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D E C I S I O N
of 16 May 1995

Case Number: T 0212/91 - 3.3.2

Application Number: 81300443.9

Publication Number: 0034037

IPC: B01J 20/32

Language of the proceedings: EN

Title of invention:

Material for adsorbing iodine and method for preparation thereof

Patentee:

HITACHI, Ltd., et al

Opponent:

Kernforschungszentrum Karlsruhe GmbH
Bayer AG, Leverkusen Konzernverwaltung RP Patente Konzern
SÜD-CHEMIE AG

Headword:

Iodine adsorbens/HITACHI Ltd.

Relevant legal provisions:

EPC Art. 54, 56, 83, 100(a), 100(b), 114(2)
EPC R. 55(c)

Keyword:

"Novelty (yes)"
"Inventive step (yes)"
"Late filed evidence (not accepted)"
"Sufficiency (yes)"

Decisions cited:

G 0009/91, G 0010/91

Catchword:

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Case Number: T 0212/91 - 3.3.2

D E C I S I O N
of the Technical Board of Appeal 3.3.2
of 16 May 1995

Appellant 1:
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Representative: -

Appellant 2:
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Respondent:
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(Opponent 01)

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Representative:

-

Decision under appeal:

Interlocutory decision of the Opposition Division
of the European Patent Office dated 9 January 1991
concerning maintenance of European patent
No. 0 034 037 in amended form.

Composition of the Board:

Chairman: P. A. M. Lançon
Members: G. J. Wassenaar
J. A. Stephens-Ofner

Summary of Facts and Submissions

- I. European patent No. 0 034 037 was granted in response to European patent application No. 81 300 443.9.
- II. Notices of Opposition were filed against the European patent by Opponents 01, 02 and 03. Revocation of the patent on the grounds of lack of novelty and lack of inventive step (Article 100(a) EPC) was requested by all three Opponents. Opponent 01 also mentioned as opposition ground insufficient disclosure (Article 100(b) EPC). Opponents 02 and 03 lodged an appeal, whilst Opponent 01 did not, thereby remaining in the case as party as of right under Article 107 EPC.

During the proceedings before the Opposition Division 10 documents were cited, but in the reasons of the decision under appeal only document US-A-3 838 554 (1) was relied upon and no additional citation was relied upon in the appeal proceedings.

- III. In a communication dated 21 March 1990, the Opposition Division had provisionally indicated that they were of the opinion that the patent in suit did meet the requirements of Articles 54 and 83 EPC but that its subject-matter lacked an inventive step (Article 56 EPC).

In the decision, the Opposition Division maintained the patent in amended form (auxiliary request II, submitted during oral proceedings which took place on 17 October 1990), with a main claim which reads as follows:

"A process for preparing an adsorbing material for adsorbing iodine and/or organic iodine compounds, the material comprising a porous body impregnated with a

substance which reacts readily with iodine and/or organic compounds, characterised in that the process comprises,

a first step of forming particles of the body material, the particles having pores of a mean pore diameter of 4 to 20 nm,

a second step of bonding together the said particles obtained in the first step to form the said porous body in such a way that pores having a mean pore diameter of 20 to 200 nm are formed between the particles bonded together, and

a third step of impregnating the porous body with said substance which reacts readily with iodine and/or organic iodine compounds."

With respect to the insufficiency allegation they rejected the submission that the sintering step for producing pores with a mean pore diameter of 20 to 200 nm would affect the mean pore diameter of the pores in the particles having a mean pore diameter of 4 to 20 nm.

With respect to novelty they held that (1) did not disclose a two-step process, wherein particles of a mean pore diameter of 4 to 20 nm were formed in a first step followed by a second step whereby these particles were bonded together such that pores having a mean diameter of 20 to 200 nm were formed between the particles.

With respect to inventive step they held that nowhere did (1) suggest a separate process step of bonding together particles with a mean pore diameter of 4 to 20 nm so that pores having a mean pore diameter of 20 to 200 nm were formed.

IV. The Appellants (Opponent 02 and 03) lodged an appeal against this decision but Opponent 01 did not.

In the Statement of Grounds, the Appellants argued that the process claims as allowed by the Opposition Division lacked novelty or at least an inventive step (Articles 54 and 56 EPC) over (1) and that the disclosure of the invention was not sufficiently clear and complete to be carried out by a person skilled in the art (Article 83 EPC).

Appellant 2 (Opponent 03) provided with his Statement of Grounds, filed on 4 May 1991 certain experimental evidence to show on the one hand that the example referred to on page 4 of the patent in suit could not be performed and, on the other hand, that after having modified some conditions of the example, the pore size of the particles having a mean pore diameter of 4 to 20 nm was increased at higher sintering temperatures. Both Appellants stood by these written submissions and evidence during the oral proceedings, held on 16 May 1995.

V. The Respondent (Patentee) disagreed with these submissions and argued with respect to the admissibility of the insufficiency objection under Article 100(b) EPC, that since Appellant 2 had not brought this ground in the opposition period (9 months after the grant of the patent) he was not entitled to rely upon it at the appeal stage (Rule 55(c) EPC).

The Respondent also strenuously objected to the introduction of the late filed evidence on the basis, initially, that it constituted a fresh "ground" of appeal, albeit falling within Article 100(b) EPC, and later on the footing that whilst still relating to an insufficiency attack under that Article, the late filed

evidence constituted a new type of attack, thereby altering if not the legal, then at least the factual framework of the case which the Board had to decide. Article 100(b) EPC, lack of sufficiency, was, so he submitted, an extremely broad ground compared with the grounds of novelty and obviousness, so that it was possible, once this ground had been formally pleaded by one opponent, for other opponents to use it as a "Trojan horse" at an extremely late date in the proceedings, thereby altering the entire centre of gravity of the case that the Respondent had been called upon to, and did, argue before the Opposition Division, and upon which the Opposition Division's decision had been based. He furthermore stressed that the patent in suit was now some 14 years old, so that in the event that the late filed evidence and the arguments which it supported were admitted into the proceedings, with the consequence that - as he had originally requested in writing the case was remitted to the Opposition Division, the whole proceedings including any subsequent appeal, could well outlast the life of the patent itself.

VI. Both Appellants as well as the party as of right (Opponent 01) requested that the decision under appeal be set aside and the patent be revoked.

The Respondent (Patentee) requested that the appeal be dismissed and that the patent be maintained on the basis of the main request submitted during the oral proceedings (previously filed as auxiliary request II on 21 January 1992 and corresponding to the claims allowed by the Opposition Division) or on the basis of auxiliary requests 1 and 2 also submitted in the course of the oral proceedings.

At the end of the proceedings the Board dismissed the appeal and remitted the case to the first instance with the order to maintain the patent on the basis of the main request.

Reasons for the Decision

1. The appeal is admissible.
2. *Admissibility of the late filed evidence: a preliminary point*

The admissibility of late filed evidence is a matter of discretion for the Boards, which of course, act in a judicial capacity to decide whether or not the first instance's decision was correct on its merits: (see decisions G 9/91 and G 10/91, OJ 1993, 408 and 420). Whilst those decisions dealt expressly only with the issues of whether or not the Boards of Appeal, as judicial bodies, had the power to decide on matters which went beyond the **extent** to which the European patent had been opposed (G 9/91) or, (G 10/91) the **grounds** upon which such opposition had been based, it is clear to this Board that the legal principles in both these cases apply with equal force to the third component of all those matters that Rule 55(c) EPC enjoins the parties to state within the opposition period, namely the "**indication of the facts evidence and arguments**" in support of the grounds on which the opposition is based. The heart of the matter, of course, is that cases decided by the Boards of Appeal should have the same, or substantially the same, **legal and factual framework** as the case on the basis of which the first instances decision had been rendered.

Following those principles, new facts and in particular new evidence which do go beyond the "indication of the facts and evidence" presented in the Notice of Opposition in support of the grounds of opposition, should only very exceptionally be admitted into the proceedings, and then only if such material is prima-facie highly relevant, in the sense that it is highly likely to prejudice the maintenance of the European patent in suit. In the Board's judgement there can be no question that in this instance the late filed evidence does relate to a ground, namely insufficiency, upon which the Opposition Division's decision had been based. However, it is equally clear to the Board that, this evidence does substantially alter the factual (but not the legal) framework of the case which the Respondent had to deal with before the first instance (see point III above - the communication annexed to the summons), and, furthermore, it has been filed at a very late stage of the proceedings i.e. more than a year after the Appellants had become aware that the Opposition Division regarded the ground of insufficiency as being unfounded. In exercising its discretion either to admit or to reject such matters, the Board needs to have regard to all the circumstances of the case, including the lack of satisfactory explanation as to why the evidence had been filed in such a tardy manner; that the patent is now some 14 years old, and, lastly and possibly most significantly, that the evidence is not of such a high degree of relevance as to be reasonably likely to change the eventual result in the Appellants' and the party as of rights favour. Having regard to all these considerations, the Board has accordingly decided to exclude the late filed evidence, and also to refuse to hear all insufficiency arguments which are based upon it or are in any way whatsoever related to it.

3. *Sufficiency of disclosure*

3.1 Appellant 2 submitted that the Opposition Division's finding that the second sintering step to obtain the pores with a mean diameter of 20 to 200 nm does not substantially affect the mean pore diameter of the smaller pores, was incorrect in view of Table 1 of the patent specification, which showed a substantial decrease of the volume of the smaller pores at higher sintering temperatures, whereas the volume of the larger pores is increased at sintering temperatures from 800 to 1200°C. This meant that the mean pore size had been shifted to larger pores.

According to the Respondent, the increase in pore volume of the larger pores could be explained by the difference in pH during gel-forming. For the samples with the same gel-forming conditions, i.e. Nos. 1, 5 and 7, the pore volume of the larger pores was the same at 800 and 1200°C and was only substantially reduced at 1400°C. This reflected the phenomenon that pore volume was reduced at high sintering temperatures. Thus at higher temperatures the pore volume of both the smaller and the larger pores was reduced, but this did not mean that the distribution of the pores was substantially changed.

In view of the total lack of evidence for a significant increase in the mean pore size of the smaller pores during the sintering process for obtaining the larger pores, the Board up holds the finding of the Opposition Division in this respect. Moreover, the present process claim does not require that the mean pore size of the smaller pores in the particles formed in the first step does not change when these particles are bonded together in the second step.

3.2 Appellant 2 further challenged the sufficiency of the patent, on the basis that it did not indicate how particles could be bonded together without a bonding agent, in order to obtain pores between the particles with a mean pore size of 20 to 200 nm. Whilst the Board agrees that such a process is not expressly disclosed in the patent specification, it notes that such a process is not part of claims here at issue. Indeed, in present Claim 1, the second step is defined by the result to be achieved. If this result can only be achieved by the use of a bonding agent as illustrated by the examples, said definition simply implies the use of a bonding agent. Thus the Board finds this insufficiency objection to be unfounded, since the claim excludes processes which do not provide a structure whereby the particles obtained in the first step are bonded in a porous matrix with a mean pore diameter of 20 to 200 nm.

4. *Novelty (main request)*

4.1 Novelty was attacked by the Appellants on the basis of Example 7 of (1). This example discloses a process for preparing an adsorbing material for adsorbing an organic iodine compound by impregnating porous beads with a silver nitrate solution. The silver taken up reacts readily with organic iodine compounds. The beads were prepared according to Example 6, whereby silicic acid filler particles were mixed with a silica sol to form a suspension, followed by forming spherical droplets thereof, gelling the droplets to obtain a granular material and heating the granules to 700°C for 2 hours to obtain the porous beads. After a subsequent acid treatment and annealing at 700°C for one hour, the beads had a specific surface of 125 m²/g and a pore diameter range of 4 to 200 nm. Of these pores 28% have a diameter less than 10 nm and 10% have a diameter of more than 100 nm.

According to the Appellants, said pore size distribution meant that the beads contained small pores with a pore diameter below 10 nm, derived from the silicic acid filler particles, and large pores with a pore diameter of more than 100 nm in the matrix between the filler particles, derived from the silica sol used to bond the filler particles. Because the above prior art example also disclosed the two-step method of forming small particles in a first step, and binding them in a second step, so that pores with a diameter between 100 and 200 nm were formed between the particles, they submitted that the process of present Claim 1 lacked novelty over (1).

4.2 Apart from the fact that the pore diameters given in Claim 1 relate to mean pore diameters, so that these figures cannot be directly compared with those given in Example 7 of (1), there exists another fundamental difference caused by the requirement of present Claim 1 that in the first step particles having pores with a mean pore diameter of 4 to 20 nm are formed.

The silicic acid filler used in Example 6 of (1) is made up of porous particles, whose pores are, at least, partially filled with water (column 7, lines 45 to 51). The pore size distribution is not given and indeed could not be given, since the current method of determining the pore size distribution is the mercury-porosimeter method as used in the patent in suit, which requires a stabilised pore structure. In the case of a silicic acid gel, the latter requirement means that the particle should be sintered. Since in said prior art Example 6 the filler was not sintered before it was mixed with the sol it could not have had a stabilised pore structure permitting the determination of the mean pore diameter.

Thus the method of present Claim 1 is new for the simple reason that in the first step a particle is formed with a stabilised pore structure permitting the determination of the mean pore diameter.

Moreover, the required mean pore diameter of 4 to 20 nm is not necessarily implied by the presence of pores with diameters of between 4 to 10 nm in the sintered beads of Example 7 of (1), since the original pores underwent substantial change by the sintering at 700°C for 2 hours followed by acid treatment and annealing at 700°C for another hour as indicated in Example 6 for the beads used in Example 7.

For all the above reasons the Board confirms the finding of the Opposition Division that the method of present Claim 1 is new.

5. *Inventive step (main request)*

5.1 The Board considers (1) as the closest prior art, as did the parties and the Opposition Division. As indicated above, both (1) and the patent in suit relate to a process of preparing an adsorption material for the adsorption of organic iodine compounds and both materials have been proven to be highly effective. According to (1), Example 7, CH₃I could be removed from a humid gas-stream to an extent of 99.9995%. According to the patent-in-suit, Sample 2, the same compound could be removed with an efficiency of 99.9992%. The conditions under which the removing efficiency was determined were, however, not identical. In the later filed comparative examples the conditions were also not identical so that a fair comparison was not possible. Since other advantages have not been made credible

either, the technical problem underlying the invention can only be seen in providing an alternative process for preparing an effective adsorption material for the adsorption of organic iodine compounds.

From the examples given in the patent specification (Table 1), falling within the realm of present Claim 1, it is evident that an effective adsorption material could be obtained, so that the Board is satisfied that the above mentioned problem has indeed been solved by the process of Claim 1.

- 5.2 It remains therefore to be decided whether, in view of the prior art, the claimed solution would have been obvious to persons skilled in the art.

Present Claim 1 differs from (1) in that in a first step porous particles are formed with a defined pore size distribution.

The general procedure for obtaining the sorption agent as set out in (1), column 4, lines 22 to 49, requires in a first step the forming of silicic acid filler particles which are then suspended in a silicic acid sol. As set out under paragraph 4.2 above, such particles have no defined pore size distribution. There is no indication for the forming of particles with a well defined pore size distribution with a mean pore size of 4 to 20 nm.

In the absence of any other prior art document disclosing a process for preparing an adsorbent by first forming particles with a well defined pore structure before they are mixed with a binding agent, the Board must conclude that the present solution to the said problem would not have been obvious to persons skilled in the art.

5.3 For these reasons the process of Claim 1 of the main request involves an inventive step.

Since the dependent Claims 2 and 3 relate to particular embodiments of Claim 1, the same applies to said claims.

Since the main request is allowed, there is no need to consider the auxiliary requests.

Order

For these reasons it is decided that:

1. The appeal is dismissed.
2. The case is remitted to the first instance with the order to maintain the patent on the basis of the main request submitted during oral proceedings.

The Registrar:

The Chairman:

E. Görgmaier

P. A. M. Lançon