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D E C I S I O N
of 21 September 1994

Case Number: T 0569/91 - 3.2.2

Application Number: 83305082.6

Publication Number: 0102251

IPC: B23K 26/00

Language of the proceedings: EN

Title of invention:
Plural computer control for shared laser machining

Patentee:
WESTINGHOUSE ELECTRIC CORPORATION

Opponent:
Siemens AG

Headword:
-

Relevant legal provisions:
EPC Art. -

Keyword:
"Inventive step (yes)"

Decisions cited:
-

Catchword:
-

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Case Number: T 0569/91 - 3.2.2

D E C I S I O N
of the Technical Board of Appeal 3.2.2
of 21 September 1994

Appellant: (Opponent)
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Representative:
-

Respondent: (Proprietor of the patent)
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Decision under appeal:
Decision of the Opposition Division of the European Patent Office dated 31 May 1991 rejecting the opposition filed against European patent No. 0 102 251 pursuant to Article 102(2) EPC.

Composition of the Board:

Chairman: H. J. Seidenschwarz
Members: C. G. F. Biggio
M. K. S. Aúz Castro

Summary of Facts and Submissions

I. The Appellant (Opponent) lodged an appeal, received on 29 July 1991, against the decision of the Opposition Division rejecting the opposition against the grant of European patent No. 102 251 and paid the appeal fee the same day.

II. Claim 1 of the patent as granted reads as follows:

"A laser welding apparatus comprising a single, time-shared laser source (170) for emitting a laser beam; beam directing means (172) operable to direct the laser beam along different laser paths; and laser beam focusing optics disposed in the respective laser paths; characterized by:
(a) first and second work stations (108a, 108b) separate and physically distinct from each other and adapted to receive separate workpieces independently of one another, each of said work stations being associated with one of said different laser paths and so located with respect thereto as to permit the laser beam, when directed along the particular laser path, to be focused upon the workpiece within the work station associated with said particular laser path; and
(b) a plurality of computer controllers (J22-41 and 42) each for causing said beam directing means to direct the laser beam along one of said laser paths, and for controlling welding operations on the work piece within the work station associated with said one laser path, said computer controllers being operatively interconnected and connected to said beam directing means in a manner such as to enable only one of the computer controllers at a time to gain and have control of said laser beam directing means while allowing the or

each other computer controller to control an operation at the respective work station associated therewith".

III. The Opposition Division held that the subject-matter of the above-quoted Claim 1 was not obvious, in the light of the following prior art documents, taken alone or in combination:

D1 = EP-A-0 042 173,

D2 = US-A-4 083 629,

D3 = US-A-4 088 865, and

D4 = Werner Diehl: "Prozeßrechnertechnik", Vogel Verlag, Würzburg, 1997, page 71.

IV. The Appellant requested in writing that the appealed decision be set aside and the patent be revoked.

The Appellant argued that document D1, although it did not deal with a laser welding apparatus, nevertheless disclosed all the features mentioned in the preamble of said claim and both characterising features (a) and (b) thereof. Characterising feature (b) was, moreover, a feature well known by any person skilled in the art, as illustrated by document D4.

Furthermore, the Opposition Division had held that laser welding represented a very specific technical field involving different technical elements, e.g. the power of the laser beam, the pulse width, the pulse frequency and the fact that laser welding must take place into appropriate "atmospheres" comprising appropriate gases, whereas said technical elements had no relevance in the teaching disclosed by document D1, which was dealing with the perforation of cigarettes paper. However, none of these technical elements was mentioned in the granted Claim 1, the subject-matter of which differs from the device according to document D1 only in its application, i.e. "welding by laser".

The technical features of the device according to Claim 1 were obvious in the light of the disclosures of documents D1 and D4.

V. The Respondent (Patentee) requested in writing that the appeal be dismissed, and submitted that none of the statements made in the notice of appeal were of relevance.

VI. On 21 September 1994, an Oral Proceedings was held at the request of both Parties. Although both Parties had been duly summoned to the Oral Proceedings, neither appeared. Pursuant to Rule 71 (2) EPC, the Oral Proceedings was continued without them.

Reasons for the Decision

1. The appeal is admissible.

2. *Novelty*

2.1. Document D2

It discloses a beam splitting system for use with a welding laser and having means for distributively directing an incoming welding beam along a pair of independent output optical paths, whereby a single welding laser may weld sequentially or simultaneously at a pair of spatially separate weld sites (see: column 2, lines 5 to 36).

From the description (column 3, lines 3 to 51 and Figure 1), it follows that two separate welds are performed on one work piece at the same work station, i.e. the separate "weld sites" do not correspond to

different work stations which receive separate work pieces independently of one another for being worked differently (see also the description of the patent in suit: column 5, lines 29 to 35).

Therefore, this known device does not comprise the features specified in the characterising clause of Claim 1 of the patent in suit.

2.2. Document D1

It deals with an apparatus and method for processing webs of flat material, such as paper, plastic, foils and the like, namely for perforating said material by using radiant energy issued by a laser source.

In order to increase the efficiency of such an apparatus, document D1 discloses a laser apparatus comprising a single, time-shared laser source (88) for emitting a laser beam; beam directing means (108, 106) operable to direct the laser beam along different laser paths; and laser beam focusing optics (110, 116, 122, 128) disposed in the respective laser paths; first and second work stations (rollers 14 and 16) separate and physically distinct from each other and adapted to receive separate workpieces (webs) independently of one another, each of said work stations being associated with one of said different laser paths and so located with respect thereto as to permit the laser beam, when directed along the particular laser path, to be focused upon the workpiece within the work station associated with said particular laser path. A control means is actuated for coordinating the operations of the beam directing means with those of the working stations (see in particular: Figure 3; page 2, lines 5 to 11; page 3, lines 7 to 19; page 4, lines 4 to 13; page 12, lines 8 to 13).

The subject-matter of Claim 1 of the patent in suit is therefore distinguished from the apparatus according to document D1 by the following features:
(a) the laser apparatus is a laser welding apparatus;
(b) a plurality of computer controllers (J22-41 and 42) each for causing said beam directing means to direct the laser beam along one of said laser paths, and for controlling welding operations on the work piece within the work station associated with said one laser path, said computer controllers being operatively interconnected and connected to said bean directing means in a manner such as to enable only one of the computer controllers at a time to gain and have control of said laser beam directing means while allowing the or each other computer controller to control an operation at the respective work station associated therewith, i.e. feature (b) of Claim 1.

2.3. Document D3

It deals with a laser beam welding apparatus and discloses laser beam directing means for directing a beam of radiation collimated about a fixed input axis to a joint to be welded between abutting stationary work pieces (pipeline lengths). This apparatus does not, however, comprise beam directing means, first and second working stations and a plurality of computer controllers as specified in Claim 1 of the patent in suit.

2.4. Document D4

This document shows general background art in the field of process control computers, namely, a plurality of computer controllers operatively interconnected and connected to each other in such a manner as to enable various operations to be carried out.

2.5. From the above points 2.1 and 2.2, it follows that document D2 represents the closest prior art on file within the meaning of Rule 29(1)(a) EPC, since said document indicates the designation of the subject-matter of the invention and those technical features which are necessary for the definition of the claimed subject-matter but which, in combination, are part of the prior art.

2.6. The subject-matter of Claim 1 of the patent in suit is to be considered to be novel within the meaning of Article 54 EPC.

3. *Inventive Step*

3.1. Starting from the apparatus disclosed by document D2 as representing the closest prior art, the problem to be solved by the claimed invention is therefore to increase the efficiency of known laser welders (see the description of the patent in suit: column 5, line 29 to column 6, line 15).

This is achieved by the possibility of machining two work pieces at two different work stations with a single laser source in such a manner that a welding operation is carried out by focusing the laser beam on a first work piece within a first work station and a non-welding operation can be carried out on a second work piece within a second work station.

3.2. Document D2 in particular suggests that the laser beam is diverted into a heat sink, while the welded work piece is being replaced with another to be welded (see the description of the patent in suit: column 5, line 59 to column 6, line 1).

Therefore, no hint can be derived from said document, which could lead a person skilled in the art to improve the known laser welding apparatus by adopting the features (a) and (b) of Claim 1 as granted.

3.3. As to the control means for coordinating the operation of the beam directing means in the web transport and treatment apparatus disclosed by document D1, said control means is actuated to start operations within one of the two work stations and simultaneously direct the laser beam to the other of the two work stations.

However, nothing is disclosed in this document concerning the nature of this control means or how it is activated. No information, in this respect, can be derived from said document.

The person skilled in the art, therefore, does not get any suggestion to embody in a laser welding apparatus according to document D2 a plurality of interconnected computer controllers and to use them in the manner specified by feature (b) of Claim 1 of the patent in suit.

The general background knowledge of a person skilled in the art, as illustrated by document D4, cannot, without more detailed information fill the information gap left by the combined teachings from documents D2 and D1.

3.4. Since document D3 cannot give likewise a hint to the subject-matter of Claim 1, its teaching could not, in combination with the teaching of the documents discussed in the foregoing points, lead the person skilled in the art to an apparatus according to said claim.

4. It follows that the laser welding apparatus according to Claim 1 cannot be derived in an obvious manner from the cited prior art and, thus, involves an inventive step pursuant to Article 56 EPC.

5. The subject-matter of Claim 1 is therefore patentable pursuant to Articles 52(1), 54 and 56 EPC. Claims 2 to 9 define further embodiments and meet likewise the requirements of the EPC.

6. The patent can be maintained unamended.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

S. Fabiani H. Seidenschwarz