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D E C I S I O N
of 4 July 2000

Case Number: T 0938/96 - 3.5.1

Application Number: 87305835.8

Publication Number: 0258976

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Language of the proceedings: EN

Title of invention:
An image viewing station for picture archiving &
communications systems

Patentee:
THE UNIVERSITY OF ARIZONA

Opponent:
Koninklijke Philips Electronics N.V.

Headword:
Image viewing station/THE UNIVERSITY OF ARIZONA

Relevant legal provisions:
EPC Art. 100(a), 56

Keyword:
"Inventive step (no)"

Decisions cited:
-

Catchword:
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Boards of Appeal

Chambres de recours

Case Number: T 0938/96 – 3.5.1

D E C I S I O N
of the Technical Board of Appeal 3.5.1
of 4 July 2000

Appellant: (Proprietor of the patent)	THE UNIVERSITY OF ARIZONA Vice President for Research Administration 601 Tucson Arizona 85721 (US)
Representative:	Shindler, Nigel BATCHELLOR, KIRK & CO. 102-108 Clerkenwell Road London EC1M 5SA (GB)
Respondent: (Opponent)	Koninklijke Philips Electronics N.V. Groenewoudseweg 1 NL-5621 BA Eindhoven (NL)
Representative:	Schouten, Marcus Maria INTERNATIONAAL OCTROOIBUREAU B.V. Prof. Holstlaan 6 NL-5656 AA Eindhoven (NL)

Decision under appeal: Decision of the Opposition Division of the European Patent Office posted 16 August 1996 revoking European patent No. 0 258 976 pursuant to Article 102(1) EPC.

Composition of the Board:

Chairman: P. K. J. van den Berg
Members: R. R. K. Zimmermann
P. H. Mühlens

Summary of Facts and Submissions

I.   The appeal concerns European patent No. 0 258 976
        (application No. 87 305 835.8, priority date: 9 July
        1986), the mention of the grant being published on
        8 June 1994. The patent claim as granted was directed
        to an image viewing station for picture archiving and
        communication systems, provided for storing, processing
        and displaying image data produced by a plurality of
        modalities, each with a different dynamic range.

II.   The appellant filed an opposition against the patent on
        6 March 1995, invoking lack of inventive step
        (Article 100(a) EPC) as the only ground of opposition
        and requesting revocation of the patent in its
        entirety. In support of the opposition, the appellant
        cited, *inter alia*, the following documents:

        S. M. Goldwasser et al."Physician's Workstation with
        Real-time Performance", IEEE Computer Graphics and
        Applications, vol. 5, No. 12, December 1985,
        pages 44-57 (cited as document D1)

        S. M. Goldwasser "A Generalised Object Display
        Processor Architecture", IEEE Computer Graphics and
        Applications, vol. 4, No. 10, October 1984, pages 43-55
        (cited as document D2)

        EP-A-0 105 707 (cited as document D3, published
        18 April 1984)

III.   The opposition division revoked the patent for the
        reason of lack of inventive step in a decision posted
        on 16 August 1996. In its view the invention differed
        from the closest prior art, considered to be disclosed

in document D1, only by the claimed method for
interpolating image data, a method, however, which
would already have been known from document D3.

IV.   Against this decision the patent proprietor filed a
        notice of appeal on 15 October 1996, requesting
        complete reversal of the decision. The appeal fee was
        paid the same day; the grounds of appeal were
        subsequently filed on 20 December 1996.

        In public oral proceedings held before the Board on
        4 July 2000, the matters at issue were discussed with
        the representatives. The appellant requested that the
        decision under appeal be set aside and the patent
        maintained on the basis of the claim named "second
        auxiliary request - second proposal" as filed on
        20 December 1996 and amended by adding the word "raw"
        at the end of the third line after the word "storing".
        The claim according to the appellant's request reads
        then as follows:

        "An image viewing station for picture archiving and
        communication systems, comprising:
        random access base memory means (10) for storing raw
        image data corresponding to plural images to be
        displayed;
        image processing means (12) coupled to said base memory
        means for performing predetermined processing
        operations on said raw image data and for providing
        corresponding display data, said image processing means
        including:
        zooming means (106) responsive to said stored raw image
        data for obtaining values of estimated image data along
        a line between said data;
        display memory means (14) coupled to said image

processing means for storing the display data processed
by said image data processing means;
user input means (35) for generating input signals
indicative of selected images and image formats to be
viewed;
display means coupled to said display memory means for
displaying images based on the display signals stored
in said display memory means; and
control processor means for connection through an
internal bus to said base memory, image processor, and
display memory means for providing the corresponding
command signals responsive to said input signals from
said user input means; characterised in that:
said random access base memory means (10) stores raw
image data produced by a plurality of modalities each
with a different dynamic range and image data word
length;
said image processing means further includes
normalising means (102) for normalising said different
dynamic ranges of said raw image data stored in said
base memory means;
said zoom means performs a fractional bilinear
interpolation between the values of said normalised raw
image data so as to produce selectably continuous
magnification or reduction of the image; and
means (114,116) being provided to define the length of
the image data word during memory read and write
operations."

The respondent requested that the appeal be dismissed.

V.   Regarding the issue of inventive step, the respondent
        referred to document D2 as the most pertinent prior art
        document. The only difference distinguishing the
        claimed subject-matter from the system described in

document D2, the "generalized object display processor architecture GODPA", was the feature according to which the zoom means performed a fractional bilinear interpolation of the image data for zooming the image. As already pointed out in the decision under appeal, this feature was rendered obvious by document D3.

This prior art system, however, permitted the real-time display and processing of independent objects derived from medical imagery produced by CT, PET and NMR reconstruction techniques. Each one of the distinct objects were associated with an object descriptor block ODB containing the parameter "format" which defined the number of bits per voxel. Such a parameter made sense only if objects having different dynamic ranges and image data word length were stored and processed: it was in fact explicitly mentioned that the generalized object display processor architecture might support a plurality of different tone scales.

Therefore, the claimed viewing station lacked any inventive step having regard to the combination of documents D2 and document D3.

VI.   The appellant agreed that document D2 represented the closest piece of prior art but rejected the view that the object memory of the generalized object display processor architecture was intended to store, simultaneously, different image data formats. The appellant observed that document D2 indicated on page 49 that "currently, the only format is eight bits/voxel gray scale data". The invention was thus distinguished from the GODP system essentially by the features ensuring that image data having different formats could be stored simultaneously in the base

memory. This rendered data conversion superfluous; the raw image data from different modalities could directly be loaded into the base memory and then repeatedly and independently processed and displayed on an image by image basis without a need to reload the raw data from the respective data source. Preprocessing was not necessary, the normalisation step could be carried out after the raw image data had been read from the base memory. The conventional workstations did not provide such a functionality.

Reasons for the Decision

1.   The appeal complies with the requirements of Articles 106 to 108 and Rules 1(1) and 64 EPC and is thus admissible.

2.   As to the merits of the case, the principal issue to be decided is whether the patent as amended complies with the requirement of inventive step as set out in Articles 52(1) and 56 EPC.

3.   Both parties to the appeal procedure concur that the "generalized object display processor architecture GODPA", the prior art system described in document D2 primarily with reference to Figures 7 ff., comes closest to the image viewing station defined in the claim under consideration and thus forms an appropriate starting point for assessing the inventive step.

4.   The "GODP system" allows for processing and viewing medical images captured from imaging devices such as CT and PET scanner as well as for interacting in real time with those images (see in particular the introductory

and closing paragraphs of document D2). The system
comprises data access components (host bus, object
access unit OAU, object memory bus OMB, etc.) so that
it may form part of a multiprocessing environment (see
page 54, section titled "Object database access").
Therefore, the GODP system is suitable to be used as an
image viewing station within a picture archiving and
communication system.

Furthermore, the GODP system includes random access
base memory means ("object memory modules" using RAMs,
see page 46, section titled "Object memory system" and
page 55, first paragraph), image processing means
("density map", "arithmetic processors", "buffer
memories", etc.), zooming means ("anamorphic scaling",
see page 48, section titled "Sequence control table",
2nd paragraph), display and display memory means
("output buffers" and "monitors"), user input means
(the system allows the "manipulation" of the objects
displayed and a "real-time interaction", see e.g the
introductory paragraph of document D2), furthermore
control processor means ("microprocessor controller",
see Figures 7 and 8), and normalizing means ("format
converter", see page 54, left-hand column, 3rd
paragraph), all components functionally connected as
defined in the present claim under consideration. In
addition, image data may be interpolated for zooming
(scaling) purposes (see page 48, section titled
"Sequence control table", 2nd paragraph).

5.   Whereas the disclosure of these features by document D2
        has not been disputed by any of the parties to the
        appeal procedure, the appellant clearly objected to the
        view taken by the respondent that the object memory
        modules were intended to store raw image data which

have been produced by a plurality of modalities each
with a different dynamic range and image data word and
that the different dynamic ranges of the stored raw
image data were normalised by the image processing
means. The appellant considered the opposite true,
arguing that document D2 mentioned 8 bits/voxel as the
only data format used.

However, as explained on page 48 in section titled
"Display of multiple, independent objects", up to 64
"independently configurable objects" may be loaded into
the object memory modules of the processing elements
PE. To the "configurable" parameters included into the
object descriptor block ODB, the parameter "format"
belongs which specifies *inter alia* the gray scale depth
of the voxel data. Moreover, in each memory module,
data "are organized into groups of eight voxels ...
occupying a pair of 32-bit words", that means that the
8 bit per voxel is the maximum bit depth which is
determined by the particular hardware configuration.
This configuration allows image data to be stored which
have a bit depth of less than 8 bits per voxel (compare
page 54, left-hand column of document D2). Therefore,
the skilled person would clearly understand that the
GODP system allows to store image data of different
formats in the base memory simultaneously.

6.   Before the first instance and in the course of the
        appeal procedure the meaning of "raw image data" was
        another object of dispute. This, however, is not an
        issue any more since document D2, which is now
        considered as the closest piece of prior art,
        explicitly refers to data stored in the object memory
        modules as the "raw data", using the term essentially
        in the same meaning as the patent under dispute.

7.   It follows that the only feature left which
        distinguishes the claimed image viewing station from
        the prior art system is the fractional bilinear
        algorithm for interpolating image data for zooming. A
        technical realisation of such an algorithm for the same
        purpose, namely the scaling of image data, is known
        from document D3. According to the respondent such a
        fractional bilinear interpolation for zooming does, for
        this reason, not contribute to inventive step. The
        appellant did not raise objections against this
        conclusion.

        The Board concurs with the view of the respondent since
        the skilled person would consider it an obvious option
        to add a feature suitable for implementing a given
        function of a prior art apparatus or system if this
        feature is disclosed in some other piece of prior art
        as suitable for this purpose. Since this is clearly the
        case for the claimed interpolation algorithm, this
        feature does not contribute to inventive step. Thus the
        claim under consideration does not comply with the
        requirement of inventive step. The appellant's request
        can, therefore, not be allowed.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

1732.D

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