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**Datasheet for the decision
of 3 May 2021**

Case Number: T 1556/18 - 3.2.01

Application Number: 10796899.2

Publication Number: 2338628

IPC: B23K9/12, B23K9/073, B23K9/09,
B23K9/067

Language of the proceedings: EN

Title of invention:
ARC WELDING CONTROL METHOD AND ARC WELDING DEVICE

Patent Proprietor:
Panasonic Intellectual Property
Management Co., Ltd.

Opponent:
Fronius International GmbH

Headword:

Relevant legal provisions:
EPC Art. 123(2), 111(2)
RPBA 2020 Art. 11

Keyword:

Amendments - added subject-matter (no)
Remittal - (yes)

Decisions cited:

G 0002/10

Catchword:



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Case Number: T 1556/18 - 3.2.01

D E C I S I O N
of Technical Board of Appeal 3.2.01
of 3 May 2021

Appellant: Panasonic Intellectual Property Management Co., Ltd.
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Representative: Isarpatent
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Decision under appeal: **Decision of the Opposition Division of the
European Patent Office posted on 18 April 2018
revoking European patent No. 2338628 pursuant to
Article 101(3) (b) EPC.**

Composition of the Board:

Chairman G. Pricolo
Members: J. J. de Acha González
 P. Guntz

Summary of Facts and Submissions

- I. The appeal of the proprietor is directed against the decision of the Opposition Division to revoke European Patent No. 2 338 628.
- II. The Opposition Division held that the amended patent according to the main request and auxiliary requests 1, 4 to 11 contravened the requirements of Article 123(2) EPC. Late filed auxiliary requests 2 and 3 were not admitted into the proceedings since *prima facie* they did not fulfill the requirements of Article 123(2) EPC.
- III. The appellant (proprietor) requested to set aside the decision of the Opposition Division and to accept that the main request or, in the alternative, one of the auxiliary requests 1 to 15 satisfies the requirements of Article 123(2) EPC. Additionally, the appellant requested to remit the case to the Opposition Division to discuss all other requirements of the EPC.

The respondent (opponent) requested to dismiss the appeal, or to remit the case to the Opposition Division if the appeal was not dismissed.
- IV. In its communication of 19.04.2021 the Board expressed its preliminary view of the case, according to which the main request of the appellant met the requirements of Article 123(2) EPC. Further, the Board pointed out that the case was ready for decision pursuant to Article 12(8) RPBA 2020 (Rules of Procedure of the Boards of Appeal OJ EPO 2019, A63) and that it intended to issue a decision in written proceedings to set aside the decision of the Opposition Division and to remit

the case back to the Opposition Division for further prosecution regarding the other requirements of the EPC as requested by the parties.

V. Oral proceedings scheduled for 25 June 2021 were cancelled on issuing this decision.

VI. Claims 1 and 10 according to the main request read as follows (differences with respect to claim 1 as granted in **bold**):

"An arc welding control method for carrying out welding by generating an arc (17) between a welding wire (16) as a consumable electrode and a material (15) to be welded, the method being characterized by the steps of:

forming a molten pool by feeding the welding wire (16) at a wire feed speed of periodically repeating forward feeding and reverse feeding with predetermined frequency and amplitude from a time point (100) at which a start of the welding is instructed, or from a certain time point (101) after the start of the welding is instructed; and then changing the wire feed speed to a constant speed (W f1)."

"An arc welding apparatus for carrying out welding by generating an arc between a welding wire (16) as a consumable electrode and a material (15) to be welded, the apparatus comprising:

a switching element (4) for controlling a welding output;
a welding voltage detector (9) for detecting a welding voltage;
a welding current detector (8) for detecting a welding current;

a welding condition setting section (12) for setting a set current and a set voltage;

a short-circuit/arc detector (10) for detecting whether a state between the welding wire and the material to be welded is a short-circuit state or an arc state, based on an output of the welding voltage detector;

a welding start instruction section (21) for instructing a start of the welding;

a timer section (20) for counting a predetermined time from a time point as a starting time point for detecting an electric current flowing when the welding wire and the material to be welded are brought into contact with each other after the welding is started;

an output control unit (11) for controlling an output of the welding current or the welding voltage according to an output of the short-circuit/arc detector and the welding wire feed speed, and

characterized by

a wire feed speed control unit (13) for controlling the wire feed speed by receiving an output of the short-circuit/arc detector and an output of the timer section; and

wherein the welding wire is fed at a wire feed speed of periodically repeating forward feeding and reverse feeding with predetermined frequency and amplitude **so as to form a molten pool** from a time point at which a start of the welding is instructed by the welding start instruction section, or from a certain time point after the start of the welding is instructed, and then the wire feed speed is changed to a constant speed."

Reasons for the Decision

1. *Inadmissible extension - Article 123(2) EPC*

- 1.1 The subject-matter of independent claims 1 and 10 of the main request does not go beyond the content of the application as originally filed.

When discussing the allowability of the amendments, the Opposition Division and the parties referred to paragraphs of the description of the patent rather than to the corresponding passages in the description of the application as filed. Since the cited paragraphs undisputedly are present in the application as filed, the Board will also refer to those passages, for easy reference.

- 1.2 The respondent, in line with the Opposition Division in its decision (see point 13), held that the feature added to granted claim 1 - "...forming a molten pool by..." - and the feature added to granted claim 10 - "...so as to form a molten pool..." - amended the subject-matter of claim 1 and claim 10 in such a way that it represented an inadmissible extension of the content of the application as originally filed. In particular, the respondent considered that the application as originally filed did not establish a direct and mandatory, immediate and unambiguous connection between the forward and backward movement of the wire on the one hand and the generation of a molten pool on the other. Rather, the molten pool was merely created by introducing heat into the workpiece. The original application did not disclose what conditions must be met for something to be called a molten pool;

rather the forming of the molten pool began with the start of the arc (at point 101 in figure 2) and continued during the welding process. However, the periodic feeding of the wire took place before the first formation of the molten pool at point 101 and continued well beyond that time, so that no relationship between the periodic wire feed and the generation of the molten pool was causally described in the original application documents.

Additionally, and in line with the Opposition Division in its decision, the introduction of the term "forming a molten pool by..." modified the meaning of the next step of the method introduced by the word "then". The term "then" meant "immediately after", whereby according to claim 1 the changing of the wire feed speed was triggered by and immediately followed by the formation of a molten pool. This was not supported by the application as originally filed.

Finally, the respondent also objected that the subject-matter of claims 1 and 10 represented an intermediate generalisation of the first embodiment of the invention described in paragraphs 31 to 34 of the patent. In particular, the feature of paragraph 33 which specified that the forward feeding of the wire forcibly generated a short-circuit and the reverse feeding of the wire forcibly opened the short-circuit had been omitted.

- 1.3 According to established case law of the Boards of Appeal the criterion for assessing whether the amendment to a patent introduces subject-matter extending beyond the content of the application as originally filed is the "gold standard", i.e. whether the claimed subject-matter is derivable directly and unambiguously for the skilled person from the application as originally filed (see e.g. point 4.3 in

the Decision of the Enlarged Board of Appeal G 2/10, OJ EPO 2012, 376).

- 1.4 The Board shares the view of the appellant and holds that the amended patent according to the main request satisfies this criterion for the following reasons. Contrary to the respondent's submissions, it can be derived from the application as originally filed (see para. 2 to 17 and 29 to 43) that the invention is aimed at improving avoidance of spatter generation at welding start until a molten pool is formed and the arc is stabilized. According to the state of the art, the conventional arc start control is done by starting the arc welding with a pulse wave-like current pulse control (see para. 3 and 12 and, additionally, by lift-up of the arm of an arc welding robot including the welding wire on its tip; see para. 3 and 13). The invention proposes an alternative and improved solution for the arc start which reduces the amount of spatters generated until the arc is stabilized, i.e. the molten pool is formed, by a periodic feeding of the wire. It is thus directly and unambiguously derivable from the application as originally filed that the periodic feeding of the welding wire forms a molten pool. In other words, the molten pool is formed by feeding the welding wire periodically. The start of the periodic feeding can be at 100 (para. 29), at 101 (para. 41), at 104 (para. 42) or at 104a (para. 43). Once the molten pool that stabilizes the arc is obtained, the periodic feeding is changed to constant feeding and to a conventional arc welding procedure. The duration of the periodic feeding of the wire at the start of the arc welding is, according to the application as originally filed, at least long enough to provide a molten pool that stabilizes the arc for continuing the known arc welding procedure afterwards. Consequently, the only

purpose of the periodic feeding of the wire is to obtain said molten pool whilst minimizing generation of spatters. The time needed therefor is unspecified and "predetermined by experiment and the like for each subject to be welded" (see para. 37). Further, during the complete periodic feeding a molten pool is being formed, since this is the consequence of the periodic feeding as recited in the application as originally filed. The feature concerning the time t_1 being such that the molten pool generated when t_1 is over is bigger than the minimum required for arc stabilization is also originally disclosed (see para. 37).

Accordingly, the Board does not see any problems with the "then" formulation at the end of claim 1, since the periodic feeding as disclosed in the application as originally filed equates to forming a molten pool for arc stabilization (the size of the pool being bigger or smaller but at least such that it provides the aimed arc stabilization).

The amendment to granted claim 1 merely specifies that the periodic feeding of the wire is maintained till a molten pool is formed. This has indeed a basis in the application as originally filed. The amendments carried out to claims 1 and 10 do not thus provide any further technical information with respect to the application as originally filed.

Accordingly, the alleged intermediate generalization of the first embodiment is not present. The features referred to by the respondent represent merely the technical effects of the periodic feeding of the wire to form a molten pool in the claimed arc welding control method and the welding apparatus for carrying out such method.

2. *Remittal to the Opposition Division*

The impugned decision on the revocation of the patent is only based on Article 123(2) EPC for the subject-matter of independent claims 1 and 10 of the main request.

Under Article 111(1) EPC the Board of Appeal may either decide on the appeal or remit the case to the department which was responsible for the appealed decision.

Under Article 11 RPBA 2020 the Board may remit the case to the department whose decision was appealed if there are special reasons for doing so.

The Board holds that such special reasons are immediately apparent in the present case as the contested decision does not deal with the issues of sufficiency of disclosure, clarity, novelty and inventive step (Articles 83, 84, 54 and 56 EPC; see in particular point 13.4 of the decision) for any of the requests outstanding.

Under these circumstances and further considering that both the appellant and the respondent requested a remittal, the Board considers it appropriate to remit the case to the Opposition Division for further prosecution.

3. Finally, the Board notes that the present decision was taken in written proceedings as the appellant's main request is allowed and the respondent did not request oral proceedings.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The case is remitted to the Opposition Division for further prosecution.

The Registrar:

The Chairman:



A. Vottner

G. Pricolo

Decision electronically authenticated