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D E C I S I O N
of 20 October 1995

Case Number: T 0263/94 - 3.5.1

Application Number: 82901442.2

Publication Number: 0078856

IPC: G05B 19/403

Language of the proceedings: EN

Title of invention:
Numerical control device

Patentee:
FANUC LTD.

Opponent:
Robert Bosch GmbH

Headword:
Numerical Control Device/FANUC

Relevant legal provisions:
EPC Art. 54(3), 56

Keyword:
"Novelty (yes)"
"Inventive step (yes)"

Decisions cited:
-

Catchword:
-



Case Number: T 0263/94 - 3.5.1

D E C I S I O N
of the Technical Board of Appeal 3.5.1
of 20 October 1995

Appellant: Robert Bosch GmbH
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Representative: -

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Decision under appeal: Interlocutory decision of the Opposition Division
of the European Patent Office dated 17 January
1994 concerning maintenance of European patent
No. 0 078 856 in amended form.

Composition of the Board:

Chairman: P. K. J. van den Berg
Members: R. Randes
G. Davies

Summary of Facts and Submissions

- I. European patent No. 0 078 856 was granted on 17 August 1988 on the basis of European patent application 82 901 442.2, filed on 18 May 1982 and claiming a priority date of 18 May 1981.
- II. An opposition was filed on 9 May 1989 on the grounds that the subject-matter of the patent was not new or did not involve an inventive step (Article 100(a) EPC).
- III. On 5 September 1990 the opponent referred for the first time to the prior art document:
- Weck**, "Fortschritte in der Steuerungstechnik für spanende Werkzeugmaschinen", Zeitschrift für wirtschaftliche Fertigung 11/79, 544-551.
- On 5 November 1992 a further document was filed by the opponent:
- Junike**, "Bedienfunktionen einer MPST-Lösung".
- This document was said to correspond to a talk held on 23 February 1978 at the conference MPST (Modulares Mehrprozessor Steuersystem).
- On 10 September 1993 the opponent filed
- Sauer**, "Dialogorientierte Kleinrechner zum Erstellen von NC-Steuerlochstreifen", Maschinenmarkt 85 (1979) 6, 82 - 86.
- IV. By its decision of 17 January 1994 the opposition division maintained the patent in amended form.

V. Claim 1 as amended reads:

A numerical control device (102) having an NC processor (102a) for executing numerical control processing on the basis of input numerical control information, said NC processor numerically controlling a machine tool (103), the numerical control device comprising:

user operable input means (202), for operator entry of information for use in defining said numerical control information, including numerical values for machining or machining conditions,

a display unit (203) for displaying, on a screen placed in juxtaposition with the input means (202), a machining profile of a part to be machined, which profile is dependent upon the information entered by the operator from the input means (202),

a processor (102c), for creating numerical control information on the basis of the information entered by the operator from the input means (202),

characterised in that:

- A) the numerical control device further comprises an external storage unit (201) in which items of machining data conforming to various shape patterns are stored,
- B) said processor (102c) is an editing processor for reading, from said external storage unit (201), machining data which is composed of a combination of shape elements selected from a predetermined plurality of shape elements, in accordance with a part code entered by the operator from said input means (202),
- C) said display unit (203) is connected to the editing processor (102c) for displaying the selected combination of shape elements on the screen and requesting the operator to enter by the input means (202) numerical values assigning dimensions to the shape elements, which values, when combined with the shape elements by the editing processor, create said numerical control

information defining the shape and dimensions of a part to be machined, and

D) the numerical control device further comprises an internal memory (102d) connected to said editing processor (102c) and to said NC processor (102a) for storing said numerical control information, created by said editing processor (102c), in order to enter said information into said NC processor (102a) to enable it to control the machine tool (103) in dependence thereon.

The characterising features have been identified by letters corresponding to the identification made by the appellant in the statement of the grounds of appeal.

VI. On 25 March 1994 the opponent filed a notice of appeal against this decision and paid the prescribed appeal fee. A statement setting out the grounds of appeal was subsequently filed on 20 May 1994.

VII. In the annex to a summons to attend oral proceedings dated 22 August 1995 the Board introduced the following prior art document of its own motion:

Martin et al. "Ansätze zur Arbeitsbereicherung an NC-Maschinen durch Mikrocomputer", Rationalisierung, 1979-2, 39-42.

This article had been cited by the opponent in the co-pending case T 0264/94.

In addition to inventive step considerations, the rapporteur introduced the issue of novelty in respect of the respondent's own earlier European patent application

EP-A-0 044 192

which forms prior art under Article 54(3) EPC. The corresponding patent is the subject of the appeal T 0264/94.

VIII. Oral proceedings before the Board were held on 20 October 1995. The appellant's (opponent's) arguments in support of its submission that the subject-matter of claim 1 lacked an inventive step may be summarised as follows.

The contested patent was concerned with a numerical control device comprising an NC processor, an editing processor, a memory connected between the processors, input means, display means and an external storage unit. Having regard to EP-A-0 044 192, such a device was not new. Furthermore, all the hardware was known from prior art falling under Article 54(2) EPC. The combination of an NC processor and a separate editing processor could be derived from Weck, Figures 7 and 8; to connect a memory between the processors was self-evident since in Figure 8 of Weck it was shown that a memory could be connected between two separate processors; input means, display means and external storage units were also well-known components, as demonstrated for example by Sauer, page 84. The structure therefore did not involve an inventive step. The device's structure had to be distinguished from its method of operation. Said method was in principle claimed in the patent opposed in the appeal case T 0264/94, which patent had been maintained as amended in opposition proceedings by decision of the Board earlier that day. This method, even if not previously suggested, could not render the device inventive. If the essential subject-matter of a patent was a method, the method - and not the device for performing the method - must be claimed.

- IX. The respondent (patentee) argued that the claimed device required a specific operability. The fragments of different prior art referred to in the proceedings were not close to the invention. Martin, in particular, did not disclose portable macros. As regards Junike, it had not been shown that this paper was actually prepublished: it was not certain that the conference at which the paper was presented had been public; there was not even any proof that it had taken place. Moreover, the claimed subject-matter was not disclosed in EP-A-0 044 192 since the cassette described in this document did not correspond to the external storage unit for storing shape data in claim 1. The cassette instead contained complete, edited NC control information, as could be seen from column 19, lines 37 and 38 of the patent specification EP-B-044 192.
- X. The appellant requested that the decision under appeal be set aside and the patent be revoked.
- XI. The respondent requested that the appeal be dismissed and the patent be maintained as maintained by the opposition division.
- XII. At the end of the oral proceedings the Chairman announced that the decision of the Board was reserved and would be given later in writing.

Reasons for the Decision

1. The appeal is admissible.

2. *Amendments*

The Board is satisfied that the amendments to the claims made during the opposition proceedings do not extend beyond the content of the application as filed or cause the protection conferred to be extended. The patent therefore complies with Article 123(2), (3) EPC.

3. *Interpretation of claim 1*

The numerical control device according to claim 1 contains an editing processor for reading "machining data which is composed of a combination of shape elements". The shape elements correspond to certain "shape patterns", ie contours of articles to be machined, and do not contain dimensions since these are entered by the operator in order to generate the numerical control information which is needed for machining. Moreover, in the opinion of the Board, the formulation of the claim excludes the possibility that the shape elements form part of a (sub-)program or macro, which are made up of code. Instead, the shape elements are pure data corresponding to a series of symbols which define (in a way which is specified only in claim 2) patterns corresponding to articles to be machined.

4. *Novelty*

4.1 The Board has introduced the earlier European application EP-A-0 044 192 into the proceedings. This application forms prior art under Article 54(3) EPC.

Figure 30 of EP-A-0 044 192 shows "an apparatus for preparing numerical control information". This apparatus has many features in common with the present invention, such as two processors, an internal memory, input means and a display unit. It also comprises an external memory in the form of a (tape or bubble) cassette 203.

4.3 The respondent has argued that the invention as claimed is new with respect to EP-A-0 044 192 since the external storage unit according to claim 1, which contains "items of machining data conforming to various shape patterns", would not correspond to the cassette described in the previous application.

4.3 The Board agrees that this difference exists. The two first paragraphs of the characterising part of claim 1 make it clear that "machining data which is composed of a combination of shape elements" are stored in an "external storage unit". "External" implies in this context that the storage unit is removable from the control device so that a whole library of machining data can be stored on a plurality of replaceable units, eg cassettes (see the last sentence of the description). In EP-A-0 044 192, however, the corresponding data are "fed into a storage device located in the present apparatus" (see the corresponding patent specification EP-B-0 044 192, column 8, lines 24 to 31). Not once in the entire description is this storage device associated with the cassette 203, which is for storing "edited numerical control information and the like" and may be used to control the machine tool directly (column 19, lines 35 to 60). If the skilled man had tried to identify the storage device mentioned in the description with one of the memories shown in Figure 30 he would probably rather have opted for the memory 101 which "stores, picture-by-picture, all of the picture information which is displayed on the display screen"

(column 19, lines 18 to 21). This is because the shape elements are intended to be displayed (in a way similar to the present invention) so that dimensions can be attributed to them; they are not intended for immediate control of the machine tool.

4.4 Thus it is not possible to identify in Figure 1 of EP-A-0 044 192 an "external storage unit" in the sense of claim 1 of the contested patent. The subject-matter of claim 1 is therefore regarded as new over the device described in EP-A-0 044 192 (Article 54(1), (3) EPC).

5. *Inventive step*

5.1 Since it is not disputed that the invention is new in respect of the prior art falling under Article 54(2) EPC, only the issue of inventive step need be considered.

5.2 The appellant, referring in particular to the articles by Weck and Sauer, has submitted that the claimed device, which comprises nothing but well-known components, is not inventive, no matter whether its mode of operation is inventive or not.

The Board wishes to point out that in accordance with the established case law of the boards of appeal, it is not possible to decide the issue of inventive step of a computer running under a new program without considering the function of the program. This principle is expressed for example in the decision T 0208/84 ("VICOM", headnote II, OJ 87,014): "A computer of known type set up to operate according to a new program cannot be considered as forming part of the state of the art as defined by Article 54(2) EPC".

- 5.3 In the present case, the appellant has submitted that the hardware identified in claim 1 appears to be a rather straight-forward mix of known parts. In accordance with the case law explained above it might therefore be exactly the function that the device performs which is decisive for the question of inventive step. It appears therefore necessary to investigate whether an inventive step can be based on the function of the claimed device.
- 5.4 In the Board's view, the most pertinent document relating to the function of the invention is the article by Martin (cf the case T 0264/94).
- 5.5 Martin discloses a device for the preparation of control data which permits NC machine operators who do not possess programming skills to create small machining programs. The operator calls a selected one of a plurality of stored "macros". Each macro corresponds to a certain series of tool movements, ie to a certain shape. In the single example shown, the shape characteristics consist of parameters such as diameters and lengths. The parameters apparently have to be identified from a drawing. The operator inputs, for each parameter, the dimension of the article to be machined. Thus, according to Martin, a unity of a profile is identified. By inputting certain data (parameters) characterising this unity as a whole, the dimensions of this unity are identified.
- 5.6 Compared with Martin, which discloses the storage of shapes without dimensions in the form of macros, the invention is distinguished in particular by the feature that the editable machining data is composed of separate "shape elements". As explained at point 3 above, the shape elements (consisting of pure data) have to be regarded not as program code, but as a series of symbols

representing the shape (in principle the edges) of an article. Thus the characterising features (A) and (B) of claim 1 are clearly distinguished from the teaching of Martin in that, instead of calling up macros which have been programmed by a programmer, only data representing a combination of shape elements (making up a "shape") are fetched from an external memory.

5.7 Feature (C) of claim 1, defining the interaction between the operator and the device, at first glance appears to identify a function that is very similar to the function of the arrangement of Martin, but a careful investigation reveals distinctive differences. Thus Martin discloses in correspondence with feature (C) of claim 1 a device which (differences between the device according to claim 1 and that of Martin are given in brackets)

has a display unit which is apparently connected to an editing processor for displaying a mask of parameters of a macro on the screen

[according to claim 1 "the selected combination of shape elements" is displayed]

and which display requests the operator to enter by the input means numerical values assigning dimensions to the parameters

[the dimensions are assigned "to the shape elements" according to claim 1],

which values, when manipulated by the editing processor create said numerical control information defining the shape and the dimensions of a part to be machined.

5.8 Thus, it appears that the features (A), (B) and (C) of the invention make it clear that the geometry without dimensions represented by the shape elements is quite different from the programmed macros used in Martin. Thus, according to the invention a combination of separate shape elements is fetched from the store and displayed on the screen, whereafter each shape element of said combination is assigned a dimension so as to represent edges of the final shape. This is quite different from Martin which does not display shape elements corresponding to edges of a shape, but displays a mask of parameters. Thus an operator cannot identify edges of a shape to be machined, at least not in the sense of the invention. The Board, therefore, cannot find that, having regard to the teaching of Martin and starting from the hardware identified by claim 1, it would be obvious to arrive at the subject-matter of claim 1.

5.9 In the related case T 0264/94, in the context of permitting a machine operator to define NC programs, the document Junike was referred to. The Board is of the opinion that also in the present case this document appears at first sight to be relevant and therefore should be considered.

5.10 Junike discloses an apparatus for entering the shape of an article to be machined using the direction of extent of its successive edges. For each edge, a button symbolising the direction (x-axis, z-axis, diagonal, etc) is activated and the operator is prompted to input the corresponding dimension. The indication of x and z values in the drawings suggests that a complete contour, including dimensions, is stored.

- 5.11 According to Junike shapes are defined using buttons representing different directions of extent of article edges; said edges are however immediately provided with dimensions, which means that what is finally stored is more like a complete machining program than a series of shape elements.
- 5.12 It can thus be seen that said features (A), (B) and (C) of claim 1 of the contested patent are not found in Junike.
- 5.13 The appellant suggested during the oral proceedings in the case T 0264/94 that a skilled man would consider first applying the method described in Junike to produce sets of machine data and then adding the macro principle according to Martin to that data to form a library of shapes (according to Martin, the operator can call up the macro he needs, see page 40, right-hand column - apparently from a library).
- 5.14 The Board is of the opinion that such an approach does not lead in an obvious way to the features (A) and (B), not to mention the feature (C). In Junike, the final form of a shape seems to be a set of coordinates, characterising the outline of a single article. Martin, however, starts out with a number of parameters which define not a single outline, but a (dimensionless) shape. This is an incompatibility which, in the Board's view, would have made it difficult for the skilled man to envisage a combination of the teachings. Considering that the processes according to both Martin and Junike result in a set of complete numerical control information which can be used directly to control an NC device, the skilled man would probably have seen them as alternatives rather than as complementary.

5.15 Since Martin and Junike neither separately nor in combination with each other or with other documents referred to render the invention obvious, the Board finds that the subject-matter of claim 1 involves an inventive step.

5.16 The respondent has raised the question whether the paper by Junike, said to correspond to a talk held at a conference on 23 February 1978, can be regarded as prior art under Article 54(2) EPC. In view of the foregoing considerations and the Board's conclusions, this issue need not be resolved.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:

M. Kiehl

P. K. J. van den Berg

