BESCHWERDEKAMMERN DES EUROPÄISCHEN PATENTAMTS

BOARDS OF APPEAL OF THE EUROPEAN PATENT OFFICE

CHAMBRES DE RECOURS DE L'OFFICE EUROPEEN DES BREVETS

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File No.: T 0397/91 - 3.2.3

Application No.: 86 901 003.3

Publication No.: W086/04132

Classification: F21L 13/00, H01M 12/00

Title of invention: Self-charging solar battery

D E C I S I O N
of 22 November 1993

Applicant: Sunlight Technologies Corporation

Proprietor of the patent: -

Opponent: -

Headword:

EPC: Art. 56

Keyword: "Inventive step (no)"

Headnote
Catchwords

Europäisches Patentamt | European Patent Office | Office européen des brevets

Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number: T 0397/91 - 3.2.3

D E C I S I O N
of the Technical Board of Appeal 3.2.3
of 22 November 1993

Appellant: Sunlight Technologies Corporation
49-04 Hanford Street
Douglaston, New York 11362 (US)

Representative: Ablett, Graham Keith
F.J. Cleveland & Company
40-43 Chancery Lane
London WC2A 1JQ (GB)

Decision under appeal: **Decision of the Examining Division 2.2.08.103 of the European Patent Office dated 27 December 1990 refusing European patent application No. 86 901 003.3 pursuant to Article 97(1) EPC.**

Composition of the Board:

Chairman: C.T. Wilson
Members: H. Andrae
L.C. Mancini

Summary of facts and Submissions

I. European patent application No. 86 901 003.3, filed as International application PCT/US85/02584 on 7 January 1986, was refused by a decision of the Examining Division dated 27 December 1990.

II. The decision was based on Claim 1 filed with letter of 24 May 1990, Claims 2 to 13 filed with letter of 28 November 1989 and Claims 14 and 15 filed with letter of 22 February 1990.

The reason given for the refusal was that the subject-matter of Claim 1 did not involve an inventive step in view of the disclosure of the citations "Patent Abstracts of Japan", vol. 7, No. 258 (E-211) 1403 & JP-A-58 145 071 (D2) and US-A-4 293 808 (D3). Claim 1 is worded as follows:

"A self-charging battery assembly having positive and negative terminals and having external dimensions corresponding substantially to those of a standard battery cell comprising: a rechargeable battery means (11,200 or 215) and solar cell means (12 or 201) for producing charging electric current for said battery means in response to its exposure to light,
an open-ended cylindrical housing (19,106 or 206), first means (13 or 202) for connecting a positive terminal of said solar cell means to a positive terminal of said battery cell means; and second means (25 or 204) for connecting a negative terminal of said solar cell means to a negative terminal of said battery cell means; first conductive cap means (14 or 205) closing one end of said housing and electrically connected to said positive terminal of said battery means; and second conductive cap means (15 or 203) closing the other end of said

housing and electrically connected to said negative terminal of said battery means; characterised in that said housing (19, 106 or 206) is formed at least partially of transparent material, said battery means, said solar cell means, said first and second means, the positive and negative terminals of said battery means are all mounted within said housing, and said solar cell means is mounted in juxtaposition to the transparent material of said housing such that solar light rays may pass through said transparent material and excite said solar cell means."

III. An appeal was lodged against this decision on 2 March 1991, the appeal fee having been paid on 27 February 1991. The Statement of Grounds of Appeal was filed on 4 May 1991.

The appellant argued that he failed completely to understand how document (D3) could suggest to a man skilled in the art that he should modify the arrangement of (D2) to place the solar cells within the standard size housing of a rechargeable battery. The most that a man skilled in the art could be expected to produce as a matter of course from documents (D2) and (D3) was to provide solar cell means within the housing of a particular apparatus, e.g. a torch and a calculator, and connect the cell means to the conventional rechargeable batteries housed in that device. This would then have the advantage of enabling the batteries to be recharged within the device without removal from the apparatus. However, to suggest that the skilled man would be led as a matter of course to the step of constructing the battery so that the solar cells are within the battery housing was in the appellant's submission totally without foundation.

IV. In their communication according to Article 11(2) RPBA dated 23 March 1993, the Board referred to the further piece of prior art GB-A-2 017 359 cited in the Search Report and expressed the provisional opinion that the subject-matter of Claim 1 would not appear to involve an inventive step, particularly in the light of the disclosure of document (D2) in combination with that of the further citation GB-A-2 017 359.

V. In his letter dated 22 October 1993, the appellant announced, without presenting any observations with regard to the communication of the Board indicated above, that he would not appear at the oral proceedings which had been arranged at his request and that he did not intend making any further submissions in connection with this application.

VI. The appellant, therefore requests, in accordance with the Statement of Grounds of Appeal, that the contested decision be set aside and the application be allowed to proceed to grant on the basis of the documents underlying the contested decision.

Reasons for the decision

1. The appeal is admissible

2. *Amendments (Article 123(2) EPC)*

Claim 1 is essentially a combination of features of original Claims 16, 24 and 25.

The term "solar cell means" used in Claim 1 is equivalent to the corresponding term "solar electric panel" in original Claim 16, the original description

(cf. page, 6 last paragraph) indicating that the solar panel may be made up of any number of individual photo-voltaic solar cells. The additional feature of Claim 1 that the self-charging battery assembly has external dimensions corresponding substantially to those of a standard battery cell is supported by page 3, paragraph 2 of the original description.

Claim 1 is not, therefore, objectionable under Article 123(2) EPC.

2.1 Claims 2 to 7 are supported by the corresponding original Claims 2 to 7. Claim 8 is based on original Claim 17, Claim 9 on features of original Claims 1 and 9, Claim 10 on features of original Claims 1 and 8, Claim 11 on original Claim 10, Claim 12 on original Claim 11, Claim 13 on original Claim 19, Claim 14 on original 21 and Claim 15 on original Claim 22.

The dependent Claims 2 to 15 also comply with the requirement of Article 123(2) EPC.

3. *Novelty and nearest prior art*

In agreement with the opinion of the Examining Division and of the appellant, the closest prior art is described by "Patent Abstracts of Japan, Vol. 7, No. 258 (E-211) [1403] & JP-A-58 14507 (D2). This prior art discloses a self-charging battery assembly having positive and negative terminals, a rechargeable battery means and solar cell means for producing charging electric current for the battery means in response to its exposure to light, first means for connecting a positive terminal of the solar cell means to a positive terminal of the battery cell means, second means for connecting a negative terminal of the solar cell means to a negative terminal of the battery cell means, an open-ended

cylindrical housing, first conductive cap means closing one end of the housing and electrically connected to the positive terminal of the battery means and second conductive cap means closing the other end of the housing and electrically connected to the negative terminal of the battery means.

The feature that the battery assembly has external dimensions corresponding substantially to those of a standard battery cell, although not explicitly described, may also be regarded as being known from document (D2) since the shape of the battery depicted in the citation corresponds to that of usual standard battery cells.

Thus, Claim 1 is correctly delimited *vis-à-vis* the disclosure of D2.

It follows from the foregoing that the subject-matter of Claim 1 is novel. Since this has not been questioned in the contested decision, there is no reason for detailed substantiation of this matter.

4. *Inventive step*

4.1 Claim 1 is distinguished from the disclosure according to document (D2) by the features that the housing of the battery assembly is formed at least partially of transparent material, the battery means, the solar cell means, the first and second connecting means and the positive and negative terminals of the battery means are all mounted within the housing, and the solar cell means is mounted in juxtaposition to the transparent material of the housing such that solar light rays may pass through the transparent material and excite the solar cell means.

According to the appellant (cf. the letter dated 24 May 1990, in particular the passage bridging pages 2 and 3), the battery known from document (D2) suffers from the inherent disadvantage that abrasion from the interior of the device in which the battery is used can easily damage the solar cells.

4.2 It follows from the above-cited drawback of the battery assembly according to document (D2) that the problem to be solved is seen in providing a self-charging solar battery with solar cells that are protected from damage caused by contact with the device containing the battery.
By forming the housing of the battery assembly at least partially of transparent material and arranging the battery means and the solar cell means together with the corresponding circuit connection means within the battery housing such that the solar light may pass through the transparent material and excite the solar cell means, a sufficient protection of the solar cell means from damage may be obtained.

The Board has no doubt that the above-cited problem is solved by the features of Claim 1. This problem is therefore the one underlying objectively the subject-matter of Claim 1 and having to be taken account of in the assessment of the question of inventive step.

It is clear that the recognition of the problem as such does not require any inventive skills since it results from experience made during normal use of the known battery assembly.

4.3 The document GB-A-2 017 359 cited in the International Search Report as being of particular relevance deals with an electronic timepiece including an electronic power supply device which comprises a solid electrolyte

battery and a solar battery for charging the solid electrolyte battery.

According to Figure 6 and the description on page 2, lines 58 to 101 of this citation, the housing of the self-charging battery assembly utilised in the timepiece is formed of transparent material (42), the battery means (10), the solar cell means (40), the first and second means for connecting a positive and a negative terminal, respectively, of the solar cell means to a positive and a negative terminal, respectively, of the battery cell means and the positive and negative terminals of the battery means all being mounted within the housing, and the solar cell means being mounted in juxtaposition to the transparent material of the housing such that solar light rays may pass through the transparent material and excite the solar cell means.

Although this prior art concern an electronic time piece in which a solar battery is used, the skilled person would, in the judgement of the Board, take account of the technical field of electronic timepieces when seeking a solution to the inherent problem, electronic timepieces being a typical example of industrial products for which the use of batteries is common.

The skilled person would realise that the solar battery assembly described in the citation as a unitary structure power supply device would also be appropriate for being utilised in a power consuming device of a type different from that of electronic time pieces. He would see at once that the provision of the solar cells, the battery means and the corresponding circuit connections within the housing made up of transparent material would decrease the danger of any damage done to the solar cells and he would therefore substitute the self-

charging battery known from the document GB-A-2 017 359 for that described in document (D2).
He would thereby arrive at the subject-matter of Claim 1 without an inventive step being involved in such a substitution.

4.4 The Board considers that even without relying on the disclosure of the document GB-A-2 017 359 the result of the examination as to the issue of inventive step would remain unchanged.

If, during use, solar cells placed on the outside of the battery housing suffer from damage caused by contact with the device in which the battery is used, it would be self-evident for the skilled person to protect the solar cells by placing them inside the battery housing as is the case with the connections between the terminals of the solar cell means and the terminals of the battery cell means, the battery housing being necessarily transparent in the region of entry of the solar rays. Starting out from the prior art battery assembly described by document (D2), the skilled person, faced with the inherent problem, of reducing the risk of damage done to the solar cells would arrive at the subject-matter of Claim 1 by mere exercise of the customary practice in combination with the logical application of his general knowledge.

4.5 For the foregoing reasons, the subject-matter of Claim 1 lacks an inventive step as required by Article 56 EPC. Therefore, Claim 1 cannot be allowed having regard to Article 52(1) EPC.

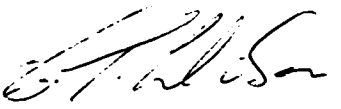
5. Claims 2 to 15 cannot be allowed either, these claims being dependent on Claim 1.

Order

For these reasons it is decided that:

The appeal is dismissed

The Registrar: The Chairman:



N. Maslin C.T. Wilson