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D E C I S I O N
of 7 June 1999

Case Number: T 0458/97 - 3.5.2

Application Number: 89904961.3

Publication Number: 0415950

IPC: H01R 4/30

Language of the proceedings: EN

Title of invention:
Anti-corrosive battery terminal

Patentee:
PRO-START, INC.

Opponent:
-

Headword:
-

Relevant legal provisions:
EPC Art. 56

Keyword:
"Inventive step - after amendment, yes"

Decisions cited:
-

Catchword:
-

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Case Number: T 0458/97 - 3.5.2

D E C I S I O N
of the Technical Board of Appeal 3.5.2
of 7 June 1999

Appellant: PRO-START, INC.
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Decision under appeal: **Decision of the Examining Division of the European Patent Office posted 28 october 1996 refusing European patent application No. 89 904 961.3 pursuant to Article 97(1) EPC.**

Composition of the Board:

Chairman: W. J. L. Wheeler
Members: F. Edlinger
B. J. Schachenmann

Summary of Facts and Submissions

I. The appeal is against the decision of the examining division refusing European application No. 89 904 961.3 (published as International application WO 89/10013). The main reason given for the refusal was that the subject-matter of claims 13 and 14 then on file lacked an inventive step in view of documents US-A-2 622 120 (document D1) and US-A-2 210 827 (document D2).

II. In response to written and telephone communications of the board, the appellant, with the letter dated 26 April 1999, filed new claims 1 to 14 and pages 2, 3, 3A, 3B and 6 of the description. With the telefax dated 28 April 1999, the appellant confirmed his agreement with the further amendments set out in the minutes of the telephone conversation dated 27 April 1999.

III. Claim 1 now reads as follows:

"1. A battery connector assembly (10) for detachably connecting an electrical conductor to a pole of a battery (3), said assembly comprising:

(a) a pole connector (5) protruding from said battery (3) and having an external surface area;

(b) a terminal block (20) detachably mounted on said battery (3) and having an outer surface (21, 22, 23), said terminal block (20) defining a socket (30) having an interior which surrounds said external surface area of said pole connector (5), and defining an entryway to said socket (30) through which said pole connector (5) enters said socket (30);

(c) sealing means (9) associated with said entryway for impeding fluid flow through said entryway from the interior of said socket (30);

(d) fluid conduit means (27) in said terminal block (20) communicating between the interior of said socket (30) and the outer surface of said terminal block (20) independently of said entryway for conducting fluid from said outer surface to the interior of said socket (30); characterised by:

(e) the interior of said socket (30) loosely surrounding said pole connector (5) so as to leave a fluid-containing space between a first portion of said surface area of said pole connector and the interior of said socket; and

(f) engagement means (55) on the interior of said socket (30) engaging said pole connector (5) to provide dry, fluid free electrical contact between said engagement means (55) and said pole connector (5) while covering not more than a second portion of said surface area of said pole connector (5) so as to leave said first portion of said surface area exposed to said fluid-containing space, said engagement means providing an electrical connection between the electrical conductor and the pole connector."

Claims 2 to 14 are dependent on claim 1.

IV. The appellant argued essentially as follows:

(i) The person skilled in the art would not

naturally find and combine documents D1 and D2 more than fifty years after their respective publication dates and thereby satisfy a long felt need of providing clean secure electrical contact between a pole of a battery post and a detachably connected conductor. Starting from a sealed connector assembly as in D1, disclosing the features a) to f) of present claim 1, it was completely unrealistic to assume that the person skilled in the art would have consulted the even older document D2 relating to an unsealed ring connector.

(ii) Even if the teachings of D1 and D2 had been combined, the person skilled in the art would not have been led to the present invention. D1 gave a different teaching in that the parts of the assembly were lubricated with grease before they were tightly clamped together. Similarly, also D2 disclosed that grease was provided over the entire battery post before assembly. Moreover, D2 related to a ring type connector which had the inherent disadvantage that the top of the battery post was completely left open, and an impregnated felt ring was necessary to apply a grease coating around the battery post. The present invention did not require such a felt ring.

(iii) The reasoning as to lack of an inventive step was therefore the result of an ex post facto analysis considering, in an artificial way, what the person skilled in the art could have deduced from two very old documents without taking into

account the overall state of the art, and ignoring the fact that the present application presented a surprisingly simple solution to an age-old problem.

V. The appellant requested that the decision under appeal be set aside and that a patent be granted on the basis of the following documents amended as set out in the minutes of the telephone conversation dated 27 April 1999:

Claims: 1 to 14 as filed with the letter dated 26 April 1999;

Description: pages 1, 4 and 5 as published with the International application;
pages 2, 3, 3A, 3B and 6 as filed with the letter dated 26 April 1999; and

Figures: 1 to 4 as published with the International application.

Reasons for the Decision

1. The appeal is admissible.

2. *Amendments*

2.1 Claim 1 is based on claim 13 of the International application as published (WO 89/10013), is cast in the two part form according to Rule 29(1) EPC and includes reference signs according to Rule 29(7) EPC. It

comprises the following substantial amendments:

"conduit" (claim 13, page 9, line 33) has been corrected to "conductor" (claim 1, page 7, line 4) as disclosed in the application as published (page 4, line 34, and figures 1 and 3);

"at least a major" and "minor" portions (claim 13, page 10, lines 23, 28 and 30) have been replaced by "first" and "second" portions, respectively (claim 1, page 7, line 31 and page 8, lines 1 and 2) as derivable from the application as published (page 5, lines 8 to 10 and page 6, lines 6 to 9; feature (f) of claim 1); and

the features "to provide dry, fluid free electrical contact between said engagement means (55) and said pole connector (5)" and "said engagement means providing an electrical connection between the electrical conductor and the pole connector" have been added in claim 1 (feature (f)) as derivable from the application as published (page 2, lines 8 to 11 and 25 to 30; page 5, lines 1 to 10; figures 2 and 3).

2.2 Claims 2 and 3 are derivable from claim 13, feature (f) and claim 1, feature (f), respectively as published. Claim 12 can be derived from page 4, lines 24 to 29, as published. Claims 4 to 11, 13 and 14 are derived from claims 3 to 12 as published. The description has been adapted to the amended claims.

2.3 The board is satisfied that these amendments do not infringe Article 123(2) EPC.

3. *Novelty*

3.1 A battery connector assembly for detachably connecting an electrical conductor to a pole of a battery, comprising the features (a) to (d) of the preamble of present claim 1 is disclosed in D1, figures 6 and 7. The pole connector of D1 is clamped between the interior surface of the terminal block and a clamp member (60) tightened by a screw (62). The structure is such that substantially all of the conical surface of the pole connector is in contact with the interior of the terminal block or the clamp member so that there is no socket loosely surrounding the battery pole connector (11) to leave a fluid containing space as defined in feature (e) of claim 1. Moreover, the engagement means (60 to 67) does not provide dry, fluid free electrical contact covering not more than a second portion as specified in feature (f) of present claim 1, because fluid in the form of grease is forced through a fluid conduit means (grease fitting 70) before the clamp member is tightened. Serrations of the clamp member will establish electrical connection by mechanical friction (see D1, column 5, line 56 - column 6, line 12).

3.2 D2 (left-hand column, lines 2 to 11 and 38 to 43; right-hand column, lines 1 to 7 and 22 to 47; figures 1 to 5) discloses a battery ring connector designed to preclude the formation of corrosion to make the removal of the ring easier. Accordingly, firm and solid contact between a battery pole connector and the ring connector (10) is reduced to a minimum contacting surface of three set screws and ample space is left for the reception of anti-corrosive grease between the

interior of the ring and the pole connector surface. This is achieved by applying a felt ring (16) impregnated with grease over the set screws and between the ring (10) and the pole connector (11). This ring connector, however, does not have sealing means and fluid conduit means as specified in features (c) and (d) of present claim 1.

3.3 Neither D1 nor D2 (or any of the other documents cited in the search report) discloses all the features of present claim 1 in combination. The subject-matter of claim 1 is thus considered to be new.

4. *Inventive step*

4.1 D1 (figures 6 and 7) is considered as reflecting the closest prior art because it relates to the same type of sealed battery connector assembly comprising fluid conduit means for lubricating all the parts to prevent terminal corrosion (D1, column 1, lines 17 to 40).

4.2 The subject-matter of present claim 1, with respect to this prior art, solves the problem of improving corrosion protection of the battery pole connector, while still providing efficient electrical contact. However, contrary to the indication on page 2, lines 9 to 12 of the present description, the board regards fluid free electrical contact as forming part of the solution rather than part of the objective problem.

4.3 Nothing in D1 suggests a socket loosely surrounding the pole connector and dry, fluid free electrical contact of the engagement means. On the contrary, all the embodiments have sockets which closely surround the

external surface of the protruding pole connector, except for its top, and grease is provided to the parts for sealing them before or when they are tightened (D1, column 1, lines 22 to 30; column 4, lines 48 to 53; column 5, lines 56 to 66; column 6, line 72 - column 7, line 6). Electrical connection is taught to be improved in a different way by providing cutting threads or serrations which bite into the pole connector, thereby cleaning off oxidation (column 4, lines 64 to 71; column 6, lines 52 to 57). Starting from this disclosure, engagement means such as screws, generally known per se, for clamping the terminal block to the battery pole connector and keeping the socket loosely spaced would thus not achieve the functions aimed at in D1, ie a closely surrounding socket cutting into the pole connector to provide frictional contact through the grease, and cannot therefore be considered as an obvious alternative clamping means.

4.4 The teaching of D2 (see point 3.2 above) would not lead the person skilled in the art to include features (e) and (f) either because the ample space suggested therein is necessary for housing the impregnated felt ring in a different type of connector, and D1 already achieves a minimum contacting surface and a maximum grease covered surface for corrosion protection in that D1 suggests covering all the parts with grease and establishing frictional contact with threads or serrations.

4.5 On the other hand starting from a ring type connector as disclosed in D2, the person skilled in the art might get a hint from D1 to completely seal the battery connector assembly. He would then rather choose one of

the preferred embodiments of D1 as a whole because ample space for applying a felt ring with grease between the pole connector and the ring is no longer necessary in a sealed type connector, the object of a minimum contacting surface and a maximum of grease covered surface being already achieved by different means.

4.6 The person skilled in the art, without knowledge of the present application, would not therefore combine D1 and D2 and thereby arrive at the subject-matter of claim 1 in an obvious manner. Since none of the other documents of the search report suggest such a combination, the subject-matter of claim 1 and that of dependent claims 2 to 14 shall be considered as involving an inventive step within the meaning of Article 56 EPC.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the first instance with the order to grant a patent with the following claims and description:

Claims: 1 to 14 as filed with the letter dated 26 April 1999;

Description: pages 1, 4 and 5 as published with the International application;
pages 2, 3, 3A, 3B and 6 as filed with the letter dated 26 April 1999; and

Figures: 1 to 4 as published with the International application;

page 3 and claims 1, 5, 6 and 14 being amended as set out in the minutes of the telephone conversation dated 27 April 1999.

The Registrar: The Chairman :

M. Kiehl W. J. L. Wheeler