Internal distribution code:

(A) [-] Publication in OJ
(B) [-] To Chairmen and Members
(C) [-] To Chairmen
(D) [X] No distribution

Datasheet for the decision of 16 September 2014

Case Number: T 2050/11 - 3.3.05

Application Number: 01121391.5

Publication Number: 1186342

IPC: B01J19/32, F25J3/04

Language of the proceedings: EN

Title of invention:
Structured packing with asymmetric crimp pattern

Patent Proprietor:
PRAXAIR TECHNOLOGY, INC.

Opponents:
L'AIR LIQUIDE, SOCIETE ANONYME POUR L'ETUDE ET L'EXPLOITATION DES PROCEDES GEORGES CLAUDE
SULZER Chemtech AG

Headword:
Asymmetric crimp pattern/PRAXAIR

Relevant legal provisions:
EPC Art. 54(1), 54(2), 56, 83, 84, 123(2)

Keyword:

Main request : sufficiency of disclosure (no) - absence of a specific embodiment reflecting the invention - undue burden

First auxiliary request : amendments (allowable) - no inadmissible generalisation - inventive step (yes) - identification of the closest prior art - non-obvious improvement

Decisions cited:

Catchword:

Europäisches Patentamt
European Patent Office
Office européen des brevets

Beschwerdekammern
Boards of Appeal
Chambres de recours

European Patent Office
D-80298 MUNICH
GERMANY
Tel. +49 (0) 89 2399-0
Fax +49 (0) 89 2399-4465

Case Number: T 2050/11 - 3.3.05

D E C I S I O N
of Technical Board of Appeal 3.3.05
of 16 September 2014

Appellant: (Opponent 2)	SULZER Chemtech AG Sulzer Allee 48 Postfach 65 8404 Winterthur (CH)
Representative:	Manitz, Finsterwald & Partner GbR Postfach 31 02 20 80102 München (DE)
Respondent: (Patent Proprietor)	PRAXAIR TECHNOLOGY, INC. 39 Old Ridgebury Road Danbury, CT 06810-5113 (US)
Representative:	Schwan Schorer & Partner mbB Patentanwälte Bauerstrasse 22 80796 München (DE)
Party as of right: (Opponent 1)	L'AIR LIQUIDE, SOCIETE ANONYME POUR L'ETUDE ET L'EXPLOITATION DES PROCEDES GEORGES CLAUDE 75, Quai d'Orsay 75007 Paris (FR)
Representative:	Mercey, Fiona Susan L'Air Liquide SA Direction de la Propriété Intellectuelle 75, Quai d'Orsay 75321 Paris Cedex 07 (FR)
Decision under appeal:	**Interlocutory decision of the Opposition Division of the European Patent Office posted on 15 July 2011 concerning maintenance of the European Patent No. 1186342 in amended form.**

Composition of the Board:

Chairman	G. Raths
Members:	J.-M. Schwaller
	P. Guntz

Summary of Facts and Submissions

I. The present appeal lies from the decision of the opposition division maintaining European patent No. 1 186 342 on the basis of the first auxiliary request dated 20 May 2011, independent claims 1 and 3 of which read as follows:

"*1. A structured packing module comprising a plurality of vertically oriented, diagonally cross-corrugated packing sheets, said sheets being stacked side-by-side such that the direction of the corrugation is reversed in neighboring sheets, each corrugated structured packing sheet having a crimp pattern which is asymmetrical about a line drawn perpendicular to the centerline of the structured packing sheet and through the apex of either a corrugation peak or corrugation trough, and wherein the distance along the centerline from the apex of a corrugation trough to the apex of an adjacent corrugation peak is not evenly divided by the point where the crimp pattern crosses the centerline between said corrugation trough and said corrugation peak, wherein the packing sheet is symmetrical about the centerline of the packing sheet.*"

"*3. A method for carrying out rectification comprising:*

(A) passing a feed mixture comprising a more volatile component and a less volatile component into a column containing a plurality of modules, each module comprising a plurality of vertically oriented corrugated structured packing sheets, said sheets being stacked side-by-side such that the direction of the corrugation is reversed in neighboring sheets, each structured packing sheet having a crimp pattern which is asymmetrical about a line drawn perpendicular to the

centerline of the structured packing sheet and through the apex of either a corrugation peak or corrugation trough, and wherein the distance along the centerline from the apex of a corrugation trough to the apex of an adjacent corrugation peak is not evenly divided by the point where the crimp pattern crosses the centerline between said corrugation trough and said corrugation peak; wherein the said structured packing sheets are symmetrical about their respective centerlines.

(B) carrying out rectification within the column wherein vapor flows upward through the modules and liquid flows downward through the modules whereby the said more volatile component concentrates in the upflowing vapor and the said less volatile component concentrates in the downflowing liquid; and

(C) withdrawing first fluid from the upper portion of the column, said first fluid having a concentration of more volatile component which exceeds that of the feed mixture, and withdrawing second fluid from the lower portion of the column, said second fluid having a concentration of less volatile component which exceeds that of the feed mixture."

II. Among the documents cited during the opposition proceedings, the following are of importance for the present decision:

E1: US 4 455 339

E5: US 4 449 573

E8: US 3 466 019

E16: US 4 096 214

E17: US 5 921 109.

III. In its decision, the opposition division held the claimed subject-matter as defined above to fulfil the requirements of Articles 83, 54 and 56 EPC.

As regards in particular sufficiency of disclosure, the department of first instance held that the skilled person would derive from the patent specification that the meaning of "symmetrical" was not the usual one and that this term was to be interpreted as meaning that the peaks/troughs on one side of the centerline were shifted half a period and then were a mathematical mirror of the peaks/troughs on the other side of the centerline. This was derivable from the sentence "*although it is 180° out of phase*" in paragraph [0028] of the patent. Given this interpretation, the objection of insufficiency of disclosure failed since the skilled person was able to manufacture corrugated packing sheets as claimed, in particular those illustrated in drawings 4 and 5.

IV. With its grounds of appeal dated 15 November 2011, opponent II (hereinafter "the appellant") contested the decision of the opposition division under Articles 83, 54 and 56 EPC and submitted five new documents, among which

E29: CH 398 503

is of relevance for the present decision.

V. On 30 March 2012, the proprietor (hereinafter "the respondent") submitted four new sets of claims as auxiliary requests 1 to 4 and requested that document E29 not be admitted into the proceedings.

Independent claims 1 and 3 of the first auxiliary request reads as follows (differences to the main request emphasised by the board):

"*1. A structured packing module comprising a plurality of vertically oriented, diagonally cross-corrugated packing sheets, said sheets being stacked side-by-side such that the direction of the corrugation is reversed in neighboring sheets, each corrugated structured packing sheet having a crimp pattern which is asymmetrical about a line drawn perpendicular to the centerline of the structured packing sheet and through the apex of either a corrugation peak or corrugation trough, and wherein the distance along the centerline from the apex of a corrugation trough to the apex of an adjacent corrugation peak is not evenly divided by the point where the crimp pattern crosses the centerline between said corrugation trough and said corrugation peak, wherein the packing sheet is symmetrical about the centerline of the packing sheet,* ***although it is 180° out of phase***."

"*3. A method for carrying out rectification comprising: (A) passing a feed mixture comprising a more volatile component and a less volatile component into a column containing a plurality of modules, each module comprising a plurality of vertically oriented corrugated structured packing sheets, said sheets being stacked side-by-side such that the direction of the corrugation is reversed in neighboring sheets, each structured packing sheet having a crimp pattern which is asymmetrical about a line drawn perpendicular to the centerline of the structured packing sheet and through the apex of either a corrugation peak or corrugation trough, and wherein the distance along the centerline from the apex of a corrugation trough to the apex of an*

adjacent corrugation peak is not evenly divided by the point where the crimp pattern crosses the centerline between said corrugation trough and said corrugation peak; wherein the said structured packing sheets are symmetrical about their respective centerlines, ***although they are 180° out of phase.***
(B) carrying out rectification within the column wherein vapor flows upward through the modules and liquid flows downward through the modules whereby the said more volatile component concentrates in the upflowing vapor and the said less volatile component concentrates in the downflowing liquid; and
(C) withdrawing first fluid from the upper portion of the column, said first fluid having a concentration of more volatile component which exceeds that of the feed mixture, and withdrawing second fluid from the lower portion of the column, said second fluid having a concentration of less volatile component which exceeds that of the feed mixture."

Claim 2 represents a specific embodiment of the packing module according to claim 1 and claims 4, 5 and 6 represent specific embodiments of the method according to claims 3, 4 and 3 respectively.

VI. With letter dated 14 August 2014, the appellant *inter alia* contested the first auxiliary request under Articles 123(2), 54 and 56 EPC. In particular, it held that the invention defined in claims 1 and 3 was not novel over document E1, and lacked an inventive step over the combinations of documents E8 and E29; E29 with E16; or E17 with E16.

VII. At the oral proceedings, which took place on 16 September 2014, the discussion focused on Articles 83, 123(2), 54 and 56 EPC issues. The appellant further

objected to the amended claims of the auxiliary request under Article 84 and Rule 80 EPC. In response to the Rule 80 EPC objection, the respondent filed an amended first auxiliary request. The wording of claim 1 of the first auxiliary request filed before the board is identical to the one of claim 1 of 30 March 2012. Claims 4, 5 and 6 were made dependent on claims 3, 4 and 3, respectively. Regarding inventive step, the appellant modified its attacks to the following combinations of documents: E8 (in particular the packing sheet of Figure 6) with E29; E1 with E8; E29 with E8; or E17 with E16. The respondent requested that document E16 not be admitted into the proceedings; it however no longer contested the admissibility of document E29.

VIII. After closure of the debate, the chairman established the parties' requests as follows:

The appellant requested that the decision under appeal be set aside and that the patent be revoked.

The respondent requested that the appeal be dismissed or, alternatively, that the patent be maintained in amended form on the basis of the claims according to the first auxiliary request filed during the oral proceedings before the board, or alternatively, on the basis of one of the sets of claims according to the second to fourth auxiliary request filed with letter of 30 March 2012.

Reasons for the Decision

1. Main request - disclosure of the invention (Article 83 EPC)

1.1 The invention as defined in claim 1 of the main request requires in particular that the corrugated packing sheet be *"symmetrical about the centerline of the packing sheet"*.

The sole specific embodiment disclosed in the contested patent, namely the one illustrated in Figure 4

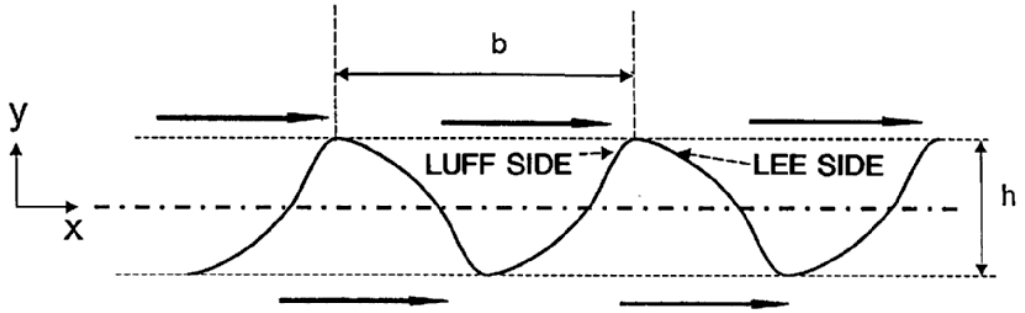


FIG. 4

however does not satisfy the particular requirement that the packing sheet has to be symmetrical about its centerline. This observation is confirmed by the description (patent, paragraph [0028]), which describes the above specific embodiment to be substantially symmetrical about the center line, but **180° out of phase.**

1.2 Hence, the patent does not disclose at least one single specific embodiment which reflects the invention as defined in claim 1, and so the question arises whether the invention could be performed at the filing date of the application by a person skilled in the art in the whole area claimed without undue burden, using common

general knowledge and having regard to further information given in the patent in suit.

1.3 For the respondent, according to the jurisprudence that the patent may be its own dictionary, the skilled person would understand from the reading of the specification and in particular from paragraph [0028] of the description (see point 1.1 above) that the word "symmetrical" was not to be understood in its usual way, but that it was to be interpreted in such a way that it had to denote "a symmetry which included a phase shift of 180°".

1.4 The board observes that the patent (paragraphs [0010] to [0016]) contains a glossary which explains the meaning of certain terms, however the terms "symmetry" or "symmetrical" do not appear therein. Moreover, paragraph [0028] of the patent merely describes the crimp pattern of the specific embodiment illustrated in Figure 4 as having a symmetry with a phase shift of 180°. It follows that the patent does not provide any definition for the above terms which would be different from the usual one. For the board, the word "symmetrical" is therefore to be construed according to its usual meaning.

1.5 Bearing in mind the above considerations, and the respondent having not been able to show that it was common general knowledge for a person skilled in the art to manufacture without undue burden a symmetrical crimp pattern with the usual meaning of the word "symmetrical", the board - which is also not aware of any possibility of manufacturing such a symmetrical crimp pattern - concludes that claim 1 of the main request does not meet the requirements of Article 83 EPC. The main request is therefore not allowable.

2. First auxiliary request - Admissibility of amendments under Article 123(2) and Rule 80 EPC

2.1 The wording of claim 1 of the first auxiliary request is the one of claim 1 of the first auxiliary request of 20 May 2011 to which the sentence "*although it is 180° out of phase*" has been added.

For the board, the above amendment has a basis in the following passage at page 10, lines 19 to 21 of the application as filed: "*Preferably, as shown in Figure 4, the packing sheet is substantially symmetrical about the packing centerline, although it is 180° out of phase*".

2.2 The appellant argued that said amendment consisted in an inadmissible intermediate generalisation because the feature "*although it is 180° out of phase*" had been extracted from the specific embodiment illustrated in Figure 4, in which the feature was inextricably linked to other features. In particular in said embodiment the peaks and troughs all had the same dimension. Said amendment further infringed Article 123(2) EPC, because the word "substantially" had been omitted from the claimed subject-matter.

2.3 The board observes that the deletion of the word "substantially" in claims is a usual amendment in the European patent system since its deletion generally increases the clarity of the claimed subject-matter. This criteria being also satisfied in the present case (see point 3. below), the board does not see any reason to depart from this practice.

2.4 Regarding the alleged intermediate generalisation, the board notes that if - as alleged by the appellant - the feature "*although it is 180° out of phase*" was inextricably linked to other features in Figure 4, this would mean that the effect underlying the invention at issue would only be achieved with the definite combination of features disclosed in Figure 4. This, however, is not the case for the following reasons.

The patent (page 4, lines 18 and 19) discloses that any deviation from uniform flow in heat and mass transfer equipment would be detrimental to the overall heat and mass transfer performance through the packing.

For the board, the skilled person understands from this disclosure that the aim of the invention is to provide a uniform flow in heat and mass transfer equipment; according to the passage at page 4, lines 34 to 38 of the patent, this effect is obtained with opposite faces of the packing sheet having the same shape so as to achieve the same pressure drop across both faces of the sheet illustrated in Figure 4. It follows that the key feature of the invention is not the dimension of the peaks/troughs, as alleged by the appellant, but rather the shape of the pattern which must be the same on both faces of the sheet.

From the above considerations, and in the absence of evidence to the contrary, it follows that the symmetry with a phase shift of 180° is the sole feature necessary for achieving the effect underlying the invention. The picking out of this particular feature from the specific embodiment illustrated in Figure 4 is therefore plainly acceptable in the case at issue, so that the subject-matter of claim 1 of this request does

not extend beyond the content of the application as filed.

2.5 The same arguments as above apply for the amendment "*although they are 180° out of phase*" in independent claim 3 at issue.

2.6 Dependent claims 2, 4, 5 and 6 have their basis in claims 2, 5, 6 and 7, respectively, of the application as filed.

2.7 The appellant's objection under Rule 80 EPC to dependent claims 4 to 6 has been overcome by amending the dependency of the above claims.

2.8 It follows that the claims of the request at issue meet the requirements of Article 123(2) and of Rule 80 EPC.

3. First auxiliary request - Clarity (Article 84 EPC)

For the board, the skilled reader of the patent specification understands the symmetry defined in claim 1 at issue to be a symmetry with a phase shift of 180°. It is referred in this respect to paragraph [0028] and Figure 4 which unambiguously illustrate this symmetry.

The board therefore cannot accept the appellant's argument that the subject-matter of claim 1 at issue lacked clarity because of an alleged contradiction between the term "*symmetry*" and the expression "*although it is 180° out of phase*".

It follows that the requirements of Article 84 EPC are met.

4. First auxiliary request - Novelty

4.1 Document E1, that the appellant held to be novelty-destroying, discloses (see Figure 1 reproduced below) a structured packing module comprising a plurality of vertically oriented, diagonally cross-corrugated packing sheets, said sheets being stacked side-by-side such that the direction of the corrugation is reversed in neighboring sheets.

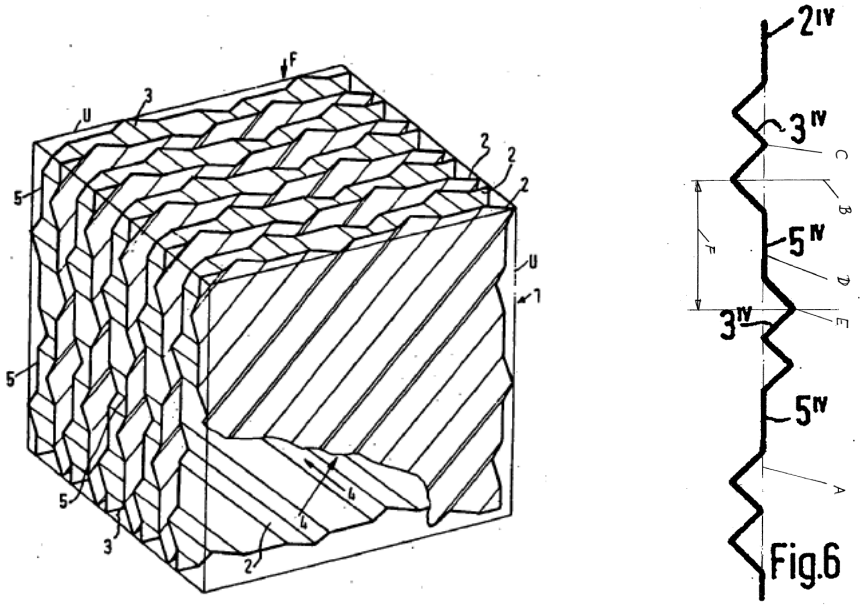


Figure 1

In the specific embodiment illustrated in Figure 6, the sheet is symmetrical about its centerline with a phase shift of 180° and the crimp pattern is asymmetrical about a line drawn perpendicular to the centerline of the sheet and through the apex of a corrugation peak (point E on Figure 6).

4.2 E1 however does not disclose the feature that *"the distance along the centerline from the apex of a corrugation trough to the apex of an adjacent corrugation peak is not evenly divided by the point where the crimp pattern crosses the centerline between*

said corrugation trough and said corrugation peak" (in the following this feature will be referred (i)).

It follows that the subject-matter of claim 1 at issue is novel over the disclosure of document E1.

4.3 The appellant argued that the packing sheet was a material feature and so it had a certain thickness. In contrast, the centerline of the packing sheet, which was a fictive line, had no measurable thickness. It followed therefrom that the point where the crimp pattern crossed the centerline between a corrugation trough (e.g. point B in Figure 6 above) and a corrugation peak (e.g. point E in Figure 6 above) was located at the upper extremity of the plateau D on Figure 6 above. So the requirements of feature (i) defined under point 4.2 above were fulfilled in the embodiment of Figure 6.

The board cannot accept this argument because feature (i) defines the crimp pattern - not the sheet - i.e. a shape with no measurable thickness, too. It follows that the point where said shape crosses the centerline between point B and point E in Figure 6 above is mathematically located in the middle of the plateau D, and, so, at equidistance between B and E.

4.4 It has not been contested that the other documents in the proceedings do not disclose the subject-matter of claim 1 at issue, and the board does not deviate from this conclusion.

4.5 It follows that claim 1 satisfies the requirements of Article 54(1) and (2) EPC.

The same arguments and conclusion apply to independent claim 3.

Claims 2, 4, 5 and 6, which are dependent on independent claims 1, 3, 4 and 3, respectively, thus also meet the requirements of Article 54(1) and (2) EPC.

5. First auxiliary request - Inventive step

5.1 The invention relates to a structured packing module useful for carrying out a rectification, especially a cryogenic rectification.

5.2 As regards the closest state of the art, the appellant brought up four different documents: E1, E8, E17, E29. The board thus has, in a first step, to identify which one is the most promising starting point for assessing the inventive step of the claimed subject-matter.

5.2.1 It is standard practice that the closest state of the art is normally a document disclosing subject-matter conceived for the same purpose or aiming at the same objective as the claimed invention and having the most relevant technical features in common, i.e. requiring the minimum of structural modifications.

5.2.2 Document E1 discloses a packing sheet which, as explained in points 4.1 and 4.2 above, is distinguished from the one according to claim 1 at issue in that the distance along the centerline from the apex of a corrugation trough to the apex of an adjacent corrugation peak is **evenly divided** by the point where the crimp pattern crosses the centerline between said corrugation trough and said corrugation peak. E1 also discloses that the above packing is suitable for being used in a rectifying column (E1: column 1, lines 18 and

19, but is **not concerned with the same objective** as the present invention, since it aims (see column 1, lines 28 to 32) at accelerating the mass transfer and reducing the pressure drop in the packing. In contrast, the contested patent (paragraph [0007]) aims at improving the structured packing in such a way that it enables separation to be carried out over a reduced column height.

5.2.3 Document E8 discloses a packing sheet, in particular the one illustrated in Figure 6 reproduced hereinafter,

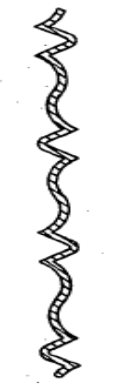


FIG.6

said packing sheet being used in an apparatus wherein a film of liquid is caused to flow in contact with a gas, with a pair of said sheets being spatially disposed with respect to each other to define a tortuous passage through which the gas can flow and down the surfaces of which the liquid can flow. In use, each sheet is substantially parallel to the next, the axes of curvature of the curved portions of the sheet are arranged to be substantially horizontal, and the plane of the sheet is either vertical or at a small angle to the vertical (column 1, lines 65 to 69). E8 further discloses that the above apparatus can, among others, be used for fractionation of two or more components by distillation (column 1, lines 25 to 37).

E8 **does not disclose** that the sheets are "*diagonally cross-corrugated packing sheets, such that the direction of the corrugation is reversed in neighboring sheets".* E8 (column 1, lines 37 to 43 and column 2, lines 46 to 65) furthermore aims at solving a **problem** different from the one of the contested patent, namely providing a packing for improved contact between gas and liquid and wherein the liquid is to be caused to flow down as a film. Said packing is further described as having an increase performance and efficiency, in the sense that it ensures an even distribution of the liquid film running down the packing and provides a smaller pressure drop in the gas as compared with that obtained using a sinusoidal packing, for a given rate of heat transfer.

5.2.4 Document E17 (claim 1) relates to a method for operating a cryogenic rectification column characterised in particular in that the packing comprises sheets having a lower portion which differs in structure from the upper portion. The packing sheets have a sinusoidal crimp pattern and are stacked side-by-side such that the direction of the corrugation is reversed in neighboring sheets.

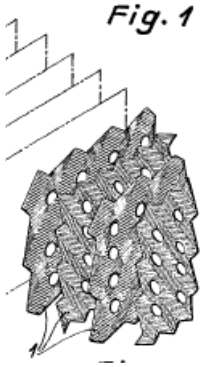
E17 is concerned with a **problem different** from the one underlying the contested patent, since it aims (column 1, line 66 to column 2, line 2) at providing a method for operating a cryogenic rectification column to carry out the separation of the components of air at increased capacity while avoiding flooding. E17 also **does not disclose** the specific asymmetric crimp pattern defined in claim 1 at issue.

5.2.5 Document E29 (claim 1) discloses a column suitable for distillation containing at least two packing elements

one above another, each element consisting of or including corrugated lamellae which are generally parallel with one another and generally parallel with the column axis, and the corrugations of adjacent lamellae extending in different directions and the corrugations of at least one of each adjacent pair of corrugated lamellae being diagonal to the column axis, the elements being so arranged that the planes in which the lamellae of adjacent elements lie are angularly displaced relatively to one another around the column axis.

The individual packing sheet according to E29 thus **differs** from the one in claim 1 at issue only by its sinusoidal crimp pattern (see Figure 1).

Fig. 1



5.2.6 For the board, it follows that E29 represents the closest state of the art because it discloses a packing sheet conceived for the same purpose, namely the distillation of liquids, and the same objective as the claimed invention, namely reducing the size of the distillation column (E29: page 1, right column 23 to 31), while the other documents are concerned with different technical problems.

5.3 As to the problem underlying the contested patent, this is described at paragraph [0007] as consisting in the provision of an improved packing which, in comparison

to conventional packings, enables separation such as cryogenic rectification to be carried out over a reduced column height.

5.4 As a solution to this problem, the contested patent proposes the structured packing according to claim 1 at issue, which is in particular characterised in that the crimp pattern of each packing sheet is asymmetrical about a line drawn perpendicular to the centerline of the structured packing sheet and through the apex of either a corrugation peak or corrugation trough, and the distance along the centerline from the apex of a corrugation trough to the apex of an adjacent corrugation peak is not evenly divided by the point where the crimp pattern crosses the centerline between said corrugation trough and said corrugation peak.

5.5 For the board, it is credible that the problem identified in point 5.3 above has been solved because, as indicated in paragraph [0029] of the patent, the asymmetric crimp pattern defined in claim 1 provides for a more uniform flow in heat and mass transfer on both sides of the packing sheet in comparison to the conventional patterns (triangular-, sinusoidal- and sawtooth-shaped) illustrated in Figures 1 to 3.

So, there is no need to reformulate the technical problem.

In this respect, the board does not accept the appellant's reformulation of the problem in terms of an alternative packing, because the sinusoidal crimp pattern disclosed in document E29 is precisely one of the three patterns from which the invention has been made and which were described as "conventional" in the

patent. In the absence of evidence to the contrary, an improvement is therefore to be acknowledged.

5.6 As to the question of obviousness, it has to be determined whether the proposed solution was obvious in the light of the state of the art, in particular in the light of document E8.

For the board, the solution is not obvious, because even if - as argued by the appellant - the packing according to E8 (see column 2, lines 58 to 62) gives rise to an improvement in comparison to a packing with a sinusoidal crimp pattern, the problem addressed in D8 is different from the one in the patent, and so the skilled person faced with the problem underlying the invention would not have any incentive to use the crimp pattern disclosed in E8.

For sake of argument, the board observes that even if the skilled person had an incentive to look at document E8, it would anyway not arrive at the wording of claim 1 at issue because E8 explicitly requires that the axes of curvature of the curved portions be arranged substantially horizontal, which is in contradiction with the requirement in E29 (claim 1) that the corrugations be diagonal to the column axis.

For the board, starting from document E29, the other documents in the proceedings do also not disclose or suggest the solution as defined in claim 1 at issue to the problem underlying the patent.

5.7 The other combinations of documents proposed by the appellant also do not lead in an obvious manner to the subject-matter of claim 1 at issue for the following reasons:

5.7.1 Starting from document E1, it was argued that the problem to be solved was merely to be seen in an alternative packing sheet and that the solution was obvious in the light of the teaching of E8.

For the board, the proposed reformulation of the problem in terms of an alternative is not acceptable, because there is no evidence that modules manufactured with packing sheets of either documents E1 and E8 were technically equivalent in terms of gas/liquid separation. Moreover, none of the documents E1 or E8 is concerned with the problem underlying the invention, namely reducing the column height in a separation unit. So, the skilled person starting from document E1 has no reason to look at document E8 to find a solution to this problem.

5.7.2 Starting from document E8, the appellant argued that the problem to be solved was to improve the mixing of the fluids in the cross-sectional area of the packing module and that the solution, namely that the packing sheets were diagonally cross-corrugated, was derivable from document E29.

For the board, assuming that the problem was as identified above, the skilled person would not arrive at the claimed subject-matter because documents E8 and E29 individually require features which are incompatible, namely that the axes of curvature of the curved portions be arranged substantially horizontal (E8), respectively that the corrugations be diagonal to the column axis (E29). It follows that the contents of E8 and E29 cannot be combined, or, at least, the skilled person does not have any indication of a possible combination mode.

5.7.3 Regarding the alleged combination of documents E17 with E16, for the board document E16 is not relevant and therefore it should also not be admitted into the proceedings, because it concerns neither a separation nor a rectification process.

E16 (column 1, lines 1 to 36) merely discloses a reactor for contacting a gas with a liquid, said reactor being classified in the following categories:

- filling-in, filling-up, etc., with flowing of liquid;
- tuyeres, venturis, gates and plates;
- pulverisation chambers;

and said reactor functioning according to the following principles:

- generation of a maximum turbulence of gas on a large support surface on which the liquids are flowed but without removing the layer of liquid from the support surface;
- dispersion of a gas in a liquid through the dynamic energy of the gaseous currents;
- dispersion of a liquid under pressure in a gas.

Thus, since E16 discloses neither a separation or rectification column nor the principle of functioning of such a column, the skilled person has no reason to combine its subject-matter with the disclosure of E17.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the department of first instance with the order to maintain the patent in amended form on the basis of the claims according to the first auxiliary request submitted on 16 September 2014, and a description to be adapted, if necessary.

The Registrar: The Chairman:

C. Vodz G. Raths

Decision electronically authenticated