BESCHWERDEKAMMERN DES EUROPÄISCHEN PATENTAMTS

BOARDS OF APPEAL OF THE EUROPEAN PATENT OFFICE

CHAMBRES DE RECOURS DE L'OFFICE EUROPEEN DES BREVETS

A		B		C	X

File Number: T 403/92 - 3.3.1

Application No.: 89 202 073.6

Publication No.: 0 354 626

Title of invention: Process for the hydrocracking of a hydrocarbonaceous feedstock

Classification: C10G 65/10

DECISION
of 5 February 1993

Applicant: Shell Internationale Research Maatschappij B.V.

Proprietor of the patent:

Opponent:

Headword: Hydrocracking/SHELL

EPC Articles 54, 56 and 109(1)

Keyword: "Novelty (confirmed)"
"Remittal - for examination in respect of inventive step"

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Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number : T 403/92 - 3.3.1

D E C I S I O N
of the Technical Board of Appeal 3.3.1
of 5 February 1993

Appellant : Shell Internationale Research Maatschappij B.V.
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Decision under appeal : Decision of the Examining Division 029 of the European Patent Office dated 29 January 1992 refusing European patent application No. 89 202 073.6 pursuant to Article 97(1) EPC.

Composition of the Board :

Chairman : K.J. Jahn
Members : R.W. Andrews
J.A. Stephens-Ofner

Summary of Facts and Submissions

I. European patent application No. 89 202 073.6 (publication No. 0 354 626) was filed on 8 August 1989.

II. By a decision dated 29 January 1992, the Examining Division refused the application on the grounds that the subject-matter of Claims 1, 5, 8 to 12 and 14 as originally filed lacked novelty in the light of the disclosure in US-A-3 385 781 (1) and that the subject-matter of originally filed Claims 2 to 4, 6, 7, 13 and 15 did not involve an inventive step.

III. An appeal was lodged against the decision on 14 March 1992 with payment of the prescribed fee. With his Statement of Grounds of Appeal filed on the same day, the Appellant submitted a set of amended claims and the results of a comparison between the claimed process and the known two-stage hydrocracking process.

The Appellant argued that the subject-matter of the amended claims was novel in the light of the disclosure of document (1). The Appellant also contended that the proposed solution to the problem of nitrogen-sensitivity of the hydrocracking catalyst and inadequate hydrocracking of bulky materials (boiling points > 540°C) encountered in the known two-stage hydrocracking processes was inventive.

IV. The Appellant requests that a patent be granted on the basis of Claims 1 to 11 filed on 14 March 1992. The only independent claim of the set of claims reads as follows:

> "Process for the hydrocracking of a hydrocarbonaceous feedstock in a plurality of reaction stages, comprising contacting the feedstock with a first

hydrocracking catalyst at elevated temperature and pressure in the presence of hydrogen in a first reaction stage to yield a first effluent, mixing at least a liquid portion of the first effluent with a second effluent that originates from a second reaction stage, contacting the mixture obtained in a third reaction stage with a third hydrocracking catalyst comprising at least one component of a group 8 and/or group 6b metal on a faujasite type zeolite-containing carrier at elevated temperature and pressure in the presence of hydrogen to yield a third effluent, passing the third effluent to a separation stage where at least one top fraction and a residual fraction are obtained and passing the residual fraction to the second reaction stage where it is contacted with a second hydrocracking catalyst comprising at least one component of a group 8 and/or group 6b metal on a silica-alumina-containing or a faujasite type zeolite-containing carrier at elevated temperature and pressure in the presence of hydrogen to yield the second effluent."

Reasons for the decision

1. The appeal is admissible.

2. There are no objections under Article 123(2) EPC to the present version of the claims. In particular, Claim 1 corresponds to originally filed Claims 1 and 11 to 13 in combination with column 4, lines 45 and 46 and column 5, lines 16 to 21, of the printed patent application. Claims 2 to 11 correspond to Claims 2 to 10 and 14 as originally filed.

3. Document (1) discloses a process for hydrocracking a hydrocarbon feed by contacting it at hydrocracking conditions in the presence of hydrogen in a first hydrocracker with a conventional hydrocracking catalyst such as sulphides of nickel, molybdenum, tungsten, cobalt or a noble metal on silica-alumina or preferably with a catalyst comprising a platinum group metal combined with a crystalline alumino-silicate zeolite, having uniform pore openings of about 6 to 15 A and containing less than 10% by weight of alkali metal oxide; and contacting at least a portion of the normally liquid effluent from said first hydrocracking zone at hydrocracking conditions in the presence of added hydrogen in a second hydrocracking zone with a catalyst comprising a platinum metal combined with a zinc containing crystalline alumino-silicate zeolite having uniform pore openings of about 5 A (cf. Claim 1 in combination with column 2, lines 53 to 67). Before being passed to the first hydrocracking zone the hydrocarbon feed may be hydrofined by passing over any of the conventional hydrofining catalysts, such as cobalt molybdenate on alumina (cf. column 6, lines 10 to 13 and line 67 to column 7, line 4).

3.1 Although hydrofining (or hydrotreating) and hydrocracking are classified in the art under the general heading hydroprocessing and hydrocracking may be considered to be a high severity hydrofining operation, in the Board's opinion, the skilled person in the petrochemical field reading document (1) would not regard the hydrofining stage of this known process as being equivalent to a hydrocracking stage. This is made abundantly clear from document (1) itself since it is stated in its first paragraph that the invention relates to a two-stage hydrocracking process.

However, even if the hydrofining stage of the process of document (1) were considered to be similar to a first hydrocracking stage, the Board still finds that the subject-matter of the present claims is novel with respect to document (1).

In these circumstances, the relevant process is that illustrated in Figure 1 of this document wherein the hydrofiner (14) is considered, for the sake of argument, to be the first hydrocracker of the present process.

After passage through a gas separator, the effluent (20) from this "first hydrocracker" is combined with the effluent from the fractionator (48) in which the effluent from hydrocracker (43) has been fractionated. Since according to the present process at least a liquid portion of the first effluent must be combined with the effluent from the second hydrocracker, hydrocracker (43) of the prior art process has to be considered as equivalent to the present second hydrocracking unit. This combined effluent (21) is then fed to the hydrocracker (27), which is therefore equivalent to the present third hydrocracking unit.

3.2 According to the present Claim 1, the catalyst in the second hydrocracking unit comprises at least one component of a Group 8 and/or Group 6b metal on a silica-alumina-containing or a faujasite type zeolite-containing carrier and that in the third hydrocracker comprises at least one component of a Group 8 and/or Group 6b metal on a faujasite type zeolite-containing carrier. However, the catalysts in the corresponding hydrocrackers of document (1), i.e. hydrocrackers (43) and (27), comprise a platinum group metal combined with a zinc-containing crystalline alumino-silicate zeolite having uniform pore openings of about 5 A and conventional hydrocracking catalyst or one

comprising a platinum group metal combined with a crystalline alumino-silicate zeolite having uniform pore openings of about 6 to 15 A, respectively (cf. Claim 1 in combination with column 2, lines 54 to 58).

3.3 Therefore, the present process differs from this prior art one at least in that different hydrocracking catalysts are used in the second hydrocracking stage. In particular, a silica-alumina containing carrier or faujasite type zeolite-containing carrier (large pore size) is used in the present process as compared with a crystalline zeolite having a relatively small pore size, for example Zeolite A (cf. document (1) column 3, line 24 to column 4, line 17 and Example 1).

3.4 Since the flow of the reaction mixture as illustrated in Figures 2 and 3 of document (1) does not correspond to that of the present process, it is not necessary to consider these prior art embodiments in detail.

3.5 Therefore, in the Board's judgement, the subject-matter of the present claims is novel having regard to the disclosure of document (1).

3.6 After examination of the other cited documents, the Board has reached the conclusion that the claimed subject-matter is also novel with respect to these. Since the Examining Division did not raise any objections with respect to novelty in the light of these documents, it is not necessary to give detailed reasons for this conclusion.

4. In the decision under appeal the Examining Division held that the subject-matter of Claims 2 to 4, 7, 13 and 15 did not involve an inventive step since their features would be selected by the skilled person, in accordance with

circumstances, without the exercise of inventive skill to solve the posed problem.

Although the Examining Division stated in the contested decision that document (1) represented the closest prior art, there is no indication that the Examining Division had determined the technical problem underlying the disputed application in the light of this closest state of the art.

In these circumstances, it is clear that a full first instance examination on the basis of the principles developed by the Boards of Appeal has not yet taken place. Consequently the decision under appeal must be set aside and the case remitted to the first instance without decision on the question of inventive step.

5. In the present case, the Appellant proposed substantial amendments to Claim 1 which were clearly intended to overcome the objections raised in the decision under appeal. Having regard to the jurisprudence of the Boards of Appeal as laid down in, for example, T 139/89, Governor Valve/BENDIX, OJ EPO 1990, 68 and T 9/81, Remittal/SUMMITOMO, OJ EPO 1991 486, the Board considers that the Examining Division should have rectified its decision under the procedure for interlocutory revision set out in Article 109(1) EPC.

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 prosecution on the basis of Claims 1 to 11 filed on 14 March 1992.

The Registrar: The Chairman:

E. Görgmaier K.J.A. Jahn