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Datasheet for the decision of 15 February 2007

Case Number: T 1385/04 - 3.5.02

Application Number: 95113702.5

Publication Number: 0698899

IPC: H01H 9/44

Language of the proceedings: EN

Title of invention:
Switch

Patentee:
MITSUBISHI DENKI KABUSHIKI KAISHA

Opponent:
SCHNEIDER ELECTRIC INDUSTRIES SAS

Headword:
-

Relevant legal provisions:
EPC Art. 56

Keyword:
"Inventive step - after amendment (yes)"-

Decisions cited:
-

Catchword:
-

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Case Number: T 1385/04 - 3.5.02

D E C I S I O N
of the Technical Board of Appeal 3.5.02
of 15 February 2007

Appellant: (Patent Proprietor)
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Decision under appeal:
Decision of the Opposition Division of the European Patent Office posted 7 October 2004 revoking European patent No. 0698899 pursuant to Article 102(1) EPC.

Composition of the Board:

Chairman: W. J. L. Wheeler
Members: J.-M. Cannard
C. Holtz

Summary of Facts and Submissions

I. The proprietor appealed against the decision of the opposition division revoking European patent No. 0 698 899. The reason given for the revocation was that the subject-matter of claim 1 of the patent as granted and claim 1 of the patent amended according to the auxiliary request filed with the letter dated 9 July 2002 did not involve an inventive step in the sense of Article 56 EPC.

II. The following documents:

D1: EP-A-0 492 456,

D2: US-A-4 644 307, and

D9: DE-A- 2 237 280,

were considered during the proceedings before the opposition division.

Document:

D12: EP-A-0 003 447,

cited in the patent as granted, is also relevant to the present appeal.

III. Oral proceedings were held before the Board on 15 February 2007. As announced beforehand, the opponent did not attend. During the oral proceedings the appellant filed a new request (current request).

IV. Independent claims 1, 13 and 17 of the current request read as follows:

Claim 1:

"A switch comprising

a moving element (101) having a travelling contact (102) at one end thereof,

a repelling element (103) having a repelling contact (104) at a first end thereof and extending substantially parallel to said moving element, and said repelling element pivotally mounted so that said repelling contact is capable of making and breaking contact with said travelling contact, said repelling element comprising a repelling element conductor portion (103a),

biasing means (109) for biasing said repelling element so that said repelling contact touches said travelling contact in a closed condition,

a terminal (105) connected to a power source system,

a conductor (107, 108) connecting said repelling element to the terminal, and said conductor including

a first conductor portion (107) being straight and coplanar with said terminal (105), and

a second conductor portion (108) connecting said first conductor portion (107) to said repelling element (103) at an end of the side opposed to said repelling contact (104), and

wherein said repelling element conductor portion (103a) is positioned below said first conductor portion (107) such that when a large current flows through said switch, current in said repelling element conductor portion (103a) has a direction opposed to that of current in said first conductor portion (107), and an electromagnetic repulsion is applied between said repelling element (103) and said first conductor portion (107) to rotate said repelling element (103) in the opening direction,

characterized in

that said biasing means (109) is connected to a second end of said repelling element and

that said first conductor portion (107) is substantially flat U-shaped or flat L-shaped and is positioned between said travelling contact (102) and said repelling contact (104) when said moving element (101) and said repelling element (103) are opened so as to be connected to said terminal (105)."

Claim 13

Claim 13 differs from claim 1 in that the feature "a first conductor portion (107)" replaces the feature "a first conductor portion (107) being straight and coplanar with said terminal (105)", and in that the words "and that a vertical third conductor portion (119) continuously connecting said terminal (105) and said first conductor portion (107) is arranged" have been added at the end of the claim.

Claim 17 differs from claim 1 in that the feature "a first conductor portion (107)" replaces the feature "a first conductor portion (107) being straight and coplanar with said terminal (105)" and in that the words "said first conductor portion (107) being inclined with respect to said terminal (105)" have been added at the end of the claim.

Claims 2 to 12 and 14 to 16 are respectively dependent on claim 1 and claim 13.

V. The arguments of the appellant proprietor can be summarized as follows:

The switch shown in figure 4 of document D12, which was the closest prior art, corresponded to the pre-characterizing part of claim 1 of the current request. D12 did not disclose the characterizing features of the claim. The technical problem starting from D12 would consist in increasing the opening speed of the switch.

The switches disclosed in document D9 were fundamentally different from the closest prior art switch because their repelling elements were not pivotally mounted. The arrangement according to figure 3 of D9 improved the guidance of the arc when the switch was opened, but would not solve the technical problem starting from D12. There was no good reason for combining the teachings of D12 and D9.

D9 did not disclose the features of the characterizing part of claim 1. More particularly, a first conductor portion which was flat U-shaped or flat L-shaped and was

positioned between the travelling and repelling contact when the switch was opened, as recited in the last paragraph of claim 1, was neither mentioned in the description of D9, nor shown in figure 3. A combination of D12 and D9 would not have resulted in the claimed switch.

VI. No substantive submission was received from the respondent.

VII. The appellant (patentee) requested that the decision under appeal be set aside, and that the patent be maintained in amended form in the following version: claims: 1 to 17 as filed in the oral proceedings; description: columns 1 to 10, 13 to 22, and 25 of the patent specification, columns 11, 12, 23 and 24 as filed in the oral proceedings; and drawings: figures 1 to 54 of the patent specification.

Reasons for the Decision

1. The appeal is admissible.

2. The Board is satisfied that the amendments made to the claims and the description according to the current request satisfy the requirements of Article 84 EPC and do not contravene Article 123(2) or (3) EPC. More specifically:

2.1 The independent claims 1, 13 and 17 of the current request are respectively based on granted claims 1, 13 and 17 with the added restriction to a first conductor

portion which is "substantially flat U-shaped or flat L-shaped". Such a switch is disclosed in the application as originally filed (see figures 312 to 346 and 349 to 355 and the corresponding passages of the description).

2.2 The amendments made to the description of the patent specification bring the description into conformity with the amended claims.

Closest prior art

3. The Board shares the appellant's view according to which document D12, which was acknowledged in the patent specification and having regard to which the independent claims of the granted patent are characterized, is the closest prior art to be treated as the starting point of the invention.

3.1 More specifically, the embodiment described on page 9, lines 15 to 32, of D12 with reference to figure 4 relates to a switch which comprises all the features recited in the pre-characterizing part of claim 1 of the current request. This switch is essentially concerned with the solutions to problems which are the same as the subjective technical problems mentioned in the originally filed application (column 9, lines 16 to 27), i.e. increasing the opening speed of the moving contacts by electromagnetic force and stretching an arc on the side of the terminal (see for instance, page 2 of D12, lines 26 to 34).

3.2 D9 discloses improvements made to a prior art switch (figure 1) for stretching the arc on the side of the terminal: a first portion (5) and a second portion (7)

of a conductor connecting a terminal connected to a power source to the repelling element (4) should be disposed outside the plane of movement of the moving element (3) and outside the plane of movement of the arc (page 6, lines 8 to 11). In the embodiment disclosed with reference to figure 3, this is obtained by arranging a first conductor portion, which consists of two individual conductors (36, 37), positioned one on each side of the repelling element and between the moving element and the repelling element when the switch is opened. The repelling element, or the first conductor portion, can be made movable relatively to the moving element (3) by means of an articulation or a braid for increasing the length of the arc (page 7, lines 1 to 8).

3.3 However, no example of a switch in which the repelling element is pivotally mounted is mentioned in D9. Figure 3 only shows, in a plane of the arc perpendicular to the plane of movement of the moving element, relative positions of the moving element, the repelling element and the two individual conductors forming the first conductor portion which are adapted for stretching the arc. But the example of figure 3 gives no disclosure of the complete structure of the conductor connecting the repelling element to the terminal, and particularly no disclosure of a first conductor portion which is "substantially flat U-shaped or flat L-shaped", or of the second conductor portion connecting the individual conductors (36, 37) to the repelling element at an end of the side opposed to the repelling contact. Nor are biasing means for biasing the repelling element disclosed in D9. Accordingly, the switch according to figure 4 of D12, which has the most features in common with the claimed switch and is also concerned with the

solution to the problem of increasing the opening speed of the switch, as mentioned in the application of the patent in suit, is considered as the starting point for assessing the inventive merits of the invention.

Inventive step

4. Starting from D12 and having regard to the effects provided by the claimed invention, the objective technical problem addressed by the invention could be seen as seeking to stretch the arc more quickly, as appears from the objects of the invention stated in the patent specification (see paragraphs [0045] and [0046]). This problem is solved by the features, and more specifically the arrangement of the first conductor portion, specified in the characterizing part of claim 1.

5. In the judgement of the Board, it has not been proved that the subject-matter of current claim 1 does not involve an inventive step having regard to the teachings of the prior art documents on file. More particularly, the mere combination of the teachings of D12 and D9 would not directly result in a switch having all the features of claim 1 of the current request, because it would not have the required arrangement of the first conductor portion, i.e. a first conductor portion which is "substantially flat U-shaped or flat L-shaped".

5.1 There is in D9 no disclosure of a first conductor portion which is "substantially flat U-shaped or flat L-shaped", as recited in claim 1 (see *above* 3.3).

5.2 According to D9 (see *above* 3.2), the first and second portion of a conductor (5, 7) connecting the repelling

contact (4) to a terminal connected to a power source is disposed outside the plane of movement of the moving element (3) and outside the plane of the arc for stretching the arc on the side of the terminal (page 6, lines 8 to 11); and the repelling element, or the first conductor portion, could be made movable relatively to the moving element (3) by means of an articulation or a braid (page 7, lines 1 to 8). Meeting these conditions does not however necessarily imply or suggest a first conductor portion which would be "substantially flat U-shaped or flat L-shaped", as recited in claim 1.

5.3 The skilled person starting from figure 4 of D12 and seeking to solve the objective technical problem addressed by the invention by applying the teaching of D9 might consider increasing the length of the arc by allowing the repelling contact (64) to be positioned below the first conductor portion (46) when the switch is fully opened. This could be achieved for instance by increasing the size of the hole in the first conductor portion (46) of D12 which allows the repelling contact (62) to touch the travelling contact (26) in a closed position of the switch, or by reducing the size of the end of the repelling element (64) supporting the repelling contact. However, the teaching of D9 does not suggest further modifications to the prior art switch, and particularly not to its first conductor portion, because this portion is already, in the plane of the arc, in accordance with the teaching of D9.

5.4 Document D1, which discloses a switch in which one of the two contacts is fixed, and document D2, in which the first conductor portion consists of two U-shaped arms

extending in planes parallel to the plane of movement of the moving element, are less relevant.

6. The same considerations apply mutatis mutandis to the switches according to claims 13 and 17. The Board therefore concludes the subject-matter of independent claims 1, 13 and 17 of the current request involves an inventive step within the meaning of Article 56 EPC.

7. In the Board's judgement, taking into account the amendments according the current request, the patent in suit and the invention to which it relates satisfy the requirement of the Convention (Article 103(3) EPC).

Order

For these reasons it is decided that :

1. The decision under appeal is set aside.

2. The case is remitted to the department of the first instance with the order to maintain the patent in amended form in the following version:

   claims: 1 to 17 filed in the oral proceedings;

   description: columns 1 to 10, 13 to 22, and 25 of the patent specification, columns 11, 12, 23 and 24 as filed in the oral proceedings; and

   drawings: figures 1 to 54 of the patent specification.

The registrar: The Chairman:

U. Bultmann W. J. L. Wheeler