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D E C I S I O N
of 10 December 2001

Case Number: T 0399/98 - 3.3.5

Application Number: 92300852.5

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IPC: B01D 3/00

Language of the proceedings: EN

Title of invention:
Liquid distributor assembly

Applicant:
KOCH (CYPRUS LIMITED)

Opponent:

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Headword:

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Relevant legal provisions:
EPC Art. 56

Keyword:
"Inventive step: yes - Non-obvious modification"

Decisions cited:

-

Catchword:

-



Case Number: T 0399/98 - 3.3.5

D E C I S I O N
of the Technical Board of Appeal 3.3.5
of 10 December 2001

Appellant: KOCH (CYPRUS LIMITED)
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Decision under appeal: Decision of the Examining Division of the
European Patent Office posted 28 November 1997
refusing European patent application
No. 92 300 858.5 pursuant to Article 97(1) EPC.

Composition of the Board:

Chairman: R. K. Spangenberg
Members: A. T. Liu
J. H. Van Moer

Summary of Facts and Submissions

- I. The appeal is from the decision of the examining division refusing the European patent application No. 92 300 858.5.
- II. The decision was based on the claims as filed with the letter of 19 November 1996. The set of claims in question consisted of an independent claim 1 for a liquid distributor assembly and claims 2 to 8 depending thereon. Claim 1 read as follows:

"A liquid distributor assembly for use over a packing section in a process column, which assembly comprises a plurality of troughs (49, 100) with ports (56, 112, 175) for discharge of liquid to be distributed; and distributor tube assemblies (62, 132, 152, 169) attached to the outer sides of the troughs (49, 100) and in registry with the discharge ports (56, 112, 175) to direct liquid downwardly from the troughs,

CHARACTERISED IN THAT

a separate distributor plate (63, 18, 139, 163) having side walls (146) is attached to each tube assembly (62, 132, 152, 169) to receive and accumulate liquid therefrom and distribute liquid laterally to a plurality of openings (124, 142, 180, 206, 216, 234, 246) in the plate for discharge onto a said packing section."

- III. The examining division held that the subject-matter of claim 1 did not involve an inventive step in view of the prior art documents:

D1: DE-C-3 415 203

D2: EP-A-0 367 525

Essentially, the examining division was of the view that the technical problem with respect to the closest prior art according to D2 was the inefficient repartition of the liquid issued from the tube assemblies. The solution proposed in claim 1, namely the attachment of a separate distributor plate having side walls to each tube assembly, was held to be obvious in view of D1.

IV. With the statement of the grounds of appeal, the appellant submitted an additional independent claim 1.

V. The appellant's arguments may be summarised as follows:

- The claimed liquid distributor assembly was essentially a development of the assembly disclosed in D2.
- The problem with regard to D2 was the relatively high speed of descent of the liquid discharged from the ports of each trough.
- The solution proposed in claim 1 was the provision of an additional liquid distributor mechanism attached at the lower end of the tube assemblies depending from the outer sides of the troughs.
- The distributor plates according to claim 1 provided a valuable decelerating effect, not suggested in D2.

- D1, which did not concern redistribution of liquid, could not be used as a teaching for solving the present technical problem.

VI. The appellant's main request was that a patent be granted on the basis of claims 1 to 8 as filed by letter of 19 November 1996. Auxiliarily, he requested that a patent be granted on the basis of claim 1 filed with the statement of the grounds of appeal with dependent claims 2 to 8 in accordance with the 19 November 1996 submission.

Reasons for the Decision

Main request

1. *Amendments*

Claim 1 is essentially based on claim 1 as originally filed, with the following further restrictions:

- (a) the distributor tube assemblies are attached to the outer sides of the troughs,
- (b) a separate distributor plate is attached to each tube assembly,
- (c) the distributor plates have side walls.

The added features are originally disclosed in the original description: page 16, lines 3 to 6; the paragraph bridging pages 18 and 19 and the first full paragraph of page 15, respectively. Since these features are described in general terms and not

restricted to particular embodiments, the resulting combination of features in present claim 1 does not contravene Article 123(2) EPC.

2. *Novelty*

The novelty of the subject-matter of present claim 1 has not been questioned. Indeed, the claimed liquid distributor assembly is distinguished from that of D2 by the incorporation of distributor plates as stipulated in the characterising portion of the claim. It is distinguished from that of D1 by the stipulation that the distributor tube assemblies are attached to the outer sides of the troughs and that a separate distributor plate is attached to each tube assembly.

3. *Inventive step*

3.1 Claim 1

Claim 1 is directed to a liquid distributor assembly for use over a packing section in a process column. The assembly comprises a plurality of troughs with ports and distributor tube assemblies attached to the outer sides of the troughs and in registry with the ports for discharge of liquid to be distributed.

3.2 Closest prior art document

It is undisputed that the closest prior art document is D2 which discloses liquid distributor assemblies displaying the technical features stipulated in the preamble of claim 1.

3.3 Technical problem with regard to D2

With respect to D2, the problem to be solved can be seen in the provision of means for improved liquid and vapour distribution prior to entry of said liquid and vapour into the packing bed (see patent application, page 7, lines 2 to 7).

3.4 Solution proposed in claim 1.

In order to solve the above stated technical problem, claim 1 proposes that each tube assembly be provided with a separate distributor plate with side walls and a plurality of openings in the plate such that liquid can be received from the tube assembly and distributed laterally in the plate for discharge (see characterising part of claim 1).

3.5 The Board accepts the applicant's submissions that the use of a separate distributor plate in association with each tube assembly results in little disruption to the upward flow of the vapour but does serve to reduce the speed at which the liquid falls. It is thus plausible that the additional distributor plate as stipulated leads to an improvement in the distribution of liquid.

3.6 The only question that remains to be elucidated is whether the liquid distributor assembly as claimed is obvious in view of the available prior art.

3.6.1 It is undisputed that D2 does not address the problem as stated in point 3.3 above. Thus, it cannot have suggested reducing the relatively high speeds of descent of the liquid discharged from the tube assemblies by a redistribution of liquid as stipulated in claim 1.

3.6.2 D1 concerns a liquid distributor for use over a packing column consisting of a split-deck construction with a plurality of gas openings (5). Due to this open construction, the area underneath the gas openings run the risk of not receiving liquid from the distributor (column 1, line 51 to column 2, line 6). Thus, the technical problem faced by D1 is entirely different from that to be solved by the application.

Furthermore, the technical problem is solved in D1 by the provision of a trough (7) underlying each gas opening (claim 1 and column 2, lines 7 to 14). The troughs are suspended beneath the deck by narrow supports (9) and in registry of discharge holes (10) in the deck through tubes (11) (column 2, lines 46 to 65). The Board particularly notes that D1 neither discloses nor suggests attaching such tubes to the outer sides of the deck. Moreover, each additional trough (7) is attached to several tubes (11) and extends over the entire area of the gas opening. Thus, D1 neither discloses nor suggests that the trough (7) be in the form of a discrete reservoir receiving liquid from only one source, as is the case for the distributor plates of claim 1.

3.6.3 The provision of additional distributor plates as stipulated in claim 1 may appear simple for solving the technical problem as stated in point 3.3 above. Without the benefit of hindsight, the Board, however, cannot jump to the conclusion that such a solution is necessarily self-evident. In the absence of any pointer in that direction, the Board therefore finds that the claimed subject-matter is not rendered obvious by the available prior art.

4. As corollary of the above, the Board holds that the subject-matter of claim 1 of the main request involves an inventive step. The dependent claims 2 to 8 are accepted as relating to specific embodiments of that subject-matter. The Board has, however, some reservations as to their support in the original disclosure, this remark applying in particular to claims 5, 7 and 8 (Article 123(2) EPC). Furthermore, the description and the drawings have not been properly adapted to the present claims. Specifically, the Board observes that the embodiments represented in Figures 8A and 8B do not appear to be encompassed by the wording of present claim 1.

Order

For these reasons it is decided that:

- The decision under appeal is set aside.
- The case is remitted to the first instance for further examination on the basis of claims 1 to 8 of the main request.

The Registrar:

The Chairman:

U. Bultmann

R. Spangenberg