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Datasheet for the decision of 11 November 2020

Case Number: T 1783/16 - 3.2.05

Application Number: 10015327.9

Publication Number: 2460637

IPC: B29C45/16, H01H33/66

Language of the proceedings: EN

Title of invention:
A push rod of a vacuum interrupter and method of manufacturing the same

Patent Proprietor:
ABB Schweiz AG

Opponent:
Siemens Aktiengesellschaft

Headword:

Relevant legal provisions:
EPC Art. 54, 56
RPBA Art. 12(4)

Keyword:
Novelty (yes)
Inventive step (yes)

Decisions cited:
T 0410/99

Catchword:

Europäisches Patentamt
European Patent Office
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Beschwerdekammern

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Case Number: T 1783/16 - 3.2.05

D E C I S I O N
of Technical Board of Appeal 3.2.05
of 11 November 2020

Appellant: (Opponent)	Siemens Aktiengesellschaft Werner-von-Siemens-Straße 1 80333 München (DE)
Representative:	Siemens AG Postfach 22 16 34 80506 München (DE)
Respondent: (Patent Proprietor)	ABB Schweiz AG Brown Boveri Strasse 6 5400 Baden (CH)
Representative:	Maiwald Patent- und Rechtsanwaltsgesellschaft mbH Elisenhof Elisenstraße 3 80335 München (DE)
Decision under appeal:	**Decision of the Opposition Division of the European Patent Office posted on 25 May 2016 rejecting the opposition filed against European patent No. 2460637 pursuant to Article 101(2) EPC.**

Composition of the Board:

Chairman	P. Lanz
Members:	B. Spitzer
	C. Brandt

Summary of Facts and Submissions

I. The opponent appealed against the decision of the opposition division rejecting the opposition filed against the European patent No. 2 460 637.

II. The oral proceedings before the board of appeal were held by video conference on 11 November 2020.

III. The appellant (opponent) requested that the decision under appeal be set aside and that the European patent be revoked.

The respondent (patent proprietor) requested as a main request that the appeal be dismissed or, as an auxiliary measure, that the decision under appeal be set aside and the patent in suit be maintained on the basis of the claims of any of the auxiliary requests 1 or 2 filed together with the reply to the statement setting out the grounds of appeal dated 3 February 2017.

IV. The following documents were cited in the appeal proceedings:

E1: EP 1 999 768 B1
E2: EP 1 367 616 A1
E5: DE 34 45 359 A1
E6: DE 101 44 438 C1
E7: Lehrbuch der Hochspannungstechnik, G. Lesch, herausgegeben von E. Baumann, 1959, Springer-Verlag ISBN: 978-3-642-50200-2

V. Claim 1 as granted (main request) has the following wording:

"Method (600) of manufacturing a push rod (100) for switching a vacuum interrupter, wherein the method (600) comprises the step of:
- Moulding (601) the push rod (100) with a plastic material, wherein the push rod (100) comprises a core component (101) adapted for receiving a spring element (203), characterized in that the moulding step (601) comprises the steps of:
- Moulding (701) the core component (101) of the push rod (100) with a first plastic material;
- Embedding (702) the first plastic material of the core component (101) with a second plastic material thereby forming a rod component (102) of the push rod (100) embedding the core component (101)."

Claim 4 as granted (main request) has the following wording:

"Push rod (100) for switching a vacuum interrupter, characterized in that the push rod (100) comprises:
- a core component (101) comprising a first plastic material;
- a rod component (102) comprising a second plastic material;
wherein the core component (101) is embedded in the rod component (102) thereby forming the push rod (100)."

VI. With respect to the main request, the appellant essentially argued as follows:

Novelty

The subject-matter of claim 4 was not new vis-à-vis document E1, which disclosed a push rod (10) for switching a vacuum interrupter (5) comprising a core component (12) and a rod component (10), the core component (12) being embedded in the rod component (10). Although the plastic material for the core and the rod components was not explicitly mentioned in document E1, it was implicitly disclosed.

The "Isolierkörper 11" of document E1 corresponded to the rod component (102) of the patent in suit. Plastics were generally known as insulating materials. In addition, there were only a few options for insulating materials, among them glass, ceramics and plastics. Glass and ceramics were not suitable due to the mechanical stress. Further evidence for the use of plastics was the term "eingegossen" used in column 3, lines 27 and 28, of document E1. With this knowledge, the skilled person would inevitably understand that part 11 of document E1 was made of plastics. As the core component of document E1 was embedded in the rod component, it was equally made of plastics.

Reference was made to the Case Law (see Case Law of the Boards of Appeal of the European Patent Office, 9th edition 2019, I.C.4.1), especially to decision T 410/99 where it was concluded that a prior art disclosure was novelty-destroying if it directly and unambiguously disclosed the subject-matter in question, account also being taken of a skilled person's common general

knowledge at the publication date of the prior art document.

Inventive step

The subject-matter of claims 1 and 4 lacked an inventive step over document E1 in combination with the common general knowledge. The objective technical problem was to choose appropriate materials for the rod and the core component.

The rod component corresponded to the "Isolierkörper 11" and the core component to the "eingegossenes Gehäuseteil 12" of document E1. The skilled person would choose plastics for the rod component. Document E2 disclosed that the "Antriebselement 17", which was comparable in its insulating function to the "Isolierkörper 11" of document E1, was made of a glass-fibre reinforced plastic (see document E2, column 4, lines 37 to 41). The skilled person would use the same material for the rod and the core components. The core component was embedded in the rod component, and the formation of cracks due to the different thermal expansion of different materials had to be avoided. Thus, metal was not a suitable material for the core. Even if adjusting the thermal expansion coefficient of the plastic material of the rod component to a metal core component were possible, this would be too complex. The two-piece structure was not a consequence of the use of different materials but of the pre-assembling of the parts.

For demonstrating the common general knowledge, document E7 was cited which revealed that plastics had been used in the field of high-voltage technology for a long time. Document E7 identified different groups of

materials for insulating purposes. Of these, plastics were preferred due to their ease of handling compared, for instance, to the other groups listed in the table on page 277 of document E7.

The production costs were a further reason for the skilled person to consider a similar material for the rod and the core components and, therefore, to use a plastic material also for the core component.

The presence of a metal spring inside the core component would not negatively influence the core being made of plastics. The thermal expansion of the metal spring would merely raise the preload of the spring. Possible wear could be considered in advance.

These reasons applied to the subject-matter of claims 1 and 4, which was not inventive over of a combination of document E1 and the common general knowledge.

VII. The respondent's submissions regarding the main request were essentially as follows:

Novelty

The subject-matter of claim 4 was new because document E1 did not disclose the materials for the rod and the core components, neither explicitly nor implicitly. A disclosure was just implicit if it was directly and unambiguously derivable. This was not the case for document E1. The appellant did not prove that there was no alternative to the use of plastic for the rod and the core components.

Inventive step

The subject-matter of claims 1 and 4 was inventive with respect to the cited prior art, even considering the newly filed documents E5 to E7. There was agreement between the parties on the distinguishing features and the objective technical problem. As none of the prior art documents disclosed a core component made of plastic and as documents E5 to E7 did not represent the common general knowledge in this regard, the subject-matter of claims 1 and 4 was not obvious. Finally, the core component was not necessarily made of an insulating material because the rod component 11 already served as an insulating body. Thus, there was no hint to use the same material for the rod and the core component.

Reasons for the Decision

1. Main request - Novelty

1.1 According to established case law, it is a prerequisite for the acceptance of lack of novelty that the claimed subject-matter be "directly and unambiguously derivable from the prior art". In other words, it has to be "beyond doubt – not merely probable – that the claimed subject-matter was directly and unambiguously disclosed in a patent document" (see Case Law of the Boards of Appeal of the European Patent Office, 9th edition 2019, I.C.4.1).

1.2 In applying these principles to the case at hand, the subject-matter of claim 4 is new vis-à-vis document E1. Document E1 discloses neither the material of the core

nor the rod component. Document E1 generally mentions that the rod component (11) is made of an insulating material but does not specify the material (see paragraph [0013]). Since there are several insulating materials known in the art, such as plastics, ceramics and glass, there is no direct and unambiguous disclosure of a rod component made of moulded plastic.

1.3 Even taking into account the common general knowledge of the skilled person, the subject-matter in question has to be disclosed in a direct and unambiguous manner (see T 410/99). The board agrees with the appellant that the use of plastics as insulating materials is generally known. However, plastics are not the only option in the present case, and the use of glass or ceramics for the rod component is not excluded per se. Nor does the term "eingegossen" used in column 3, lines 27 and 28, of document E1 prompt the skilled person to use only plastics. Thus, it is not a one-way situation as argued by the appellant. The claim features of the rod and the core components being both made of plastic material are thus neither explicitly nor implicitly disclosed in document E1.

1.4 Consequently, the subject-matter of claim 4 is new vis-à-vis document E1.

2. Admittance of documents E5, E6 and E7

The admission of documents E5, E6 and E7 is governed by Article 12(4) RPBA 2007, which applies in view of the transitional provisions codified in Article 25(2) RPBA 2020. In accordance with these provisions, the non-admission of documents that could have been submitted in the first-instance proceedings into the appeal proceedings is at the discretion of the board.

According to established case law, the filing of new facts and evidence before the board is normally considered to be made in due time if it is an appropriate and immediate response to developments in the previous proceedings. Hence, an appellant who has lost opposition proceedings could be given the opportunity to fill the gaps in its arguments by presenting further evidence in this regard (see cases cited in Case Law of the Boards of Appeal of the European Patent Office, 9th edition, 2019, V.A. 4.13.1 a)).

In applying these principles to the case in hand, the board notes that under point 3.4 of the decision under appeal, the opposition division reasoned that the appellant's assertion that "plastic materials belong to the common general knowledge was not backed by documentary evidence, for example a textbook, even though it was contested by the proprietor". Before the decision under appeal was issued, no preliminary opinion on inventive step was given by the opposition division. Hence, the appellant had received no indication from the opposition division that the evidence regarding the alleged common general knowledge was insufficient. Under these circumstances, submitting further evidence on this issue at the beginning of the appeal proceedings is considered an immediate and appropriate response to the decision under appeal.

In the light of the above, the board holds documents E5 to E7 admissible under Article 12(4) RPBA 2007.

3. Main request - Inventive step

3.1 Starting from document E1, it does not disclose that the core component is moulded of a first plastic material and that the rod component is formed of a second plastic material. According to the patent in suit, on the basis of these differences, the technical effect is to provide an improved, simple and efficient method of manufacturing a push rod with an improved dielectric strength and having a lighter weight (see paragraphs [0006] and [0014]). Accordingly, the objective technical problem is to choose appropriate materials for the rod and the core component. This is undisputed by the parties.

3.2 The use of plastic material as an insulating material in high-voltage engineering is generally known (see e.g. documents E2, E6 and E7). The core issue is whether - starting from document E1 - it is obvious that both the core component 12 and the rod component 11 are made of plastic.

As stated above, document E1 discloses that the rod component 11 is electrically insulating but does not hint at a specific material - neither plastics nor ceramics. Even if the skilled person considered using plastic for the rod component in view of the term "eingegossen" (see paragraph [0013] of document E1), which could hint at injection moulding, and because of its insulating properties, this would still leave open the selection of the material for the core component, for which for example metal or plastic could be used.

3.3 Furthermore, the other documents cited by the appellant do not contain any suggestion that a plastic material

should be chosen for the core and the rod components.

Document E2 teaches the use of a drive element ("Antriebselement 17") made of glass-fibre reinforced plastic (see column 4, lines 37 to 41). As the drive element of document E2, in view of its insulating function, rather corresponds to the rod component 11 of document E1, the skilled person would possibly choose a plastic material for the rod component 11. However, the core component 12 of document E1 does not have a corresponding part in document E2 so no teaching regarding its material can be derived from it.

Document E5 discloses a push rod made of an insulating material without mentioning plastics. Therefore, document E5 does also not prompt the skilled person to use plastics for the core and the rod components of document E1.

Document E6 discloses a switch rod made of plastic. However, the switch rod of document E6 does not comprise a rod and a core component. Consequently, document E6 cannot suggest to use plastic for a core and a rod component of the push rod of document E1.

Finally, document E7 is a textbook concerned with the properties and use of plastics in high-voltage engineering. This textbook demonstrates the advantages of plastics as insulating material. However, since the core component of document E1 does not necessarily need to have insulating properties, this general teaching does not lead the skilled person to use plastics for both the core and the rod component of the push rod of document E1.

3.4 The appellant's argument that the skilled person would choose the same material for the rod and the core component to avoid the formation of cracks due to different thermal expansion for different materials did not convince the board. As the appellant admitted, the thermal expansion coefficient of plastics can be adjusted within a wide range. Thus, in the arrangement of document E1, a rod component made of plastics could be combined with a core component made of metal. Moreover, in view of the term "eingegossen" used in document E1 (see paragraph [0013]), the fact that the core component need not be insulating and given the presence of a (metal) spring inside the core element, the skilled person would seriously consider using metal for the core component. For these reasons, the appellant's assertion that the skilled person would use plastics for both the core and the rod component of the push rod of document E1 is based on an *ex-post facto* analysis.

3.5 Consequently, the subject-matter of claim 1 involves an inventive step within the meaning of Article 56 EPC.

3.6 The reasons set out above for claim 1 also apply, *mutatis mutandis*, for claim 4.

The subject-matter of claim 4 thus equally involves an inventive step within the meaning of Article 56 EPC.

4. As none of the grounds for opposition prejudices the maintenance of the patent, the opponent's appeal has to be dismissed.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

N. Schneider P. Lanz

Decision electronically authenticated