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Case Number: T 46 / 84

T 228

DECISION
of the Technical Board of Appeal 3.3.1
of 16 April 1985

Appellant: Mobil Oil Corp.
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Decision under appeal: Decision of Examining Division 029 of the European Patent Office dated 7 September 1983 refusing European patent application No 79 301 342.6 pursuant to Article 97(1) EPC

Composition of the Board:
Chairman: K. Jahn
Member: G. Szabo
Member: F. Benussi

Summary of Facts and Submissions

I. European patent application 79 301 342.6 filed on 10 July 1979, published on 6 February 1980 with publication number 7734 and claiming priority of the earlier application on 25 July 1978 (US 928 036) was refused by decision of the Examining Division 029 of the European Patent Office dated 7 September 1983. The decision was based on Claims 1 to 9. The main claim was worded as follows:

"1. A cyclic regenerative catalytic cracking process employing a circulating inventory of cracking catalyst the quantity and activity of which is regulated by addition from time to time of fresh catalyst, catalyst as a substantially uniform blend of a minor portion of particles containing from 10 to 1000 ppm of platinum, iridium, osmium, palladium, rhodium, ruthenium or rhenium and a major portion of active cracking catalyst, the blend being formed by intimate mixing, in-line mixing or separate addition, the proportions of said minor and major portions being such that said blend contains no more than 10 ppm of said metal."

Apparently, the following words have been omitted,in line 4 of the claim after "catalyst", in error - see description page 3, lines 7 and 8-:"is characterised by supplying said fresh".

II. The reason given for the refusal was that the subject-matter of this and the other claims lack inventive step. FR-A-2 349 641 (I) discloses an inventory with a non-uniform catalyst which has a composition corresponding to that specified in the claim in the present case. The cited document indicates that there are losses with

regard to the catalyst but is silent as to how such naturally occurring losses are to be rectified. It is generally presumed that the specific catalyst composition should be maintaind as far as possible. The starting catalyst can in the cited art as well as in the application be the same two-phase system, and there is no reason to suppose that the skilled man would not consider adding make-up catalyst of the same composition to the inventory and thereby arrive at the presently claimed method.

III On 28 October 1983 the Applicant lodged an appeal against the decision of 7 September 1983 with the payment of the fee. The Statement of Grounds was filed, together with a new set of claims on 11 January 1984. After the Board raised objections in a communication and the Appellant submitted his reply, an oral hearing was appointed for the 16 April 1985. The amended set of claims was withdrawn at the hearing, and a new set of claims were lodged which was substantially identical with those originally filed with the application, except for the insertion of the missing phrase in the main claim. In addition, an auxiliary set was also presented wherein the main claim was limited at the end by the addition of the phrase: "the regeneration being conducted at a temperature of <u>at least 1240°F"</u> (emphasis added).

IV. In the submissions and at the oral hearing the Appellant argued substantially as follows:

(a) Whilst the cited document (I) may have disclosed a non-uniform catalyst, only the present application teaches the operator precisely how to achieve a

long-term optimum operation of the cracking unit by utilising a particular make-up catalyst formulation. The same document has not revealed at all the discovery upon which the present invention is based, i.e. the superiority of the non-uniform blend. The claimed process is advantageous relative to the prior cracking process according to GB-1 481 563 (II) in consequence of the utilisation of the non-uniform catalyst according to the Applicant's discovery.

(b) It is clear that the object of the present invention is to boost carbon monoxide oxidation in the regenerator. The change of conditions to that effect is provided by altering the composition of the circulating catalyst, which is disclosed at least by implication in the specification. The need for such alteration of the inventory by increasing the quantity of the oxidation promoting metal is known from (II), acknowledged as the most pertinent prior art. By increasing the metal content of the inventory through adding a non-uniform blend instead of a uniform catalytic material according to (II), some metal can be saved whilst achieving the same level of carbon monoxide combustion.

(c) Even if it were assumed that (I) implies the addition of a blend identical with that already supplied to the inventory at the start, this would not change or regulate the system. Whilst the present application contains no expressis verbis statement as to this distinction, the skilled reader would find it implicit that the composition of the circulating inventory may be different from that of the make-up catalyst. What the skilled man would not do on the

basis of the state of the art is "to add something different from that already in circulation". The present process "now adds something different".

(d) The cited document (I) runs the regenerating part of the process at a temperature range somewhat lower than 1300°F. On the other hand, it is suggested that the advantages of the process according to the application are associated with the possibility of running the process at a higher temperature, i.e. at 1240°F or above. Hence the incorporation of this condition in the auxiliary set of claims.

V. The Appellant requests that the decision of the Examining Division be set aside and a European patent granted on the basis of the claims or the set of auxiliary claims, both submitted with the main and auxiliary requests for relief.

Reasons for the Decision

1. The appeal complies with Articles 106 to 108 and Rule 64 EPC and is, therefore, admissible.

2. There can be no objection to the present version of the claims in the main request, since the claims were those originally filed with the application, except for the insertion of the missing phrase in the main claim from the consistory clause on page 3, lines 6 and 7. On the other hand, the limitation inserted at the end of the main claim of the auxiliary set to "... at least 1240°F" has at best only direct support for the stated lower limit of the temperature range and may remain unclear and unsupported as to the upper limit thereof. Nevertheless, the question of the allowability of the amendment

on the basis of proper support can be left in abeyance in view of more relevant other considerations as explained hereinafter.

3. FR-A-2 349 641 (I) discloses a circulating catalyst inventory and the process of using it, which comprises a non-uniform blend having 1 to 20% by weight of particles containing from 0.05 to 1000 ppm of a metal of the platin group and 80 to 99% by weight of an active cracking catalyst. The purpose of the moiety "promoted" with the metal is to facilitate the oxidation of carbon monoxide in the regeneration zone. Although the disclosure is silent as to how the naturally occurring losses are to be rectified, the document mentions that under particular conditions the decline of the carbon monoxide oxidation catalytic activity may be effectively reduced (Example IX, page 29, lines 29 to 34). Besides, it was undeniably common general knowledge that the activity was to be maintained and any loss thereof to be replaced in view of the desire to operate the cracking plant without interruption for many months or even for more than a year.

4. The problem of the present invention was, in the light of this particular art, to provide appropriate make-up catalysts for a system operating with such or any kind of circulating inventory, which is capable of maintaining or even allegedly improving the cracking and regeneration process involved. The solution of the problem was to use a non-uniform make-up catalyst consisting of a blend of particles having the composition specified in the claim. It appears from the Examples that the use of such blends in the inventory effectively oxidises carbon monoxide whilst the particular manner of formulating and supplying the make-up parts intermittently is left to the

skill of the operator. Although the make-up composition is substantially identical with the non-uniform blend used in (I) as a starting catalyst, the suggested use of the make-up composition itself is not expressly described in any document available to the Board and can therefore be recognised as novel.

5. As regards the inventive step it is relevant that (I) discloses the loss of activity and that the replacement of the same has been common knowledge for any continuous cracking operation. There is, in addition, no reason to assume that any removal of the catalyst from the recycling system or any additional natural loss could not be routinely replaced by the addition of the same kind of catalyst, i.e. by using a make-up which has the composition identical with or at least somewhat similar to that originally supplied at the start. Although the exact composition of such kind of replacement is not known from (I) it would, admittedly, be within the ordinary skill of the operator of the cracking unit to determine the nature of the requirements for such replacement and to select the quality, composition, and rate of the make-up appropriately in the case of a unit running with an inventory described in document (I).

6. Once the cracking and regeneration of the process according to (I) has been established, the maintenance of the operation could therefore be envisaged at least on the basis of the same blend. To use the same kind of catalyst, which corresponds to starting or stationary conditions is a reasonable assumption and nothing so far submitted to the Board contradicts the possibility. The Appellant himself admitted that "what the skilled man would not do is to add something peculiarly different

from that already in circulation" (cf. Statement of Grounds, page 2, Part 4, lines 11 to 13). The same applied apparently to the "first generation" uniform catalyst disclosed in (II). Such obvious manner of operating now the process according to the document (I) using the "second generation" non-uniform catalyst is, however, also covered by the main claim in the present application.

7. As regards the more ambitious goal, i.e. the alleged boosting of the oxidation of carbon monoxide, this was only demonstrated in the application in comparison with the earlier more remote state of the art, the uniform cracking and regenerating catalyst of document (II). There is no evidence as to any improvement over the closest state of the art represented by document (I). Since this and the present application both rely on the same non-uniform circulating inventory in their examples, any difference in results can only come from the specific manner the make-up is provided under the conditions of the operation. However, there is no guidance in the application as to how the make-up catalyst should differ from that already in the circulating inventory and in what quality, composition and rate is should be supplied to the operating system to achieve the alleged improvement or optimisation. In the absence of any proper disclosure and any limitation of the process claim to ensure the improved results, any suggestion by the Appellant as to a different manner of operation and to unexpected effects must be dismissed. What remains is the ordinary and obvious manner of operating the process of document (I) by the addition of a make-up catalyst having a composition identical with or very similar to the already circulating inventory, as suggested in the decision of the Examining Division.

9. The Appellant's contention that he has discovered the beneficial effect of the non-uniform blend in this respect, is unacceptable. The catalyst and its main use was readily known in the state of the art both as a circulating inventory and as a make-up therefor. The present application contributed nothing to our knowledge as to how to modify the catalyst composition in relation to the circulating part, in order to obtain unexpectedly better results. There is no feature in the claim which would reflect any distinctions in this respect, let alone to require that the metal content of the inventory should be increased, as it was suggested on behalf of the Appellant.

10. The suggested restriction of the main claim in the auxiliary request to a temperature range of "at least 1240°F" in the regeneration zone, cannot impart inventive merit to an otherwise obvious process. The closest state of the art, document (I) discloses a temperature range from 900 to 1510°F, advantageously from 1100 to 1300°F (page 19, lines 23 to 27). The end-points of these ranges fall, as specific values, well within the range of "at least 1240°F" and were readily available to the skilled person to operate the regeneration accordingly. In view of above, and of the circumstances just mentioned, both main claims in the two requests for relief lack inventive step. The same applies to the common subsidiary claims 2 to 9, since these are dependent on the main claims and fall within the same.

Order

It is decided that

The appeal against the decision of the Examining Division of the European Patent Office dated 7 September 1983 is rejected.

Registrar

15/5.

Chairman