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D E C I S I O N
of 12 April 2000

Case Number: T 0237/97 - 3.4.1

Application Number: 89303193.0

Publication Number: 0335729

IPC: G01R 23/16

Language of the proceedings: EN

Title of invention:

Method and apparatus for aiding manual instrument settings by displaying estimates of future measurement results

Applicant:

Hewlett-Packard Company

Opponent:

-

Headword:

-

Relevant legal provisions:

EPC Art. 82, 123(2), 54, 56, 92(1), 113(1), 111(1)
EPC R. 62(2), 67

Keyword:

"EPC Art. 82: Unity (yes)"
"EPC Art. 113(1): Basis of decisions - opportunity to comment (no)"
"EPC Art. 111(1): Decision re appeals - remittal (yes)"

Decisions cited:

-

Catchword:

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Boards of Appeal

Chambres de recours

Case Number: T 0237/97 - 3.4.1

D E C I S I O N
of the Technical Board of Appeal 3.4.1
of 12 April 2000

Appellant: Hewlett-Packard Company
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Decision under appeal: Decision of the Examining Division of the
European Patent Office posted 19 September 1996
refusing European patent application
No. 89 303 193.0 pursuant to Article 97(1) EPC.

Composition of the Board:

Chairman: G. Davies
Members: G. Assi
U. G. O. Himmler

Summary of Facts and Submissions

I. The appellant (applicant) lodged an appeal, received on 4 November 1996, against the decision of the Examining Division, dispatched on 19 September 1996, refusing the European patent application No. 89 303 193.0 (EP-A-0 335 729). The fee for the appeal was paid on 4 November 1996. The statement setting out the grounds of appeal was received on 13 January 1997.

Following a request of the appellant dated 16 January 1996, the Examining Division took a decision according to the state of the file. In its decision, the Examining Division held that the application did not meet the requirements of the EPC for the reasons given in the result of the consultation by telephone on 19 September 1995, dispatched with the communication of 25 September 1995. In particular, point 1(ii) of the result concerns the allowability of amendments under Article 123(2) EPC. Moreover, in the decision, the Examining Division drew attention to points 1, 4 and 5 of the communication of 16 June 1994 pertaining to objections under Articles 54 and 56 EPC.

During the examining procedure, the Examining Division considered the following documents:

- (D1) US-A-4 244 024, cited in the search report, and
- (D2) EP-A-0 284 821, cited in the light of the EPO Guidelines, paragraph C-VI, 8.9.

II. The appellant requested that the decision under appeal

be set aside and a patent be granted on the basis of the following application documents:

Main request:

Claims:

No. 1 (in part) as filed with the letter of 18 February 1994,
Nos. 1 (in part)-4 as filed with the letter of 14 December 1994,
Nos. 5 to 12 (in part) as filed with the letter of 18 February 1994,
Nos. 12 (in part)-14 as filed with the letter of 14 December 1994,

Description:

Pages 1, 3, 5 to 17 as originally filed,
Pages 66 to 70 (renumbered 18 to 22) as originally filed,
Page 2 as filed with the letter of 13 May 1993,
Page 4 as filed with the letter of 14 December 1994,
Pages 4a, 4b, 4c as filed with the letter of 18 February 1994,

Drawings:

Sheets 1/11 to 11/11 as filed with the letter of 20 April 1989,

Auxiliary request:

Claims:

Nos. 1 to 14 as filed with the letter of 10 January 1997,

Description:

as for the main request,

Drawings:

as for the main request.

Moreover, the appellant requested reimbursement of the appeal fee and, as an auxiliary request, oral proceedings.

By letter of 22 December 1999, the appellant withdrew the request for oral proceedings "should the Board of Appeal decide to remit the case to the Examining Division for further prosecution."

III. The wording of claim 1 according to the main request reads as follows:

"A swept-tuned test instrument (10) comprising:
an input (12) for receiving an incoming signal (RF),
a swept local oscillator (16) for producing a local oscillator signal (LO),
a frequency mixer (14) connected to the input (12) and to the local oscillator (16) for mixing the incoming signal (RF) with the local oscillator signal (LO),
an IF filter (18) connected to the mixer (14) for passing a mixing product (MIXER PRODUCTS) when the frequency of the mixing products (MIXER PRODUCTS) equals a predetermined IF,
a peak detector (20) connected to the filter (18) to detect the passed signal (IF),
a digitiser (22) connected to the peak detector (20) for sampling and storing the detected signal (VIDEO) to form trace data,

a display device (24) connected to the digitiser (22) and responsive to the trace data to cause a vertical deflection on the display device (24),
a measure control circuit (26) connected to the local oscillator (16) and the display device (24) for driving the horizontal deflection of the display device (24) and for tuning the local oscillator (16) over a measurement range to enable a full set of trace data to be stored for the measurement range, and means (28, 30) connected to the measure control circuit (26) for adjusting a control setting of a measurement parameter for measurement of the incoming signal (RF), characterised by:
said measure control circuit (26) being responsive to adjustment of the control setting of a measurement parameter by the means (28, 30) for adjusting the control setting (STATE CHANGES) for a new measurement to be made and to the stored traced data (DATA FOR ESTIMATE) from a previously made measurement for calculating an approximation of the new measurement (TRACE ESTIMATE) incorporating said adjustment of the control setting and causing the display device (24) to display revised trace data processed in light of the adjustment as a precursor to the new measurement, the revised trace data providing a full or less than full display across the display device (24) to the extent that the stored trace data (DATA FOR ESTIMATE) are available in respect of the particular said adjustment of the control setting, and
said measure control circuit (26) enabling a full set of trace data to be stored responsive to a full range of a new measurement in accordance with an adjusted said control setting and to be displayed as a full replacement of whatever data were displayed as a full

trace from said previous measurement prior to the display of said revised trace data according to said calculated approximation and as a replacement of the displayed revised trace data."

The wording of claim 8 according to the main request reads as follows:

"A method (Fig. 4, Fig. 5) for facilitating adjustment of control settings of a test instrument (10) by displaying an estimate before performing a time consuming measurement, comprising the steps of: determining (40, 50) whether or not a user is adjusting a control setting of a measurement parameter;
calculating an estimate of how newly measured data will appear, if a new measurement which is subsequently made is in accordance with that particular adjusted said control setting, the estimate being based on the adjusted control setting and previously measured data to the extent that the previously measured data are available in respect of that particular adjustment of said control setting, if the user adjusts a control setting;
displaying (42, 52) the estimate as a full or less than full trace across a display device (24);
performing (44, 56) said subsequent new measurement; and displaying (46, 58) the newly measured data as a full trace across the display device (24) with the display updated to incorporate any adjustments in the control settings and fully replacing whatever said previously measured data were displayed as a full trace on the display device prior to display of the estimate and replacing the display of the estimate."

Claims 2 to 7 and 9 to 14 according to the main request are dependent.

IV. The appellant essentially argued as follows.

As to procedural matters, the following issues contravened Article 113(1) and Rule 51(3) EPC, so that refund of the appeal fee under Rule 67 EPC was justified:

- An apparent objection under Article 123(2) EPC was raised in the consultation by telephone on 19 September 1995. This objection had never been previously raised, despite the fact that the feature referred to had been introduced into the claims in February 1994 and that a communication dated 16 June 1994 was subsequently issued. Moreover, proper reasoning was not given, so that the appellant was not in a position to understand the nature and extent of the objection.
- With the letter of 14 December 1994, the appellant filed a statement from the inventors of document D1 explaining the differences between the teachings of D1, D2 and the claimed subject-matter. The statement was completely disregarded by the Examining Division without reasons being given, although it formed an integral part of the appellant's submissions.
- In the letter of 11 April 1995, the appellant indicated that the objections raised against claims 1 and 8 on file apparently took account of only part of the claimed features. No comments or

objections had been raised by the Examining Division to the other features in these claims. If the Examining Division had objections, then it ought to have raised them in order to give the appellant an opportunity to comment thereon.

- The communication of 16 June 1994 repeated a lack of novelty objection raised against claim 8 in a previous communication. However, substantial amendments to this claim had been made and arguments raised in support of the claim. The Examining Division had a duty to consider the new features introduced into claim 8 and to advise the appellant accordingly.

As to substantive matters, the invention as claimed was neither disclosed nor suggested in either D1 or D2.

Document D1 disclosed a spectrum analyser with graphic display. In operation, when the user adjusted an instrument control setting, a new measurement was performed, and the graphic display was updated to reflect the newly measured data in accordance with the adjusted control setting. This operation was shown in Figure 2 of the present application. In the display, a discontinuity appeared in the trace data at the point where the sweep resumed. Thus, the spectrum analyser known from D1 did not process stored measurement data by recalculating the trace data in the light of any adjustment entered by the user in order to provide an estimate of a future measurement.

Document D2 disclosed a signal analyser having a

scrolling function of a display screen. The analyser comprised a scroll command section providing a command for shifting an image previously acquired in a first frequency sweep range. When the scroll command was received, newly acquired measurement data were processed in a second frequency sweep range. An image of the second frequency sweep range was then displayed so that it was continuous with the image of the first frequency sweep range shifted in accordance with the scroll command.

Reasons for the Decision

1. The appeal is admissible.

2. *Substantive matters*

2.1 Main request

2.1.1 Unity of invention

The present requests include claims 1 to 7 concerning a swept-tuned test instrument and claims 8 to 14 relating to a method for facilitating adjustment of control settings of a test instrument. The Board takes the view that the application meets the requirement of unity of invention. The "single general inventive concept" referred to in Article 82 EPC is seen in the fact that an estimate is calculated, which is based on the previously measured data and the adjusted control setting (see point 2.1.5 below).

2.1.2 Amendments

The application as amended according to the main request meets the requirements of Article 123(2) EPC. Support for the amended claims can be found in the published original application as follows:

claim 1: see claim 1, Figures 3, 6 and 10,
 page 4, lines 39 to 47,

claims 2 to 7: see claims 2 to 7,

claim 8: see claims 8 and 9,

claims 9 to 14: see claims 9 to 20.

The description has been brought into conformity with the new claims. Moreover, D1 has been acknowledged pursuant to Rule 27(1)(b) EPC.

2.1.3 Clarity

The claims read in the light of the description are clear to the skilled person.

2.1.4 Novelty

2.1.4.1 Document D1

Document D1 discloses a spectrum analyser comprising the features of the precharacterising part of claim 1 (see column 6, line 34, to column 7, line 20, Figure 1). The operation of the analyser known from D1 is described in the affidavit submitted by the appellant with the letter of 14 December 1994, which affidavit forms an integral part of the appellant's

submissions (see the letter of 10 January 1997, page 4, second paragraph). Having regard to the fact that the affidavit is signed by the inventors of D1 and to the disclosure in column 7, lines 8 to 20, of D1, the Board has no reason to doubt the correctness of the appellant's contention in this respect. According to it, in operation of the spectrum analyser disclosed in D1, the user can adjust an instrument control setting at any time. If an instrument control setting is adjusted by means of the front panel, an interrupt is generated. An interrupt type routine interrogates the front panel to determine the new instrument control setting, and corresponding data are transferred from the main processor 250 to the display controller 135 which operates as a "slave" controller performing the necessary manipulation of data stored in memory 140 to change the display. In other words, when the interrupt is detected, the current sweep stops, and the sweep and display settings are updated based on the new instrument control setting. Then, the sweep is restarted, and additional trace data from a new measurement are displayed on the screen from the point where the sweep resumes using the new instrument control settings. The sweep continues until retrace, at which time a new sweep is initiated. A discontinuity will thus appear in the trace data at the point where the sweep resumes. Evidence that a new measurement is performed after adjustment of a control setting can be found, for instance, in Figure 16 of D1. Indeed, additional data are shown in the traces according to Figures 16B to 16E as compared to the original trace in Figure 16A (see the letter of 10 January 1997, page 5, last two paragraphs, page 6, first line).

The situation is completely different in the present case because, in accordance with claims 1 and 8, upon the adjustment of an instrument control setting, the stored trace data, measured before the change is effected, are used for calculating how the trace data would appear in the light of any adjustment that is entered by the user. This represents an estimate of the effect of the adjustment, which estimate is displayed so as to provide immediate feedback to the user. Adjustment can thus be effected without slowing the measurement process. Moreover, when the sweep resumes, there is no discontinuity in the trace data.

The feature concerning the calculation of an estimate based on the adjusted control setting and the previously measured data is neither implicitly nor explicitly disclosed by D1.

Therefore, the subject-matter of claims 1 and 8 according to the main request is novel with regard to the document D1.

2.1.4.2 Document D2

Document D2 is a state of the art according to Article 54(3),(4) EPC.

It discloses a signal analyser having a scrolling function for a display screen. The analyser essentially comprises the following features (see claim 1):

- input processing means for measuring an input signal in a predetermined frequency sweep range,

- memory means for storing the signal,
- display means for displaying the signal,
- scroll command means for shifting the image displayed, and
- control means for supplying
 - a first control signal for measuring the input signal in a first frequency sweep range prior to reception of a command from the scroll command means and
 - a second control signal for storing the signal,
 - a third control signal for measuring the input signal in a second frequency sweep range when a command from the scroll command means is received, and
 - a fourth control signal for storing the signal.

Moreover, the display means displays an image in the second frequency sweep range to be continuous with the image in the first frequency sweep range which is shifted in accordance with the scroll command (see Figures 4 and 5).

D2 does not disclose calculation of an estimate of a subsequent new measurement, as provided in accordance with the invention defined by apparatus claim 1 and process claim 8. Indeed, the previously generated trace is not used as an estimate of the effect of

changes in control settings on the subsequent trace. In other words, the known spectrum analyser merely stores the measurement data shifted in accordance with the scroll command without processing the stored data based on adjustment of control settings. Moreover, the previously generated trace is not replaced by the subsequent trace. Only the second frequency sweep range is measured during a subsequent measurement, and the stored data obtained when the first frequency sweep range was measured are simply re-displayed as an image continuous with the image of the measured second frequency sweep range.

Therefore, the subject-matter of claims 1 and 8 according to the main request is novel with regard to the intermediate document D2.

2.1.5 *Inventive step*

Document D1 is considered as the most relevant state of the art. It shows a spectrum analyser with graphic display, which typically has user controls to adjust the parameters of the measurement being taken. According to column 7, lines 23 to 49, front panel controls consist in function controls and data controls. In particular, once a function is selected, its value can be changed. The changes in values and conditions which are input "immediately" cause a change in the displayed waveform. The meaning of the adverb "immediately" is not defined in D1. However, it is clear from the whole context of the document that, when the user adjusts a control setting by means of a knob or button on the front panel, a new measurement is taken and the graphic display is updated to reflect

the new measured data (see column 7, lines 8 to 20 and point 2.1.4.1 above). The graphic display thus provides the result of the last measurement taken. The disadvantage of this system consists in that considerable time may be required to perform a new swept measurement. For this reason, changes in control settings are normally restricted to periods between measurements. Conventional spectrum analysers either do not address the problem, or they restart the sweep to reduce the delay (see the published application, page 2, lines 47 to 57), whereby resuming the sweep produces the discontinuity in the trace data mentioned above. The problem to be solved is thus to enable adjustment in control settings prior to or during a subsequent measurement (sweep) after a data trace from an initial measurement is observed by the user. This problem is not considered as contributing to inventive step because the user of the spectrum analyser would obviously appreciate the possibility of adjusting the instrument control settings at any time with a rapid feedback on the display. On the contrary, the claimed solution is inventive. In accordance with the invention, upon adjustment of a control setting, the current data, taken before the change if effected, are recalculated in the light of any adjustment that is entered by the user. This is advantageous because the time needed to calculate the estimate of the effect of the adjustment is normally shorter than that for taking a real measurement. Document D1 does not suggest the solution of manipulating old measured data to provide a prediction of how new measured data will appear.

Therefore, the subject-matter of claims 1 and 8

according to the main request involves an inventive step.

2.1.6 Having regard to the prior art disclosed in documents D1 and D2 only, the main request is allowable.

3. *Procedural matters*

3.1 *Search report*

With the communication dated 5 November 1990, the EPO transmitted the partial European search report under Rule 46(1) EPC. The Search Division considered that the application did not comply with the requirement of unity of invention (Article 82 EPC) and informed the appellant that the search report had been drawn up only for those parts of the application relating to the first invention mentioned in claims 1 to 7. The Search Division, moreover, informed the appellant that, if the search report was also to cover the other inventions identified (see claims 8 to 13 and 14 to 20), a further search fee had to be paid for each of these inventions, within one month from the notification of the communication. The appellant, however, did not pay any further search fee for the inventions mentioned in the original claims 8 to 13 (second invention) and 14 to 20 (third invention). With the communication of 20 February 1991, the EPO thus transmitted the European search report relating to claims 1 to 7 only.

With the communication of 30 November 1992, point 2, the Examining Division disagreed with the conclusion of the Search Division and stated that the claims were

considered to satisfy the requirement of unity of invention. The Examining Division, however, did not require an additional search for the method claims 8 to 20.

During the examination procedure and with the statement setting out the grounds of appeal, amended claims have been filed. It is clear that the method claims according to both the main and auxiliary requests have not been searched. However, Article 92(1) EPC imposes the obligation to draw up a complete search report for an application which complies with the requirement of unity and for which the search fee has been paid, whereby all search work other than for Article 54(3) EPC material should, in principle, be done by the Search Division (see the Guidelines, paragraph C-VI, 8.9). In view of this, and considering that the search report ought to provide an applicant with an accurate indication of the state of the art that is relevant for assessing the issues of novelty and inventiveness and that the search report is the basis for substantive examination by the Examining Division, the fact that the Examining Division did not request an additional search constitutes a procedural violation (see the Guidelines, paragraph C-VI, 8.5).

In this respect, even assuming that the Examining Division, having concluded that the application complies with the requirement of unity, did not request an additional search because it considered documents D1 and D2 sufficient to refuse the application, the appellant cannot nevertheless be deprived of its right that a complete search report be

drawn up, leaving aside the consideration that the second instance might take a different view on patentability.

3.2 *Reimbursement of the appeal fee*

In the statement setting out the grounds of appeal, pages 2 and 3, points (a) to (d), the appellant has drawn attention to various procedural irregularities.

Following the appellant's request for a decision according to the state of the file (see the letter of 16 January 1996), the application was refused according to Article 97(1) EPC. The reasons for the decision were given on EPO Form 2061, which is usually used by the examining divisions for decisions according to the state of the file, by referring to the consultation by telephone on 19 September 1995 and to the communication dated 16 June 1994.

- 3.2.1 In the Board's judgment, a first procedural violation consists in that it is not clear whether, during the examination procedure, the Examining Division indeed raised an objection under Article 123(2) EPC (see the result of the telephone consultation on 19 September 1995, point 1(ii)) and whether such an objection is a ground for the decision under appeal (see the decision dated 19 September 1996, the sentence after "Grounds for the decision:"). This violation is substantial because it constitutes a violation of the fundamental principle of affording parties the right to be heard on matters affecting their rights (Article 113(1) EPC).

3.2.2 A further procedural violation consists in the objection under Article 54(3) EPC. The decision includes the hand-written sentence "The division also draws particular attention to sections 1, 4 and 5 of the communication of 16/6/94, for the applicant's information." According to section 4, the feature of claim 8 that an estimate is displayed as a less than full trace is anticipated by D2, "as are the remainder of the steps of claim 8". As proof thereof, reference was made to "the sections of D2 quoted under point 5 of the examiner's communication of 30.11.92". In point 5 of this communication, the Examining Division stated that "all the steps of independent claim 8 and of dependent claim 10 are known in combination from D2". Now, with the letter of 18 February 1994, i.e. between the communications dated 30 November 1992 and 16 June 1994, the appellant filed a new claim 8 which included *inter alia* the features of the original claims 8 and 9. In none of the official communications, however, did the Examining Division raise the objection that the subject-matter of the original claim 9 was not novel with regard to D2.

Therefore, in the decision under appeal, the Examining Division raised an objection under Article 54(3) EPC against claim 8 on file but failed to give reasons why all the features of the claim should not be novel.

It is the duty of the Examining Division to give reasoned decisions (Rule 68(2) EPC). Reasoning is essential because the appellant should be in a position to state in the grounds of appeal the legal and factual reasons why the contested decision should be set aside and the appeal allowed. Failure to comply

with this essential duty constitutes a substantial procedural violation.

3.2.3 Both procedural violations mentioned above are substantial. The appeal being allowable, reimbursement of the appeal fee is justified.

3.3 Further procedure

The method claims according to all requests have not been searched (see point 3.1 above). Article 92(1) imposes the obligation to provide a search report. Thus, an additional search has to be requested.

For these reasons, the case is remitted to the Examining Division for further prosecution. Once the additional search report has been drawn up, the Examining Division will, in particular, have to decide on the patentability of the claims on the basis of the new documents cited in the additional search report. If no documents are cited, which would justify a refusing of the application once more, a patent shall be granted on the basis of the documents according to the main request presently on file.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The case is remitted to the Examining Division for

further prosecution (see point 3.3 of the reasons).

3. The request for reimbursement of the appeal fee is allowed.

The Registrar:

The Chairman:

R. Schumacher

G. Davies