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BOARDS OF APPEAL OF THE EUROPEAN PATENT OFFICE

CHAMBRES DE RECOURS DE L'OFFICE EUROPEEN DES BREVETS

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File Number: T 512/89 - 3.4.1

Application No.: 83 104 646.1

Publication No.: 0 094 090

Title of invention: Display apparatus for vehicle

Classification: G01P 3/48, B60Q 9/00

D E C I S I O N
of 11 December 1990

Applicant:

Proprietor of the patent: HITACHI, Ltd.

Opponent: Siemens AG

Headword:

EPC Article 56

Keyword: "Inventive step (no)"

Headnote

Europäisches Patentamt | European Patent Office | Office européen des brevets

Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number : T 512/89 - 3.4.1

D E C I S I O N
of the Technical Board of Appeal 3.4.1
of 11 December 1990

Appellant : (Proprietor of the patent)
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Decision under appeal :
Decision of the Opposition Division of the European Patent Office dated 2 June 1989 revoking European patent No. 0 094 090 pursuant to Article 102(1) EPC.

Composition of the Board :

Chairman : G.D. Paterson
Members : Y.J.F. van Henden
U. Himmler

Summary of Facts and Submissions

I. European patent No. 0 094 090 was granted to the Appellant on the basis of European patent application No. 83 104 646.1.

II. The Respondent filed a notice of opposition against the patent, requesting that it be revoked in its entirety because of lack of inventive step in view of the prior art disclosed in document

D1: DE-A-2 952 500.

III. The Opposition Division revoked the patent by decision dated 2 June 1989.

In its decision, the Opposition Division referred to (D1) and to the US patent specification

D2: US-A-4 281 388

already cited in the European Search Report, and held that, having regard to the state of the art disclosed in these documents, the subject-matter of Claim 1 as granted did not involve an inventive step. In particular, the Opposition Division pointed out that the problem of adapting a display apparatus to different national standards is known in the art, as can be seen from (D2) which discloses a tachometer easily and quickly adjustable to either the metric or US speed units. Said problem thus does not support the presence of an inventive step.

IV. The Appellant lodged an appeal against the decision on 7 August 1989 and paid the corresponding fee simultaneously. The Statement of Grounds of Appeal was received on 12 October 1989, together with four sets of claims forming the basis of a main request and three subsidiary requests.

V. The Respondent commented on the grounds of appeal in a letter dated 10 May 1990.

VI. In a communication issued on 27 July 1990 in pursuance of Article 11(2) of the Rules of Procedure of the Boards of Appeal, the rapporteur of the Board explained to the parties that, with regard to the available illustrations of prior art, cancellation of the impugned decision seemed to be excluded.

VII. Oral proceedings were held on 11 December 1990.

VIII. During the oral proceedings, the Appellant's representative handed over new versions of Claim 1 to replace those previously on file. He requested the patent to be maintained in amended form on the basis of one of these new claims.

Claim 1 according to the Appellant's main request reads

"A display apparatus for vehicles comprising:

a sensor (10, 11, 12, 13) for detecting the vehicle speed, the sensor, in use, producing a first signal representing an actual speed value,

processor means (9) storing a plurality of different programs and, in use, processing said first signal according to the state of selecting means for selecting one of said different programs, thereby producing a second

signal relating to the speed, and display means (1) for displaying said second signal,

c h a r a c t e r i z e d in that

said second signal corresponds to the value of the speed to be displayed, and

said selecting means (14-21) comprise an externally settable index register (94) and select predetermined different relationships between the actual value (x) of the speed and a desired value (S) of the speed to be displayed in accordance with a plurality of different programs respectively defining said predetermined different relationships."

Claim 1 according to the Appellant's first subsidiary request reads

"A switchable display apparatus for vehicle speed,

comprising

- a sensor (10) for detecting the vehicle speed and, in use, producing a first signal representing the actual speed value,

- selecting means for selecting one of a plurality of different programs,

- processor means (9) comprising a memory (ROM, 95) storing said programs and, in use, processing the first signal in accordance with the selected state of the selecting means, thereby producing a second signal (S) corresponding to the value of the speed to be displayed, and

- a display unit (1), which, in use, receives the second signal (S) and displays the value of the speed,

c h a r a c t e r i z e d in that

the selecting means (14-21) comprise an index register (94) which is externally settable in accordance with any desired one of different standards, and

the processor means (9) are adapted to calculate the second signal (S) from the actual speed value (x) according to the relation

$$S = x + y,$$

wherein y is a predetermined function of x corresponding to the selected state of the selecting means (14-21, 94),

the values of y being calculated on the basis of a program corresponding to the selected state of the selecting means (14-21, 94) which is stored in the memory (ROM, 95)

or on the basis of a single program common to all standards with use of coefficients (a_1, b_1; a_2, b_2) of the predetermined function of x which are stored in the memory (ROM, 95)."

Claim 1 according to the Appellant's second subsidiary request differs from the latter version in that, at the end of the characterising part, the alternative clause "or on the basis of a single program ..." is dropped out. Besides this difference, Claim 1 according to the third subsidiary request is still further limited in that y is said there to be "a predetermined function of x according to $y = ax + b$, the coefficients a and b being predetermined values according to the respective selected standard".

IX. In support of his request, the Appellant substantially argued as follows.

Document (D1) pertains to a control device in which a plurality of programs are prepared for determining a correct value of a parameter, even if the sensors used have different characteristics and thus give different measured values. According to the invention, however, the first signal represents the actual value of a vehicle speed, various programs define display values derived from the actual value but based on different functions thereof, and the second signal represents the speed value to be displayed. Therefore, even if the actual value is not changed, the display value can be changed depending on the user's selection. This advantage is not provided in a device according to (D2), since that document fails to disclose any arrangement capable of displaying a speed value selected among a plurality of values having different relationships with respect to the actual speed value.

As a matter of fact, the core of the invention is to make it possible to meet various display standards by just switching: the sensor remains the same and the adaptation is carried out on the subsequent data processing level. The invention furthermore solves a new problem, which represents an additional support for the inventive step.

X. The Respondent requested the patent to be revoked and argued in substance as follows.

Document (D1) pertains to a control device including a sensor which measures a parameter depending on the operating conditions of a vehicle, for instance a temperature. Said sensor delivers a first signal corresponding to the actual value of the parameter. The

device further comprises a processor in which a plurality of programs are stored and a switching device for selecting a program concerning the measured parameter. As a result of signal processing a second signal is output, whereby the relationship between first and second signal is selected by means of the switching device. Finally, the use of an externally settable register may be inferred from the indications on page 4 of the description.

That (D1) does not explicitly disclose whether the second signal is to be further processed or displayed is not enough to credit the subject-matter of Claim 1 according to any one of the Appellant's requests with an inventive step, and actually the less so as (D1) refers to the suitability of the device for use in a board computer. Inventive step is neither required to process a signal representing a speed rather than a temperature, nor to select one of the formulas mentioned in the subsidiary requests. Furthermore, all new versions of Claim 1 contravene the requirements of Article 123(3) EPC since they no longer state that the second signal represents a display value of the speed in the same unit of measurement as the first signal.

Reasons for the Decision

1. The appeal is admissible - Articles 106 to 108 and Rule 64 EPC.

2. **Novelty**

2.1 Document (D2) pertains to a speed monitor, especially a digital tachometer intended for giving a ground speed indication and which can be adjusted for reading in either metric units or US equivalents, even for varying tire

sizes - see the first two lines of column 1 and column 2, lines 10 to 14. Said monitor is thus an apparatus for displaying a vehicle speed and it necessarily comprises display means.

Above monitor also comprises magnetic pickup devices providing a-c signals, the frequencies of which are proportional to speeds to be monitored, which signals are converted to square waves before being fed to a microprocessor - see column 2, lines 18 to 23 and column 3, lines 57 to 60. As appears from the description of the input circuits operating the conversion, a-c signals and corresponding square wave signals have the same frequencies - see column 3, lines 15 to 56. Said frequencies are furthermore proportional to the angular speeds of rotating members and one of the signals may correspond to the rotation rate of the engine - see column 3, lines 4 to 14. The ground speed of a vehicle being related to the rotation rate of its motor, it may be asserted that, in the known device, a first signal representing the actual speed of a vehicle is fed to processor means.

The microprocessor of the speed monitor selectively converts the square wave signals to ground or shaft speed information to be displayed - see column 2, lines 23 to 25. Considering that a digital display unit comprises a plurality of segments, of which only selected ones have to light up to form figures and/or letters on the display, it is nonetheless clear that the output signal of the microprocessor consists of a plurality of signals, each one thereof having one of two levels which respectively correspond to extinction and lighting up of a related display segment. Elaborating such a second signal consisting of a plurality of binary signals requires, however, a program to be carried out. Bearing now in mind

that the vehicle speed can be displayed in different units and that various tire sizes can be taken into account, it thus appears that, in the processor means of the prior art monitor, a plurality of programs producing the second signal relating to the vehicle speed are stored. This finding is actually confirmed by the reference in (D2) to operator switches provided for selecting the functions to be monitored - see column 2, lines 37 and 38 - and to programming switches provided for choosing proper ground speed windows for various tire sizes, and also for selecting mph or km/h readings without need for a trimming potentiometer or internal circuit changes - see column 2, lines 43 to 47 and column 4, lines 42 to 45. Said switches are program selecting means, and the first signal is processed according to the state of these means. Finally, the signal elaborated there by the microprocessor corresponds to the speed value to be displayed.

2.2 With respect to the state of the art disclosed in (D2), the subject-matter of Claim 1 according to the Appellant's main request is novel in that "the selecting means (14-21) comprise an externally settable index register (94) and select predetermined different relationships between the actual value (x) of the speed and a desired value (S) of the speed to be displayed in accordance with a plurality of different programs respectively defining said predetermined different relationships".

As regards the Appellant's auxiliary requests, the features recited in the precharacterising part common to all three versions of Claim 1 appear to be known in combination from (D2).

3. **Inventive step**

3.1 Providing the possibility to display a vehicle speed either in km/h or in mph, as proposed in (D2), obviously aims at adapting the display to different national standards. The Board, therefore, shares the opinion of the Opposition Division that the problem to be solved by the present invention was already known at the priority date of the patent in suit, and that setting said problem does not require the exercise of inventive ingenuity.

3.2 The Appellant pointed out the lack of explicit information in (D1) as regards an eventual display or a further processing of the output signal from the microprocessor. To the skilled person, however, it is clear that such a signal is produced for some purpose. Therefore, rather than a limitation of the teachings given in (D1), said lack of explicit information is an indication that the device known from this document is intended for various utilisations.

Document (D1) now states that the control apparatus disclosed there is suitable for use in a vehicle board computer - see the last paragraph of description. The function of a board computer is, however, not limited to optimising the engine operation. It is indeed widely known that board computers are also provided for giving information to the driver, in particular as regards the instantaneous value of fuel consumption rate, whereby appropriate display means are needed.

With regard thereto, the Board shares the opinion of both the Respondent and the Opposition Division that (D1) is relevant to the present case.

3.3 As illustrated by (D1), the use of an externally settable register in processor means which store a plurality of programs for processing sensor output signals according to the state of selecting means and for producing a second signal is known - see the paragraph bridging pages 3 and 4, and second paragraph of page 8. Furthermore, in the present case, no unexpected advantageous effect is achieved through the provision of such means, which the Appellant actually never contended. Providing an externally settable register in a display apparatus of the kind known from (D2) thus appears to be a technological option which is familiar to the computer specialist. Therefore, no inventive step can be perceived in the provision of the above mentioned register.

3.4 Envisaging to store in a memory a plurality of programs for elaborating, in response to an input signal received by a processor and in compliance with respective national regulations, orders to be sent to a digital speed display does not involve the skilled person in the exercise of inventive ingenuity. It is indeed obvious that, in an apparatus meeting US and European regulations, as does the one described in (D2), at least two programs must be available, since numerically different digital displays, i.e. in mph or in km/h, are to be produced. Now, that there should be a predetermined relationship between the actual value (x) of a speed and the value (S) to be displayed is not a technician's option but a legislator's prescription. To the skilled person, managing to comply with prescriptions of that kind is only a question of routine and does not require an inventive talent. Finally, it is readily understandable that, if a plurality of countries have different requirements as regards the display of vehicle speeds, then as many programs have to be stored in the memory.

3.5 The subject-matter of Claim 1 according to the Appellant's main request lacks, therefore, an inventive step.

3.6 For the reasons already explained in section 3.4 of the present decision, none of the mathematical relations mentioned in the alternative versions of Claim 1 may be considered as support of inventive step. Now, whatever the function (S) of (x) might be, providing processor means adapted to its calculation is an obvious necessity. Finally, it is also evident that the register (94) must be settable in accordance with the desired standards, for else it would not serve any purpose in relation with the object of the invention.

None of the alternative versions of Claim 1 submitted by the Appellant thus appears to add anything inventive with respect to Claim 1 of the Appellant's main request.

4. None of the Appellant's request is allowable - Article 52(1) EPC in relation with Article 56.

Order

For these reasons, it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

P. Martorana G.D. Paterson

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