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**Datasheet for the decision  
of 12 March 2024**

**Case Number:** T 2134/21 - 3.2.06

**Application Number:** 08169167.7

**Publication Number:** 2065297

**IPC:** B62M9/12

**Language of the proceedings:** EN

**Title of invention:**

Bicycle rear derailleur

**Patent Proprietor:**

SHIMANO INC.

**Opponent:**

SRAM Deutschland GmbH

**Headword:**

**Relevant legal provisions:**

EPC Art. 100(a), 56  
RPBA 2020 Art. 13(1)

**Keyword:**

Inventive step - main request (no) - auxiliary requests 1 to 3  
(no)

Late-filed documents D24 to D26 - admitted (yes)

**Decisions cited:**

**Catchword:**



**Beschwerdekammern**

**Boards of Appeal**

**Chambres de recours**

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Case Number: T 2134/21 - 3.2.06

**D E C I S I O N**  
**of Technical Board of Appeal 3.2.06**  
**of 12 March 2024**

**Appellant:** SRAM Deutschland GmbH  
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**Decision under appeal:** **Decision of the Opposition Division of the  
European Patent Office posted on 30 September  
2021 rejecting the opposition filed against  
European patent No. 2065297 pursuant to Article  
101(2) EPC.**

**Composition of the Board:**

**Chairman** M. Harrison  
**Members:** P. Cipriano  
W. Ungler

## Summary of Facts and Submissions

- I. The appellant (opponent) filed an appeal against the decision of the opposition division rejecting the opposition against European patent No. 2 065 297 (hereinafter "the patent"). It requested that the decision under appeal be set aside and the patent be revoked.
- II. With its reply, the respondent (patent proprietor) requested that the appeal be dismissed or, as an auxiliary measure, that the patent be maintained in amended form according to one of the set of claims of auxiliary requests 1 to 3 filed therewith.
- III. The following documents, referred to by the appellant in its statement of grounds of appeal, are relevant to the present decision:  
D3 US 6 350 212 B1  
D13 US 6 202 506 B1  
D24 EP 1 746 020 A2 and its US family member D26 US 2007/0021247 A1  
D25 US 4 618 333
- IV. The Board issued a summons to oral proceedings and a subsequent communication under Article 15(1) RPBA containing its provisional opinion, in which it indicated *inter alia* that inventive step would require discussion.
- V. Oral proceedings were held by videoconference before the Board on 12 March 2024.

At the close of the proceedings, the requests of the parties remained unchanged.

- VI. Claim 1 of the main request reads as follows (feature breakdown as used in item 14 of the decision):
- "1.0 A bicycle rear derailleur (12) comprising:
- 1.1 a base member (16);
  - 1.2 a linkage assembly movably coupled to the base member (16);
  - 1.3 a movable member (22) movably coupled to the linkage assembly,
  - 1.4 the movable member (22) including
    - 1.4a a resin main body (40),
    - 1.4b a metallic coupling member (42) fixed to the resin main body (40) and
    - 1.4c a pivot axle (51)
    - 1.4d having a first end (51a) coupled to the metallic coupling member (42); and
  - 1.5 a chain guide (24)
    - 1.5a pivotally coupled to a second end (51b) of the pivot axle (51) of the movable member (22);
- characterized in that
- 1.6 the metallic coupling member (42) includes a plurality of projections (42b) embedded within the resin main body (40)."
- VII. Claim 1 of auxiliary request 1 differs from claim 1 of the main request in that the following feature is appended at the end of the claim:
- "the metallic coupling member (42) including a threaded bore (42a) with the pivot axle (51) threadedly engaged with the threaded bore (42a) of the metallic coupling member (42)."
- VIII. Claim 1 of auxiliary request 2 differs from claim 1 of the main request in that the following features are appended at the end of the claim:

"the resin main body (40) including at least one first pivot hole (40a) with a first metal reinforcement (44) and at least one second pivot hole (40b) with a second metal reinforcement (44); and the linkage assembly including a first link (18) pivotally attached to the resin main body (40) via a first pivot pin (46) disposed in the first pivot hole (40a) of the resin main body (40), and including a second link (20) pivotally attached to the resin main body (40) via a second pivot pin (46) disposed in the second pivot hole (40b) of the resin main body (40)."

IX. Claim 1 of auxiliary request 3 is a combination of the features of claim 1 of the main request with the added features in both auxiliary requests 2 and 3.

X. The appellant's arguments relevant to the present decision may be summarised as follows:

*Main request - inventive step*

The subject-matter of claim 1 of the main request did not involve an inventive step.

D3 disclosed all the features of claim 1 with the exception of the features 1.4a, 1.4b, 1.4d and 1.6.

The objective problem to be solved when starting from D3 was to reduce the weight and/or the manufacturing costs of the movable member of the bicycle rear derailleur without impairing the durability of the mounting of the pivot axle to the movable member.

It was obvious to the skilled person to change the material of the movable member to plastics since this was a general trend in the bicycle sector.

Couplings between metallic and plastic parts were known from the prior art in general and in other bicycle parts, such as in D13. The skilled person would therefore have immediately recognized how to make the coupling between a plastic main body and metallic pin.

*Auxiliary request 1 - inventive step*

The subject-matter of claim 1 of auxiliary request 1 did not involve an inventive step.

The features added to claim 1 of auxiliary request 1 concerning a threaded coupling would inevitably have resulted from the addition of a metallic bushing used to couple the pivot axle to the main body.

*Auxiliary request 2 - inventive step*

The subject-matter of claim 1 of auxiliary request 2 did not involve an inventive step.

D24 disclosed the features added to claim 1 in auxiliary request 2 related to the metal reinforcements in the pivot hole of the main body.

The skilled person, seeking to provide a more reliable connection to the resin main body, would have taken into consideration the teaching of D24 and modified the derailleur of D3 to arrive at the subject-matter of claim 1 without exercising an inventive step.

*Auxiliary request 3 - inventive step*

The subject-matter of claim 1 of auxiliary request 3 was merely a combination of auxiliary requests 1 and 2

and therefore did not involve an inventive step for the same reasons as the previous requests.

XI. The respondent's arguments relevant to the present decision may be summarised as follows:

*Main request - inventive step*

The subject-matter of claim 1 of the main request involved an inventive step.

D3 did not disclose the features 1.4a, 1.4b, 1.4d and 1.6 of claim 1.

The objective problem proposed by the appellant contained pointers to the solution. The objective problem should have been to reduce the weight of the bicycle's rear derailleur without impairing its performance and durability.

Even if the replacement of metal by plastics to save weight was known to the skilled person, a resin was more specific than plastic.

Furthermore, the skilled person would have to perform several steps in order to arrive at the subject-matter of claim 1, there being no indication of such steps in the prior art.

*Auxiliary request 1 - inventive step*

The subject-matter of claim 1 of auxiliary request 1 involved an inventive step.

The use of a thread in the coupling member, as defined in claim 1 of auxiliary request 1, was only one of the



numerous types of inserts from which the skilled person could choose, such that the skilled person had no motivation to choose this one specifically.

*Auxiliary request 2 - inventive step*

The subject-matter of claim 1 of auxiliary request 2 involved an inventive step.

Documents D24, D25 and D26 should not be admitted into the proceedings since claim 1 was only a combination of granted claims which should already have been dealt with in the notice of opposition.

If the documents were admitted, the additional differing features were not known from D24 or D26, each of which disclosed a different link configuration than D3. The skilled person would not perform all the necessary modifications to arrive at the subject-matter of claim 1 in an obvious manner.

*Auxiliary request 3 - inventive step*

The subject-matter of claim 1 of auxiliary request 3 involved an inventive step.

The combination of the added features of auxiliary requests 1 and 2 into claim 1 of auxiliary request 3 was not obvious.

## **Reasons for the Decision**

1. Main request - Inventive step
  - 1.1 It was not contested that D3 disclosed all the features of claim 1 with the exception of the features 1.4a, 1.4b, 1.4d and 1.6.
  - 1.2 The provision of a resin main body as defined in feature 1.4a results in a lighter movable member and consequently whole rear derailleur, but the metallic coupling member defined in features 1.4b, 1.4d and 1.6 of claim 1 ensures that the pivot axle connection to the movable member made of resin is reliable in the long term.
  - 1.3 The respondent argued that the differing features allowed the weight of the rear derailleur to be reduced without compromising its performance and durability but the Board cannot recognize any improvement in the rear derailleur's "performance" apart from that resulting from its weight reduction and increase in durability. The respondent also did not argue that there were any other specific improvements in performance.
  - 1.4 The respondent also argued that the differing features allowed a reduction in the manufacturing costs but the Board does not accept this argument. Whilst it is true that resins may often be cheaper than metals and that injection moulding may benefit from economies of scale, claim 1 does not define, and D3 does not disclose, any specific material or manufacturing method for the movable member. In addition to D3, the rear derailleur

of claim 1 further defines a metallic coupling member embedded within the resin main body. From the definition of this further component and its arrangement, the skilled person cannot infer whether the derailleur of claim 1 would be cheaper to manufacture than the one of D3.

1.5 Consequently the Board concluded that the objective technical problem to be solved when starting from D3 as the closest prior art would thus be to reduce the weight of the movable member of the bicycle rear derailleur without impairing its durability.

1.5.1 The respondent also argued that the reference to the movable member in the objective problem pointed to the solution but the Board is not persuaded by this argument. The problem does not point the skilled person to a change of material, which is the solution defined in claim 1.

1.6 A skilled person trying to reduce the weight of the movable member and using their common general knowledge would change the material of the movable member to resin as defined in feature 1.4a without exercising an inventive step. Resin materials constitute an obvious alternative to metal for the main body of a movable member which has already been used in plastic rear derailleurs of the prior art, as there is a general trend in the bicycle field to replace metallic pieces with plastic ones.

1.6.1 In this respect, the respondent argued that resin was more specific than plastics in general, as was explained in paragraph [0014] of the patent, which described a composite plastic material such as nylon with carbon fibers as a resin.

Again, the Board is not persuaded by this argument. In the first sentence of the same paragraph [0014] it is stated that "the movable member 22 basically includes a resin (non-metallic) main body 40 and a metallic coupling member or nut 42 fixed to the resin main body 40". The skilled person reading this sentence would understand that the bracketed term "non-metallic" explains the term "resin" immediately preceding it. Thus, in the context of the patent, a resin encompasses all non-metallic materials and consequently all plastics, not only specific ones such as nylon with carbon fibers.

- 1.7 When changing the material of the main body of the movable member of D3 to resin, the skilled person would then immediately recognize that the resin-metal threaded connection to the pivot axle would not be particularly durable. The Board finds that it is well-known to the skilled person to use a metal threaded bushing (which corresponds to a metallic coupling member having projections as defined in claim 1) embedded in the soft plastic material instead of making the thread directly in the plastic in order to make the connection between the axle pivot and the resin main body durable.

Such a metallic bushing is also disclosed, merely for example in D13, (see e.g. Figure 6), where it has already been used in the bicycle field.

Although in D13 it is used in a different component of the bicycle (i.e. the pedal crank), the skilled person would recognize that both threaded connections are subject to high forces affecting their durability and

would therefore also apply this solution to the pivot axle of the chain guide to solve the objective problem.

1.8 The respondent argued that the skilled person faced with the objective problem would have to perform a series of steps for which there is no motivation. The skilled person would have to change the material to resin, choose a way of connecting the pivot axle to the chain guide, choose a way of fixing the pivot axle to the main body and finally solve the problems of implementation. It further argued that the prior art did not provide any incentive for the skilled person to perform all these steps without hindsight knowledge of the invention.

1.8.1 The Board is not convinced by this argument. Firstly, the skilled person would contemplate modifying the closest prior art derailleur of D3 as little as possible to solve the objective problem. There seems to be no reason why the skilled person would need to reconsider whether the pivot axle should be fixed to the chain guide or to the main body of the movable member. D3 already discloses a working arrangement for pivoting the chain guide and switching the material of the main body to resin does not change this.

1.8.2 Secondly, even if the person skilled in the art would have to carry out further steps in order not to impair the durability of the resin main body of the movable member, the mere existence of more than one step to arrive at the claimed solution does not render it inventive. If each individual step is obvious to the skilled person in terms of what they have achieved so far and what remains for them to do, the solution is obvious to the skilled person on the basis of the prior art, even if two or more such steps are required (see

also e.g. Case Law of the Boards of Appeal, 10<sup>th</sup> edition 2022, I-D.9.21.10).

- 1.8.3 Thirdly, and following the respondent's arguments, it may well be that there are other possibilities known to the skilled person other than changing the material to reduce the weight and using a metal threaded bushing to retain the durability. However, if the person skilled in the art only has to choose between well-known possibilities, it is sufficient that the one defined in claim 1 is obvious and not necessarily relevant that there are other possible solutions.

The respondent argued specifically that, since there were other possibilities, the skilled person *could* follow the solution defined in claim 1, but there was no indication that *would* lead the skilled person to choose exactly this solution. The Board is again not persuaded by this argument. The fact that there are other options has no bearing on the obviousness of one specific option (see e.g. Case Law of the Boards of Appeal, 10<sup>th</sup> edition 2022, I-D.9.21.9b)) among other obvious ones. If all options are equally applicable, then the invention merely results in an obvious and consequently non-inventive selection among a number of known possibilities.

- 1.9 The respondent argued that even if it were well-known for the skilled person to use a metal threaded bushing, the skilled person would apply the bushing along the whole cavity, thereby making a through hole as was taught in D13 and which was notorious in the prior art. In addition, the respondent noted that D12, part 13, chapter 5.4.2, page 2, taught against (over)moulding such bushings into plastic elements.

1.9.1 The Board, however, does not accept these arguments. Firstly, D13, Figure 6, shows not only a bushing applied in a through hole to fix a pedal crank but also a further, smaller, threaded bushing applied in a blind hole to specifically reinforce the thread fixation of the gear ring 14 to the crank.

Furthermore, as already explained above in 1.8.1, the skilled person would contemplate modifying the closest prior art derailleur of D3 as little as possible in order to solve the objective problem. The skilled person knows that to reinforce the connection of the pivot axle to the main body they do not need to extend the insert to the remainder of the cavity to reinforce that as well, but just to make the threaded section of metal instead of resin.

The skilled person taking the teaching of D13 into consideration would therefore not apply a metal threaded bushing to the entire cavity, since that would be simply a waste of material. For completeness it may be noted that even if this were a possibility, such a bushing would anyway still correspond to the metallic coupling member defined in claim 1.

1.9.2 Regarding the moulding process, the Board notes that claim 1 does not specify a particular process for embedding the metallic coupling member. In addition, D12 mentions that overmoulding may prolong the machine cycle but also that a subsequent insertion (of the coupling member, in our case) would then not be required. This is simply a statement of the advantages and disadvantages of using such a process to connect inserts with plastic and that such would not deter the skilled person from using overmoulding, and even less so the more general embedding as defined in claim 1.

1.10 It follows therefore that, when starting from the rear derailleur of D3, the skilled person trying to reduce the weight of the movable member of the rear derailleur without impairing its durability would use their common general knowledge and change the material of the movable member to resin to save weight and use a metallic coupling member to fix the pivot axle in the way defined in claim 1 to avoid impairing durability, without exercising an inventive step.

1.11 The ground for opposition under Article 100(a) in combination with Article 56 EPC thus prejudices maintenance of the patent as granted. The main request is therefore not allowable.

2. Auxiliary request 1 - inventive step

2.1 Claim 1 of auxiliary request 1 differs from claim 1 of the main request in that the following feature has been added to claim 1:

"the metallic coupling member (42) including a threaded bore (42a) with the pivot axle (51) threadedly engaged with the threaded bore (42a) of the metallic coupling member (42)."

2.2 The respondent argued that most of the prior art in the bicycle field did not use threaded connections. It claimed that using a thread in the coupling member was one of the many types of inserts that the skilled person could choose from and, in addition, it allowed the skilled person to avoid any further modification to the movable member's main body.

The Board is not persuaded by this argument. The starting point for considering inventive step, namely



D3, already discloses a threaded connection between the pivot axle and the main body. When changing the material of the main body and using a metallic coupling member, there would be no reason for the skilled person to consider changing the type of connection from the one already used in the closest prior art D3 when adopting a coupling member as discussed above for the main request. The Board also finds that threaded connections are common in the bicycle field, as demonstrated in D13, Figure 6, which was previously discussed in regard to the main request. The Board cannot see how a threaded connection as defined in claim 1 would not inevitably result from adapting a metallic coupling member to the rear derailleur of D3, as discussed above for the main request. As noted by the respondent itself, this is the only option that does not require any further modification to the movable member's main body, which the Board regards not as an effect (since a threaded connection is already known from D3) but as a hint for what the skilled person would do.

- 2.3 It follows thus that, as for the main request, when starting from the rear derailleur of D3, the skilled person using a metallic coupling member to fix the pivot axle in the way defined in claim 1 would adopt a threaded bore without exercising an inventive step.
- 2.4 For these reasons, the subject-matter of claim 1 of auxiliary request 1 lacks an inventive step, contrary to the requirements of Article 56 EPC. Consequently auxiliary request 1 is not allowable.

3. Auxiliary request 2 - inventive step

3.1 Claim 1 of auxiliary request 2 differs from claim 1 of the main request in that the following features have been added to claim 1:

"the resin main body (40) including at least one first pivot hole (40a) with a first metal reinforcement (44) and at least one second pivot hole (40b) with a second metal reinforcement (44); and

the linkage assembly including a first link (18) pivotally attached to the resin main body (40) via a first pivot pin (46) disposed in the first pivot hole (40a) of the resin main body (40), and including a second link (20) pivotally attached to the resin main body (40) via a second pivot pin (46) disposed in the second pivot hole (40b) of the resin main body (40)."

3.2 The added features relating to the linkage assembly do not differentiate the inner/outer arrangement of the link joints and the holes in the main body from the linkage assembly disclosed in D3.

D3 discloses (see e.g. Figs. 2 and 3) a linkage assembly including a first link (arm 12 in D3) pivotally attached to the resin main body (the second body 9 in D3) via a first pivot pin (implicit from circle seen on the second body 9 in Figures 2 and 3) disposed in the first pivot hole (implicit) of the resin main body (second body 9 of D3), and including a second link (corresponding to arm 11 in D3) pivotally attached to the resin main body (second body 9 of D3) via a second pivot pin (hidden behind branch 14 in Figures 2 and 3 of D3 but visible in Figure 1) disposed in the second pivot hole (hidden behind branch 14 in

Figures 2 and 3 of D3 but visible in Figure 1) of the resin main body (second body 9 of D3).

- 3.3 However, D3 does not disclose the metal reinforcement features, i.e. that the first and second pivot holes of the resin main body (the second body 9 in D3) each have a metal reinforcement.
- 3.4 The metal reinforcements have the effect of reinforcing the hole and thus solve a different problem than the one discussed in the main request, i.e. they lack a common effect with the differing features discussed above. The (partial) objective problem solved by the metal reinforcement features is thus to improve the mechanical structural properties of the pivoting arrangement of the main body.
- 3.5 The respondent also argued that D24 to D26 should not be admitted into the proceedings since they were late filed in reply to auxiliary requests 2 and 3 of the respondent, which contained only combinations of granted claims.

The Board does not concur. The appellant initially filed D24 and D25 during the opposition proceedings, after the proprietor had filed its auxiliary requests. The proprietor submitted D26 (an English language family member of D24). The opposition division did not need to consider admitting the documents into the proceedings as it rejected the opposition and so there was no need to address this issue.

D24 and D25 were referred to again in these appeal proceedings in reply to the respondent's submission of its auxiliary requests in reply to the appellant's appeal grounds.

It is evident that the appellant could not anticipate which auxiliary requests the respondent might file in reply to its appeal and thus it was not necessary to refer to them again when filing its grounds of appeal (against the main request found allowable by the opposition division).

Although the appellant waited some 8 months before filing its response to these auxiliary requests, these documents were already known to the respondent from the opposition proceedings where they had been filed previously, together with substantiation as to their relevance for inventive step in regard to the same requests. Further, the communication under Article 15(1) RPBA had not been issued by the Board, such that the admittance of these documents is to be considered under Article 13(1) RPBA. Also, merely because the auxiliary requests were a combination of granted claims does not outweigh the substantiated and sufficiently early filing of these documents in the appeal proceedings, noting again here that the appellant could not know in advance which granted claims, if any, might be combined together to produce a new claim of an auxiliary request, if at all, in reply to the grounds of appeal.

D24 and D25 disclose linkage systems comprising pins and bushings in an arrangement similar to the one defined in claim 1. The *prima facie* relevance of these arrangements was also argued on page 29 *et seq* of the appellant's reply dated 27 February 2023 (in addition to having been argued during opposition proceedings). Absent any other documents containing these features, these documents are found also to be *prima facie* relevant to auxiliary requests 2 and 3.

Given the circumstances of the case, the Board thus exercised its discretion to admit these documents into the proceedings (Article 13(1) RPBA). Also, since the respondent referred to D26 in its submission of 21 August 2023 as being a family document of D24, and being a document which it had itself filed in opposition proceedings to assist its arguments, this document was also admitted.

- 3.6 The respondent argued that the additional differing features were not known from the prior art, since D24 (the respondent used D26, but the Board will use D24, which is from the same patent family but contains additional paragraphs and was the document used by the appellant) disclosed a different arrangement, in which the reinforcements ("Lagerbuchsen 3" in D24, bushings 3a and 3b in D26) were also located in the link holes and not in the resin main body.

In addition, the respondent argued that the linkage assembly in D24 had the link holes laterally outside the pivot hole in the main body, this being the opposite configuration to D3, which had a main body with one pivot hole on each side of the single link hole.

According to the respondent, since the aim of D24 was to provide a stable pivot mounting and this was achieved by placing the bushings as far apart as possible (see paragraphs [0004] and [0009] of D24), the skilled person would not change the position of the bushings to the inside when placing the metal reinforcement in the pivot hole of the main body of D3.

- 3.6.1 The Board does not find these arguments persuasive. Paragraph [0010] of D24 (n.b. this paragraph does not exist in D26) states that it is irrelevant whether the outer joint part is formed by the parallelogram element (i.e. the link) or by the main body. Thus, there is also a disclosure in D24 for a construction where the main body has two pivot holes surrounding the link, each one of them having a bushing, as in D3.
- 3.6.2 The skilled person seeking to improve the mechanical structural properties of the pivoting arrangement of the main body would derive from D24 that by placing the bushings as far apart as possible in the pivot holes of the main body in D3, this creates defined bearing surfaces and establishes a pivotal connection shielded from outside environmental influences and with less wear (see paragraphs [0004] and [0009] of D24).
- 3.6.3 Even if the simple provision of bushings might be considered to necessarily improve the strength of the holes, at least the avoidance of wear results in an improved durability and is thus also considered to be a reinforcing effect. Even if D24 does not specifically disclose a material for the bushings (as the respondent also argued) the Board finds that the skilled person would make the bushings from metal in D24, this being the most common and thus obvious material choice when trying to avoid wear and protection from outside environmental influences.
- 3.7 As discussed above, the Board notes that claim 1 does not define a different inner/outer arrangement for the link holes and the holes in the main body from the one in D3. Thus, even if the skilled person, combining D3 with the teaching of D24, would retain an arrangement as in D3 with two holes in the main body and a hole in

the link between them, which does not correspond to Figure 2 of the contested patent, such an arrangement is not excluded by the wording of claim 1.

3.8 It follows that, starting from the rear derailleur of D3, the skilled person seeking to solve the (partial) problem of improving the mechanical structural properties of the pivoting arrangement of the main body, and faced with the teaching of D24, would include metal reinforcements in the pivot holes without exercising any inventive step.

3.9 For these reasons, the subject-matter of claim 1 of auxiliary request 2 lacks an inventive step (Article 56 EPC). Consequently auxiliary request 2 is not allowable.

4. Auxiliary request 3 - Inventive step

4.1 Claim 1 of auxiliary request 3 is a combination of the features of claim 1 of auxiliary requests 1 and 2.

4.2 The respondent argued merely that the combination of the features of auxiliary requests 1 and 2 in claim 1 of auxiliary request 3 was not obvious but the Board cannot recognize any specific reason as to how, when using the problem-solution approach, by the simple combination of the features of the auxiliary requests it could come to a different set of conclusions than the ones already reasoned above for each request individually, not least since the features added in each of auxiliary requests 1 and 2 respectively have no common structural elements (nor was it argued that they did).

- 4.3 For this reason, the subject-matter of claim 1 of auxiliary request 3 lacks an inventive step (Article 56 EPC). Consequently auxiliary request 3 is not allowable.
5. Absent any set of claims complying with the requirements of the EPC, the patent has to be revoked.

## Order

### For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The patent is revoked.

The Registrar:

The Chairman:



D. Grundner

M. Harrison

Decision electronically authenticated