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**Datasheet for the decision
of 25 February 2011**

Case Number: T 0777/07 - 3.3.05

Application Number: 02016114.7

Publication Number: 1277699

IPC: C07C 29/151

Language of the proceedings: EN

Title of invention:

Method for manufacturing synthesis gas and method for
manufacturing methanol

Patentee:

mitsubishi heavy industries, ltd., et al

Opponent:

L'AIR LIQUIDE S.A. A DIRECTOIRE ET CONSEIL DE SURVEILLANCE
POUR L'ETUDE ET L'EXPLOITATION DES PROCEDES GEORGES CLAUDE

Headword:

Methanol synthesis/MITSUBISHI

Relevant legal provisions:

EPC Art. 123(2)
EPC R. 80
RPBA Art. 13(1)

Keyword:

"Main request, second and fourth auxiliary requests -
Allowability of amendments (no): no basis for incorporation of
a negative feature into a claim"
"First, third and fifth auxiliary requests - Admissibility of
late filed requests (no)"

Decisions cited:

G 0001/03, T 0278/88, T 0440/04, T 1120/05, T 1685/07

Catchword:

-



Case Number: T 0777/07 - 3.3.05

DECISION
of the Technical Board of Appeal 3.3.05
of 25 February 2011

Appellant: MITSUBISHI HEAVY INDUSTRIES, LTD.
(Patent Proprietor) 5-1, Marunouchi 2-chome
Chiyoda-ku
Tokyo (JP)

Representative: Henkel, Feiler & Hänzel
Patentanwälte
Maximiliansplatz 21
D-80333 München (DE)

Respondent: L'AIR LIQUIDE S.A. A DIRECTOIRE ET CONSEIL DE
(Opponent) SURVEILLANCE POUR L'ETUDE ET L'EXPLOITATION
DES PROCEDES GEORGES CLAUDE
75 Quai d'Orsay
F-75007 Paris (FR)

Representative: Ducreux, Marie
L'Air Liquide S.A.
Direction de la Propriété Industrielle
75 Quai d'Orsay
F-75321 Paris Cedex 07 (FR)

Decision under appeal: Decision of the Opposition Division of the
European Patent Office posted 28 February 2007
revoking European patent No. 1277699 pursuant
to Article 102(1) EPC.

Composition of the Board:

Chairman: G. Raths
Members: B. Czech
C. Vallet

Summary of Facts and Submissions

- I. The appeal is from the decision of the opposition division to revoke European Patent No. 1 277 699.

Independent claim 1 of the patent in suit as granted (identical to claim 1 of the application as filed) reads as follows:

"1. A method of manufacturing a synthesis gas comprising: reacting hydrocarbons with water vapor in a reformer (30) to produce a synthesis gas containing hydrogen, carbon monoxide and carbon dioxide; recovering carbon dioxide from combustion exhaust gas which has been discharged from the reformer by a carbon dioxide recovery apparatus (90) provided with a carbon dioxide absorption tower (92) and with a carbon dioxide-absorbing liquid regenerating tower (93); and feeding the carbon dioxide thus recovered, as a component of raw gas, to the upstream side and/or the downstream side of the reformer; characterized in that the hot synthesis gas produced in the reformer is utilized as a heat source for regenerating a carbon dioxide-absorbing liquid in the carbon dioxide-absorbing liquid regenerating tower (93) of the carbon dioxide-recovering device (90)."

- II. In the decision under appeal the opposition division found that claim 1 as granted lacked an inventive step over the following prior art:

D1: S. Teuner, "A new process to make oxo-feed";
Hydrocarbon Processing, July 1987, page 52; and

D2: S.P.Goff et al., "Syngas Production by Reforming";
Chemical Engineering Progress, August 1987, pages
46 to 53.

III. In its statement of grounds of appeal, the appellant requested the maintenance of the patent on the basis of the new claims 1 to 10 filed under cover of the statement, arguing that the amendments were based on the application as filed and that the claimed process was inventive over D1 and D2.

The newly filed independent claims 1 and 5 were amended inter alia by the incorporation of a negative expression reading "*without being subjected to CO₂ absorption in the carbon dioxide absorbing tower (92) in the carbon dioxide recovery apparatus (90)*".

IV. In its reply, the respondent inter alia raised objections under Articles 84 and 123(2) EPC having regard to the amendments carried out in the claims, inter alia having regard to the incorporation of said negative expression into claim 1.

V. In a first communication issued in preparation for the oral proceedings the board, referring to decision G 0001/03 (OJ 1994, 541), inter alia also questioned the clarity and original disclosure of said negative expression. The board also expressly referred to Articles 12 and 13 of the Rules of Procedure of the Boards of Appeal ("RPBA" hereinafter).

VI. Under cover of a further written submission dated 24 January 2011, the appellant filed five sets of claims as a new main request and first to fourth

auxiliary requests, respectively. Referring to specific parts of the application as filed, including the drawings, it argued that the application as filed clearly and unambiguously disclosed the subject-matter according to the amended claims, which was inventive in view of D1 and D2.

Independent claim 1 according to the main request reads as follows (amendments by addition and deletion to claim 1 of the application as filed made visible by the board):

"1. A method of manufacturing a synthesis gas comprising: reacting hydrocarbons with water vapor in a reformer (30) to produce a synthesis gas containing hydrogen, carbon monoxide and carbon dioxide; recovering carbon dioxide from combustion exhaust gas which has been discharged from the reformer by a carbon dioxide recovery apparatus (90) provided with a carbon dioxide absorption tower (92) and with a carbon dioxide-absorbing liquid regenerating tower (93); and feeding the carbon dioxide thus recovered, as a component of raw gas, to the upstream side and/or the downstream side of the reformer;

*characterized in that the hot synthesis gas produced in the reformer **without being subjected to CO₂ absorption in the carbon dioxide absorbing tower (92) in the carbon dioxide recovery apparatus (90), is utilized as a heat source for regenerating a carbon dioxide-absorbing liquid an absorbing liquid from the absorbing liquid which has absorbed the carbon dioxide in the carbon dioxide-absorbing liquid regenerating tower (93) of the carbon dioxide-recovering device apparatus (90) so that the heat of the hot synthesis***

gas is used for heating the regenerated absorbing liquid and the heated regenerated liquid heats the carbon dioxide-absorbing liquid regenerating tower (93)."

Claim 1 according to the first auxiliary request differs from claim 1 according to the main request in that the preamble was modified to read:

"1. A method of manufacturing a synthesis gas comprising: **heating reacting** hydrocarbons **and with** water vapor in a reformer (30) **through combustion of a fuel** to produce a synthesis gas containing hydrogen, carbon monoxide and carbon dioxide; recovering carbon dioxide from combustion exhaust gas ~~which has been discharged from the reformer~~ by a carbon dioxide recovery apparatus (90) provided with a carbon dioxide absorption tower (92) and with a carbon dioxide-absorbing liquid regenerating tower (93), **the combustion exhaust gas resulting from the combustion and having been discharged from the reformer, the carbon dioxide absorption tower (92) absorbing carbon dioxide contained in the combustion exhaust gas with an absorbing liquid; and feeding the carbon dioxide thus recovered, as a component of raw gas, to the upstream side and/or the downstream side of the reformer; characterized in that ..."**

Claim 1 according to the second auxiliary request differs from claim 1 according to the main request in that the negative expression comprised therein was amended to read:

"without being subjected to CO₂ absorption in ~~the a~~

carbon dioxide absorbing tower (92) in ~~the~~ a carbon dioxide recovery apparatus (90)".

Claim 1 according to the third auxiliary request differs from claim 1 according to the second auxiliary request in that the following features were inserted between "synthesis gas produced in the reformer" and "without being subjected to ...":

", having a molar ratio of $H_2/(CO+CO_2)$ which is suitable for the synthesis of methanol"

Claim 1 according to the fourth auxiliary request is based on claim 5 of the application as filed (and as granted) and reads as follows (amendments by addition and deletion to claim 5 of the application as filed made visible by the board):

"5 1. A method of manufacturing methanol comprising:

reacting hydrocarbons with water vapor in a reformer to produce a synthesis gas containing hydrogen, carbon monoxide and carbon dioxide;

recovering carbon dioxide from combustion exhaust gas which has been discharged from the reformer (30) by a carbon dioxide recovery apparatus (90) provided with a carbon dioxide absorption tower (92) and with a carbon dioxide-absorbing liquid regenerating tower (93);

feeding the carbon dioxide thus recovered, as a component of raw gas, to the upstream side and/or the downstream side of the reformer (30);

producing a crude methanol by introducing the synthesis gas into a methanol-synthesizing reactor; and

*distilling crude methanol by making use of a distillation apparatus to produce a refined methanol; characterized in that the hot synthesis gas produced in the reformer (30) **without being subjected to CO₂ absorption in a carbon dioxide absorbing tower in a carbon dioxide recovery apparatus** is utilized as a heat source for regenerating ~~a carbon dioxide absorbing liquid~~ **an absorbing liquid from the absorbing liquid which has absorbed the carbon dioxide in the carbon dioxide-absorbing liquid regenerating tower (93) of the carbon dioxide recovery apparatus (90) so that the heat of the hot synthesis gas is used for heating the regenerated absorbing liquid and the heated regenerated absorbing liquid heats the carbon dioxide-absorbing liquid regenerating tower (93), and** the hot synthesis gas produced in the reformer (30) is utilized as a heat source for the distillation apparatus.*

- VII. In its reply dated 17 February 2011, the respondent contested the admissibility of the four auxiliary requests. It raised objections under Article 123(2) and Rule 80 EPC against the claims according to all requests, objections under Article 123(3) EPC against the claims according to the first to fourth auxiliary requests, and an objection under Article 84 EPC against the claims according to the third auxiliary request. The respondent also referred to decision T 1120/05 of 21 February 2008.
- VIII. In a second communication issued on 23 February 2011 in preparation for the oral proceedings, the board drew the parties' attention to the contents of two prior art

documents that had been disregarded by the opposition division, as well as to some specific passages of D2.

- IX. Oral proceedings were held on 25 February 2011. At the beginning of the oral proceedings, the appellant expressly confirmed its requests as presented in writing (see point VII above). When asked by the board whether further requests were envisaged, the appellant indicated that it had prepared a further request that it intended to file in case the board considered that the requests on file were not allowable. The board invited the appellant to file said request straightaway, and the appellant filed it as a fifth auxiliary request.

Claim 1 according to said fifth auxiliary request differs from claim 1 as originally filed (and as granted) in that the following features were appended to the latter:

"by making use of a heat exchanger (104) where the regenerated carbon dioxide absorbing liquid is heat-exchanged and through which a hot synthesis gas is permitted to pass, so that the regenerated carbon dioxide absorbing liquid feed heated in this manner is utilized to heat the absorbing liquid regenerating tower (93) itself."

- X. As far as they concern the issues of admissibility of the appellant's requests and the allowability of some of the amendments (incorporation of negative expression), the essential arguments of the parties can be summarised as follows:

The **appellant** submitted that the amendment consisting in the incorporation of the negative expression into claim 1 according of the main request was based on Figure 1 in combination with several passages of the description of the application as filed describing the flow paths of the combustion exhaust gas and of the synthesis gas. The CO₂ recovery apparatus was only used for treating the combustion exhaust and there was no recovery of CO₂ from the synthesis gas. At the oral proceedings, upon being prompted by the board to point out where in the application as filed a disclosure could be found of the group of processes which differ from the specific one shown in figure 1 whilst presenting all the features recited in claim 1, including the negative feature, the appellant argued that the description implicitly disclosed to the skilled person that the molar ratio of the components in the synthesis gas had to be suitable for the synthesis of methanol after the reformer and that there was no need to remove CO₂ from the synthesis gas produced, which could be directly used in the synthesis of e.g. methanol. Moreover, it could be inferred from decision T 0278/88 of 20 February 1991, point 3.2.3 of the reasons (cited in the above mentioned decision T 1120/05), that under certain circumstances drawings could be considered to disclose negative features. Since the methods according to claim 1 were disclosed in the application as filed, the amendment was allowable under Article 123(2) EPC. Decision G 0001/03 was concerned with the allowability of "undisclosed disclaimers" and therefore not relevant in the present case, since the amendment in question was clearly and unambiguously disclosed in the application as filed.

The amendments in claim 1 according to the first auxiliary request had been made to define more clearly the process referred to in the preamble.

In claim 1 according to the second auxiliary request, it was made clear that there was no CO₂ removal whatsoever from the synthesis gas. Figure 1 of the application showed every detail of the process, but no CO₂ recovery from the synthesis gas, unlike D2, where CO₂ recovery from synthesis gas was shown in the figure and referred to as being usual.

The amendment in claim 1 according to the third auxiliary request made it clear that the molar ratio of the components of the synthesis gas produced had to be suitable for methanol production.

Claim 1 according to the fourth auxiliary request was directed to the total method of manufacturing methanol and thus found an even better basis in Figure 1 of the application as filed. There was no necessity to incorporate more features of Figure 1 into claim 1 since this would unduly limit the protection conferred by the claim.

The claims according to the fifth auxiliary request were prima facie clear and they stuck closely to the wording of the application as filed. The request was admissible since it was filed in reply to earlier objections of the board and also in reaction to the board's second communication. The amendments were straightforward and consisted in the incorporation into claim 1 of the features of claim 4 as granted and of some features disclosed in the description, with minor

editorial adaptations, thereby further distinguishing the claimed subject-matter from the prior art.

The **respondent** argued that the negative feature incorporated into claim 1 according to the main request was not disclosed in the application as filed. Referring to decision T 1120/05 it argued that the Figure 1, which concerned a more specific integrated process for the production of methanol, was schematic only and did not provide a sufficient basis for the amendment. The text of the description did not explicitly or implicitly disclose this feature and did not exclude further process steps, such as a carbon dioxide recovery, in addition to the ones shown in Figure 1.

The respondent objected to the admissibility of all five auxiliary requests in view of their late filing.

The first to fourth auxiliary requests were all objectionable under Article 123(2) EPC, inter alia in view of the negative feature contained therein.

It considered that the amendments in the preamble of claim 1 according to the first auxiliary request did not appear to be occasioned by a ground of opposition and were therefore objectionable under Rule 80 EC.

Moreover, the respective claims 1 according to the third auxiliary request (feature "*suitable for the synthesis of methanol*") and fifth auxiliary request (features isolated from their context) lacked clarity.

XI. The appellant requested that the decision under appeal be set aside and that the patent be maintained on the

basis of the claims according to the main request filed under cover of its letter dated 24 January 2011 or, in the alternative, on the basis of the claims according to one of the first to fourth auxiliary requests, taken in that order, which were filed under cover of the same letter, or on the basis of the claims filed as the fifth auxiliary request at the oral proceedings.

The respondent requested that the appeal be dismissed.

Reasons for the Decision

Main request

1. Admissibility of the main request
 - 1.1 The admissibility of this request has not been questioned by the respondent. The fresh claims can be regarded as a reaction to the questioning of the allowability of the amended claims then on file under Article 123(2) EPC by the respondent and the board (first communication, points 3 and 6). Moreover, the amendments restrict the ambit of the claims as granted.
 - 1.2 Pursuant to Article 13(1) of the RPBA, the board thus admitted this request despite its late filing.
2. Allowability of the amendments (Article 123(2) EPC)
 - 2.1 Claim 1 according to the instant request differs from claim 1 as filed (and as granted) inter alia in that the former additionally comprises the negative expression "*without being subjected to CO₂ absorption in*

the carbon dioxide tower (92) in the carbon dioxide recovery apparatus (90)", relating to the processing of the synthesis gas.

- 2.2 In order for the amendments to be allowable under Article 123(2) EPC, the subject-matter of the amended claim 1, i.e. the combination of features recited in claim 1 including the negative feature, must be directly and unambiguously derivable from the content of the application as filed as a whole, i.e. the description, the claims and/or the drawings.
- 2.3 In this respect, it remained undisputed
- i) that there was no literal basis in the application as filed for the negative wording introduced into claim 1, and
 - ii) that Figure 1 of the application as filed did not show a carbon dioxide absorbing tower arranged in the flow path of the synthesis gas from the reformer reaction tube (31) to the reactor (53) for the synthesis of methanol.
- 2.4 First of all, it must be noted that providing a unit for recovering carbon dioxide from a synthesis gas product stream, i.e. downstream of a reformer, is not something unusual in the technical field concerned. In this respect, reference can be made e.g. to document D1, paragraph bridging the two columns and Fig.1, and to document D2, paragraph bridging pages 46 and 47; page 47, right-hand column, first full paragraph and Figure 1 (see unit labelled "CO₂ REMOVAL").
- 2.5 Figure 1 of the application as filed, "**schematically illustrating one *example* of a plant for manufacturing**

methanol according to the present invention" (page 4, lines 26 to 28; emphasis added), shows a complex arrangement of machinery and piping. Having regard to Figure 1, the board observes that present claim 1 is not restricted to the method schematically illustrated in said figure, since the latter shows many features (e.g. unit operations such as heat exchanges) which are not referred to in claim 1. On the other hand, the schematic Figure 1 and its textual description actually do not show or refer to a unit for recovering carbon dioxide by absorption from the synthesis gas, known as such (see point 2.4 above). However, Figure 1 and its textual description do not exclude the provision of such a unit, if necessary or desired, and it cannot be deduced therefrom that the absence of the specific features excluded from claim 1 was mandatory in a process as schematically illustrated by Figure 1.

2.6 Hence, the fact that Figure 1, illustrating a specific plant, does not show a unit for the recovery of CO₂ from the synthesis gas does not amount to a general, direct and unambiguous teaching to do without such a unit in the context of any conceivable method for the production of synthesis gas with all the (positive) features recited in claim 1 in combination.

2.7 In the board's view, the entire text of the application as filed does not contain any express or implicit indication of a general desirability or necessity to do without a CO₂ recovery step by means of an absorption tower arranged in the synthesis gas flow path.

2.7.1 This is equally true for the passages describing in more detail the process and plant illustrated by

Figure 1 (page 5, line 18, to page 22, line 36) as well as for the more general passages of the description that were cited by the appellant.

2.7.2 At the oral proceedings, the appellant pointed out in particular the passages on page 20, lines 15 to 19, and on page 23, lines 6 to 30.

2.7.3 However, the first quoted passage is too general to imply the presence or absence of a particular process step besides the ones mentioned in claim 1 as filed.

2.7.4 In the second quoted passage, it is stated that "*As described above, according to the present invention, it is possible to provide a method of manufacturing a synthesis gas having an $H_2/(CO+CO_2)$ molar ratio which is suited for the synthesis of methanol **at the reformer...***" (emphasis added by the board).

i) However, it has to be noted in this respect that the method of claim 1, according to one alternative, expressly comprises **feeding** the carbon dioxide recovered from the combustion exhaust gas only at a point **downstream** of the reformer (see the expression "... to the upstream side and/or the **downstream** side ..."). In the board's view, in this latter process alternative, the molar ratio of the synthesis gas components leaving the reformer ("at the reformer") is subsequently changed by the addition of the recycled CO_2 .

ii) Furthermore, it has to be considered that in the field of methanol synthesis from synthesis gas it is not uncommon to add CO_2 recovered from flue gas to the

synthesis gas produced in a steam reforming process, in order to establish the proper molar ratio of the components for the subsequent synthesis of methanol (see D2, page 50, last paragraph, to page 51, second paragraph).

2.7.5 Bearing this in mind, the sentence in the description quoted under point 2.7.4 does not even constitute an implicit disclosure, which could be qualified as direct and unambiguous, of the subset of those methods (intermediate generalisation) showing all the (positively worded) features recited in claim 1 in combination and, at the same time, meeting the condition imposed by the added negative expression. This finding applies in particular to the alternative subset constituted by those methods according to which recycled CO₂ is fed to the downstream side of the reformer.

2.8 Since the subset of methods which is the subject-matter of instant claim 1 constitutes subject-matter extending beyond the content of the application as filed, the amendment in question does not meet the requirements of Article 123(2) EPC.

2.9 For the sake of completeness the board additionally notes the following. The claimed subset of methods is defined inter alia by a negative expression, which can be regarded as a disclaimer since it excludes those methods which comprise a step for subjecting the synthesis gas produced to a CO₂ absorption step.

2.9.1 Figure 1 and its description illustrate a specific process which does not comprise such a step and can -

at least for the sake of argument - be considered to disclose the exclusion or absence of such a step in the specific context of the process illustrated by Figure 1. However, in the absence of a corresponding more general teaching in the description, Figure 1 and its description do not constitute a direct and unambiguous disclosure of said disclaimer (or exclusion) in connection with the much broader set of processes defined by the combination of positive features according to claim 1.

2.9.2 Considering that said disclaimer, which is undisclosed in the broader context of the subject-matter claimed, was not incorporated in order to restore novelty, it is not allowable under Article 123(2) EPC pursuant to decision G 0001/03 (OJ 2004, 413), Order, point 2.1, first indent (see e.g. decision T 0440/04 of 26 November 2008, point 5 of the reasons).

2.10 Consequently, the main request of the appellant is not allowable.

First auxiliary request

3. Admissibility of the first auxiliary request

3.1 Compared to claim 1 of the main request, the instant claim 1 was further amended by replacing certain terms and expressions comprised in its pre-characterising part and also by incorporating additional features into the latter.

3.2 According to the appellant, these amendments were made "to define more clearly that the processes of

generating the combustion exhaust gas and the hot synthesis gas and the function of the carbon dioxide absorption tower to be used to absorb carbon dioxide from the combustion exhaust gas but not the synthesis gas". The appellant thus argued that a lack of clarity was overcome by the amendments in question.

3.3 According to Rule 80 EPC, the claims of a European patent "may be amended, provided that the amendments are occasioned by a ground for opposition under Article 100" EPC. However, a possible lack of clarity as invoked by the appellant does not constitute a ground for opposition according to Article 100 EPC.

3.4 Moreover, neither the board nor the respondent had previously called into question the meaning of the pre-characterising part of claim 1. For the board, even without the amendments in question, the wording of claim 1 (as granted and as according to the main request) clearly means that two different gas streams are discharged from the "reformer" (30), i.e. on the one hand the "synthesis gas" and on the other hand the "combustion exhaust gas". The latter gas stream implicitly stems from the combustion of fuel, heats the reformer and is then subjected to carbon dioxide recovery in apparatus (90).

3.5 As a corollary to the above, the amendments allegedly aimed at improving the clarity of the claims appear prima facie to be objectionable under Rule 80 EPC.

3.6 Since this further issue is raised by the amendments in question, the late filed first auxiliary request was not admitted pursuant to Article 13(1) RPBA.

Second auxiliary request

4. Admissibility of the second auxiliary request
 - 4.1 Compared to claim 1 according to the main request, said negative expression has been generalised by replacing the definite article "*the*" relating to the absorbing tower (90) and the recovery apparatus (90) by the indefinite article "*a*". Moreover, the reference numerals "(92)" and "(90)" as previously appearing in the negative expression included in claim 1 (according to the main request) were deleted.
 - 4.2 The amended claims according to the instant request can be regarded as an attempt also to overcome the further objection raised in the board's first communication (point 4.1) concerning the lack of clarity of the negative expression comprised in claim 1 then on file. Moreover, since the exclusion is broadened, the ambit of the claim is more restricted compared to claim 1 according to the main request.
 - 4.3 Pursuant to Article 13(1) of the RPBA, the board thus admitted this request despite its late filing.
5. Allowability of the amendment (Article 123(2) EPC)
 - 5.1 Claim 1 according to the second auxiliary request only differs from claim 1 according to the main request in that the wording of the negative expression has been changed, rendering it more general in terms of the carbon dioxide recovery steps to be excluded.

5.2 This particular amendment, which due to the broader wording of the negative expression excludes even more subject-matter than the amendment carried out in claim 1 according to the main request, also does not find a basis anywhere in the application as filed. Therefore, the reasoning under points 2.2 to 2.9.2 above applies *mutatis mutandis* to claim 1 according to the instant request.

5.3 Consequently, the second auxiliary request is not allowable either (Article 123(2) EPC).

Third auxiliary request

6. Compared to claim 1 of the second auxiliary request, claim 1 of the third auxiliary request was further amended by incorporating the features "*having a molar ratio of $H_2/(CO + CO_2)$ which is suitable for the synthesis of methanol*".

7. Admissibility of the third auxiliary request

7.1 It has to be noted that the amendment consisting in the incorporation of said additional features into claim 1 would appear to find support only in the description of the application as filed, if at all.

7.2 The amendment in question *prima facie* gives rise to concerns concerning the clarity (Article 84 EPC) of the wording of the resulting amended claim.

7.2.1 In particular, it has to be noted that present claim 1, according to one alternative (see "... *to the upstream side and/or the **downstream** side ...*"), expressly

comprises feeding the carbon dioxide recovered from the combustion exhaust gas **downstream** of the reformer. Having regard to this alternative of the claimed method, a question immediately arises due to said amendment, namely whether the gas as "*produced in the reformer*" must have the suitable molar ratio, or whether a further addition of recovered carbon dioxide may also be performed to achieve the suitable molar ratio.

7.2.2 At the oral proceedings, prompted by the board to take position on this aspect, the appellant merely argued that claim 1 referred to feeding the recovered carbon dioxide upstream of the reformer and that the alternative "*or downstream*" could be deleted. However, the above-mentioned concerns are in no way dispelled by this reaction of the appellant.

7.2.3 The board, having to decide on the requests as submitted, thus considers that the amendment in question is not clearly allowable under Article 84 EPC.

7.3 In view of the above circumstances, the late filed third auxiliary request was not admitted pursuant to Article 13(1) RPBA.

Fourth auxiliary request

8. Admissibility of the fourth auxiliary request

8.1 The amended claims according to this request can be regarded as a further attempt to overcome previous objections raised by the respondent and the board by reverting to the narrower definition of the invention (integrated process comprising synthesis gas production

and methanol synthesis). The ambit of the instant claim 1 is substantially restricted in comparison to claim 1 according to the second auxiliary request.

8.2 Pursuant to Article 13(1) of the RPBA, the board thus admitted this request despite its late filing.

9. Allowability of the amendment (Article 123(2) EPC)

9.1 Present claim 1 is based on claim 5 of the application as filed and relates to an integrated process comprising the production of synthesis gas and the production and distillation of methanol.

9.2 The characterising part of instant claim 1 comprises all the features of claim 1 according to the second auxiliary request, including the negative expression "*without being subjected to CO₂ absorption in a carbon dioxide absorbing tower in a carbon dioxide recovery apparatus*" concerning the hot synthesis gas produced.

9.3 Present claim 1 is more specific than claim 1 according to auxiliary request 2, since it is directed to an integrated process for the production of the final product methanol from the synthesis gas produced as an intermediate product. An example of such an integrated production method is schematically illustrated by Figure 1 of the application as filed. As already indicated above (points 2.3 ii) and 2.5), Figure 1 and the corresponding parts of the description describe a process which does not comprise an absorption step for carbon dioxide recovery from the synthesis gas, without, however, excluding or mentioning the absence of such a step. It is however noted that Figure 1 does not

illustrate the claimed alternative according to which recovered carbon dioxide is fed downstream of the reformer. Neither does the description contain further information concerning this alternative.

- 9.4 Instant method claim 1 does not recite all the features of the process schematically illustrated by Figure 1, which includes further heat-exchanges of the hot synthesis gas (see reference numbers 41 and 12), a specific arrangement of the distillation column heat exchangers (reference numbers 81₁, 81₂ and 81₃) relative to a specific heat exchanger (reference number 104) for heat exchange between the hot synthesis gas and the regenerated absorbing liquid and only comprises feeding recovered CO₂ upstream of the reformer. Moreover, claim 1 in its present wording (see "comprising...") does not exclude the presence or absence of further process steps.
- 9.5 The board acknowledges that the incorporation into a claim of a negative feature not contained verbatim in the application as filed may be allowable under specific circumstances, such as in the case underlying the decision T 0278/88 referred to by the appellant. The board however notes that in the particular case underlying said decision (see points 3.2.3 and 3.2.4 of the reasons), the absence of a feature in the figures was corroborated by an implicit disclosure of the absence of this feature in the text of the description.
- 9.6 However, in the present case, there is no such corroborating implicit disclosure in the description, not even on page 23, lines 17 to 29, of the absence of said CO₂ recovery step in the broader context of a

methanol production process as defined by the positive features of claim 1, at least for the alternative wherein CO₂ is fed downstream of the reformer.

9.7 The reasoning under points 2.7 to 2.7.4 thus applies *mutatis mutandis* to present claim 1. The subject-matter of present claim 1 is defined in terms which provide a definition of the methanol production method which is generic compared to the process described in Figure 1. In other words, the absence of a step for recovering carbon dioxide from the synthesis gas has been extracted from the total information provided by Figure 1 and has been incorporated into claim 1 in the form of a negative expression. However, there are many other conceivable process steps which can be considered to be absent from Figure 1 of the application as filed. In particular since the mass and heat streams involved in the method claimed depend on the relative arrangement and the interaction of unit operations (e.g. heat exchangers) and piping (recycling of carbon dioxide), not all of which are detailed in claim 1, the board considers that the skilled person would not directly and unambiguously derive the absence of said carbon dioxide recovery step as a salient feature of the invention. In the absence of a corresponding teaching in the description, an amendment based on arbitrarily choosing one of many possible negative features (in the present case: the absence of a process feature which is not shown in Figure 1), is not permissible (see e.g. decision T 1120/05, point 2.2.2 of the reasons).

9.8 For the board, the combination of, on the one hand, the positive features of a method for the production of

methanol as previously comprised in claim 5 as granted, with, on the other hand, the negative feature excluding carbon dioxide recovery from the synthesis gas, thus generates a subset of methods for the production of methanol, which subset constitutes subject-matter not directly and unambiguously disclosed in the application as filed (intermediate generalisation).

9.9 Since instant claim 1 is directed to subject-matter extending beyond the content of the application as filed, the amendment in question does not meet the requirements of Article 123(2) EPC.

9.10 The appellant also argued that incorporating all the features of Figure 1 into claim 1 would unduly limit the scope of protection conferred. This may be the case from a subjective point of view; however, the question to be answered in the present case is whether the amendments requested by the appellant meet the requirements of Article 123(2) EPC.

9.11 Therefore, the fourth auxiliary request is not allowable either (Article 123(2) EPC).

Fifth auxiliary request

10. Admissibility of the fifth auxiliary request

10.1 The board accepts that the amendments requested may be considered as an attempt to overcome various objections under Articles 123(2) and 84 EPC raised earlier by the respondent as well as by the board, in particular against the negative expression incorporated into the independent claims.

- 10.2 However, the request was filed at an extremely late stage of the proceedings, namely at the beginning of the oral proceedings. Moreover, the appellant did not put forward convincing reasons justifying why the request could not have been filed earlier.
- 10.2.1 In particular, the board observes that its second communication did not deal with outstanding objections under Article 123(2) EPC, but merely drew the parties' attention to the contents of some prior art documents.
- 10.2.2 Therefore, the amendment to claim 1 consisting in the deletion of the negative feature present in the respective claim 1 according to all requests previously on file cannot be regarded as a reaction to the said second communication.
- 10.2.3 A negative feature (exclusion of CO₂ recovery by absorption from the synthesis gas) was already contained in the claims filed as the main request with the appellant's statement of grounds of appeal, and this negative feature was objected to under Article 123(2) EPC by both the respondent and the board. Nevertheless, the appellant maintained such a negative expression in each of the independent claims according to the new main request and the new auxiliary requests filed in response to the summons to oral proceedings and the board's first communication, and did not file a request comprising no such negative expression till the date of the oral proceedings.
- 10.3 It is also noted that the fifth auxiliary request cannot be considered as a "converging" request in the sense of decision T 1685/07 of 4 August 2010; see

"Leitsatz" and "Reasons", points 6 to 6.8. In particular, although some further limiting (positive) features setting out details of synthesis gas heat utilisation were incorporated into claim 1, the negative expression previously contained in claim 1 according to all requests was dropped altogether, leading to a broadening of the claimed subject-matter in this respect. Moreover, whereas claim 1 according to the preceding fourth auxiliary request was limited to methanol production, in claim 1 according to the present fifth auxiliary request the appellant reverts to a broader claim directed to the manufacturing of synthesis gas in general, i.e. not necessarily within the context of methanol synthesis.

10.4 Moreover, present claim 1 is not based on a straightforward combination of claims 1 and 4 as granted, but also comprises additional features which according to the appellant find their basis in the description as filed and comprise minor adaptations in wording.

10.4.1 It is noted that the passages of the application as filed (page 13, line 33 to page 14, line 2) pointed out by the appellant as forming a basis for the amendment in question relate to the specific embodiment represented in Figures 1 and 2 of the patent in suit, i.e. to a specific example of an integrated process for the production of synthesis gas and methanol.

10.4.2 The proposed amendment thus consists in the incorporation of features isolated from the description of said specific example into the broader method (production of synthesis gas in general) according to

claim 1 as granted. An assessment of the allowability of this amendment under Article 123(2) EPC requires inter alia a careful check of whether or not the skilled person could directly and unambiguously derive from the application as filed a disclosure of the set of methods constituting the subject-matter of claim 1 as amended. Moreover, the minor adaptations of the wording used would also have to be checked for possible implications in terms of allowability under Articles 123(2) and 84 EPC. Finally, considering that some of the added features were not previously present in the claims but were taken from the description, it could not be ruled out that a review of the entire prior art on file would possibly become necessary in the context of the evaluation of inventive step.

- 10.5 In view of all the above circumstances, the board does not consider the instant request to be clearly allowable in the sense that no extensive examination would be required as to whether or not the amendments meet the requirements of Articles 123(2), 84 and 56 EPC.
- 10.6 Consequently, the fifth auxiliary request filed at the oral proceedings was not admitted pursuant to Article 13(1) RPBA.
11. In summary, the appellant's pending requests are either not admissible in view of their late filing or not allowable under Article 123(2) EPC.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar

The Chairman

C. Vodz

G. Rath