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Datasheet for the decision of 16 January 2013

Case Number: T 0115/09 - 3.4.01

Application Number: 06000193.0

Publication Number: 1679638

IPC: G06K 7/14

Language of the proceedings: EN

Title of invention:
Improved apparatus and method for recognizing pattern data

Applicant:
Samsung Electronics Co., Ltd.

Headword:
-

Relevant legal provisions (EPC 1973):
EPC Art. 83

Keyword:
"Disclosure - sufficiency - (no)"

Decisions cited:
T 0409/91

Catchword:
-

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Case Number: T 0115/09 - 3.4.01

D E C I S I O N
of the Technical Board of Appeal 3.4.01
of 16 January 2013

Appellant: (Applicant)
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Decision under appeal: **Decision of the Examining Division of the European Patent Office posted 28 July 2008 refusing European patent application No. 06000193.0 pursuant to Article 97(2) EPC.**

Composition of the Board:

Chairman: G. Assi
Members: F. Neumann
C. Schmidt

Summary of Facts and Submissions

I. European patent application 06 000 193.0 was refused by a decision of the examining division dispatched on 28 July 2008, pursuant to Article 97(2) EPC.

The examining division refused the application for failure to comply with Article 83 EPC 1973.

II. The applicant (appellant) lodged an appeal against the decision on 7 October 2008 and paid the appeal fee on the same day. The statement setting out the grounds of appeal was filed on 8 December 2008.

III. With the statement setting out the grounds of appeal, the appellant filed a set of claims 1-5 forming the basis of a main request, a set of claims 1-3 forming the basis of a first auxiliary request and a set of claims 1-2 forming the basis of a second auxiliary request. These sets of claims correspond to the claims on which the contested decision was based.

Arguments were filed to support the view that the invention was sufficiently disclosed in the application.

IV. On 25 October 2012, the Board summonsed the appellant to oral proceedings, scheduled to take place on 16 January 2013.

V. In a communication dated 30 November 2012, the Board indicated that it agreed with the findings of the examining division and set out its preliminary opinion with respect to Article 83 EPC 1973.

VI. In response to this communication, by letter of 3 January 2013, the appellant submitted arguments with regard to Article 83 EPC and filed the Wikipedia entry on "*Weighted mean*" for explanatory purposes.

VII. During the oral proceedings on 16 January 2013, three replacement sets of claims were filed containing clerical amendments and forming the basis of new main, first and second auxiliary requests.

VIII. The appellant requested that the decision under appeal be set aside and that a patent be granted on the basis of claims 1-5 filed during the oral proceedings as a main request, or alternatively, on the basis of claims 1 to 3 filed during the oral proceedings as a first auxiliary request or claims 1 to 2 filed during the oral proceedings as a second auxiliary request. Description pages 1 to 7 and drawing pages 1 to 5 as originally filed complete the documents on which grant of a patent was requested.

IX. Independent claim 3 of the **main request** reads:

"*A method for recognizing a monochromatic pattern for a mobile station, the method comprising:*
detecting an input of pattern data corresponding to a sensed monochromatic pattern;
extracting Y data and Cb data according to a YCrCb format from the pattern data;
weighting only the extracted Y data and the extracted Cb data with respective predetermined weights; and
generating input data for recognizing the pattern data using the weighted Y data and the weighted Cb data; and

recognizing the sensed monochromatic using the generated input data."

Independent claim 1 is the corresponding apparatus claim. Claims 2, 4 and 5 are dependent claims.

Independent claim 2 of the **first auxiliary request** reads:

"*A method for recognizing a monochromatic pattern for a mobile station, the method comprising:*
detecting an input of pattern data corresponding to a sensed monochromatic pattern;
extracting Y data and Cb data according to a YCrCb format from the pattern data, wherein extracting further comprises decreasing recognition resolution from a first recognition resolution to obtain a second recognition resolution which is used to recognize the pattern data when the input of the pattern data is detected;
weighting only the extracted Y data and the extracted Cb data with respective predetermined weights; and
generating input data for recognizing the pattern data using the weighted Y data and the weighted Cb data; and
recognizing the sensed monochromatic using the generated input data."

Independent claim 1 is the corresponding apparatus claim. Claim 3 is a dependent claim.

Independent claim 2 of the **second auxiliary request** reads:

"*A method for recognizing a monochromatic pattern for a mobile station, the method comprising:*
detecting an input of pattern data corresponding to a sensed monochromatic pattern;
extracting Y data and Cb data according to a YCrCb format from the pattern data, wherein extracting further comprises decreasing recognition resolution from a first recognition resolution to obtain a second recognition resolution which is used to recognize the pattern data when the input of the pattern data is detected;
weighting only the extracted Y data and the extracted Cb data with respective predetermined weights; and
generating input data for recognizing the pattern data using the weighted Y data and the weighted Cb data; and
recognizing the sensed monochromatic using the generated input data,
wherein in the step of generating input data, the input data is generated by weighting the Y data and the Cb data according to the following equation:

input data = (Y data x first weight + Cb data x second weight — compensation value)/third weight,

wherein the first weight is a predetermined weight corresponding to the Y data, the second weight is a predetermined weight corresponding to the Cb data, the compensation value is a predetermined value which is used to compensate the weighted values such that the input data corresponds to be derived within a recognizable, valid value, and the third weight is a constant which is used to obtain an average of the weights on the Y data and the Cb data."

Independent claim 1 is the corresponding apparatus claim.

Reasons for the Decision

1. The appeal is admissible.

2. Admissibility of the requests filed during the oral proceedings

2.1 The claims filed during the oral proceedings were based on the claims of the requests previously on file with modifications to remove inconsistencies in the nomenclature of the various predetermined weights. Since these amendments were self-explanatory and indeed, to be expected, the Board exercised its discretion under Article 13(1) of the Rules of Procedure of the Boards of Appeal to admit these requests into the procedure.

3. Background of the invention

3.1 The present application concerns a method and apparatus for recognising pattern data. Although the claims do not specify the type of pattern to be recognised, the prior art referred to in the application concerns the recognition of QR codes using a mobile station (typically a mobile phone) equipped with a camera. The RGB colour information contained in the pattern is digitally encoded as YCbCr data. In the conventional method of pattern recognition only the Y data, which corresponds to the brightness information, is used. This has generally proved to be sufficient to recognise

the black and white regions of a QR code. Nevertheless, ambiguities can arise in the interpretation of the image: for example, under poor lighting conditions it will be harder to distinguish between the black and the white regions and the image may be misinterpreted. In an attempt to improve the pattern recognition, the applicant has established that if the Cb data is extracted and is combined with the Y data in a certain manner, then the pattern recognition becomes more reliable.

4. Main request - Article 83 EPC 1973

4.1 The Board has to consider whether the invention is disclosed in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art (Article 83 EPC 1973).

4.2 According to the description as filed, the invention aims to provide improved pattern recognition (page 2, lines 15 to 25), this object being solved by the subject-matter of the independent claims (page 2, line 26).

Independent claim 3 defines a method for recognising a monochromatic pattern and involves the steps of "*extracting Y data and Cb data according to a YCbCr format from the pattern data; weighting only the extracted Y data and the extracted Cb data with respective predetermined weights; and generating input data for recognizing the pattern data using the weighted Y data and the weighted Cb data*".

4.3 The definition of the invention thus hinges not only on the fact that Y and Cb data is extracted and used but also on the significance (weighting) which this Y and Cb data is given in the subsequent generation of input data. The optimal balance of Y and Cb data represents an important aspect of the invention which the appellant is seeking to protect. The disclosure of the invention must therefore include sufficient instructions to enable the skilled person to apply the correct weightings to each of the Y and Cb data.

The wording of claim 3 places no restriction on the values of the predetermined weights or on the manner of "*using*" the weighted Y and weighted Cb data. Thus, claim 3 encompasses an indefinite number of possible values for the weighting factors that can be arbitrarily combined and an indefinite number of ways of generating input data using the weighted Y and weighted Cb data. The question which has to be answered is therefore whether the skilled person receives sufficient guidance from the application to derive, without undue burden, suitable first and second weights throughout the infinite range of values covered by claim 3.

4.4 The appellant explained that the "*first predetermined weight*" and the "*second predetermined weight*" were values which had to be determined before the pattern recognition method was performed. The weights were established during the development of the pattern-recognition software and depended to a certain degree on the hardware (e.g. the camera on the mobile phone) being used to recognise the pattern. Once these values had been incorporated in the software, they no longer

had to be re-determined and were used each time a QR code was presented to the camera. Different hardware specifications were likely to give rise to the use of different weightings for the Y and Cb data. For this reason, specific values of the first and second predetermined weights could not be defined in claim 3, the choice of appropriate values for a specific hardware being left for the skilled person to derive.

Despite the lack of definition in claim 3, the appellant considered that the description offered sufficient information to allow the skilled person to derive the appropriate weighting factors without undue burden. In particular, equation 1 on page 5 of the application as filed could be re-written as follows:

$$\text{input data} = \frac{a \times Y + b \times Cb - c}{d},$$

where a is the first weight,
b is the second weight,
c is the compensation value and
d is the third weight.

By setting $\alpha=\frac{a}{d}$, $\beta=\frac{b}{d}$ and $\gamma=\frac{c}{d}$, it follows that

$$\text{input data} = \alpha \times Y + \beta \times Cb - \gamma.$$

It was then argued that the skilled person would realise that the quotient γ corresponded to an offset which may, first of all, be set to zero in order to establish suitable values for the other two parameters. Thus, the skilled person would derive input data using

a first guessed combination of the quotients α and β with the quotient γ being zero. The fact that the third weight is described as being "*a constant value which is used to obtain an average of the weights on the Y data and the Cb data*" (page 6, lines 1-2 of the application as filed) would lead the skilled person to realise that

$$\frac{a}{d}+\frac{b}{d}= \alpha+\beta = 1,$$

with the result that

$$\beta = 1-\alpha$$

and

$$\text{input data} = \alpha \times Y + (1-\alpha) \times Cb .$$

Because the quotient α clearly had to be less than one, the skilled person would simply determine the input data using, for example, values of α = 0.1, α = 0.2, α = 0.3, ... α = 0.9. So the skilled person would only have to obtain nine different data sets which could then be compared with a corresponding data set obtained using just the Y data (α=1). The value of α yielding the best input data would be selected. In the opinion of the appellant, this straightforward processing could not be considered an undue burden.

4.5 In principle, a broad claim which relies on trial and error for its implementation is not objectionable as long as the skilled person has at his disposal, either in the specification or on the basis of common general knowledge, adequate information leading necessarily and directly towards success through the evaluation of initial failures or through an acceptable statistical expectation rate in case of random experiments (see Case Law of the Boards of Appeal of the European Patent Office, 6th Edition 2010, II.A.4.2, paragraph 2).

4.6 In the present case, the wording of claim 3 covers all conceivable weighted combinations of the Y and Cb data. The first and second weights in claim 3 are not restricted in any way and are not even defined in such terms as to make clear that they are selected in order to achieve an improvement in pattern recognition with respect to the pattern recognition using only the Y data.

The appellant has attempted to demonstrate that the teaching of the application - specifically the teaching of equation 1 - in fact limits the number of choices of values for the weights to nine, and that in view of this, the skilled person would have no difficulty in identifying suitable weights.

4.7 As an initial observation, the Board notes that equation 1 is not presented as an aid to establishing the first and second weights but merely indicates how the Y data and the Cb data are to be combined once the various weighting/compensation factors are set. However, even if the appellant's reasoning can be followed, this would concern only a very narrow framework in which $0 < \alpha < 1$, $0 < \beta < 1$, $\alpha + \beta = 1$ and $\gamma = 0$. There is no teaching as to how to establish the weights of equation 1 outside of this framework. In fact, it may be left open whether the skilled person would really be able to derive suitable weighting factors from equation 1 as the appellant has asserted. Instead, what matters here is that the appellant is attempting to monopolise all conceivable weighted combinations of Y and Cb data without having provided any teaching as to which combinations, beyond the restricted framework

mentioned above, would actually solve the stated problem.

To leave the selection of appropriate weighting factors to the skilled person means that an important teaching has been omitted from the patent application. The skilled person will have to revert to indiscriminate experimentation in order to establish which weighting factors give rise to an improved pattern recognition. Trial-and-error must be exercised with every arbitrary selection of weights to determine whether they solve the stated problem by improving the pattern recognition. The application contains no teaching which would help the skilled person make the correct selections throughout the whole breadth claimed. This constitutes an undue burden.

Consequently the invention, i.e. a method which improves pattern recognition, is not disclosed in a manner clear and complete enough to lead the skilled person necessarily and directly towards the selection of the correct weighting factors in the entire claimed range.

4.8 In coming to this finding the Board follows the general legal principle that the protection covered by a patent should correspond to the technical contribution to the art made by the disclosure of the invention described therein, which excludes that the patent monopoly be extended to subject-matter which, after reading the patent specification, would still not be at the disposal of the skilled person (T 435/91, OJ 1995, 188, Reasons 2.2.1). In the present case, the protection which would be conferred by claim 3 would extend to any

arbitrarily chosen weighting factors and any arbitrarily chosen mechanism for using the arbitrarily weighted Y data and the arbitrarily weighted Cb data.

4.9 The Board therefore concludes that the main request does not satisfy Article 83 EPC 1973 since the application does not disclose the invention in a manner sufficiently clear and complete for it to be carried out by the skilled person.

5. First auxiliary request - Article 83 EPC 1973

5.1 With respect to claim 3 of the main request, claim 2 of the first auxiliary request has been modified to specify that the step of extracting Y data and Cb data involves "*decreasing recognition resolution from a first recognition resolution to obtain a second recognition resolution which is used to recognize the pattern data when the input of the pattern data is detected.*"

This added detail has no bearing on the reasoning of the Board set out above and does not change the conclusion that the claimed invention is insufficiently disclosed.

No further arguments with regard to Article 83 EPC 1973 were submitted in support of this request.

5.2 The first auxiliary request therefore also fails to satisfy Article 83 EPC 1973.

6. Second auxiliary request - Article 83 EPC 1973

6.1 In an attempt to further define the step of generating input data and to thus ensure that the claimed invention is sufficiently disclosed in its entire breadth, the appellant incorporated equation 1 into claim 2.

6.2 The appellant insisted that, as argued above, using this equation, the skilled person would be able to derive appropriate weights for the Y data and the Cb data without undue burden.

6.3 The added equation has no bearing on the reasoning of the Board set out above with regard to the main request and the first auxiliary request. Although the equation serves to define the manner in which the values of Y and Cb are to be combined once the first weight, second weight, third weight and the compensation value have been established, it does nothing to restrict the possible values of these parameters. Thus, the introduction of the equation into claim 2 cannot change the finding that the skilled person will have to resort to indiscriminate trial-and-error in order to determine which values of the first weight, second weight, third weight and the compensation value will solve the stated problem.

6.4 The Board therefore concludes that the invention, as defined in claim 2 of the second auxiliary request, is not disclosed in a manner sufficiently clear and complete for it to be carried out by a skilled person in the whole breadth claimed.

For this reason, auxiliary request 2 fails to meet the requirement of Article 83 EPC 1973.

7. Consequently, none of the requests are allowable.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

R. Schumacher G. Assi