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D E C I S I O N
of 22 March 1996

Case Number: T 0083/94 - 3.2.5

Application Number: 85905891.9

Publication Number: 0203201

IPC: B29C 45/76

Language of the proceedings: EN

Title of invention:
Method of setting operational conditions for injection molding machines

Patentee:
FANUC LTD.

Opponent:
Battenfeld Kunstoffmaschinen Ges.m.b.H

Headword:
-

Relevant legal provisions:
EPC Art. 56

Keyword:
"Inventive step (yes)"

Decisions cited:
-

Catchword:
-

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Case Number: T 0083/94 - 3.2.5

D E C I S I O N
of the Technical Board of Appeal 3.2.5
of 22 March 1996

Appellant: (Opponent)
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Decision under appeal: **Decision of the Opposition Division of the European Patent Office posted 30 November 1993 rejecting the opposition filed against European patent No. 0 203 201 pursuant to Article 102(2) EPC.**

Composition of the Board:

Chairman: G. O. J. Gall
Members: A. Burkhart
C. G. F. Biggio

Summary of Facts and Submissions

I. The appellant (opponent) lodged an appeal against the decision of the Opposition Division rejecting the opposition against the patent No. 0 203 201.

Opposition was filed against the patent as a whole and based on Article 100(a) EPC (lack of novelty and inventive step).

The Opposition Division held that the grounds for opposition mentioned in Article 100(a) EPC did not prejudice the maintenance of the patent unamended, having regard to the following documents

D4: KUNSTSTOFFE, volume 71, no. 6, June 1981, pages 342 to 346

D5: MODERN PLASTICS INTERNATIONAL, volume 9, no. 12, December 1979, pages 8 to 11

D6: KUNSTSOFFE; volume 63, no. 4, April 1973, pages 205

D7: Battenfeld Firmendruckschift: "CNC 80/85 Regelungssystem für Spritzgießmaschinen"

D8: Kunststoffmaschinen Ges.m.b.H.: Firmendruckschrift "UNILOG Steuerungen mit System"

D9: LEXIKON DER ELEKTRONIK, 1983, page 291.

II. In a communication annexed to the summons for oral proceedings the Board referred to a further document

D10: "Lexikon der Mikro-Elektronik", IWT Verlag, München, 1978, page 508.

III. Oral proceedings were held on 22 March 1996.

(i) The appellant requested that the decision under appeal be set aside and the patent be revoked.

(ii) The respondent (patent proprietor) requested that the appeal be dismissed (main request) or, as an auxiliary request, that the patent be maintained in amended form on the basis of an amended claim comprising the combination of the features of claims 1 and 2 of the patent as granted, filed with letter of 31 January 1996.

(iii) Claims 1 and 2 of the patent as granted read as follows:

"1. A method of setting operating conditions for an injection molding machine incorporating a numerical control unit, comprising forming a numerical control program providing a fixed pattern of injection molding operations of the injection molding machine, and setting parameters in memory areas to describe various operating conditions of the injection molding machine, characterised by

(a) the numerical control program describing various operating conditions of the injection molding operation using macro parameters,

(b) determining memory areas corresponding to respective ones of the macro parameters in advance,

(c) setting values of the operating conditions for the corresponding macro parameters, and

(d) storing the set values of the operating conditions in the memory areas assigned to the corresponding macro parameters.

2. A method according to claim 1, wherein said numerical control unit comprises a display unit having display screen selecting means and an input unit, the injection molding operation comprises a plurality of processes, and the step (c) comprises the step of operating said display screen selecting means to selectively display a screen for setting values of the various operating conditions of one of the plurality of processes, and the step of operating said input unit to set the set values of the operating conditions for the memory areas assigned to them by utilizing the display screen."

(iv) The appellant argued essentially as follows:

In microprocessor-controlled systems for injection molding machines according to documents D4, D7 and D8 the microprocessor system had the immanent facility to store a program separately from the machine data and to receive into the program memory addresses in which the machine data are contained, in order to change certain operating conditions within a fixed pattern of injection molding operations. Since the use of macro parameters was common practice in the microcomputer technique, as was demonstrated by the documents D9 and D10, it was obvious to the person skilled in the art to use in a micro processor control system for an injection molding machine according to document D4 macro parameters describing various operating conditions, in order to facilitate the setting of various operating conditions without the need of reprogramming the overall control program.

Thus, the person skilled in the art would arrive at the method of claim 1 of the patent in suit without any inventive skill.

Since the use of a display screen for selecting and inputting various operating conditions was known from document D4, page 343, last paragraph, and Figure 6, also the subject-matter of the claim according to the respondent's auxiliary request did not involve an inventive step.

(v) The respondent argued essentially as follows:

In all of the microprocessor-controlled systems for injection molding machines according to the documents D4, D7 or D8 unchangeable storage means were used, and therefore this state of the art led the person skilled in the art away from the field of the patent in suit, which stressed the advantages of the changeable nature of the data.

The documents D9 and D10, which gave definitions of the terms "macro instruction" and "macro parameter", only demonstrated that the use of macro parameters in computer programmes for the purpose of facilitating programming was known.

The method of claim 1 of the patent in suit differed from the methods disclosed in documents D4, D7 and D8 not only by using a control program comprising macro parameters but by providing a variable program which, by using macro parameters describing various operating conditions according to step (a), could be readily changed according to steps (b), (c) and (d) without the need of reprogramming the main control program.

The particular use of macro parameters in an injection molding NC program as indicated in claim 1 of the patent in suit would therefore not be obvious to the person skilled in the art.

Although a display unit was disclosed in the prior art, there was no disclosure in the prior art documents of employing the means of claim 2 of the patent in suit in order to set injection molding operating conditions in memory areas corresponding to respective macro parameters. Therefore, at least the claim according to the auxiliary request should be allowable.

Reasons for the Decision

1. *Novelty*

None of the documents D4, D7 or D8 discloses the use of macro parameters for describing various operating conditions in a NC program for controlling an injection molding machine.

Documents D9 and D10 do not relate to a control program for an injection molding machine.

Therefore, the method of claim 1 of the patent in suit is novel with respect to the prior art referred to by the appellant.

In fact, novelty was no longer in dispute in the appeal proceeding.

2. *Inventive step*

2.1 Problem underlying the invention

The problem underlying the invention consists in providing an operating condition setting method for an injecting molding machine, which can make the values of operating conditions of an injection molding operation variable provided that a fixed pattern of injection molding operations of the injection molding machine is retained, without involving reprogramming.

2.2 Solution

This problem is solved, according to the characterising portion of claim 1 of the patent in suit, by the following steps:

(a) the numerical control program describing various operating conditions of the injection molding operation uses macro parameters,

(b) memory areas corresponding to respective ones of the macro parameters are determined in advance,

(c) values of the operating conditions for the corresponding macro parameters are set, and

(d) the set values of the operating conditions are stored in the memory areas assigned to the corresponding macro parameters.

Steps (a) and (b) provide for memory areas corresponding to the macro parameters to be predetermined. In a next step (c) values of operating conditions are set for the corresponding macro parameters, the said values being then stored (step (d)) in the memory areas assigned to the corresponding macro parameters.

Thus, the said values for the operating conditions can be arbitrarily changed provided that the operating pattern of the injection molding process is the same.

The block circuit diagram of the control circuit of the injection molding machine according to Figure 1 of the patent in suit shows a non-volatile pattern storing memory (4) which stores the NC program for executing a predetermined injection molding operation and a non-volatile macro parameter storing memory (5) which stores the various operating conditions as macro parameters. The values of these operating conditions can therefore be readily changed, as is explained in the example of columns 3 and 4 and Figure 2 of the patent specification.

2.3 This solution is not rendered obvious by the prior art documents referred to by the appellant, for the following reasons.

Document D4 gives a general survey for the application of microprocessor technique for controlling injection molding machines. It indicates that the program and the fixed data are stored in a ROM which is specified as a plug-in ROM being invariable and data-secure. Such a plug-in operation is shown in Figure 5. Since the ROM is unchangeable, the setting of new values of operating conditions requires a new ROM to be programmed.

The appellant did not contest that the documents D7 and D8 relate to the use of ROMs too. As far as document D7 mentions a EAROM, similar considerations apply, since for changing the program of a EAROM a specific electrical altering process is required.

The disclosure of documents D4, D7 and D8 that the program is stored unchangeably in a ROM indicates that the operating condition values should not be changed unless reprogramming is effected. Therefore, the teachings of these documents lead away from the invention of the patent in suit.

Documents D9 and D10, which are extracts from lexicons relating generally to microelectronics, give definitions of the terms "macro instruction" and "macro parameter". These documents only demonstrate that the use of macro parameters in computer programs for the purpose of facilitating programming was known at the priority date of the patent in suit. However, these documents do not suggest to the person skilled in the art the specific steps (a) to (d) of claim 1 of the patent in suit.

2.4 Therefore, the method of claim 1 of the patent in suit also involves an inventive step in the meaning of Article 56 EPC.

3. Consequently, the method of claim 1 constitutes a patentable invention within the meaning of Article 52(1) EPC, and the patent can be maintained as granted.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

A. Townend G. Gall