BESCHWERDEKAMMERN
DES EUROPÄISCHEN
PATENTAMTS

BOARDS OF APPEAL OF
THE EUROPEAN PATENT
OFFICE

CHAMBRES DE RECOURS
DE L'OFFICE EUROPEEN
DES BREVETS

Internal distribution code:
(A) [ ] Publication in OJ
(B) [ ] To Chairmen and Members
(C) [X] To Chairmen

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

Case Number: T 0264/94 - 3.5.1

Application Number: 81303110.1

Publication Number: 0044192

IPC: G05B 19/42

Language of the proceedings: EN

Title of invention:
A method for preparing numerical control information

Patentee:
FANUC LTD.

Opponent:
Robert Bosch GmbH

Headword:
Method for preparing NC-information/FANUC

Relevant legal provisions:
EPC Art. 56

Keyword:
"Inventive step - yes"

Decisions cited:
-

Catchword:
-

Europäisches
Patentamt

European
Patent Office

Office européen
des brevets

Beschwerdekammern   Boards of Appeal   Chambres de recours

Case Number: T 0264/94 - 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
(Opponent)   Zentralabteilung Patente
                          Postfach 30 02 20
                          D-70442 Stuttgart   (DE)

Representative: --

Respondent: FANUC LTD.
(Proprietor of the patent) 3580, Shibokusa Aza-Komanba, Oshinomura
                          Minamitsuru-gun
                          Yamanashi 401-05   (JP)

Representative: Billington, Lawrence Emlyn
                          HASELTINE LAKE & CO
                          Hazlitt House
                          28 Southampton Buildings
                          Chancery Lane
                          London WC2A 1AT   (GB)

Decision under appeal: Interlocutory decision of the Opposition Division
                          of the European Patent Office dated 17 January
                          1994 concerning maintenance of European patent
                          No. 0 044 192 in amended form.

Composition of the Board:

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

Summary of Facts and Submissions

I.   European patent No. 0 044 192 was granted on 13 May 1987
       on the basis of European patent application
       No. 81 303 110.1, filed on 8 July 1981 and claiming
       priority date of 10 July 1980.

II.   An opposition was filed on 4 February 1988 on the
       grounds that the subject-matter of the patent was not
       new and did not involve an inventive step
       (Article 100(a) EPC).

       The opponent relied in particular on the document

       Spur et al, "Entwicklung einer CNC-Steuerung mit
       integriertem Programmiersystem für Drehautomaten", ZwF
       74(1979) 10, 482-486.

III.   On 15 October 1988 the opponent referred additionally to
       the prior art document

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

IV.   In a communication dated 20 January 1993 the Opposition
       Division introduced a document on its own motion:

       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). It had initially been filed
       by the present opponent in a co-pending case relating to
       similar subject-matter (T 0263/94).

IV.   On 11 September 1993 the opponent filed the document

        Sauer, "Dialogorientierte Kleinrechner zum Erstellen von
        NC-Steuerlochstreifen", Maschinenmarkt 85 (1979) 6, 82 -
        86.

V.   By its decision of 17 January 1994 the Opposition
        Division maintained the patent in amended form.

VI.   Claim 1 as amended reads:

        "A method of preparing numerical control information for
        use in operating a machine tool comprising the steps of:
        - programming the shape of an article to be machined;
        - displaying characters and/or symbols relating to the
        shape of the article to be machined; and
        - inputting by an operator prescribed data in the form
        of characters and/or symbols and numerical values
        relating to the article;
        characterised in that:
        - sets of representations of respective shapes of
        articles are prestored as data in a memory by an
        operator entering via a data input device (1,2,3) a
        series of items of data (→,↓,C,R) which indicate the
        directions of extent of successive edges of an outline
        of each respective article, each of said data items
        (→,↓,C,R) being entered separately by the operator and
        representing a specific direction of extent;
        - the prestored shape data is successively recalled for
        activating a display device (4) according to a
        predetermined sequence of sets of representations of
        respective article shapes;
        - the article shapes are displayed to an operator as
        successive inquiries having codes (001, 002, 003...)
        according to said sequence, by means of characters
        and/or symbols (→,↓,C,R) displaying to the operator the

directions of extent of successive edges of the outlines of the displayed article shapes;

- the operator chooses a required shape from amongst the displayed article outlines, by comparing an article shape to be machined with the displayed article outlines as represented by said characters and/or symbols ($\rightarrow$, $\downarrow$, C, R) until he locates a displayed article outline which corresponds to the article shape to be machined as regards the directions of extent of the successive edges of its outline;

- the operator inputs the located displayed article shape by using a data input device (1, 2, 3) to enter the code thereof;

- and subsequently inputs the dimensions of the article shape to be machined by inputting the dimensions to be ascribed to said successive edges of the outline thereof."

VII.   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 29 April 1994.

VIII. In the annex to a summons to attend oral proceedings dated 22 August 1995, the Rapporteur made particular reference to the articles by Junike and by Martin. Oral proceedings were appointed for 19 October 1995.

IX.   Oral proceedings were held on 19 and 20 October 1995.

The appellant's (opponent's) arguments in support of his submission that the subject-matter of claim 1 lacked an inventive step can be summarised as follows.

The contested patent was concerned with the preparation of control information for use with a numerically controlled (NC) machine. The technical problem indicated

in the description was to "enable even an inexperienced operator to prepare numerical control information relating to arbitrary article shapes quickly, simply and accurately". Such an aim was known from a large number of documents, for example Spur (point 2.1), Sauer (page 83) and Junike (page 105 onwards). In accordance with the method set out in claim 1 of the contested patent this problem was solved basically by the following steps: an operator stored shapes in a memory, the shapes were recalled and displayed on a display device, an operator selected the required shape and entered dimensions which were attributed to the respective edges of the shapes. A similar technique was known from Martin in respect of macros. A macro was a program defining a typical tool movement. It did not specify dimensions values. These were added after a macro had been called, similar to the invention. Martin did not disclose that shapes were displayed; graphical displays were however well known at the relevant date even if their price was prohibitive for many applications. Obviously a graphical display would be desirable for displaying the shapes defined by the macros in Martin. Furthermore, Junike suggested a way of inputting shapes edge by edge using buttons indicating the direction of the edge. A skilled person would consider first using the method described in Junike to produce sets of machine data and then applying the macro principle according to Martin to the sets of data in order to create a shape library. The combination of Martin and Junike thus rendered the invention obvious.

X.   The respondent (patentee) argued that a macro, as described in Martin, did not represent a complete shape but merely contained indications as to what the parameters of the shape were. Junike was nearer to the idea of symbolic representations according to the invention; however, it suggested that an edge was always

defined together with its dimension value. This was
different from the series of data items, excluding
dimensions, which the operator stored according to
claim 1. Even if Martin perhaps showed the separate
treatment of a function and its associated parameter,
this was not a feature which could be arbitrarily
generalised. It was in particular not applicable to the
Junike teaching. Moreover, it had not been shown that
the Junike paper was prepublished: it was not certain
that the conference at which the paper was presented had
been public; there was not even any proof that the
lecture corresponding to the Junike paper had taken
place.

XI.   The appellant requested that the decision under appeal
        be set aside and the patent be revoked.

XII.   The respondent requested that the appeal be dismissed
        and that the patent be maintained as maintained by the
        Opposition Division.

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.   Novelty not being at issue, only the question of
        inventive step requires consideration.

4.   *The invention*

        The invention as claimed in claim 1 relates to a method
        of preparing numerical control information for use in
        operating a machine tool. The salient features of the
        claim are concerned with the way an operator stores
        shapes to be machined into a library. The operator
        enters a series of items which indicate the directions
        of extent of successive edges of the shape of each
        article. Dimensions are not stored. Prestored shapes may
        be displayed on a screen. The directions of extent are
        displayed by means of symbols such as arrows. In order
        to prepare machining data for a certain article the
        operator selects the proper shape and enters, for each
        edge of the shape, the correct dimension.

5.   *Prior art*

5.1   The Board is of the opinion that the two closest
        documents on file are the papers by Martin and by
        Junike.

5.2   The respondent 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 following
        considerations and the conclusions of the Board, cf
        paragraph 7, this issue need not be resolved by the
        Board.

5.3   The preamble of claim 1 of the patent can be read onto
        the teaching of Martin. Furthermore, the method of
        Martin permits operators of NC machines 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 a certain shape.

In the single example shown, the shape characteristics
do not consist of the direction of successive edges but
rather of such conventional parameters as diameters and
lengths. These are apparently not ordered in a
particular way and would therefore have to be
identified, for example from a drawing. The operator
inputs, for each parameter, the dimension of the article
to be machined.

5.4   Junike discloses, also in the context of permitting a
machine operator to create NC programs, a way of
defining 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. There is
no mention in the document that items symbolising the
direction of edges should be stored separately from the
dimension values; on the contrary, the indication of x
and z coordinates in the drawings suggests that a
complete contour, including dimensions, is stored.

6.   *The technical problem*

Taking Martin as the closest prior art, it can be seen
that the rather general technical problem indicated in
the description of the contested patent - to "enable
even an inexperienced operator to prepare numerical
control information relating to arbitrary article shapes
quickly, simply and accurately" - has already been
solved. The objective problem in this case is, in the
opinion of the Board, simply to improve said method
further so that the machine operator himself may prepare
numerical control information corresponding also to
articles whose shape have not been prestored, ie the
operator should be able to define not only dimensions
but also article outlines.

7.   *The inventive step*

7.1   The macro technique in Martin offers no solution to the
        aforementioned problem. Stored article shapes can be
        varied by entering different dimensions, but there is no
        simple way for an operator to input completely new
        shapes since the macros have to be programmed. Moreover,
        the stored shapes cannot be easily visualised since the
        displayed parameters have to be interpreted by means of
        a drawing. Also, according to Martin, a creation of a
        library in the sense as claimed is not possible. Martin
        does not even disclose how or where the macros are
        stored.

7.2   Junike offers a solution to part of the problem. Shapes
        can be entered in very much the same way as according to
        the invention, using buttons representing different
        directions of extent of article edges. However, Junike
        does not hint at the idea that the created shapes could
        be stored in a library in order to be recalled later.
        Furthermore, the edges are immediately provided with
        dimensions, which means that what is finally stored is
        in principle a complete machining program. When an
        article is displayed on screen, for example when its
        dimensions are to be modified, this is apparently done
        in the form of x and z coordinates, as shown in
        Figure 4. Such a representation cannot be easily
        visualised.

7.3   A combination of Martin and Junike does not render the
        invention obvious either. In Junike, the final form of a
        shape seems to be a set of coordinates, characterising
        one single article outline. Martin, however, starts with
        a number of parameters which define not a single article
        outline, but a general, dimensionless shape. This is an
        incompatibility which, in the Board's view, made it
        difficult for the skilled person to visualise a

0101.D   .../...

combination of the teachings. Considering that the processes according both to Martin and to Junike end up with a set of complete numerical control information which can be used directly to control an NC device, the skilled person would probably have seen these teachings as alternatives rather than as complementary.

7.4   It might be added that it would no doubt have been obvious to represent shapes graphically on the screen in the form of contours. Such a method, however, would not correspond to the one claimed in the contested patent. According to claim 1, the article shapes are displayed by means of symbols representing the directions of extent of successive edges. On a fair reading of the claim the symbols must be taken to be identical with the ones previously entered by the operator. Graphical representations in the form of contours are not provided when the stored shapes are displayed.

Thus the available prior art, although disclosing parts of the method, does not suggest such a consistent use of the representation.

7.5   To summarise, the invention solves the problem formulated at point 6 above by a representation of shapes consisting of items which indicate the direction of extent of successive edges of the contour. These items are convenient to use when storing a new shape in a library. Thus the operator himself may create the library and does not need to use macros. Moreover, the same series of items are displayed to the operator when he selects a desired shape to be machined. There is no need for a complete geometrical contour to be displayed, nor for a drawing to serve as an interpretation aid.

7.6   The Board therefore concludes that the subject-matter of claim 1 involves an inventive step.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

M. Kiehl   P. K. J. van den Berg