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Datasheet for the decision of 19 February 2009

Case Number: T 0901/06 - 3.2.05

Application Number: 94850041.8

Publication Number: 0620313

IPC: D21F 5/04

Language of the proceedings: EN

Title of invention:
Drying method and drying module, as well as dryer sections that make use of same, in particular for a high-speed paper machine

Patentee:
Metso Paper, Inc.

Opponent:
Voith Paper Patent GmbH

Headword:
-

Relevant legal provisions:
EPC Art. 56, 83, 123(2)

Relevant legal provisions (EPC 1973):
-

Keyword:
"Extension beyond the content of the application as filed - no"
"Insufficiency of disclosure - no"
"Inventive step - yes"

Decisions cited:
-

Catchword:
-

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Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number: T 0901/06 - 3.2.05

D E C I S I O N
of the Technical Board of Appeal 3.2.05
of 19 February 2009

Appellant: (Opponent)	Voith Paper Patent GmbH St. Pöltener Strasse 43 D-89522 Heidenheim (DE)
Representative:	Thul, Stephan Manitz, Finsterwald & Partner GbR Postfach 31 02 20 D-80102 München (DE)
Respondent: (Patent Proprietor)	Metso Paper, Inc. Fabianinkatu 9 A FI-00130 Helsinki (FI)
Representative:	TBK-Patent Bavariaring 4-6 D-80336 München (DE)
Decision under appeal:	**Decision of the Opposition Division of the European Patent Office posted 16 May 2006 rejecting the opposition filed against European patent No. 0620313 pursuant to Article 102(2) EPC.**

Composition of the Board:

Chairman: W. Zellhuber
Members: H. Schram
M. J. Vogel

Summary of Facts and Submissions

I. The appellant (opponent) lodged an appeal against the decision of the Opposition Division posted on 16 May 2006 rejecting its opposition against European patent No. 0 620 313, based on Article 100(a) EPC (lack of inventive step, Article 56 EPC), Article 100(b) EPC (insufficiency of disclosure, Article 83 EPC) and Article 100(c) EPC (extension beyond the content of the application as filed, Article 123(2) EPC).

II. Oral proceedings were held before the Board of Appeal on 19 February 2009.

III. The appellant requested that the decision under appeal be set aside and that the patent in suit be revoked. It further requested that the submission dated 15 March 2007 (erroneously indicated as 12 February 2007 in the minutes) of the respondent (patent proprietor) is not admitted into the proceedings.

The respondent requested that the decision under appeal be set aside and the patent in suit be maintained on the basis of claims 1 and 17 filed on 12th January 2009, and claims 2 to 16 and 18 to 31 of the patent as granted.

IV. The following documents were *inter alia* referred to in the appeal proceedings:

D1 FI-B 87 669

D2 EP-A 0 383 744

D5 EP-A 0 559 628

D23 *Present theories on multi-cylinder paper drying*, Nederveen, C. J., et al, in: Proceedings of *The Helsinki Symposium on Alternate Methods of Pulp and Paper Drying*, June 4 - 7, 1991, pages 23 to 41.

V. Claims 1 and 17 of the main request of the respondent read as follows:

"1. Method of drying a paper web (W) in the dryer section of a paper-making machine, in which method the paper web (W) is on support of a drying wire (20) without substantially long open draws of the web (W) over the length of the portion of the web that is being dried, the method comprising the following steps:

(a) the paper web (W) is contact-dried by pressing it with the drying wire (20) on the cylinder face (21') of a contact-drying cylinder (21) having a diameter $D_2 > 1.5$ m, wherein the drying sector b on said contact-drying cylinder (21) is chosen as $b > 180°$;

(c) a step substantially equal to step (a) is carried out;

(d) before step (a) or after step (c) the web (W) to be dried is passed over a sector c of a suction roll (22), which sector c is subjected to a negative pressure, while the web (W) is supported on the drying wire (20) with the drying wire located between the suction roll (22) and the web (W), the magnitude of said sector being chosen as $c > 160°$ and the diameter D_3 of said suction roll (22) being chosen as $D_3 < D_2$,

characterized in that the method further includes the following step:

(b) evaporation drying is carried out as blowing-on drying by means of high-velocity drying-gas jets applied to the web (W) on said drying wire (20) on a sector a of the face of a large-diameter cylinder (15), the drying wire (20) being disposed between the large-diameter cylinder face and the web (W), and the web (W) being pressed against the drying-wire (20) on said sector a by a differential pressure applied to the web (W) and being produced by means of a negative pressure in the face of said large-diameter cylinder (15), wherein a > 180° and the large-diameter cylinder (15) has a diameter D_1 > 2 m; wherein no through-drying is employed on the large-diameter cylinder (15) in step (b); and wherein about 65 to 75% of the entire evaporation capacity inside a drying module (10) comprising said contact-drying cylinder (21) used in step (a), said contact-drying cylinder (21) used in step (c), said large-diameter cylinder (15) and said suction roll (22) takes place on said large-diameter cylinder (15), while the rest of said entire evaporation capacity is divided substantially evenly between the pair of contact-drying cylinders (21) and the suction roll (22)."

"17. Drying module (10) for the dryer section of a paper-making machine, which drying module is intended in particular for the dryer section of a high-speed paper-making machine whose running speed is v ≈ 25 to 40 m/s, and which drying module (10) includes

a loop of a drying wire (20) for supporting a web (W) to be dried,

guide rolls (25) for guiding the drying wire (20),

two smooth-faced heated contact-drying cylinders (21) placed outside said drying-wire loop, and

one reversing suction roll (22) which is placed, in the running direction of the web (W), before or after said two contact-drying cylinders (21) and inside said drying-wire loop,

wherein the diameter D_3 of said suction roll (22) is smaller than the diameter D_2 of said contact-drying cylinders (21),

wherein the web (W) and the drying wire (20) are passed over a contact sector b on said contact-drying cylinders (21) which is $b > 180°$, and

wherein the web (W) and the drying wire are passed over a contact sector c on said suction roll (22), which contact sector c is subjected to negative pressure and is $c > 160°$,

characterized

by a large-diameter blowing-on-drying cylinder (15) which is placed inside said drying-wire loop and between said two contact-drying cylinders (21) and at the proximity of them,

wherein said blowing-on-drying cylinder (15) has a diameter $D_1 > 2$ m with $D_1 > D_2$,

wherein the web (W) and the drying wire (20) are passed over a contact sector a on said blowing-on-drying cylinder (15) which is $a > 180°$,

wherein said blowing-on-drying cylinder (15) has an outer mantle (16) which is provided with grooves (16R) and/or perforations (16P) for applying a negative pressure to the web (W) for holding the web (W) on the

face of the drying wire (20) on the contact sector a, and

by a drying hood (11) provided on said contact sector a of said blowing-on-drying cylinder (15), in the interior of which hood (11), at the proximity of the outer face of the web (W), there is a nozzle field (43) through which a set of drying-gas jets can be applied at a high velocity against the free outer face of the web (W) in a substantial area of said contact sector a,

wherein no through-drying is employed on the blowing-on-drying cylinder (15), and

wherein about 65 to 75% of the entire evaporation capacity inside said drying module (10) takes place on said blowing-on-drying cylinder (15), while the rest of said entire evaporation capacity is divided substantially evenly between said pair of contact-drying cylinders (21) and said suction roll (22)."

Claims 23 and 24 are directed to a "Dryer section of a paper-making machine comprising drying modules as claimed in any of the claims 17 to 22, ...". Claim 31 is directed to "The use of a dryer module as claimed in any of the claims 17 to 22 and/or a dryer section as claimed in any of the claims 23 to 30 ...".

VI. The arguments of the appellant, in writing and during the oral proceedings, can be summarized as follows:

Submission of the respondent not to be admitted?

The submission dated 15 March 2007 including its annex, document D23, should not be admitted into the appeal proceedings, because it was late filed.

Added matter, Article 123(2) EPC

The feature "*wherein about 65 to 75% of the entire evaporation capacity inside a drying module (10) ... takes place on said large-diameter cylinder (15)*" in claim 1 of the main request introduced subject-matter extending beyond the contents of the application as filed, Article 123(2) EPC, because the claim left open where the module was located, in the initial or in the final end of the drying section. This also held for the corresponding feature in claim 17. It was merely disclosed that the evaporation capacity of the large-diameter cylinder of a module in the initial and final end of the dryer section was 67.7% (about 65%) and 76.1% (about 75%), respectively, see the table on page 11, lines 30 to 42, of the application as filed (published version).

Insufficiency of disclosure, Article 83 EPC

The patent in suit failed to describe how the claimed distribution of the evaporation capacities inside a drying module comprising the two contact-drying cylinders 21 used in steps (a) and (c), and the large-diameter cylinder 15 and the suction roll 22 used in steps (b) and (d), respectively, was achieved. It was contested that simulation programs existed that would enable the calculation of said evaporation capacities. It followed that the patent in suit did not disclose the invention claimed in claims 1 and 17 in a manner sufficiently clear and complete to be carried out by a person skilled in the art.

Objection of lack of inventive step, Article 56 EPC

The Finnish document D1 was the closest prior art. Henceforth reference was made to the corresponding document D5, which is in English, although document D5 was published after the relevant filing date of the patent in suit. Document D5 disclosed a drying module comprising contact-drying cylinder 13, a large-diameter blowing-on-drying cylinder 20 and a contact-drying cylinder 14 (see Figure 1). It was clear that some sort of paper guide roll was necessary for transferring the paper web from the contact-drying cylinder 14 to the next module (see claim 10 of document D5). To the person skilled in the art it was implicit that for such a guide roll a transfer suction roll had to be provided (see eg document D2, column 5, lines 21 to 25, and Figure 1) for ensuring that the paper web was maintained on the roll. A complete drying module of document D5 thus consisted of two contact-drying cylinders, a (transfer) suction roll, and a large-diameter cylinder, having an evaporation capacity of E_a, E_b, and E_c, respectively [symbols E_i introduced by the Board]. The total evaporation capacity of this drying module was $2\ E_a + E_b + E_c = E_{tot}$, which could be rewritten as $2a + b + c = 1$, cf. Equation 2 of the calculation submitted during the oral proceedings, wherein the total evaporation capacity (gesamte Verdampfungsleistung) V_{Lges} is set to 1. In said equation "a" was the normalized evaporation capacity of a contact-drying cylinder E_a/E_{tot}, likewise for "b" and "c". The evaporation capacity per unit of cylinder face of the large-diameter cylinder was (at most) ten times higher than that of the contact-drying cylinder. This followed from the passage in column 1, lines 39 to 43,

where the range of the evaporation capacity per square meter of a prior art cylinder was from about 15 to 30 kg/h/m^2, whereas the evaporation capacity per square meter for a Yankee cylinder was of an order of 100 to 150 kg/h/m^2. Since the cylinder face of the large-diameter cylinder was about twice the cylinder face of the contact-drying cylinder (cf. the diameters of the cylinders shown in Figure 1 of document D5), it followed that c = 2 x 10 a = 20 a (cf. Equation 4 of said calculation). The drying module according to document D5 had an evaporation capacity which was up to two times better than the evaporation capacity of prior art drying modules, which consisted of two contact-drying cylinders and two suction rolls. This followed from the passage in column 1, lines 23 to 30, and the passage in column 1, line 56, to column 2, line 5. In other words, 2 E_a + 2 E_b = ½ E_{tot}, or 2a + 2b = ½ (cf. Equation 1 of said calculation). The solution of the three equations above for the three unknown parameters a, b and c was a = 3,6% b = 21,4% and c = 71,4% (cf. Equations 9 to 11 of said calculation). It followed that document D5 disclosed that 71,4% of the entire evaporation capacity inside the drying module takes place on the large-diameter cylinder, which was within the range of "about 65 to 75%" claimed in claim 1 of the main request, and that the rest was divided between the suction roll and the pair of contact-drying cylinders in a ratio b : 2a = 21,4% : 7,2% = 2,97 (cf. Equation 11 of said calculation), ie the rest was divided substantially evenly over the suction roll and said pair. Document D5 not only disclosed the claimed distribution of the evaporation capacity, it also disclosed that the diameters and the drying sections of the contact-drying cylinders and the large-diameter

cylinder were within the ranges claimed in claim 1 of the main request (see column 3, lines 10 to 14, and Figure 1). Choosing a diameter for the suction roll which was smaller than the diameter of the contact-drying cylinder, and a drying section of > 160°, was obvious, see document D2, column 7, line 57, to column 8, line 3, and Figure 1. Summarizing, it was not inventive, starting from document D5, to provide a transfer suction roll between the drying module shown in Figure 1 and the next drying module.

The alleged invention started from document D2 as closest prior art, see paragraph [0004] of the patent in suit. A comparison of the subject-matter of claims 1 and 17 of the main request and the method of drying a paper web and drying module known from document D2 showed that the main difference was that a suction roll of a prior art drying module was replaced by a large-diameter blowing-on-drying cylinder. The invention was not concerned with providing a novel contact-drying cylinder, reversing suction roll, or large-diameter cylinder, it was only concerned with arranging these known parts in an allegedly novel way, see paragraphs [0021] and [0023] of the patent in suit. The provision of a large-diameter blowing-on-drying cylinder solved the problem of enhancing the drying capacity, cf. paragraph [0015] of the patent in suit. This problem was solved in the same way by document D5. As shown above, replacing a suction roll by a blowing-on-drying cylinder inevitably led to a drying module, wherein "about 65 to 75%" of the evaporation capacity took place on the blowing-on-drying cylinder. It was thus obvious to the person skilled in the art, starting from the drying method and module known from document D2 and

seeking to enhance the drying capacity thereof, to arrive at the subject-matter of claims 1 and 17.

VII. The respondent's arguments, in writing and during the oral proceedings, can be summarized as follows:

Submission of the respondent not to be admitted?

The submission dated 15 March 2007 including document D23 was not late filed and should be admitted into the appeal proceedings. Document D23 had been filed in particular as a reaction to the filing of the statement setting out the grounds of appeal, wherein the appellant had denied that simulation programs for determining the evaporation capacity of the claimed invention such as the one cited in paragraph [0066] of the patent in suit existed, and were common general knowledge, at the priority date of the patent application that matured into the patent in suit. It was noted however that the question whether the invention was sufficiently disclosed or not, did not depend on the availability of such programs at said priority date.

Added matter, Article 123(2) EPC

The application as filed explicitly disclosed that about 65 to 75% of the entire evaporation capacity inside a drying module takes place on the large-diameter cylinder, see the passage on page 11, lines 44 and 45, of the application as filed (published version). The range cited in said passage, namely ~ 65...75 %, was not merely a reproduction of a repetition of the values 67.7% and 76.1% according to

the table above said passage. Claims 1 and 17 of the main request thus met the requirements of Article 123(2) EPC.

Insufficiency of disclosure, Article 83 EPC

The Opposition Division had found (see point 3.2.3 of the Reasons of the decision under appeal) that it was clear to the person skilled in the art which parameters influenced the evaporation capacity of each of the cylinders 15, 21, 22 and that it was a matter of routine work for the skilled person to design the various parts of a dryer module such that about 65 to 75% of the entire evaporation capacity inside a drying module took place on the large-diameter cylinder, and the rest was divided substantially evenly between the pair of contact-drying cylinders and the suction roll. The availability, or use of, a simulation program was not essential for carrying out the invention. The patent in suit thus met the requirements of Article 83 EPC.

Objection of lack of inventive step, Article 56 EPC

The invention offered a compact drying module having a high evaporation capacity in which both contact-drying and blowing-on-drying were applied in a novel and synergistic manner, see paragraphs [0014], [0016] and [0043] of the patent in suit. The following features of claim 1 of the main request were not disclosed in the closest prior art document D5 (D1):

(i) the contact-drying cylinder (21) in steps (a) and (c) having a diameter $D_2 > 1.5$ m;

(ii) the drying sector b on said contact-drying cylinder is chosen as $b > 180°$;

(iii) before step (a) or after step (c) the web (W) to be dried is passed over a sector c of a suction roll (22), which sector c is subjected to a negative pressure, while the web (W) is supported on the drying wire (20) with the drying wire located between the suction roll (22) and the web (W), the magnitude of said sector being chosen as $c > 160°$ and the diameter D_3 of said suction roll (22) being chosen as $D_3 < D_2$; and

(iv) wherein about 65 to 75% of the entire evaporation capacity inside a drying module (10) comprising said contact-drying cylinder (21) used in step (a), said contact-drying cylinder (21) used in step (c), said large-diameter cylinder (15) and said suction roll (22) takes place on said large-diameter cylinder (15), while the rest of said entire evaporation capacity is divided substantially evenly between the pair of contact-drying cylinders (21) and the suction roll (22).

In particular, the drying module known from document D5 did not comprise a suction roll before or after a contact-drying cylinder. According to the invention about 12,5 to 17,5% of the evaporation capacity took place on said suction roll. This amount was of the same order as the evaporation capacity of the two contact-drying cylinders combined. The suction roll did not merely transfer the paper web to the next drying module but played an active role in drying the web. This was also not known from document D2. The calculations of the appellant with respect to the distribution of the evaporation capacity were based on many assumptions for

which there was no basis in document D5. Moreover, the obtained result of said calculation, namely that the evaporation capacity that took place on the suction roll was three times as high as the evaporation capacity of the pair of contact-drying cylinders, could not fairly be said to be "divided substantially evenly" between these parts. It followed that the subject-matter of claims 1 and 17 involved an inventive step.

Reasons for the Decision

1. *Procedural matters*

1.1 The respondent is a party to the appeal proceedings as of right, Article 107 EPC, second sentence. The reply of a party as of right shall be filed within four months of notification of the grounds of appeal, Article 12(1)(b) RPBA, and shall contain a party's complete case, Article 12(2) RPBA, see Rules of Procedure of the Boards of Appeal, OJ EPO 2007, 536 ff.

With a communication dated 2 October 2006, a copy of the statement setting out the grounds of appeal was sent to the respondent containing the following text: *Any reply must be filed within four months of this notification*. With a communication dated 21 February 2007, an extension of time of 2 months to reply to the communication dated 2 October 2006 was refused. The respondent filed its reply (which merely contained two requests) to the communication dated 2 October 2006 on 12 February 2007, ie within the time limit set in said communication. A further submission filed on 15 March 2007 contained the respondent's substantive

observations on the statement setting out the grounds of appeal.

1.2 The appellant requested with letter dated 20 October 2008 that the submission of the respondent filed on 15 March 2007 including its annex (document D23) should not be admitted into the appeal proceedings, because it was late filed ("... den ... Schriftsatz der Patentinhaberin einschließlich Anlagen als verspätet zurückzuweisen.").

The objection of the appellant that the submission of the respondent was late filed, is understood by the Board to refer to the fact that said submission was filed when the time limit set in the notification dated 2 October 2006 had expired. The legal sanction for a party who files submissions after the time limit for filing a reply to the notification of the grounds of appeal has expired is not, however, that such submissions are automatically rejected by the Board for that reason alone.

Article 13(1) RPBA ("Amendment to a party's case") provides the following: *Any amendment to a party's case after it has filed its grounds of appeal or reply may be admitted and considered at the Board's discretion. The discretion shall be exercised in view of inter alia the complexity of the new subject matter submitted, the current state of the proceedings and the need for procedural economy*.

In drafting the Annex to the summons to oral proceedings dated 1 October 2008, the Board duly considered pursuant to Article 12(4) RPBA the notice of

appeal and the statement setting out the grounds of appeal filed by the appellant, the reply to the appeal filed on 12 February by the respondent and, exercising its discretion under Article 13(1) RPBA, the further observations filed by the respondent with letter of 15 March 2007, which were filed after said reply was filed.

The request of the appellant not to admit the submission dated 15 March 2007 of the respondent into the appeal proceedings is therefore refused.

1.3 Document D23 was filed for the first time during the appeal proceedings as a reaction to the filing of the statement setting out the grounds of appeal by the appellant. Since the appellant wished to rely on this document during the oral proceedings before the Board, and it has some relevance with respect to the issue of sufficiency of disclosure, document D23 was duly admitted into the appeal proceedings as well.

2. *Extension beyond the contents of the application as filed, Article 123(2) EPC*

2.1 Claims 1 and 17 of the main request differ from the corresponding claims 1 and 17 as granted in that the expression "while the rest of said entire evaporation capacity is divided between" present at the end of each claim is replaced by the expression "while the rest of said entire evaporation capacity is divided substantially evenly between".

A basis for this amendment, ie the addition of the expression "substantially evenly", is the passage on

page 11, lines 43 to 45, of the application as filed (published version), viz. *As comes out from the table above, of the entire evaporation capacity of the module 10, ~ 65...75 % takes place on the large cylinder 15, while the rest of the evaporation capacity is divided substantially evenly between the pair of contact cylinders 21 and the reversing suction roll 22*.

2.2 In the judgement of the Board, said passage must be interpreted as a generalization of the values given in the table for the simulation example, in the sense that the (distribution of the) evaporation capacities of the different parts of the module 10 are given as a percentage range (rather than as two specific values for two specific modules in the initial and in the final end of the drying section, respectively, as in the table). It may be noted, that in said passage, reference is made to "the module 10" (and no longer to a module in the initial or final end of the drying section). The reader of said passage understands in the context of the preceding paragraph on page 11, lines 23 to 43, of the application as filed (published version) that, from two specific values in the table, namely 67.7% and 76.1%, the range "about 65 to 75%" is derived from the table (whence "*As comes out from the table above, ...*), which range is, in contrast to the specific values, independent of in which part of the drying section the drying module is located.

The submission of the appellant, that the introductory phrase "*As comes out from the table above*" in said passage expressly restricted the remaining text of the passage to what was disclosed in the table, is not

convincing, since the values given in the table are not merely reiterated.

2.3 It follows that claims 1 and 17 of the main request do not contain subject-matter extending beyond the content of the application as filed, Article 123(2) EPC.

3. *Insufficiency of disclosure, Article 83 EPC*

3.1 According to claim 17, "about 65 to 75% of the entire evaporation capacity inside said drying module (10) takes place on said blowing-on-drying cylinder (15), while the rest of said entire evaporation capacity is divided substantially evenly between said pair of contact-drying cylinders (21) and said suction roll (22)". The method claim 1 comprises in slightly different wording essentially the same feature.

The appellant has argued that the patent in suit failed to describe how the different parts of the drying module were designed so as to achieve the above distribution of the evaporation capacity. Moreover, the different parts of the drying module interacted with each other and could not be considered in isolation. The simulation example referred to in paragraph [0066] of the patent in suit did not disclose which simulation program had been used. Document D23 related to a survey of various models describing the evaporation on contact-drying cylinders. It was clear from the discussion and conclusions on pages 37 and 38 of document D23 that, whilst various theories on cylinder drying - each based on different suppositions - were available, comprehensive experimental work was necessary.

3.2 The invention does not relate to a novel blowing-on-drying cylinder, contact-drying cylinder or suctions roll as such. On the contrary, the three different parts of the claimed module are said to belong to the prior art, but have been combined in a novel way, cf. paragraphs [0021] and [0023] of the patent in suit.

In the judgement of the Board, designing the evaporation capacity of a given, single cylinder (roll) in a drying module as defined in claims 1 and 17 is a matter of routine work for the person skilled in the art for the following reasons. Firstly, the evaporation capacity of a prior art cylinder is known, or can be experimentally determined for given operating conditions, eg by measuring the water content of the paper web before and after the cylinder. Moreover, since the parameters that influence the evaporation capacity are largely known (e.g. the diameter and contact sector of the cylinders, the temperature of the contact-drying cylinders, the amount and temperature of the drying-gas jets, the permeability of the drying wire, and paper web parameters such as water content, basis weight, width, and running speed), prior art cylinders can be modified with a view to reduce or increase their evaporation capacity.

3.3 The burden of proof that the *overall design* of a drying module consisting of a blowing-on-drying cylinder, two contact-drying cylinders and a suction roll having the distribution of the evaporation capacity as claimed in claims 1 and 17 cannot be carried out by the person skilled in the art, rests with the appellant in the present case.

In the judgement of the Board, the appellant has not shown that such a drying module cannot be designed by the person skilled in the art.

The invention claimed in claims 1 and 17 is therefore disclosed in a manner sufficiently clear and complete to be carried out by a person skilled in the art, Article 83 EPC.

4. *Objection of lack of inventive step, Article 56 EPC*

4.1 Document D1, which is cited in paragraph [0009] of the patent in suit, represents the closest prior art. The respondent stated in his reply to the statement of grounds dated 12 February 2007 that (see page 3, lines 10 to 14) the content of document D5, which is published after the priority date of the patent in suit, corresponds to that of document D1. Henceforth reference will be made to document D5, which is in English, rather than to document D1, which is in Finnish.

In particular, the embodiment shown in Figure 1 and described in the description of document D5 represents the closest prior art. The Board concurs with the respondent that the subject-matter of claim 1 differs from what is disclosed in document D5 in the features (i) to (iv) as set out in point VII above. It may be noticed that the subject-matter of claim 17 differs from what is disclosed in document D5 in corresponding, very similar features.

The distinguishing features concern, on the one hand, the diameters and drying sections of the cylinders/rolls (D_2 > 1.5 m (claim 1 only), D_3 < D_2, b > 180°; c > 160°), and on the other hand, the presence of a suction roll and the evaporation capacity distribution within a drying module. With respect to the first group of distinguishing features, it is noted that document D5 is silent about the magnitude of the drying sector b on the steam-heated drying cylinder 13. Whilst the diameter of the large-diameter cylinder 20 is stated to be "as a rule, in a range of D = 2...5 m, preferably ≈ 3.5 m" in document D5 (see column 3, lines 10 to 14), this document is silent about the diameter of the steam-heated drying cylinders 13, 14. Figure 1 is a schematic drawing and neither the drying sector b nor the diameter of the drying cylinders can be directly and unambiguously derived from this drawing.

With respect to the second group of distinguishing features relating to the presence of a suction roll before or after a contact-drying cylinder and the evaporation capacity distribution within the drying module, the following is noted:

Independent claim 6 of document D5 relates to a dryer for paper. A drying fabric 12 is introduced in dependent claim 10. The last part of the characterizing portion of claim 10 reads as follows: "and that, before and/or after the flow-through cylinder (20), a drying cylinder (13, 14) and/or a paper guide roll (13a, 14a) is/are fitted". A drying module consisting of a large-diameter blowing-on cylinder, two contact-drying cylinders and a suction roll is not disclosed in claim 10 of document D5, and there is no hint or suggestion

in document D5 to replace the paper guide rolls 13a, 14a reiterated in claim 10 by suction transfer rolls while maintaining the contact-drying cylinders. In this respect it is noted that an embodiment with suction transfer rolls 16, 17 before and after the flow-through cylinder 20 (but without contact-drying cylinders) is shown in Figure 3 of document D5, which differs from the embodiment shown in Figure 1 (showing a pair of drying cylinders 13, 14 before and after the flow-through cylinder 20) and in Figure 2 (showing a pair of paper guide rolls 13a, 14a before and after the flow-through cylinder 20), respectively, in that the drying fabrics 12a, 12b do not run around the flow-through cylinder.

Document D5 is completely silent about the distribution of the evaporation capacity over the flow-through cylinder 20 and the drying cylinders 13, 14. Whilst the temperature and the velocity of the drying gas jets is said to be in the range of 250 to 500 °C (see claim 2) and 90 m/s (see column 5, line 17), the amount of the drying gas jets is not disclosed. The distribution of the evaporation capacity over the flow-through cylinder 20 and the drying cylinders 13, 14 cannot be calculated, or estimated, on the basis of the information provided by document D5. This applies *a fortiori* to the hypothetical distribution of the evaporation capacity over the flow-through cylinder 20, the drying cylinders 13, 14, and a (hypothetical) "suction roll", since document D5 does not disclose a suction roll in combination with a contact-drying cylinder.

Summarizing, the subject-matter of claims 1 and 17 of the main request differ from what is disclosed in document D5 in that a particular arrangement of two contact-drying cylinders, a suction roll, and a large-diameter blowing-on cylinder, whereby $D_2 > 1.5$ m (claim 1 only), $D_3 < D_2$, $b > 180°$ and $c > 160°$, is claimed (the sequence of said cylinders/rolls is not completely determined in claim 1) and in that a particular distribution of the evaporation capacity is claimed (cf. distinguishing feature (iv)).

4.2 According to the patent in suit the subject-matter of claims 1 and 17 of the main request solves the problem(s) posed in paragraphs [0011] to [0017] of the patent in suit. There is no evidence showing the contrary.

In particular, claims 1 and 17 of the main request specify that about 65 to 75% of the entire evaporation capacity inside a/said drying module (10) ... takes place on said large-diameter/blowing-on-drying cylinder (15), while the rest of said entire evaporation capacity is divided substantially evenly between the pair of contact-drying cylinders (21) and the/said suction roll (22).

There is no hint or suggestion in any of the documents cited by the appellant concerning this feature.

The calculation of the appellant with respect to evaporation capacity distribution has been taken into consideration by the Board but was not found persuasive. The equations $2a + b + c = 1$ and $2a + 2b = ½$ allegedly describing the evaporation capacity

distribution of a drying module according to document D5 and of a drying module according to the prior art, respectively, result, when c is taken to be equal to 20a, in the relative distributions 2a : b : c = 3 : 9 : 30 (document D5) and 2a : 2b = 3 : 18 (prior art). If correct, this would mean that the hypothetical suction roll in document D5 has an evaporation capacity which is three times as high as the evaporation capacity of a pair of contact-drying cylinders (not 1 : 1, as claimed in claims 1 and 17 of the main request), and that in the prior art drying module comprising two suction rolls and a pair of contact-drying cylinders, which is allegedly taken in document D5 as a comparative example, of the entire evaporation capacity more than 85% would take place on the suction rolls, and less than 15% would take place on the pair of contact-drying cylinders. In the judgement of the Board, assuming that the prior art drying module mentioned in column 1, lines 23 to 26, has such an evaporation capacity distribution is not credible. With this state of affairs, there is no need for the Board to examine whether the assumptions made by the appellant on the basis of the information given in document D5, which led to the equations 2a + b + c = 1, 2a + 2b = ½ and c = 20 a, are convincing or not.

4.3 It follows from the above that the person skilled in the art, starting from the method of drying a paper web and the drying module known from document D5 and seeking to solve the problems mentioned above, would not have arrived at the subject-matter of claim 1 of the main request in an obvious manner.

Consequently, the subject-matter of claims 1 and 17 of the main request involve an inventive step, Article 56 EPC.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the first instance with the order to maintain the patent on the basis of the following documents: claims 1 and 17 filed on 12th January 2009, and claims 2 to 16 and 18 to 31 of the patent as granted; description and drawings as granted.

The Registrar: The Chairman:

D. Meyfarth W. Zellhuber