BESCHWERDEKAMMERN DES EUROPÄISCHEN PATENTAMTS

BOARDS OF APPEAL OF THE EUROPEAN PATENT OFFICE

CHAMBRES DE RECOURS DE L'OFFICE EUROPEEN DES BREVETS

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File Number: T 835/91 - 342

Application No.: 84 307 512.8

Publication No.: 0 149 307

Title of invention: Fluid treating

Classification: B01D 45/06, B01D 46/24, F28D 1/053

D E C I S I O N
of 7 October 1992

Applicant: Lerner, Bernard J.

Headword:

EPC Article 56, 123(2)

Keyword: "Inventive step - yes" "Added subject - no, after amendment"

Europäisches Patentamt | European Patent Office | Office européen des brevets

Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number : T 835/91

D E C I S I O N
of the Technical Board of Appeal 3.4.2
of 7 October 1992

Appellant : Lerner, Bernard J.
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Decision under appeal : **Decision of Examining Division 031 of the European Patent Office dated 18 June 1991 refusing European patent application No. 84 307 512.8 pursuant to Article 97(1) EPC.**

Composition of the Board :

Chairman : E. Turrini
Members : C. Black
L.C. Mancini

Summary of Facts and Submissions

I. The present appeal lies from the decision of the Examining Division to refuse European application No. 84 307 512.8 (publication No. 0 149 307) on the grounds that the requirements of Articles 56 and 123(2) EPC were not met.

II. The reasons for the decision were that the features represented on a new figure 7 introduced by the applicant were not unambiguously derivable from the application as originally filed, and that the subject-matter of Claim 1 then under consideration differed from the disclosure in JP-A-5 296 973 (hereinafter Fujine) in features which were obvious for the average skilled person.

The Examining Division also drew attention to other defects in the application, but indicated that these were not "subject of this decision".

III. With the grounds for the appeal, the Appellant (applicant) submitted amended pages of the description and an amended Claim 1, and deleted Figure 7 which had given rise to the objection under Article 123(2). The appeal is accordingly based on the following:

Claims 1 and 2 received 19 October 1991 with the grounds for the appeal,
Claims 3 to 14 received 16 March 1991;

Description pages 1, 15 as originally filed,
6, 13 received 28 November 1988,
4, 5, 7, 10, 21, 30 received 5 March 1990,
2, 3, 3a, 4b, 11, 12, 17, 27-29 received 16 March 1991,

4a, 8, 9, 14, 16, 18, 19, 20, 22-26
received 19 October 1991;

Drawings sheets 1/6, 2/6 received 16 March 1991,
Drawings sheets 4/6-6/6 received 19 October 1991.

It should be noted that on page 9 of the description, line 3 the reference "6" should read "5" and in the claims the reference "164" should read "163".

IV. Claim 1 reads as follows:

"Apparatus for treating fluids for liquid-gas contacting, for removing particulate, mist or fumes from fluids, or for transferring heat or mass between fluids, the said fluids flowing predominantly in a predetermined direction (179), the apparatus including separate cylindrical elements (171, 173) arrayed in a plurality of rows (164 (read "163"), 165, 167, 169) the elements (171, 173) in said rows (164 (read "163"), 165, 167, 169) being substantially perpendicular to said predetermined direction, and the respective elements (171, 173) of adjacent rows (164 (read "163"), 165-165, 167-167, 169) being staggered with respect to one another, the elements (171, 173) of each row (164 (read "163"), 165, 167, 169) being spatially separated from each other and from the elements (171, 173) of adjacent rows, the elements having non-reentrant surfaces on their upstream side with respect to the fluid flow (179); the said apparatus being characterized by that diagonal bypass flow of said fluid is prevented by partitions (189) bridging between at least a plurality of pairs (171, 173) of certain of said elements and extending generally parallel to said predetermined direction, the bridging of each pair by a partition being between a pair of elements in alternate rows (164 (read "163"), 167-165, 169), each said partition

(189) being substantially in contact with the outer surfaces of the element (171, 173) of each said pair which it bridges along the lengths of said bridged elements to interpose substantially complete obstruction to said diagonal bypass flow, there being no row from the surfaces of whose said elements (171, 173) more than one said partition (189) extends."

Claims 2 to 12 are appendant to Claim 1. Claim 13 is an independent method claim and Claim 14, though formally also independent, is a method claim which refers to Claim 1 and is therefore restricted by the features of Claim 1. However since Claims 13 and 14 will not be dealt with in this decision, their wording need not be reproduced here.

V. The gist of the Appellant's argument concerning inventive step is that, contrary to the view of the Examining Division, there is a fundamental difference between the subject-matter of Claim 1 and the disclosure in Fujine. Since the Appellant's submissions in this respect correspond in substance to the Board's reasoning in this decision, it is superfluous to summarise them at this point. The Appellant also took account of the further defects referred to in the decision refusing the application.

Reasons for the Decision

1. The appeal is admissible.

2. Since Figure 7 which gave rise to the objection under Article 123(2) has now been deleted, this ground for the refusal of the application has now been removed. It remains therefore for the Board to examine the second

ground for the refusal, that is, that the subject-matter of Claim 1 lacks inventive step having regard to the disclosure in Fujine.

3. Claim 1 now under consideration differs from that on which the decision under appeal was based on that there is inserted after the word "elements" on the nineteenth line the phrase "and extending generally parallel to said predetermined direction". This amendment takes account of one of the additional defects mentioned in the decision, and finds a basis on page 11, lines 2 and 3. It has no bearing on the question of inventive step.

The wording of the claim moreover corresponds closely to what is described with reference to figures 1 and 5. The Board therefore will not go into formal aspects except to express a reservation concerning the phrase "the elements having non-reentrant surfaces on their upstream side with respect to the fluid flow", which was introduced as an amendment during the examination proceedings. It seems doubtful whether what is in effect a negative feature can be said to be derivable from the drawings simply because these do not show the corresponding positive feature. Since, in the Board's opinion, this feature also has no bearing on the question of inventive step, and does not even seem to be necessary, it will not be considered further at this point.

4. The apparatus to which the application relates is for treating a flowing fluid stream and covers a variety of types of treatment. Basically the fluid to be treated passes through a region containing cylindrical elements arranged perpendicular to the direction of fluid flow. The said elements are arranged substantially uniformly and not in contact with one another in rows such that the elements in adjacent rows are staggered in relation to one another.

Those in alternate rows are accordingly in registry with one another. As is apparent from the introductory part of the description, this kind of apparatus has been known for a long time.

Fujine concerns a problem with such apparatus which in the English translation is called blow-through. While this is not defined, it clearly results in the fluid being incompletely treated before it leaves the treatment zone. Fujine mentions a number of unsatisfactory remedies, such as changing the radius or pitch of the cylinders, and increasing the number of rows of elements. Blow-through is ascribed to the absence of lateral obstacles (page 4, lines 6, 7 of the translation) and a solution proposed is a construction wherein flat plates and cylinders alternate in the direction of flow (figure 2). The result is that the fluid stream is divided into a plurality of separate streams, each of which flows in a zig-zag manner past the cylinders and plates. Increased efficiency (in this case of mist capture) is stated to result from the vortex flow caused by the alternating narrow and wide portions of the flow path. The elements in Fujine are slightly inclined to the horizontal, but that is of no consequence for this decision.

The same problem is the basis of the application in suit. Here it is explained in that whereas the fluid approaching the array of elements "sees" nothing but element surface, that is, there is no unobstructed flow area on a projected view, once in the array diagonal paths permit the fluid to by-pass the elements, for which reason the problem is called by-pass flow. The claimed solution differs from that proposed in Fujine in that partitions (plates) bridge only some of the pairs of elements in alternate rows; the said bridging partitions being so located that by-pass flow is prevented. A further feature defining the location

of the partitions is that there is no row from the surfaces of whose elements more than one partition extends. In the arrangements disclosed in figures 1 and 5, only alternate pairs of elements in the flow direction are thus bridged.

5. The subject-matter of Claim 1 is therefore clearly novel over Fujine, which does not disclose any arrangement in which not all pairs of elements are bridged in the flow direction. The question remains whether the average skilled person, seeking to improve the arrangement disclosed with reference to figure 2 of Fujine (the search for improvement being his constant endeavour) would be led to modify it in the manner according to the application in suit.

6. In the Board's view he would not do so. As stated above, blow-through in Fujine arises from the absence of lateral obstructions and is prevented by an arrangement wherein plates are located between each pair of elements in the flow direction. Since the plates have been introduced to provide lateral obstructions, there is no reason for the average skilled person to think of removing some of them. Moreover the Fujine construction results in what is stated there to be the advantageous lateral back and forth (zig-zag) flow path. This advantage would be lost if some of the plates were removed and again the skilled person reading Fujine would receive no hint to do so.

Fujine does not mention diagonal by-pass flow, only that blow-through tends to occur because there are no lateral obstacles. It is true that with the Fujine construction diagonal by-pass flow will be prevented because all by-pass paths are blocked. The invention of the application in suit however is based on the finding that diagonal by-pass flow is responsible for reduced efficiency of the

apparatus and that only some of the pairs of elements need be bridged to prevent it. The claimed apparatus has the advantages that the fluid to be treated is not divided into separate paths as in Fujine and the fluid streams can mix within the array of elements, resulting in a more uniform flow across the cross-section of the apparatus. Moreover fewer plates are required.

The Board has also considered the disclosure in US-A-1 603 878. This discloses a construction wherein pocket forming members, which can be said to correspond to the cylindrical elements of Fujine and the application in suit, are supported on partitions to form an assembly which bears some resemblance to Fujine in that the portions of the partitions between the pocket forming members correspond to the plates disclosed in Fujine. The result is that all pocket forming members are bridged by partitions just as in Fujine, so that this disclosure comes no closer to the subject-matter of Claim 1 than Fujine.

7. The subject-matter of Claim 1 therefore involves an inventive step (Article 56 EPC) so that the second ground for refusal of the application does not apply.

8. The Board however is of the opinion that the examination of the application is not yet complete in certain respects. In particular it is not immediately apparent that the embodiment illustrated in Figure 2 (and therefore also Figures 7 and 8) can be said to fall within the scope of Claim 1 and this requires investigation as does the question of the allowability of the feature that the elements have no reentrant surfaces on their upstream side (see paragraph 3 above). It is also not apparent from the examination proceedings that method Claim 13 has been considered; the Board notes in this respect that the

Examining Division's communication of 8 November 1990 only mentions the claims dependent on Claim 1 in paragraph 3.

In accordance with Article 111(1) EPC the Board of Appeal may either exercise any power within the competence of the department which was responsible for the decision appealed or remit the case to that department for further prosecution.

In the present case the Board has foreseen the possibility that the necessary further examination could be quite extensive, and has concluded that the Appellant should not be denied the opportunity of having this carried out by two instances. The case is therefore to be remitted to the Examining Division for further examination.

9. While the Board does not wish to fetter the Examining Division in any way in carrying out this further examination, it is observed, with the aim of reducing the number of issues remaining to be considered, that the Appellant's response to paragraph II, 3.3 of the decision of the Examining Division seems to be acceptable. It is clear from the description that the partitions may be secured to the cylindrical members or be self-supporting. In the latter case because of engineering tolerances gaps may exist between the partition and the cylinder. However, the average skilled person reading the description will appreciate that all that is necessary is that the gaps are not such that an easy path for fluid flow is presented which would reintroduce the problem of diagonal by-pass flow.

Order

For these reasons, it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the Examining Division for further examination on the basis of the documents set out in paragraph III above.

The Registrar: The Chairman:

P. Martorana E. Turrini