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**Datasheet for the decision  
of 31 January 2022**

**Case Number:** T 2420/18 - 3.5.02

**Application Number:** 08878650.4

**Publication Number:** 2374190

**IPC:** H02H3/087, H02H7/122, H02J1/10,  
H02J3/38

**Language of the proceedings:** EN

**Title of invention:**  
System and method for protection in power installations

**Patent Proprietor:**  
Solaredge Technologies Ltd.

**Opponent:**  
SMA Solar Technology AG

**Relevant legal provisions:**  
EPC Art. 123(2), 123(3), 56  
RPBA Art. 12(4)

**Keyword:**

Amendments - main request - auxiliary request 1 - extension  
beyond the content of the application as filed (yes) -  
auxiliary request 6 - broadening of claim (no)  
Inventive step - auxiliary request 6 - (yes)  
Late-filed request - auxiliary requests 2 to 5 could have been  
filed in first instance proceedings (yes)



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Case Number: T 2420/18 - 3.5.02

**D E C I S I O N**  
**of Technical Board of Appeal 3.5.02**  
**of 31 January 2022**

**Appellant:** Solaredge Technologies Ltd.  
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**Appellant:** SMA Solar Technology AG  
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**Decision under appeal:** **Interlocutory decision of the Opposition  
Division of the European Patent Office posted on  
19 July 2018 concerning maintenance of the  
European Patent No. 2374190 in amended form.**

**Composition of the Board:**

**Chairman** R. Lord  
**Members:** H. Bronold  
A. Bacchin

## **Summary of Facts and Submissions**

- I. The appeals of the patent proprietor and of the opponent are against the decision of the opposition division concerning the maintenance of European patent No. 2 374 190 in amended form according to the then auxiliary request 12 containing only a single independent method claim which corresponds to granted claim 12.
  
- II. The appellant I (patent proprietor) requested that the decision under appeal be set aside and that the patent be maintained in amended form on the basis of the main request filed with letter of 30 August 2019, or on the basis of one of the auxiliary requests 1 to 5 filed with the same letter, or on the basis of the auxiliary request 6 filed with letter dated 28 November 2018, or on the basis of the auxiliary request 6A filed with letter of 12 April 2019. The appellant I clarified that auxiliary request 6 was to be understood as a request to dismiss the appeal of the opponent.
  
- III. The appellant II (opponent) requested that the decision under appeal be set aside and that the European patent No. 2 374 190 be revoked. If one of the auxiliary requests 1 to 5 were admitted and deemed not to contravene Article 123(2) EPC, the appellant II additionally requested that the case be remitted to the opposition division.
  
- IV. The following documents cited during the proceedings before the opposition division are relevant for this decision:

E1 : DE 20 2007 002 077 U1

E3 : WO 2007/048421 A2

V. Claim 1 according to the main request reads as follows:

" A distributed power system comprising:  
a plurality of direct current, DC, power modules (405a-d, 505a-d) providing a DC output;  
an inverter (404, 504) coupled to said DC power modules and converting input power received on the DC output from said DC power modules to provide output power to an electrical load; and  
**characterized in that** the system comprises  
a protection mechanism configured to cease said input power on the DC output when said inverter stops producing said output power;  
a switch (403) disposed between the power modules and the inverter; and  
a monitoring and detection mechanism (401) configured to activate the switch when the monitoring and detection mechanism detects an electrical parameter of the load to be out of a predetermined specification."

Claims 2 to 6 are dependent on claim 1.

Independent method claim 7 is, apart from changes in the reference numbers in the preamble, identical to granted claim 12 and reads as follows:

"A method of operating a distributed power system including a plurality of direct current (DC) power modules (405a-d, 505a-d) connected in a serial string, and an inverter (404, 504) having an input coupled to said DC power modules and an output coupled to a load, so as to convert input power received from said DC

power modules and provide output power to the load, the method comprising:

monitoring operation of the inverter **[feature 14]**;

monitoring at least one electrical parameter of the load **[feature 15]**;

stopping production of the output power when said at least one electrical parameter is out of a predetermined specification **[feature 16]**;

activating a switch (403) **[feature 17]** disposed between the power modules and the inverter **[feature 17a]** when production of the output power is stopped **[feature 17b]**;

sensing a change in current flowing through the serial string in response to activating said switch **[feature 18]**; and

shutting down the input power from said DC power modules when the change in current flowing through the serial string is sensed **[feature 19]**." (references inserted by the board)

VI. Claim 1 according to auxiliary request 1 also contains the disputed feature 17a that the switch (403) is "disposed between the power modules and the inverter" in identical manner as in claim 1 according to the main request.

VII. In view of the board's decision under Article 12(4) RPBA 2007 not to admit auxiliary requests 2 to 5 into the proceedings, their wording is not presented here.

VIII. The single claim according to auxiliary request 6 corresponds to independent method claim 7 according to the main request (which corresponds to granted claim 12 as set out above under point V. above).

- IX. Given the tenor of the present decision, it is also not necessary to cite the wording of auxiliary request 6A here.
- X. The patent proprietor's arguments, as far as they are relevant for this decision, can be summarised as follows:

*Main request - Article 123(2)EPC*

Claim 1 did not contravene Article 123(2) EPC. For the claimed distributed power system it was not essential that the power modules are coupled in at least one serial string. Support for this was to be found in paragraphs [0031] to [0034] and [0049] of the originally filed specification. From the description it followed that the invention was not even limited to photovoltaic systems. The provided embodiments merely represented non-limiting examples. Paragraph [0049] explicitly stated that a single serial string was shown for simplicity only. Thus, serial strings were merely optional. Further, originally filed claim 1 did not contain serial strings. The problem underlying the invention was to realise safety benefits. These were independent from the manner in which the power modules are coupled. Therefore, removal of the feature "serial string" from the independent claim fulfilled the three point essentiality test.

*Auxiliary request 1 - Article 123(2) EPC*

Claim 1 according to auxiliary request 1 was further limited in that all power modules were shut down. For this and the reasons presented regarding the main request, claim 1 according to auxiliary request 1 did not contravene Article 123(2) EPC either.

*Auxiliary requests 2 to 5 - Article 12(4) RPBA 2007*

Auxiliary requests 2 to 5 were filed at the earliest possibility, namely with the statement of grounds of appeal. Prior to the oral proceedings before the opposition division, the proprietor did not need to file corresponding requests, because the opposition division had issued a positive opinion regarding the omission of serial strings in the independent apparatus claim. The main discussion before the first instance was about excluding variants 2 to 4 from the claims. The proprietor had therefore filed auxiliary requests 10 to 12 during the first instance oral proceedings in order to overcome the opposition division's objection.

*Auxiliary request 6*

*Article 123(3) EPC*

The method and apparatus claims of the patent were to be interpreted completely independently. Therefore, the method claim was neither explicitly nor implicitly restricted by the scope of the co-existing apparatus claim. Moreover, paragraph [0034] of the description as amended during the opposition proceedings was directed to the claimed method and defined a corresponding apparatus environment with respect to which the claimed method had to be carried out.

*Article 56 EPC*

It was inadmissible to use the disclosure of the patent as proof of common general knowledge. Even if the skilled person would have replaced the manual switch 10 of E1 with the circuit 60 of E3, such a combination

would not have resulted in the claimed method. According to the claimed method, the switch (corresponding to switch 9 in E1) was opened first. Only thereafter was the string current sensed. This was however impossible with the combination of E1 and E3 as presented by the opponent. If the switch 9 of E1 was opened, it was not even possible any more for the circuit 60 to sense the string current. Therefore, the combination of E1 and E3 did not render the subject-matter of claim 1 obvious.

- XI. The opponent's arguments, as far as they are relevant for this decision, can be summarised as follows:

*Main request - Article 123(2) EPC*

The switch now claimed in independent claim 1 was disclosed in the original description only in the context of power modules coupled in a serial string. Original claim 4 disclosed the switch exclusively in combination with at least one serial string. Paragraphs [0031] to [0034] were void of any technical content and merely meant that the described invention could be applied to alternatives. Hence they cannot provide a basis for the removal of the feature "serial". Paragraph [0049] explicitly referred to the only embodiment including the claimed switch. In this embodiment, the power modules were coupled in a serial string. A single serial string was still a serial string. The connection in a serial string further determined the control technique because in the case of a serial string, the current could be used as the feature common to all power modules. The three-point-test was not applicable when determining original

disclosure for a feature. The gold standard had to be applied instead.

*Auxiliary request 1 - Article 123(2) EPC*

Claim 1 according to auxiliary request 1 also comprised feature group 5 in an identical manner as in claim 1 according to the main request. Therefore, claim 1 according to auxiliary request 1 also contravened Article 123(2) EPC.

*Auxiliary requests 2 to 5 - Article 12(4) RPBA 2007*

Auxiliary requests 2 to 5 were filed late in the sense of Article 12(4) RPBA 2007. The corresponding objection under Article 100(c) EPC against claim 1 of the granted patent had already been raised in the notice of opposition. The preliminary opinion of the opposition division, giving a positive view in this regard, was not binding. Therefore, the patent proprietor should have filed a request dealing with the opponent's Article 123(2) EPC objection already during the first instance proceedings.

*Auxiliary request 6*

*Article 123(3) EPC*

The method claim of auxiliary request 6 had to be interpreted in the light of the granted apparatus claims. The method would have been carried out in the context of such an apparatus. According to Article 69 EPC, the claims had to be interpreted in the light of the description and drawings when determining the scope of protection. The granted invention was previously defined by a combination of apparatus and method

claims. Since the apparatus claims were now deleted and the description had been amended such that none of the described apparatus claims limited the method claim any more, the scope of protection of the remaining method claim had been extended. Thus, auxiliary request 6 contravened Article 123(3) EPC.

*Article 56 EPC*

Features 14 to 16 of the claim according to auxiliary request 6 were mandatory features for any distributed power system. This followed even from paragraphs [0002] to [0005] of the contested patent. Thus, these features belonged to the common general knowledge of the person skilled in the art. Feature 17b was disclosed in E1 according to which switch 9 was kept closed by current from inverter 12. Thus, if the inverter stopped working, the switch was opened. The subject-matter of claim 1 therefore only differed from E1 by features 18 and 19. Claim 1 did not specify on which side of the switch the current had to be measured. Circuit 60 according to E3 measured the string current and shut down the power production when the current was outside a predetermined specification. The person skilled in the art would replace the manually driven switch 10 according to E1 by circuit 60 of E3. Thereby, after the switch 9 according to E1 had opened, the circuit 60 would detect a current out of a predetermined specification and shut down the inverter correspondingly. Thus, the subject-matter of claim 1 was rendered obvious by a combination of documents E1 and E3.

## Reasons for the Decision

### 1. Admissibility of the appeals

Both appeals were filed in due time and form and at least in part sufficiently substantiated. Therefore, both appeals are admissible

### 2. Main request - Article 123(2) EPC

The opposition division found that claim 1 according to the main request contravenes Article 123 (2) EPC.

In particular, the opposition division found that the application as originally filed provided no disclosure for feature 5a of claim 1 according to the main request.

#### 2.1 Feature group 5 including feature 5a - according to the feature analysis taken over from the opposition division's decision (see point 17.) - reads as follows:

*5. a switch (403)*

*5a. disposed between the power modules and the inverter; and*

There is dispute whether claim 1 extends beyond the application as originally filed because according to the original disclosure, the switch is connected between at least one serial string of power modules and

the inverter. In claim 1 however, the feature "at least one serial string" has been omitted.

The proprietor argued that the omission of the feature "at least one serial string" was admissible because said feature was not disclosed as being essential for the invention, which could be shown using the essentiality test. The board however agrees with the opponent that on the one hand, the so-called "essentiality test" is not sufficient evidence for proving that an amendment does not contravene Article 123(2) EPC and that on the other hand the omission of "at least one serial string" in claim 1 extends beyond the content of the application as originally filed.

The proprietor essentially argued with respect to paragraphs [0031] to [0034] of the application as filed that the invention was not limited to a serial string of power modules and that the feature "serial string" could be removed from an original claim according to the essentiality test. The board is not convinced by the proprietor's arguments why the criteria of the essentiality test should be fulfilled, or that otherwise Article 123(2) EPC was not infringed.

Regardless of the fact that even a successful essentiality test as such is not sufficient evidence that a feature is originally disclosed, the corresponding arguments of the proprietor also do not convince the board. The fact that a feature was not included in the independent claim of an application does not mean that it is not essential. In particular, as in the present case the interrelated feature, namely the switch, was also not included in the originally filed independent claim 1. The switch is exclusively disclosed in combination with power modules coupled in

at least one serial string (see original claim 4). Further, the fact that figure 2 shows two serial strings of power modules which are connected in parallel cannot be interpreted to mean that the serial connection of the power modules is not essential. All power modules according to figure 2 are coupled in serial strings. As pointed out by the opponent, paragraphs [0031] to [0034] of the application as originally filed contain no technical details. They merely state that the disclosure may be applied to alternatives, which are in no way technically specified, such that no conclusions about the technical details of the indicated theoretical alternatives may be derived from those paragraphs. The board further agrees with the opponent, that the sentence in paragraph [0049] that "For simplicity a single string ... is shown..." does not mean that what is shown does not have to be in serial string configuration, but merely that the second serial string shown in other figures is not represented for "simplicity".

As correctly pointed out by the opponent, the whole original specification does not provide a basis for the omission of "serial string" with respect to the claimed switch. The switch is disclosed exclusively with the serial string throughout the description. The originally filed claims provide no basis for the amendment either. The switch is introduced only in originally filed claim 4, being dependent on claim 3 and specifying that "a switch" is disposed "between said serial string and said inverter". Thus, also the original claims do not provide any basis for the omission of the at least one serial string.

Thus, the board agrees with the opponent in that the omission of "at least one serial string" in claim 1 according to the main request represents an inadmissible generalisation.

The board has consequently come to the conclusion that claim 1 according to the main request contravenes Article 123(2) EPC.

3. Auxiliary request 1

Claim 1 according to auxiliary request 1 contains feature group 5 in an identical manner as in claim 1 according to the main request. The above conclusion with respect to claim 1 of the main request therefore applies *mutatis mutandis* to claim 1 according to auxiliary request 1. Thus, the board has reached the conclusion that claim 1 according to auxiliary request 1 also contravenes Article 123(2) EPC.

4. Auxiliary requests 2 to 5

Auxiliary requests 2 to 5 are new requests presented for the first time during the appeal proceedings. It is not apparent to the board, why it should not have been possible for the proprietor to address the corresponding objections under Article 100(c) EPC raised by the opponent against claim 1 as granted, in relation to the feature group 5, as early as in the notice of opposition, by filing corresponding requests during the first instance proceedings. None of the amendments filed in preparation for the first oral proceedings before the opposition division addressed

the opponent's objections regarding the omission of "at least one serial string".

Moreover, although the proprietor has stated that "during the oral hearing ... [they] did not succeed to prepare further suitable auxiliary requests", without indicating why this was the case, they were obviously able to prepare and file auxiliary requests 10, 11 and 12 during the same oral proceedings. The board observes that an amendment addressing the objection of added matter against feature group 5 would have been straightforward.

Finally, the fact that the opposition division gave a positive preliminary opinion with regard to this objection cannot *per se* justify the late filing of the corresponding amendments, since an opposition division is clearly not bound by the views expressed in preliminary opinions.

It is thus not apparent to the board why the patent proprietor should not also have been able to present requests corresponding to the present auxiliary requests 2 to 5 during the first instance proceedings.

Consequently, the board exercises its discretion under Article 12(4) RPBA 2007 not to admit auxiliary requests 2 to 5 into the proceedings. In addition, since none of the conditions formulated by the opponent regarding their request for remittal is fulfilled, the opponent's request for remittal is moot.

5. Auxiliary request 6

5.1 Broadening of the scope of protection - Article 123(3) EPC

Regarding the opponent's objection under Article 123(3) EPC, the board is not convinced that the deletion of the apparatus claims or the adaptation of the description has led to a broadening of the scope of protection. As argued by the proprietor, there does not exist any overriding requirement that would justify interpreting features of the described and claimed apparatus into the independent method claim.

In particular, the only paragraph of the description dealing with a switch and series connected power modules now explicitly refers to "the claimed method" and thus provides the allegedly missing basis in the description. The opponent's objection is thus moot because in fact the claim according to auxiliary request 6 has a basis in the description.

The further objection of the opponent that the independent method claim according to the granted patent is to be interpreted in the light of the independent apparatus claim and would therefore have been limited by the scope of the apparatus claim contravenes the concept of independent claims in different categories. These are by definition independent. It may be that a party might have interpreted the independent apparatus and method claims in the way the opponent argued. This would however be a purely subjective interpretation. From a legal perspective, such an interpretation would have required a minimal link or reference to the features of the apparatus claim in the method claim. In the present

case, the subject-matter of the independent method claim does not contain any such link or reference. The apparatus environment in which the claimed method is defined to be carried out is completely contained in the preamble of the independent method claim. The wording of the independent method claim as such has not been objected to for possible ambiguities or the like, so that an interpretation in the light of the scope of the former apparatus claims or the whole specification does not come into consideration. Thus, the board could not identify any apparatus element in the patent that would have restricted the scope of the granted independent method claim beyond the wording of the independent method claim itself. Therefore, the deletion of the apparatus claims in auxiliary request 6 can not be interpreted as broadening the scope of the remaining independent method claim either.

The board has therefore arrived at the conclusion that the claim according to auxiliary request 6 does not contravene Article 123(3) EPC.

## 5.2 Inventive step - Article 56 EPC

The subject-matter of the independent method claim according to auxiliary request 6 involves an inventive step over the combination of documents E1 with E3. The board is not convinced by the opponent's arguments in this respect.

On the one hand, the opponent's objections of lack of inventive step rely on the assumption that the method claim of auxiliary request 6 is to be interpreted independently of the description and that consequently method steps 14 to 19 of that claim do not have to be carried out by the parts of the distributed power

system as defined in the claim. The opponent seems to assume that since according to their arguments the corresponding method steps can be carried out anywhere, their existence in the prior art may remain unproven. However, the method claim according to auxiliary request 6 does in fact comprise limiting features defining the distributed power system which is to be operated according to the claimed method. Features 14 to 19 are linked by means of definite articles to the corresponding features of the distributed power system defined in the preamble of the claim. Thus, the opponent's assumption is not correct and the board is not convinced by this line of argument.

As argued by the proprietor, the opponent's objection of lack of inventive step combining documents E1 and E3 in fact includes several gaps. For example document E1, besides features 18 and 19, also does not disclose that the operation of the inverter is monitored (feature 14), that at least one electrical parameter of the load is monitored (feature 15), that the production of output power is stopped when said at least one electrical parameter is out of a predetermined specification (features 16 and 16a) and that the switch is activated when production of output power is stopped (feature 17b).

The opponent's related argument that features 14 to 16 were common general knowledge which followed from paragraphs [0002] to [0005] of the specification of the contested patent does not convince the board. These paragraphs describe power grids in general and mention the need for anti-islanding protection. Further it is disclosed therein that islanding may be detected via auxiliary contacts or via active or passive signal monitoring. The distinct combination of features 14 to

16 is however not mentioned in paragraphs [0002] to [0005]. Thus, even if it were established that paragraphs [0002] to [0005] would form part of the common general knowledge of the person skilled in the art, what is disclosed in these paragraphs does not correspond to features 14 to 16.

The board also does not share the opponent's interpretation of the functioning of switch 9 according to document E1 in relation to feature group 17 of claim 1. Figure 1 of E1 is represented below:

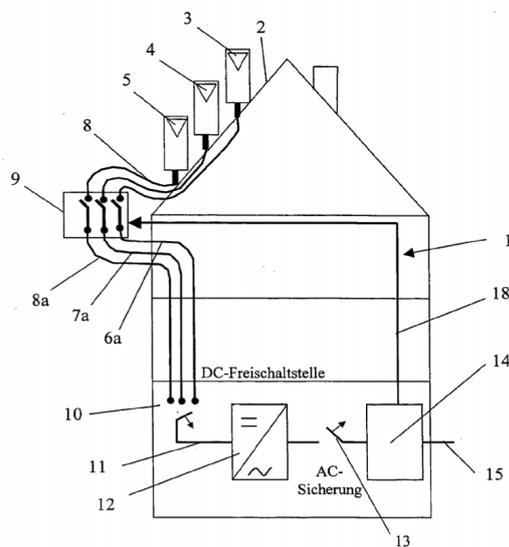


Fig. 1

Contrary to the opponent's assertions, the board agrees with the proprietor's interpretation that switch 9 of E1 is not kept closed by a current supplied by the inverter 12 but, as follows directly from paragraph [0041] of E1, by the grid current.

The relevant section of paragraph [0041] of E1 reads: "Sollte jedoch eine Netzunterbrechung vorliegen ... werden die Kontakte in die Öffnungsstellung fallen und

die Stromunterbrechung der Stränge 6, 7, 8 verursachen".

As illustrated in Figure 1, the grid 15 is connected at reference 14 from which the power supply of switch 9 branches off. Thus, the disclosure of the disputed paragraph [0041] and the disclosure of figure 1 correspond to each other. The board has no doubt that E1 explicitly discloses that switch 9 is reactive to the grid current and not to the inverter current. Therefore, switch 9 according to E1 cannot correspond to the claimed switch according to features 17, 17a and 17b.

Further, the board could at least not identify where document E3 might disclose that current in the serial string of power modules is sensed in response to activating the switch (feature 18) because, as correctly argued by the proprietor, E3 does not disclose a corresponding switch.

According to E3, a switch is opened after it has been determined that voltage and/or current is not within a predetermined range (see E3, claim 1). Thus according to E3, first the current is sensed and then the switch is opened. According to the claimed method however, first the switch is opened and thereafter the string current is sensed, see in particular claim 1, which explicitly states that the current is sensed "...in response to activating said switch...".

As further argued by the proprietor, even if the circuit 60 according to figure 1 of document E3 were to be inserted between the switch 9 and the inverter 12 according to E1, a sensing of current in the serial string would no longer be possible because after the

switch 9 opens, the serial string of power modules would no longer be connected to circuit 60 of E3.

Consequently, the board considers feature 18 not to be disclosed in document E3.

The board is therefore not convinced by the opponent's arguments regarding lack of inventive step of the claim according to auxiliary request 6.

5.3 As none of the opponent's objections against auxiliary request 6 is successful, the board concludes that auxiliary request 6 is allowable.

## 6. Conclusion

The board has come to the conclusion that the main request and auxiliary request 1 are not allowable, that auxiliary requests 2 to 5 are not admitted into the proceedings, and that auxiliary request 6 is allowable. Consequently, neither the appellant's appeal nor the opponent's appeal is successful.

**Order**

**For these reasons it is decided that:**

The appeals are dismissed.

The Registrar:

The Chairman:



U. Bultmann

R. Lord

Decision electronically authenticated