BESCHWERDEKAMMERN DES EUROPÄISCHEN PATENTAMTS | BOARDS OF APPEAL OF THE EUROPEAN PATENT OFFICE | CHAMBRES DE RECOURS DE L'OFFICE EUROPEEN DES BREVETS

Publication in the Official Journal Yes / No

File Number: T 95/91 - 3.2.3

Application No.: 88 830 032.4

Publication No.: 0 299 926

Title of invention: Headbox with a mechanism for modifying the fibrous slurry turbulence

Classification: D21F 1/02

D E C I S I O N
of 14 May 1992

Applicant: Comer S.p.A.

Headword:

EPC Article 56

Keyword: "Closest prior art"
"Inventive step (yes)"

Headnote

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Case Number : T 95/91 - 3.2.3

D E C I S I O N
of the Technical Board of Appeal 3.2.3
of 14 May 1992

Appellant : Comer S.p.A.
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Vicenza (IT)

Representative : Mercurio, Franco
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Decision under appeal : **Decision of Examining Division of the European Patent Office dated 14.09.90 refusing European patent application No. 88 830 032.4 pursuant to Article 97(1) EPC.**

Composition of the Board :

Chairman : C.T. Wilson
Members : J. Du Pouget De Nadaillac
F. Benussi

Summary of Facts and Submissions

I. European patent application No. 88 830 032.4 (publication No. 299 926) was refused by the Examining Division on the grounds that the subject-matter of the application as a whole lacks inventive step (as required by Article 56 EPC) in view of the prior art shown by the following documents:

D1: US-A-4 517 056, and
D2: US-A-3 463 701

During the examination procedure, the two following documents were also mentioned for the same ground:

D3: EP-A-209 696, and
D4: US-A-3 976 539.

II. The Appellant lodged an appeal against this decision and on 8 December 1990, together with the Statement of Grounds of Appeal, filed a new set of three claims in substitution of the claims proposed during the examination procedure.

III. In response to communications of the Board, the Appellant filed the following documents:

- Pages 1 and 3 of the description, received on 11 September 1991 and
- Claims 1 to 3 and pages 2, 2a of the description, received by telefax on 12 February 1992 and confirmed on 17 February 1992.

IV. The amended Claim 1 reads as follows:

"A headbox for a machine including an upper lip (2) and a lower lip (3), a wall member (17) of said upper lip (2) forming with said lower lip (3) a flow path for fibrous slurry, a straightening member (4) on said wall member projecting into said path from said wall member (17), a plurality of micrometrical devices (11) individually controlled, connected by means of control rods (10) to said flow straightening member (4) at spaced points along the length thereof to fine-adjust the linearity of said flow straightening member (4) and a beam (18) supporting said devices (11), said headbox having also coarse-adjustment means for moving the straightening member (4) up and down, characterized in that coarse-adjustment means comprise a mechanism (19) for modifying the turbulence of said flow comprising means (23, 24) coarse-displacing said beam (18) up and down in a vertical direction c simultaneously with said control rods (10) and said member (4) to thereby adjustably move said flow straightening member (4) through strokes of given coarse amplitudes along said wall (17) to coarse-adjustably project said flow straightening member (4) of lengths "a" relative to said wall (17) into said path to modify the turbulence of the flow passing therethrough."

V. The Appellant requested that the decision under appeal be set aside and that a patent should be granted on the basis of the following documents:

Claims: 1 to 3, as filed by telefax on 12 February 1992, and confirmed on 17 February 1992,

Description: pages 1 and 3, as filed on 11 September 1991,
pages 2 and 2a, as filed by telefax on 12 February 1992 and confirmed on 17 February 1992,
pages 4 to 7, as originally filed.

Drawings: as originally filed.

Reasons for the Decision

1. The appeal is admissible.

2. New Claim 1 results from a partial combination of the originally filed Claims 1 and 2 with incorporation of additional features, which are supported by page 5, line 15, to page 6, line 19 of the originally filed description. The individual control of each micrometrical device (11) is disclosed in page 4, lines 16-23. The feature of Claim 2 is found in the lines 9 to 16 of page 6, whereas the feature of Claim 3 is clearly illustrated by the drawings (Figures 2 and 4). Therefore, Claims 1 to 3 do not contravene Article 123(2) EPC.

3. None of the cited documents discloses, in a headbox for a paper machine, besides means for a fine or incremental adjustment of the flow straightening member relative to the wall of the upper lip, other means adapted for coarse adjusting said member in the same way. The subject-matter of Claim 1 is therefore novel in the sense of Article 54 EPC.

4. As to the question of inventive step, the Board comes to the following conclusion:

4.1 Claim 1 is delimited over D4, in preference to document D1, since document D4 relates to a headbox having all the features, which are common to Claim 1 and document D1 and additionally teaches the provision of coarse adjustment means, which indirectly moves the straightening member up and down.

4.2 Headboxes in paper machines deliver from a tank containing the paper fibre suspension a flow of a paper fibre slurry through a slice opening to discharge said flow out onto a wire wrapped about a rotating roll. Adjusting means are provided for controlling the slice opening to thereby vary the profile of the paper with respect to basis weight, moisture, and the like.

From document D4, the above-mentioned closest prior art, a headbox is known having an adjustable slice defined between a fixed lower lip and a pivoting upper lip. This upper lip is in the form of a beam, the lower wall of which confining the slice opening. A straightening member extends along the lower region of the front wall of this beam and can be moved vertically along this wall, so as to project downwardly beyond the lower wall and into the path formed by the slice. Several micrometrical devices distributed across the front wall of the upper lip adjust the flow straightening member linearity and level, controlling thereby the size and geometry of the slice. The rear wall of the beam or upper lip is hinged on the frame structure of the headbox and coarse adjusting means are provided between said rear wall and said frame structure to swivel the upper lip beam about the horizontal axis of the hinge means.

In column 2, lines 13 to 23, of this prior art, it is suggested to suppress these coarse adjusting means, since the range of the fine adjustment could be made sufficiently great for the requirement of the paper machine; a range of 10 to 25 mm is mentioned.

4.3 Starting from this state of the art, the objective problem underlying the present invention is to provide a headbox for a paper machine, which is able to use different compositions of slurry, leading to different types of paper.

The solution of the present invention is based on the idea of varying the turbulence of the slurry at the slice opening of the headbox and the problem is solved by providing, besides the fine adjusting means, coarse adjusting means for the flow straightening member.

4.4 The first feature of the characterising part of Claim 1 according to which the headbox comprises a mechanism for modifying the turbulence of the slurry flow is not described as such in document D4, the above-mentioned closest prior art, neither appears a mention of turbulence. However, as recognised by the Appellant during the examination procedure in his letter dated 14 May 1990, in the headbox according to this prior art the turbulence of the slurry can be modified by means of the displacement of the straightening member. Other documents (see D3 or DE-A-1 461 154 cited in the Search Report) show that it was well known, in this technical field, to provide headboxes with a flow straightening member protruding from the wall of the upper lip into the slice opening of the headbox in order to create a predetermined fibrous slurry turbulence or to elevate it, so that the fibre interlacement of the slurry becomes oriented in a given way. Therefore, the knowledge that the straightening member can modify the slurry turbulence appears to be part of the common knowledge of the skilled person in this technical field.

4.5 In the headbox known from document D4, however, only fine adjusting means are provided for the straightening member itself, since it is mainly searched to obtain a given geometry of the slice opening of the headbox to thereby control the profile of the paper. In this prior art (see column 2, lines 51- 57), the straightening member is defined as the upper lip of the slice and this upper lip has to be perfectly parallel to the headbox lower lip to

assure a regular thickness of the flow. The fine adjusting means are only foreseen for an incremental adjustment of the slice opening and, thus, bring infinitesimal displacements of the straightening member, which are quite insufficient to vary substantially the slurry turbulence, at least in a reasonably short time. The headbox according to document D4 is consequently used for creating a predetermined turbulence, which corresponds to a single type of slurry. It is therefore not possible to use this known headbox with different kinds of slurry. The above-mentioned suggestion of column 2 of this prior art, although giving a range which would allow a variation of the turbulence and corresponds to the one of the present invention, nevertheless does not give a hint at the claimed solution, since it suggests simultaneously to suppress the coarse adjusting means. With such a range, if it were so obvious for the skilled person to provide for coarse-adjusting means of the flow straightening member, having in view the other already shown coarse-adjusting means, a suggestion of such a feature should at least appear in this document D4. Therefore, in the view of the Board, the sole provision of coarse-adjusting means in the headbox according to document D4 in order to make major adjustments to the top lip cannot suggest the provision of coarse-adjusting means for the straightening member, since this member has a different function.

4.6 Document D1, although acknowledging that it was known to create a turbulence in the slurry by means of the flow straightening member, does not give any hint at using such a possibility in order to deal with different types of slurry. For this reason, contrary to the opinion of the Examining Division, the Board considers that the idea of varying the turbulence for this purpose in a headbox of a paper machine is an essential contribution of the present invention and should therefore not form part of the

formulation of the problem to be solved (see the Board decision T 229/85, OJ EPO 1987, page 237). Another prior art document, namely DE-A-1 461 154, which deals also with different types of slurry by varying the turbulence of said slurry inside the vat for preparing the slurry, leads the man skilled in the art astray from this direction.

4.7 Contrary also to the impugned decision, a hint towards the solution cannot be seen in the teaching of document D2. Indeed, this prior art discloses coarse-adjusting means in the form of a movable beam, which supports all the fine adjusting devices of the upper lip of a paper machine headbox, so that major adjustments of the upper lip are made by moving (more exactly, rotating) said beam. However, the upper lip in document D2 is in the form of a simple pivotable plate, which defines with the lower lip the flow path for the fibrous slurry. It corresponds, therefore, to the wall member of the upper lip in the headbox according to document D4. No straightening member is disclosed and further, in common with document D1, this document solely teaches to adjust and control the headbox slice to vary the slurry thickness and to "keep the flow smooth, uniform and free from eddies" (column 1, lines 30 to 33). No suggestion of varying the turbulence is made, neither are means to do so shown. This document does not therefore teach more than document D4.

4.8 Thus all these documents cannot suggest to a skilled man to look for a solution of the existing problem by varying the flow turbulence at the slice opening of the headbox and consequently to provide coarse adjusting means for the straightening member. On the contrary, all these documents emphasize the fact that the adjusting means for this member have to be fine. Hence, the subject-matter of Claim 1 involves an inventive step within the meaning of Article 56 EPC.

5. The following editorial amendments are necessary:

Claim 1,		line 14, replace "in" with "the"; lines 9 and 21, replace "lenghts" with "lengths";
Description,	page 2,	line 8, replace "pf" by "of" line 23, replace "adn" by "and";
	page 2a	line 8, replace "lenght" by "length"; line 14, replace "sid" by "said"; line 19, replace "lenghts" by "lengths "a"", and line 28, replace "lenghts" by "lengths".

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 grant a European patent on the basis of the documents set out in paragraph IV above, with the amendments set out under point 5 above.

The Registrar

S. Fabiani

S. Fabiani

The Chairman

C.T.Wilson