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Bezeichnung der Erfindung: Extended nip shoe
Title of invention:
Titre de l'invention :

Klassifikation / Classification / Classement : D21F 3/02

ENTSCHEIDUNG / DECISION

vom / of / du 31 January 1989

Anmelder / Applicant / Demandeur :

Patentinhaber / Proprietor of the patent /
Titulaire du brevet : BELOIT CORPORATION

Einsprechender / Opponent / Opposant : VALMET OY

Stichwort / Headword / Référence :

EPÜ / EPC / CBE Article 56 EPC

Schlagwort / Keyword / Mot clé : "Inventive step (yes)"

Leitsatz / Headnote / Sommaire

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Case Number : T 23 /88 - 3.2.1

D E C I S I O N
of the Technical Board of Appeal 3.2.1
of 31 January 1989

Appellant : (Opponent)
VALMET OY
Punanotkonkatu 2
SF-001 30 HELSINKI
(Finland)

Representative :
Peter Rostovanyi et al
c/o AWAPATENT AB
Box 5117
S-20071 MALMÖ
(Sweden)

Respondent : (Proprietor of the patent)
BELOIT CORPORATION
P.O. Box 350
Beloit Wisconsin 53511
(US)

Representative :
Dennemeyer, John James
OFFICE Dennemeyer S.à.r.l.
P.O. Box 41
L.2010 Luxembourg
(Luxembourg)

Decision under appeal :
Decision of Opposition Division of the European Patent Office dated 10 November 1987 rejecting the opposition filed against European patent No. 00 66 528 pursuant to Article 102(2) EPC.

Composition of the Board :

Chairman : F. Gumbel
Members : F. Brösamle
F. Benussi

Summary of Facts and Submissions

I. European patent No. 00 66 528 was granted with six claims on the basis of European patent application No. 82 630 046.9 on 29 January 1986.

Claim 1 as granted reads as follows:

"1. Extended nip press device for a papermaking machine, comprising an extended nip shoe (24; 60; 70) cooperating with an opposed press member (22, 70) to define therebetween a nip wherein a compliant transport system (28, 30, 32; 72) is compressed, the nip shoe (24; 60; 70) having a surface defining with a complementary shaped surface of the opposed press member (22, 70) a load area (x) extending from an inrunning nip point (38) to an outrunning nip point (50) of said nip, said nip shoe (24; 60; 70) further having an inrunning inclined ramp portion preceding said load area (x) and having a surface (36; 62) forming a first acute angle (θ) with a line substantially tangent to a surface of the opposed press member (22; 70) at the inrunning nip point (38); means for applying force to the nip shoe (24; 60; 70) to exert compressive load on the compliant transport system (28, 30, 32; 72) and means for supplying lubricant to the interface between the nip shoe (24; 60; 70) and the compliant transport system (28, 30, 32; 72), characterized in that the nip shoe (24; 60; 70) has an outrunning inclined ramp portion following said load area (48) and having a surface (52; 64) forming a second acute angle (θ) with a line substantially tangent to a surface of the opposed press member (22; 70) at the outrunning press point (50), and that said nip shoe (24; 60; 70) comprises side edge portions (58) inclined away from said complementary shaped surface of said opposed press member (22; 70)."

Claim 1 is followed by dependent Claims 2 to 6.

II. The patent was opposed in due time and form on 28 October 1986 by VALMET OY, Helsinki (Finland); the Opponent requested revocation of the patent on grounds of lack of inventive step in the light of the following documents cited with respect to Claim 1:

D1 DE-A-2 108 423
D2 US-A-4 201 624
D3 Standard Handbook of Lubrication Engineering, McGraw-Hill Book Company, 1968, pages 5-9 and 5-18.
D4 Tekniikan käsikirja 7, koneensuunnitteluoppi, Jyväskylä 1972, Figs. at page 497 (Handbook of Engineering 7, Mechanical Engineering; Sliding bearings, Metallic bearing materials),
D5 Ingenjörshandboken, Maskinteknik, Nordisk Rotogravyr, 1948, page 151, and
D6 DIN-Norm 7475, 1967

Furthermore, documents D1, D2 and D7 to D11 (see impugned decision) were cited as far as the dependent claims are concerned.

III. By a decision dated 10 November 1987 the Opposition Division rejected the opposition pursuant to Art.102(2) EPC.

IV. The Opponent (Appellant) appealed against this decision on 13 January 1988 by telecopy at the same time paying the appropriate fee and confirmed this appeal by a letter received on 16 January 1988.

The Appellant argues in his Statement of Grounds of Appeal of 14 March 1988 (telecopy) confirmed by a letter received

on 17 March 1988, that the patent should be revoked due to lack of inventive step in view of D3 to D6 disclosing hydrodynamic bearings which in his opinion are prejudicial against the claimed configuration of the nip shoe (particularly feature a) according to the Statement of Grounds of Appeal). He further points to the fact that feature b) concerning the inclined edge portions of the nip shoe is notoriously known with tools acting on relatively moving webs, for instance from an ordinary household iron, in order to avoid deformation of the web in its transverse direction. The wording of feature b) is moreover felt to be unclear as it also covers the possibilities of conventional rounding-off/bevelling and of no rounding-off/bevelling at all. Even a plane perpendicular to the web would fulfill the condition of being "inclined away".

As an auxiliary request it is therefore petitioned to render Claim 1 more precise at least in view of feature b) which in its present wording is felt to be not novel or at least not of inventive level.

V. The Patentee (Respondent) requests that the appeal be dismissed and that the patent be maintained in its granted form. He sets out that the nip shoe just performs as a hydrodynamic bearing without actually being one and that the documents D3 to D6 have no relation(ship) to the problems associated with the nip shoe in a papermaking device as known from D1 and D2.

Concerning feature b) (according to the Statement of the Grounds of Appeal) the Respondent brought forward that no document was cited by the Appellant to support his argument that this feature is notoriously known. The Respondent points moreover to the fact that in the

relevant prior art installations a rapid drop-off of the pressure is taught at the outrunning and side edge portions of the nip shoe. The argument of non-clarity raised by the Appellant as far as feature b) is concerned is deemed to be unfounded as the Respondent comes to the conclusion that a plane perpendicular to the web would not be included by the wording "inclined away".

Reasons for the Decision

1. The Appeal is admissible.

2.1 Granted Claim 1 is a combination of Claims 1, 5 and 8 as originally filed. Though in Claim 5 as originally filed the words "acute angle" for the inrunning and outrunning inclined ramp portions are not used, the requirements of Article 123(2) EPC are met as the definition used in Claim 5 as originally filed clearly covers the teaching of granted Claim 1. Moreover, the respective features are clearly shown in Fig. 3 to 5 and described in the respective parts of the description.

Granted Claims 2 to 6 are based on Claims 2, 3 and 7 as originally filed and are also not open to an objection under Article 123(2) EPC.

Granted Claim 5 is only partially covered by the wording of Claim 7 as originally filed as only the length for the inrunning surface of approximately 5 to 10 cm is defined and not the length for the outrunning surface.

From Figure 5 as originally filed it can, however, be derived that the ramp portions "36" and "52" roughly have the same length so that one can derive therefrom the

teaching of granted Claim 5. In the Board's opinion granted Claim 5 is therefore acceptable in this respect.

Granted Claim 6 is based on Claim 4 as originally filed, whereby the words "the entire width of" respectively "a substantially amount of" see patent specification 00 66 528, column 6, lines 47 respectively 49, have been added.

From page 6, lines 11 to 17 in combination with Figure 4 as originally filed it can be seen that obviously the entire width of the compliant transport system (belt "32") is contacted by the lubricant and that "a substantial amount of the lubricant" is retained in the reservoir "40". Granted Claim 6 therefore also meets the requirements of Article 123(2) EPC.

2.2 As the Respondent defends the patent in its granted form no objection under Article 123(3) EPC arises.

2.3 The Appellant has brought forward the argument that the last feature of Claim 1, see column 6, lines 17 to 22 of the patent ("and that said nip ...") lacks clarity (Art. 84 EPC). The Board cannot share this opinion as the wording "inclined away from said ... surface" clearly points to the construction of the ramp as shown in Figure 4 of the patent specification 00 66 528, see surface according to reference sign "24" in relation to the inclined surfaces "58, 58" at both of its ends seen in a direction transversely to the transport-direction of the web.

Should there be the slightest doubt about the meaning of feature b) in this respect due to the wording of granted

Claim 1, then consultation of Figure 4 and of column 5, lines 5 to 20 of the patent specification 00 66 528 would lead to the proper interpretation. In the Board's view Claim 1 therefore clearly confers protection to a configuration where the side edges as a whole form an acute angle with the complementary surfaces of the press member and the nip shoe, and excludes perpendicular side edges as well as merely rounded-off or bevelled edges.

In this context it has to be mentioned that lack of clarity in any case would not be a ground of opposition under Article 100 EPC so that a patent could not be revoked only for that reason.

For the above reasons the request for clarification of Claim 1 must be rejected.

2.4 Claim 1 is completely delimited over the nearest prior art as reflected by document D1 so that Claim 1 is also not open to a formal objection under Rule 29(1) EPC.

2.5 Summarizing Claims 1 to 6 are not open to formal objections and are acceptable insofar.

3.1 Concerning the nip press according to D1 there is no outrunning nip portion disclosed as there, see page 3, last paragraph in combination with Claim 3, it is pointed out that a steep change in the exerted pressure on the web is realised ("rascher Druckentspannung"), obviously in order to avoid "rewetting" of the web. In other words, there only exists a rounded exit edge of the nip shoe, but no outrunning nip portion in the meaning of granted Claim 1. This sudden release of the nip pressure is also taught in D2, see column 4, lines 9/10. Moreover, no

provisions are made for channeling the lubricant away from the compliant transport system after passage through the press nip.

The problems arising with the nip press according to D1 and D2 are, in accordance with the patent description, considered to be the following:

(1) the paper web quality is negatively influenced due to possible contamination by lubricant which is not sufficiently channeled away from the compliant transport system;

(2) the paper web quality is negatively influenced due to a substantial pressure difference at the outrunning nip point;

(3) the paper web may be distorted sidewise in the press nip causing stress, crimping or otherwise impairing its quality.

3.2 The object of the invention is to provide an improved extended nip press overcoming the above mentioned deficiencies of the nearest prior art construction, see column 2, lines 11 to 16 of the patent specification 00 66 528.

3.3 Starting from the known nip press according to D1 this object of the invention is solved by the characterising features of Claim 1 which in essence are

(a) the outrunning inclined ramp portion also forms an acute angle with the tangent to the opposed press member at the outrunning press point;

(b) the side edge portions of the nip shoe are inclined away from the central part of the nip shoe.

4. The subject-matter of Claim 1 is novel, as none of the documents D1 to D6 discloses the combination of features specified in Claim 1. Novelty was never disputed by the Appellant nor by the Opposition Division and the Board so that no further discussion is necessary in this respect, (Article 54 EPC).

5. The assessment of inventive step leads to the following result:

5.1 The posing of the object of the invention is not considered inventive in itself as it can be expected from a person skilled in the art that the deficiencies of the nip shoe according to D1 are studied and that a solution to overcome them is aimed at.

5.2 The Board is, however, convinced that the solution of the object of the invention laid down in Claim 1 is the result of inventive activity.

5.3 Among documents D1 to D6 only D1 and D2 concern the technical field of the subject-matter of Claim 1.

Without any doubt D1 and D2 lead a skilled person away from the teaching of Claim 1 as in this prior art a sudden release of the nip pressure is recommended to avoid the effect of "rewetting" of the paper web, see D1 page 1, lines 9 to 3 from bottom and page 3, last paragraph, where it is set out that the pressure has to be abruptly diminished when the web leaves the nip shoe. In D2 column 4, lines 9/10 the reader is again pushed to the

fact that the pressure must be abruptly diminished to avoid the effect of "rewetting". D1 and D2 therefore give no hint to find the subject-matter of Claim 1.

5.4 D3 to D6 belong to the general field of hydrodynamic bearings. The Appellant contends that a skilled person concerend with paper making installations according to Claim 1 would take this general field into account and he points to the fact that the outrunning ramp portion acts as a hydrodynamic bearing as set out in column 3, lines 46/47 of the patent specification 00 66 528.

In the Board's view there can be no doubt that the extended nip shoe of the press device of Claim 1 not only acts as a hydrodynamic bearing surface, but is a hydrodynamic bearing.

5.5 The crucial question is, however, whether a person skilled in the art being confronted with the deficiencies involved in the construction laid down in D1, i.e. with the object of the invention, would consider the general technical field of hydrodynamic bearings and if so, derive any lead therefrom to the solution as set out in the characterising part of Claim 1.

In this respect it has to be considered that hydraulic bearings as shown in documents D3 to D6 generally do not deal with the specific problems of paper making devices and in particular not with the disadvantages/deficiencies set out under 3.1. It cannot therefore be seen that a person skilled in the art could expect to get any teaching from the technical field of hydrodynamic bearings to deal with problems as maintaining paper web quality if lubricant is used, if sudden pressure changes in the press nip are existent and if the paper web is distorted

sidewise, stressed or crimped, all these conditions possibly negatively influencing paper web quality.

5.6 Even if the technical field of hydrodynamic bearings were considered by the person skilled in the art, he would not get any hint to modify the known hydrodynamic press nip device according to Claim 1. No inclined outrunning ramp area, no inclined side edges and no provisions for channeling away the lubricant from the nip area as prescribed in Claim 1 are disclosed in documents D3 to D6 as can be seen from the following:

5.7 From D3 it is clear that a configuration as shown in its Figures 5a or 5b , that is inclination of the pad in opposite directions has to be chosen if reversibility is desired, see page "5-9", lines 7 to 10. Reversibility is, however, not envisaged in paper making devices so that D3 clearly leads away from what is claimed.

The relevance of D4 and D6 is doubtful as from these documents only can be seen that end portions of a bearing can be rounded in combination with circular bearing constructions not existing in the subject-matter of Claim 1.

From D5, see Figure 6/3, bearing pads can be seen with oppositely inclined surfaces. Again the question arises why a person skilled in the art should choose a pad construction which ensures a smooth pressure decrease on its continuing side as D1 and D2 teach that this has to be avoided in any case for reasons of possible rewetting of the paper web.

Hence, the Appellant's arguments based on D3 to D6 are not convincing.

5.8 Summarizing the Board comes to the conclusion that the subject-matter of Claim 1 is based on an inventive step, Article 56 EPC, so that Claim 1 is valid.

6. The Appellant's argument that the feature of Claim 1 according to which the side edge portions "58" are inclined away is notorious to a person skilled in the art (household iron!), cannot be accepted by the Board either. This approach appears to extract a feature, which per se can be found everywhere in the art, from its context and to deny its specific purpose, namely to avoid any damage of the running paper web, and to channel away excessive lubricant which is a precondition to avoid paper web contamination and to maintain paper web quality.

The Appellant has not shown any evidence that this feature in the claimed context is "notoriously known" in nip press devices. In the Board's view this feature (inclined side edge portions) as intrepreted under point 2.3 above and its contribution the solution of the object of the invention are not disclosed or suggested in the available prior art. The Appellant's argument is therefore not supported by the facts and is therefore rejected.

As a result of the foregoing Claim 1 as granted is maintained.

7. The dependent Claims 2 to 6 are likewise valid in combination with valid Claim 1 so that D7 to D11, which were exlusively cited in respect of the dependent claims, need not be discussed in detail.

Order

For these reasons, it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

S. Fabiani F. Gumbel

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