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D E C I S I O N
of 20 June 2006

Case Number: T 0132/04 - 3.2.03

Application Number: 95942985.3

Publication Number: 0796415

IPC: F26B 13/20

Language of the proceedings: EN

Title of invention:

Combination air bar and hole bar flotation dryer

Patentee:

MEGTEC SYSTEMS, INC.

Opponent:

Langbein & Engelbracht GmbH

Headword:

-

Relevant legal provisions:

EPC Art. 56

Keyword:

"Admission of late filed document (denied)"

"Inventive step (yes)"

Decisions cited:

-

Catchword:

-



Case Number: T 0132/04 - 3.2.03

D E C I S I O N
of the Technical Board of Appeal 3.2.03
of 20 June 2006

Appellant:
(Opponent)

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Representative:

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Respondent:
(Patent Proprietor)

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Representative:

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Decision under appeal:

Decision of the Opposition Division of the
European Patent Office posted 18 November 2003
rejecting the opposition filed against European
patent No. 0796415 pursuant to Article 102(2)
EPC.

Composition of the Board:

Chairman: U. Krause
Members: C. Donnelly
K. Garnett

Summary of Facts and Submissions

I. European Patent No. 0796415 was granted on 19 September 2001 on the basis of European Patent application No. 95 942 985.3 filed on 5 December 1995 as international application No. PCT/US95/15742. The patent was opposed by the appellant (opponent) under Article 100(a) EPC on the ground that its subject-matter did not involve an inventive step in the light of documents US-A-3982328 (D1) and US-A-3979038 (D2) as well as an alleged prior use supported by documents D3-D12, the apparatus of which being depicted in the engineering drawings:

D8: Drawing No. 22.2104.0092.1.10 from Langbein & Engelbracht GmbH dated 27/03/1993, entitled "Düse (Schwebetrockner)";

D10: Drawing No. 22.2104.0093.1.10 from Langbein & Engelbracht GmbH dated 27/03/1993, entitled "Düse (Schwebetrockner)";

D12: Drawing No. 03.4800.0011.1.10 from Langbein & Engelbracht GmbH dated 29/03/1993, entitled "Düsenanordnung mit Blasrichtung".

The opposition was rejected by the opposition division with a decision dispatched by post on 18 November 2003. In its decision the opposition division concluded that the skilled person would not have turned to the alleged prior use when faced with the problem of optimising the apparatus according to D1. In view of these circumstances the division decided it did not need to investigate whether the alleged prior use actually took place and was made available to the public.

II. The contested patent comprises independent claims 1 and 7, reading as follows:

Claim 1:

"Apparatus for floatingly drying a running web, said apparatus comprising an array of nozzles comprising, in combination, a plurality of flotation nozzles (AB) for floatingly supporting said web, and a plurality of direct impingement nozzles (HB;10) for drying said web, said direct impingement nozzles comprising a top surface (14) having a plurality of apertures (18), at least one of said direct impingement nozzles (HB) being opposed by a flotation nozzle (AB); characterised in that said plurality of apertures represents a total open area of from 1.8 to about 7.5% of the total area of said top surface, and in that said at least one of the direct impingement nozzles (HB) is from 3 to 10 equivalent diameters away from the web."

Claim 7:

"A method of floatingly drying a running web comprising providing a web dryer enclosure, said enclosure having a web inlet slot and a web outlet slot; floatingly guiding said running web through said dryer with a plurality of flotation nozzles (AB) in said dryer enclosure, said flotation nozzles (AB) discharging gas on to said web to float said web; and providing enhanced drying of said web by impinging air on to said web from at least one direct impingement nozzle (HB) in said dryer enclosure, said at least one direct impingement nozzle having a plurality of apertures (18) through which gas is emitted and

directed on to said web, said apertures representing a total open area of from 1.8 to 7.5% of the total area of said top surface, wherein at least one of said direct impingement nozzles (HB) is opposed by a flotation nozzle (AB) and is from 3 to 10 equivalent diameters away from the web."

- III. The appellant filed a notice of appeal against this decision on 14 January 2004 and paid the appeal fee on the same day. The statement of grounds of appeal was filed on 19 March 2004.
- IV. To support comments made concerning the interpretation of the terms "flotation nozzle" and "direct impingement nozzle" used in the claims, the respondent filed documents D13-D21 with letter of 25 August 2005 as follows:
- D13: US-A-2574083;
D14: US-A-3549070;
D15: US-A-3837551;
D16: US-A-3982327;
D17: US-A-4326342;
D18: Obrzut, J. J., 1976, "Coil Coaters Float Strip Through Ovens", Iron Age, November 29, pp. 31-33;
D19: Proctor, R. T., 1992 "Air-Flotation Drying and Non-Contact Web Handling" Thin Film Coating, Edited by H Benkreira, Royal Society of Chemistry, pp. 154-177;
D20: Valmet Air Dryers Catalogue;
D21: Declaration by Professor Young Bae Chang dated 28 July 2005.
- V. The summons to oral proceedings was accompanied by a communication pursuant to Article 11(1) RPBA. In

particular, the board drew the attention of the parties to a further document US-A-2678237 (D1A), which is cited in D1 in connection with the design of the direct impingement nozzle. This document was considered to be of possible relevance as it explicitly mentions a range for the total open area of the apertures which falls within that claimed.

With letter of 12 May 2006 the respondent filed a further document US-A-3231165 (D22), also cited in D1, as well as three auxiliary requests.

Oral proceedings were held on 20 June 2006 and attended by both parties. During the oral proceedings the appellant requested that a further document "D. G. Arganbright and H. Resch, 'A Review of Basic Aspects of Heat Transfer under Impinging Air Jets', Wood Science and Technology, Vol. 5 (1971), p. 73-94", (D23) be taken into consideration. The appellant also handed over annotated copies of enlargements made of part of figure 1 and of figure 1B of D1.

VI. During the oral proceedings the parties made the following requests:

Appellant (opponent)

- that document D23 be admitted into the proceedings, the impugned decision be set aside and the patent revoked.

Respondent (patentee)

-that document D23 be not admitted into the proceedings, the appeal be dismissed and the patent maintained as granted, or on the basis of the amended claims filed as auxiliary requests with letter of 12 May 2006.

VII. The arguments of the parties are summarised below.

(a) *Late filed documents*

Both parties agreed that documents D13 to D22 could be admitted into the proceedings.

The appellant argued that D23 should be taken into consideration as it is prima facie extremely relevant since it explicitly mentions the claimed ranges for the total aperture open area percentage (c.f. page 76, lines 17-18) and the nozzle to web distance (c.f. page 92, lines 8-10). The document had been found when carrying out a search in response to the latest auxiliary requests filed by the respondent with letter of 12 May 2006 and which introduced parameters from the description.

The respondent argued that D23 should not be admitted as it had been filed at an extremely late stage of the proceedings, had come as a complete surprise and thus, if admitted, would create an impossible task of trying to appreciate the full scope of the document during the oral proceedings. Furthermore, the document consisted of over twenty pages and appeared to relate only to theoretical considerations of air-jets leaving a direct impingement nozzle and striking a solid surface. Hence,

the document did not deal with a floating web arrangement as claimed and could not therefore be considered as prima facie very relevant.

(b) *Technical significance of terms in the claims*

The opponent argued that the terms "flotation nozzle" and "direct impingement nozzle" do not have any technical meaning other than "nozzle", i.e. claim 1 does not necessarily mean that the device comprises two different types of nozzle. The documents D13-D22 cited by the respondent support this interpretation. D22 shows that the nozzles 2a-e as well as fulfilling a floatation function, by virtue of air 4,5 flowing out of the openings 3a,3b, also provide direct impingement by way of the air-jets coming out of apertures 8',8'',8''' provided in a central plate and which strike the web perpendicularly. D14 also shows such hybrid nozzles in figures 8-14 which it would be impossible to designate as being either of the floatation or direct impingement types.

The opponent also considered that the term "opposed" as used in claims 1 and 7 just means "on the other side of the web from". In particular, figure 2 of the contested patent shows a situation where one of the direct impingement nozzles is in an overlapping opposed arrangement with a floatation nozzle. Hence it can only be assumed that the term "opposed" does not mean "directly opposed".

The respondent argued that the use of two distinct terms to designate the nozzles in claims 1 and 7 is in itself a clear indication that there are two different

types present, whose designs either enhance their flotation properties or their heat transfer characteristics. This contention is supported at lines 38-40 of page 3 of the patent in suit and by D13 to D22. These documents, in particular the declaration by Professor Chang (D21), show that it is accepted in the art that a direct impingement nozzle is designed uniquely to provide heat transfer by shedding pressure and is thus incapable of providing stable floatation. On the other hand floatation nozzles are optimised to provide the necessary stability by forming a pressure-pad, whilst at the same time affording some heat transfer. Thus, the nozzles referred to by the appellant in D14 and D22 must be floatation nozzles as they are capable of providing some element of stable floatation.

The respondent pointed out that claims 1 and 7 only call for at least one of the direct impingement nozzles to be opposed by a flotation nozzle - not all of them, hence the appellant's argument with respect to figure 2 of the contested patent is not relevant.

(c) *Inventive step (Article 56 EPC)*

Appellant's position

The appellant argued that the subject-matter of claims 1 and 7 does not meet the requirements of Article 56 EPC in view of either (i) a combination of the teachings of (i) D1 and D1A; or (ii) D1 or D2 in combination with the device of alleged prior use as depicted in drawings D8, D10 and D12 of the supporting documentation or (iii) D1 and standard routine testing.

(i) D1 in combination with D1A

Document D1 describes an apparatus as defined in the preamble of claim 1.

The device according to claim 1 differs therefrom in that

(a) said plurality of apertures represents a total open area of from 1.8 to about 7.5% of the total area of said top surface

(b) said at least one of the direct impingement nozzles (2a,2b) is from 3 to 10 equivalent diameters away from the web.

D1 also states at col. 2, lines 1-4, that the blow box shown in Fig 1b, corresponding to the impingement nozzle, is designed according to US-A-2678237 (D1A). At col. 3, lines 58-68, of D1A the skilled person is given a direct indication as to how to select the total open area of the apertures as this passage sets an upper limit of 50% and suggests a preferred range of 2-4%. Claim 7 of D1A essentially repeats this preferred range and leaves no doubt that the surface in question is that of the nozzles and not the whole area of the conveyor including the passages.

Accordingly, the only distinguishing feature remaining is that of the range given for the distance between the impingement nozzle and the web. However, direct measurements on enlargements of figures 1 and 1B of D1 reveal aperture to web/nozzle distance ratios of 3.2 and 6.6 (see enlarged copies handed over during oral proceedings). Although it is accepted that exact

measurements cannot be taken off drawings in a patent document, it is considered that the range claimed is so wide that these figures are a sufficient indication to the skilled man that a value within the range should be chosen.

(ii) D1 or D2 in combination with the alleged prior use

The engineering drawings D8 and D10 show two types of nozzle, which essentially differ only in the arrangement of their apertures. The aperture pattern of the nozzle according to D8 can be shown by calculation to fall within the area range of feature (a) above. Drawing D12 shows the arrangement of the nozzles in the dryer housing, the nozzles according to D10 being placed at the entry and exit of the chamber and the nozzles according to D8 being placed alternately on either side of the web. D12 further discloses a nozzle-to-web distance which can be shown to fall within the claimed range of the contested patent.

Hence, the device of the alleged prior use gives the skilled person, faced with the problem of selecting the open area ratio and the nozzle-to-web distance in D1, a direct indication as to the values to be chosen.

Alternatively, the alleged prior use may be taken as the nearest prior art. In this case the nozzles according to D10 are the flotation nozzles since they only have apertures placed on one side, these promoting the flow of air in one direction along the web. The nozzles according to D8 can be classed as direct impingement nozzles as the air leaving the apertures impinges directly on the web for drying purposes as

well as producing a pressure pad. Hence, the only difference with respect to claim 1 as granted would be the arrangement of at least one flotation nozzle opposite a direct impingement nozzle. However, this arrangement is well known in the art and is shown in D1 and D2 for example, and thus cannot be the basis for an inventive step.

(iii) D1 in combination with routine testing

The skilled person would inevitably end up using values with the ranges of features (a) and (b) as they are so large that there is no other reasonable choice. Alternatively, simply by virtue of carrying out standard routine testing when faced with the problem of setting up the apparatus according to D1, the skilled person would arrive at values within the claimed ranges.

Respondent's position

(i) D1 in combination with D1A

It was accepted that D1 represents the most relevant prior art and that the subject-matter of claim 1 differs from the device disclosed therein by the features (a) and (b) identified by the appellant.

However, the reference in D1 to the specification of a blow-box used in a conveying path of D1A wherein the sum of the hole area amounts to 2-4% of the surface, is not a clear and unambiguous instruction to the skilled person to apply this teaching to the blow-boxes in the device of D1. The reference at column 2, lines 1-4, merely indicates that the blow-box should be designed

according to D1A only in as far as it should be of a type with apertures promoting airflow substantially perpendicularly to the material web.

The two documents refer to completely different devices. D1A is concerned with "air hockey table" type conveying devices which rely on the provision of a thin film of air to reduce friction such that objects may easily slide along the conveying path. As the air-film is only required on the underside of the objects to be conveyed there is no requirement for any nozzles to be placed above the conveying path. The device of D1A is purely concerned with the conveyance of objects and drying is not mentioned at all. As against this, D1 is primarily concerned with drying the sheet material conveyed through it and is provided with blow-boxes for heat-transfer on both sides of the sheet.

In D1A the 2-4% open area specification is associated with a certain floating height and reduced air consumption. This teaching cannot be simply be transferred to D1 because of the completely different purposes and nozzle arrangements of the two devices.

The appellant's attempt to take direct measurements from enlargements of figures 1 and 1B of D1 in order to show that the nozzle-to-web distance falls approximately within the claimed ranges is meaningless, not only because drawings in patent documents are generally not to scale, but also on account of the fact that the aperture shape is unclear and cannot simply be assumed to be circular.

(ii) D1 or D2 in combination with the alleged prior use

The skilled person would not apply the teachings of D1 and D2 to the apparatus of the alleged prior use as the devices function in entirely different manners. In particular, neither of the nozzles according to D8 and D10 are direct impingement nozzles as they are both incapable of producing pressure spikes. The nozzles according to D8 must be flotation nozzles as these are the only type of nozzles present over almost the entire length of the drying chamber. The nozzles according to D10 are merely intended to minimise air leakage from the chamber in the standard manner. Hence, the apparatus of the alleged prior use does not possess any direct impingement nozzles and none of the nozzles are positioned such that they are opposite each other. As indicated in the contested patent at page 5, lines 18 to 19, different conditions apply when a direct impingement nozzle is not directly opposed.

(iii) D1 in combination with routine testing

The claimed ranges are not so large that the skilled person faced with the problem of setting up D1 must inevitably end up applying parameters which fall within the claimed ranges. If this were the case then surely evidence would have been brought to substantiate it. Nor would the skilled person obtain these ranges by standard routine testing as there are two sets of parameters which would require testing far beyond what could be considered as routine.

Reasons for the Decision

1. *Late filed documents*

Only the admittance of document D23 is the subject of dispute between the parties. This document was presented to the board and respondent for the first time at the beginning of the oral proceedings. The appellant's reasons for such a late filing are flimsy. The auxiliary requests which the appellant contends prompted the additional search leading to the retrieval of D23 were filed by the respondent over a month before the oral proceedings. No explanation has been given as to why in these circumstances D23 could not have been found and communicated to the respondent and the board much sooner. As it was, this happened far too late for it to have been fair to admit it into the proceedings.

Further, although the appellant only refers to two short passages, the complete document is over twenty pages long. It would be unreasonable to expect the respondent to digest fully the whole content of the document in order to put these passages in context and prepare appropriate counter-arguments within the time-scale imposed by oral proceedings without being put at a severe disadvantage.

These reasons alone are sufficient to persuade the board that D23 should not be allowed into the proceedings.

However, the board would add that upon a preliminary appraisal D23 appears to relate only to theoretical considerations of the air-jets leaving a direct

impingement nozzle and striking a solid surface; it does not deal with a floating web arrangement as claimed. Therefore, it does not seem to be prima facie very relevant.

2. *Technical significance of terms in the claims.*

The board is of the view that the use of the two distinct terms in claim 1 clearly indicates there are two different types of nozzle present, whose designs either enhance their flotation properties or their heat transfer characteristics, as supported at paragraphs (0014) and (0015) of the patent in suit.

The board also believes that the terms "flotation nozzle" and "direct impingement nozzle" have clear technical meanings in the art. The declaration given in D21 is particularly pertinent in this respect and provides a cogent explanation as to why it is recognised in the art that a direct impingement nozzle is designed uniquely to provide heat transfer by shedding pressure and is thus incapable of providing stable floatation. On the other hand, floatation nozzles are optimised to provide the necessary stability by forming a pressure-pad, albeit at the same time affording some heat transfer. Thus, the nozzles in D14 and D22, referred to by the appellant as being of hybrid nature and thus impossible to designate as being of either direct impingement or floatation type, are floatation nozzles since they are capable of providing some element of stable floatation.

The board also considers that the description of the contested patent at page 3, lines 45- 54, and page 5,

lines 18-19, in combination with figures 1 and 2 makes it clear that "opposed" in the context of the patent means "directly opposed". Claims 1 and 7 only call for at least one of the direct impingement nozzles to be opposed by a flotation nozzle - not all of them - hence the appellant's argument with respect to figure 2 of the contested patent is not convincing.

3. *Inventive step (Article 56 EPC)*

D1 in combination with D1A

The board concurs with the parties that D1 represents the most relevant prior art and that the subject-matter of claim 1 differs from the device disclosed therein by the features (a) and (b) identified above.

These two distinguishing features solve the objective technical problem of optimising heat transfer in a device with nozzles arranged in opposed configuration.

The board is of the view that since documents D1 and D1A refer to completely different devices, the reference at column 2, lines 1-4, of D1 only indicates that the blow-box should be designed according to D1A in as far as the apertures should promote airflow substantially perpendicularly to the material web.

D1A is concerned with conveying devices which function by providing a thin film of air to reduce friction so that objects can be easily slid along the conveying path. Since there is no mention of any requirement for drying in D1A, it is evident that the air-film is only required on the underside of the objects to be conveyed;

hence there is no necessity to place nozzles above the conveying path.

As against this, D1 is primarily concerned with drying the sheet material conveyed through it and is provided with blow-boxes on both sides of the sheet for maximising heat-transfer.

In D1A the 2-4% open area specification is associated with a certain floating height and reduced air consumption of the conveying path. This teaching cannot simply be transferred to D1 because of the completely different purposes and nozzle arrangements of the two devices.

The appellant's attempt to take direct measurements from enlargements of figures 1 and 1B of D1 in order to show that nozzle-to-web distance falls approximately within the claimed range is invalid, not only because the drawings in patent documents cannot be assumed to be to scale, but also on account of the fact that the aperture shape is unclear and cannot be assumed to be circular.

(ii) D1 or D2 in combination with the alleged prior use

The device of the alleged prior use as depicted in the engineering drawing D12 shows that two types of nozzles, as detailed in drawings D8 and D10, are employed. The nozzles (1) according to D8 are placed on alternate sides of the web in an offset configuration over the major part of the length of the drying chamber and are not placed directly opposite one another. A corollary of accepting that direct impingement nozzles are

incapable of providing a stable support to the web is that they must be used in combination with floatation nozzles -otherwise unacceptable instabilities would disturb the passage of the web through the device. Consequently, as only one design of nozzle is present over essentially the whole length of the web in the drying chamber of the alleged prior use it must be of the floatation type. The nozzles (2) according to D10 are only used at the entry and exit to the drying chamber and in both cases are positioned such that the air-jets are directed towards the chamber interior. Such an arrangement of nozzles would help prevent the leakage of drying air from the chamber and it is considered that their function is no more than this, otherwise it would be expected that they would also have been applied at intermediate locations along the drying chamber.

In conclusion, the device of the alleged prior use does not employ direct impingement nozzles and the nozzles it is provided with are not arranged in a directly opposing relationship.

Hence, the board can see no reason for the skilled person, when starting from D1 or D2, to incorporate characteristics of the nozzles according to the alleged prior use when these nozzles are neither of the same type nor disposed in the same configuration. Similarly, when starting from the alleged prior use there is no reason for the skilled person to apply characteristics from D1 or D2.

Given these circumstances there is no need to investigate the validity of the alleged prior use.

(iii) D1 in combination with routine testing

The board is also of the opinion that the skilled person would not inevitably end up using values within those claimed nor obtain them by standard routine testing when faced with the problem of setting up the apparatus according to D1. It is accepted that as D1 is silent both as to the nozzle-to-web distance and as to the open hole area percentage ratio, the skilled person must select these parameters. However, the possibilities are vast and the prior art lacks anything which would lead to selection of the claimed ranges. This suggests the claimed ranges are not so broad that the skilled person must inevitably select values falling within them, otherwise they would have been found in the literature. Also, carrying out testing for optimising two sets of parameter ranges with some indeterminate degree of interaction cannot be described as routine.

In conclusion the board is of the opinion that the subject-matter of claim 1 meets the requirements of Article 56 EPC. Similar considerations apply to claim 7.

4. Since the claims as granted are patentable, there is no need to consider the auxiliary requests.

Order

For these reasons it is decided that:

The appeal is dismissed.

Registrar

Chairman

A. Counillon

U. Krause