber suspension, said drum washer (1) comprising a cylindrical drum (2) arranged to be rotatable around its longitudinal axis and adapted inside a stationery housing construction (3), outside which drum pulp compartments (5) are arranged for the fiber suspension to be washed,*
in which drum washer (1) the walls of the pulp compartments are formed on the outer surface of the drum (2) by means of wall members (7) arranged essentially circumferentially and intermediate walls (8) arranged essentially in the direction of the axis (9) of the drum (2), whereby the radial outer surfaces of said wall members (7) and intermediate walls (8) form a sealing surface (10) for the pulp compartments, in which drum washer (1) the pulp compartments (5) can be divided into sectorial zones separated from each other, comprising at least one feed zone (40) for feeding the fiber suspension, one or more washing zones (60, 70) for washing the fiber suspension and at least one discharge zone (80) for discharging the fiber suspension, in which washer (1) said sealing elements (12) are adapted in a space (6) formed between the housing part (3) and the drum (2) and extend essentially in the direction of the longitudinal axis of the drum (2), and for which sealing element (12) supporting means (14) are arranged, against which the sealing element (12) can be supported and which sealing elements (12) are arranged towards the sealing surface (10) for the pulp compartments so that said zones (40, 60, 70, 80) can be formed by means of the sealing elements (12), and
at least one adjustment member (16) is arranged between the sealing element (12) and the supporting means (14) so that the distance between the sealing element (12)

and the sealing surface (10) is adaptable to a desired size at least on a part of the sealing element's (12) area,
characterized in that
the number of adjustment members (16) arranged for each sealing element (12) is two or more in the lateral direction of the drum, or the adjustment member (16) is arranged to operate as two or more parts (26) adjustable independently of each other in the lateral direction of the drum, so as to provide for an adjustment of the sealing element (12) in its lateral direction in relation to the drum (2),
wherein restricting members (17) are additionally arranged in connection with the supporting means (14), by means of which restricting members the maximum extension of the sealing element (12) towards the sealing surface (10) is adaptable to a desired size at least on a part of the sealing element's (12) area and which restricting members (17) are arranged to allow the motion of the sealing element (12) away from the drum.".

Reasons for the Decision

1. New items of evidence D10 to D14

Since these documents were no longer used by the opponent to back up its only objection of lack of inventive step maintained at the oral proceedings, there is no need to take a decision on their admissibility.

2. Admissibility of the final main request

This request having been filed (as fifth auxiliary request) with the proprietor's grounds of appeal and

having already been pending before the Opposition Division (also as fifth auxiliary request), in which however granted claims 12 and 13 had erroneously been omitted, the Board does not see any reason under Article 12(4) RPBA not to admit it into the appeal proceedings.

3. Amendments

3.1 Apart from the reintroduction of the content of dependent claims 12 and 13 as granted, and the necessary adaptation of the back references, the only modifications made to its claims 1 and 6 (over respective claims 1 and 7 as granted) are apparent from point VII above.

3.2 As present claims 1 and 6 are narrower in scope than claims 1 and 7 as granted, they comply with Article 123(3) EPC.

3.3 As regards the compliance with Article 123(2) EPC, claims 1 and 6 are respectively based on the combination of original claims 1+2+3 and 8+9+10 taken in combination with the passage at page 6, lines 26-31 of the description as filed. The reintroduction of the content of claims 12 and 13 as granted, erroneously omitted in the fifth auxiliary request pending before the opposition division, poses no problem either.

3.4 It follows that the final main request complies with the provisions of Articles 123(2) and (3) EPC.

4. Novelty

Novelty being not disputed and the board having no reason to take a different stance, the distinguishing

features over the prior art will become apparent from the decision on inventive step (*infra*).

5. Inventive step

According to paragraph [0001] of the patent, the invention relates to a method and arrangement for improving the operation and/or adjustability of sealing elements of a drum washer for washing fiber suspension.

5.1 The closest prior art

At the oral proceedings, the opponent held the claimed subject-matter to lack inventive step over D9 in combination with D1, or, alternatively, over D1 in combination with D9.

5.1.1 D9, which pertains to rotary filters for the separation of a suspension into liquid and solid phase (column 1, lines 15-16), addresses the problem of air- and liquid-tight separation between the chambers of the filter, hence a problem of ensuring the seal in order for the filter to be operated above, below, or above and below atmospheric pressure (column 2, lines 3-7).

For the board, the rotary filter according to D9 encompasses all the structural features of the arrangement according to claim 6 at issue excepted the "*restricting members (17)*" which *"are <u>additionally</u> arranged in connection with the supporting means (14), by means of which restricting members the maximum extension of the sealing element (12) towards the sealing surface (10) is adaptable to a desired size at least on a part of the sealing element's (12) area and which restricting members (17) are arranged to allow*

the motion of the sealing element (12) away from the drum (2)."

Claim 1 is further distinguished therefrom in that the suspension is a *fiber* suspension.

5.1.2 D1 (page 1, lines 5-6) relates to a device and method for washing and dewatering cellulose pulp of the type comprising a compartmented drum. It addresses the drawbacks (see page 2, lines 15-27) of its longitudinal seals which are exposed to abrasion and wear and which change over time, which seals were manually adjusted, with a procedure which was circumstantial, irregular and completely dependent on personal qualities. The objective of D1 (page 2, lines 31-33) is the accomplishment of a more secure and more effective seal mechanism for the drum washer.

The apparatus of D1 (as shown e.g. in Figures 3, 4A, 4B, 6) only comprises seal mechanisms in the longitudinal direction, and so D1 does not disclose *for each sealing element* ***two or more*** *adjustment members arranged in the* ***lateral*** *direction of the drum and adjustable independently of each other, so as to provide for an adjustment of the sealing element in its* ***lateral*** *direction in relation to the drum.*

5.1.3 As regards the closest prior art, D1 is objectively closer at least for the claimed method since D9 does not disclose the type of suspension to be washed. As regards the device of claim 6, the broadest claim, both D9 and D1 are suitable starting points in order to assess the inventive step of the claimed subject-matter according to Article 56 EPC.

5.2 The technical problem

According to paragraph [0007] of the patent in suit the problem underlying the invention is to provide a drum washer with sealing elements which are tight, resistant and flexibly adjustable to changes of the radial location of the surfaces in varying locations.

5.3 The solution

The above technical problem is solved by the arrangement proposed in claim 6, with which the method according to claim 1 at issue can be implemented.

5.4 The success of the solution

It was not contested that the arrangement presently claimed, thanks to its distinguishing features, was suitable to ensure higher flexibility, better tolerance to changes, even wearing and reduced seal damages. Its obviousness over D9 and/or D1 was however in dispute.

5.5 Obviousness

It remains to be decided whether the skilled person starting from the closest prior art, namely the drum washers from D1 or D9, faced with the technical problem formulated in the patent in suit, would have modified them, having regard to common general knowledge and cited prior art, in order to arrive in an obvious manner and without hindsight to an arrangement as defined in claim 6 at issue.

5.6 D9 as the closest prior art

5.6.1 It was not in dispute that apart from the use features "*fiber suspension*" and "*pulp*", which are not limiting in any way the construction of the drum washer claimed,

D9 discloses all the structural features as defined in the preamble of claim 6 at issue.

5.6.2 What was in dispute was which features/functions were also implied by D9, and which of the non-disclosed features were obvious modifications for the skilled person faced with the technical problem in view of common general knowledge and prior art.

5.6.3 In relation to the characterising portion of claim 6, D9 (claim 1) discloses a device for separating the liquid and solid components from a suspension by means of a rotary filter, comprising an outer casing having a shell consisting of non-permeable material, a plurality of separating members inserted into the shell of the casing and extending parallel to the axis of the drum and in radial direction between the shell and the drum, an inner filtering drum having a plurality of separating walls which extend parallel to the axis and the spacing between the separating walls is less than the width of the separating members, and means for adjusting and pressing down the separating members against the separating walls, the arrangement being such that the intermediate space between the outer casing and the filtering drum is subdivided by the separating members into several chambers which are air tightly and liquid-tightly separated from one another, said chambers being respectively provided with openings for the supply of the suspension, of the washing medium, of the drying media, as well as for the discharge of the dried residue.

5.6.4 More particularly with reference to figure 1, D9 discloses (column 2, lines 21-34) that each separating member 4 is a one-piece material (of metal, rubber, wood or plastics) incorporated in housing 3, the width

of which preferentially corresponds to the separation of two separating ribs 2 on the drum and a length which corresponds to that of the filter drum. An alteration of the size of the chambers is achievable because a plurality of apertures is present in the housing wall, situated next to each other. Separating members 4 are adjustable by two screws 20 (hence, manually) from the outside during operation of the filter.

5.6.5 It is apparent from Figures 1 and 2 of D9 that the two screws 20 are located one laterally to the other along the circumference of the drum, but only one set of screws is visible in the longitudinal direction.

5.6.6 D9 does not disclose why these two screws are necessary for a single separating member 4, nor which function they are supposed to fulfill. D9 does not disclose any "sealing distance", but only that separating means 4 should be tightly arranged on the ribs.

5.6.7 For the board the presence of the two screws 20 located at a different lateral (circumferential) location (as shown by figure 1 of D9) implies the possibility of independently screwing anyone of these screws, thus inevitably a certain amount of (mechanical, manual) tilting of the separating member (the sealing element), whatever its rigidity. In that respect, any tilting represents an adjustment of the sealing element in its lateral (i.e. circumferential) direction in relation to the drum.

5.6.8 As mentioned above, D9 does not disclose the features of claim 6 at issue that "*restricting members (17) are additionally arranged in connection with the supporting means (14), by means of which restricting members the maximum extension of the sealing element (12) towards*

the sealing surface (10) is adaptable to a desired size at least on a part of the sealing element's (12) area and which restricting members (17) are arranged to allow the motion of the sealing element (12) away from the drum (2)."

5.6.9 For the Board, the additional fixing members (17) (in addition to the adjustment members 16, 16b; or to the screws 20 of D9), act as motion restriction and thus allow for a better adaptation and control of the sealing distance between separating members and sealed area, insofar as the maximum radial motion of the sealing element towards the sealing surface 10 can thereby be restricted (by motion restrictor 17) (see paragraph 0045 of the patent in suit, last sentence). The presence of these additional means necessarily implies a better control of the wear of the sealing elements (because a small but controllably fixed distance is maintained between separators and drum/ ribs). Moreover, as restriction means 17 fix/control the maximum radial, inward extension of the sealing elements towards the drum but allow, thanks to their arrangement, that the sealing elements move away from the drum, the occurrence of damages due to unusual running situations, such as deformation of the drum or of its segments, can thereby be efficiently compensated, in line with the teaching of the patent in suit (see paragraphs [0017], last sentence, and [0046], second and third sentence).

5.6.10 D9 does not hint at these additional means, and so does not render obvious the arrangement now defined in claim 6 at issue.

5.6.11 No common general knowledge in respect of the additional means of claim 6 at issue has ever been

invoked, let alone shown, which could have been combined with D9 to arrive at the claimed subject-matter.

5.6.12 As regards the alleged obvious combination with prior art D1, the board notes that in its claim 11 this document discloses an arrangement (100) for washing and dewatering cellulose pulp, comprising a rotatable drum (10) having a plurality of outer compartments (12) on the drum for the pulp to be washed, which compartments are defined by axial compartment walls (12b) distributed along the circumference of the drum, a stationary cylindrical casing (20) enclosing the drum, whereby an annular space (30) is defined between the casing and the drum, and where the annular space by means of longitudinal_seals (40) in the axial direction of the drum is divided in zones (F, T1, T2, U) for forming, washing and discharge of the pulp, characterised by a unit for seal adjustment (see claim 1) comprising:
- means (61) for measuring a force acting on one of the longitudinal seals in a direction from the drum; and
- means (64) for moving the longitudinal seal substantially in the radial direction of the drum according to a predetermined pattern based on the force measured by the measuring means,
whereby (see claim 2)
the moving means (64) is adapted for reversing the longitudinal seal (40) a predetermined distance if the measured force exceeds a contact threshold.

5.6.13 Thus, D1 discloses an arrangement of the type defined in claim 6 at issue with longitudinal seals for forming the chambers, controllably and separately movable, and additionally comprising a plurality of restricting means as now defined in claim 6 at issue, permitting

the longitudinal seal to move back if any unusual load acts on it, also shown in figures 4B (see spring 68) and 6 (showing that each longitudinal seal 40 is made up of multiple, separated parts 42, which are independently controllable by means 60) of D1.

5.6.14 However, D1 neither discloses nor hints at any lateral (crowning) control of its longitudinal seal parts.

5.6.15 Consequently, for the Board, considering that neither D9 nor D1 expressly highlight the importance of a lateral (crowning control) of the seal, the skilled person starting from D9 and faced with the technical problem to be solved, when confronted with D1, would find it obvious to replace the manual, screwed, seal adjustment of D9 (which according to D1 - page 2, lines 23-24 - is circumstantial, irregular and completely dependent on personal qualities) with the "more secure and more effective sealing mechanism" of D1 (see page 2, lines 32-33).

5.6.16 By so doing, however, he would still not arrive at an arrangement also comprising the other features claimed, namely that "*the number of adjustment members (16, 16b) arranged for each sealing element (12) is two or more* ***in the lateral direction of the drum****, or the adjustment member (16) is arranged to operate as two or more parts (26) adjustable independently of each other* ***in the lateral direction of the drum, so as to provide for an adjustment of the sealing element (12) in its lateral direction in relation to the drum (2)***".

5.6.17 Therefore, the invoked combination of D9 and D1 does not lead the skilled person in an obvious way, without hindsight, to the arrangement according to claim 6 at issue.

5.6.18 This conclusion applies *a fortiori* to the method of using the arrangement for washing fiber suspension in pulp compartments, as defined in claim 1 according to the final main request, insofar as this application is not even mentioned in D9.

5.7 As regards the other invoked combination, namely of D1 as the closest state of the art with D9, the Board observes that:
- the technical problem of D1 (see page 2, lines 20-33) teaches away from looking at a manual adjustment of seals, as disclosed by D9; and, in any case,
- D9 shows two screws, laterally disposed, but does not highlight the importance of any lateral or crowning control of the seal.

Thus, the combination of D1 (disclosing a plurality of adjustment members for the same sealing member in the longitudinal direction) with D9 (disclosing two manual adjustment members for the same sealing member in the lateral direction, without however expressly teaching the importance of lateral, crowning, adjustment) appears to be retrospective, insofar as it is not apparent wherefrom the skilled person would get a hint thereto, and motivation therefor, in order to modify the apparatus of D1 towards the application of two means 60 (see Figure 6 of D1) in the lateral direction, to arrive at the claimed arrangement. Hence, this combination would not be made either without hindsight by the skilled person.

5.8 It follows from the foregoing that the claimed subject-matter of the main request is not obvious over D9 and D1, let alone over D1 and D9 (Article 56 EPC).

5.9 Consequently, the claimed subject-matter of the final main request complies with the EPC.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside

2. The case is remitted to the opposition division with the order to maintain the patent on the basis of the claims according to the (final) main request filed during the oral proceedings, and a description to be adapted.

The Registrar: The Chairman:

A. Pinna J.-M. Schwaller

Decision electronically authenticated