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Datasheet for the decision of 20 February 2018

Case Number: T 2575/12 - 3.4.01

Application Number: 04821345.8

Publication Number: 1671261

IPC: G06K9/00, G07C9/00

Language of the proceedings: EN

Title of invention:
MULTI-BIOMETRIC FINGER SENSOR USING DIFFERENT BIOMETRICS HAVING DIFFERENT SELECTIVITIES AND ASSOCIATED METHODS

Applicant:
Apple Inc.

Headword:

Relevant legal provisions:
EPC 1973 Art. 83
EPC R. 137(3)
EPC Art. 123(2)
RPBA Art. 12(4)

Keyword:
Sufficiency of disclosure - (no)
Amendments of application - consent of examining division (no)
Admissibility of auxiliary requests - (no)
Amendments - added subject-matter (yes)

Decisions cited:
G 0007/93

Catchword:

Europäisches Patentamt
European Patent Office
Office européen des brevets

Beschwerdekammern

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Chambres de recours

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Case Number: T 2575/12 - 3.4.01

D E C I S I O N
of Technical Board of Appeal 3.4.01
of 20 February 2018

Appellant: (Applicant)	Apple Inc. One Infinite Loop Cupertino, CA 95014 (US)
Representative:	Schmalz, Günther Withers & Rogers LLP 4 More London Riverside London SE1 2AU (GB)
Decision under appeal:	**Decision of the Examining Division of the European Patent Office posted on 13 July 2012 refusing European patent application No. 04821345.8 pursuant to Article 97(2) EPC.**

Composition of the Board:

Chairman	P. Fontenay
Members:	F. Neumann
	R. Winkelhofer

Summary of Facts and Submissions

I. The appeal lies from the decision of the Examining Division to refuse the European patent application number 04 821 345.8.

II. The application was refused because the main request on file at that time did not comply with Article 83 EPC 1973. The Examining Division did not consent to the further amendments made to the application in the form of first and second auxiliary requests and so did not admit these requests into the proceedings.

III. With the statement setting out the grounds of appeal, the Appellant (Applicant) requested that the decision under appeal be set aside and that a patent be granted on the basis of one of the sets of claims (main request, first and second auxiliary requests) filed during the oral proceedings before the Examining Division on 19 June 2012.

Arguments were submitted to support the Appellant's view that the invention of the main request was sufficiently disclosed. While the admissibility of the first and second requests was not addressed per se, arguments were provided as to why the first auxiliary request did not infringe Art. 83 EPC 1973 and why the second auxiliary request did not infringe Art. 123(2) EPC.

IV. The Board issued a summons to oral proceedings and sent a communication outlining the points to be discussed.

V. In response thereto, the Appellant indicated that it would not be attending the oral proceedings and requested a decision "*based on the application*

currently on file". No substantive response to the issues addressed in the Board's communication was filed and no further requests were submitted.

VI. Claim 1 of the **main request** reads as follows:

"*A multi-biometric finger sensor apparatus comprising:*
an integrated circuit substrate for receiving a user's finger adjacent thereto;
a first set of biometric sensing pixels comprising electric field fingerprint image sensing pixels on said integrated circuit substrate for sensing a first finger biometric characteristic to generate first finger biometric characteristic data comprising fingerprint image data,
a second set of biometric sensing pixels comprising infrared sensing pixels or optical dispersion sensing pixels on said integrated circuit substrate for sensing a second finger biometric characteristic different from the first finger biometric characteristic including naturally emitted infrared radiation or dispersed light from the user's finger to generate second finger biometric characteristic data,
a processor cooperating with said first and second sets of biometric sensing pixels for spatially correlating the second finger biometric data relative to the fingerprint image data."

Independent claim 13 is directed to "*A multi-biometric finger sensor method*". Since the wording of claim 13 is not relevant to the present decision, it will not be reproduced here.

Claims 2-12 and 14-16 are dependent claims.

Claim 1 of the **first auxiliary request** reads as follows:

"*Multi-biometric finger sensing and matching system (235) including a multi-biometric sensor (236) coupled to a multi-biometric matcher (237), the multi-biometric sensor (236) including*
- an integrated circuit substrate (240) upon which electric field sensing pixels (241) are provided for sensing a skin impedance measurement, optical dispersion sensing pixels (242) are provided for sensing optical dispersion skin pattern and infrared sensing pixels (243) are provided for sensing sub-dermal thermal or infrared patterns;
- a block (251) receiving in input said skin impedance measurement, optical dispersion skin pattern and sub-dermal thermal or infrared pattern, for signal processing and data conversion;
- the multi-biometric matcher (237) including a finger impedance matcher block (255), a fingerprint pattern matcher block (256), a finger optical dispersion pattern matcher block (260) and a thermal pattern matcher block (257), having in input the outputs of said block (251), for matching the outputs with templates;
-wherein the finger optical dispersion pattern matcher block (260) and the sub-dermal thermal pattern matcher block (257) further receives in input a fingerprint image, to process an exact alignment of the optical dispersion skin pattern and sub-dermal thermal pattern with the template, for improving match accuracy and spoof reduction."

Independent claim 4 is directed to a "*Multi-biometric sensing and matching system*". Independent claim 5 is directed to "*A multi-biometric finger sensing and*

matching method". Independent claim 8 is directed to a "*Multi-biometric sensing and matching method*". Since the wording of claims 4, 5 and 8 is not relevant to the present decision, it will not be reproduced here.

Claims 2, 3, 6 and 7 are dependent claims.

Claim 1 of the **second auxiliary request** reads as follows:

"*A multi-biometric finger sensor apparatus comprising:*
an integrated circuit substrate for receiving a user's finger adjacent thereto;
a first set of biometric sensing pixels comprising electric field fingerprint image sensing pixels for sensing a first finger biometric characteristic to generate first finger biometric characteristic data comprising fingerprint image data,
a second set of biometric sensing pixels comprising optical dispersion sensing pixels for sensing a second finger biometric characteristic different from the first finger biometric characteristic including naturally emitted infrared radiation and/or dispersed light from the user's finger to generate second finger biometric characteristic data,
a processor cooperating with said first and second sets of biometric sensing pixels for spatially correlating the second finger biometric data relative to the fingerprint image data, wherein the optical dispersion sensing pixels are arranged in first and second groups flanking the array of electric field sensing pixels."

Independent claim 13 is directed to "*A multi-biometric finger sensor method*". Since the wording of claim 13 is not relevant to the present decision, it will not be reproduced here.

Claims 2-12 and 14-16 are dependent claims.

VII. The arguments of the Appellant, insofar as they are pertinent to the present decision, are set out below in the reasons for the decision.

Reasons for the Decision

1. Main Request

1.1 Art. 83 EPC 1973

1.1.1 In the contested decision, the Examining Division held that the invention was not sufficiently disclosed (Art. 83 EPC 1973) for two reasons. Firstly, the dimensions and arrangement of the sensing elements were not specified in the application. This information was of particular importance because the data from both sets of pixels had to be spatially correlated, thus requiring that the layout of the sensing pixels was accurately known. Secondly, the process for fabricating a hybrid array comprising heterogeneous types of sensing pixels was not disclosed. It was therefore not possible for the skilled person to construct the array as claimed.

1.1.2 The relevant question with respect to sufficiency of disclosure is whether the application provides sufficient information to enable the skilled person, taking into account common general knowledge, to reproduce the invention.

1.1.3 With regard to the first objection, the Board agrees with the Examining Division that the spatial

relationship between the first and second biometric data sets can only be established if the locations of the individual optical dispersion pixels or infrared sensing pixels are known in relation to the locations of the electric field sensing pixels. However, the Board notes that paragraph [0071] of the description indicates that the two pixel sets are arranged in a known spatial relationship to each other. In combination with the array patterns illustrated in Figures 23 and 24, the application provides sufficient teaching with regard to the layout of the pixel arrays.

1.1.4 With regard to the second objection, the Appellant submits that various types of biometric pixel sensor arrays were well established in the art and that the skilled person knew how to construct an array comprising the sensing elements set out in claim 1.

1.1.5 The Board does not contest that pixel sensor arrays of various types are well known. However, the objection of the Examining Division was directed to the fact that a mixture of different types of sensing elements are combined onto a single substrate in the claimed sensor and that no teaching is provided with respect to how such an array could be fabricated.

The only hybrid sensor referred to by the Appellant is that of D2 (US-A-2002/076089). Here two or more blocks of optical image sensors are formed on the same chip, some blocks having sensitivity in the visible light region and other blocks having sensitivity in the infrared region (cf. paragraphs [0032], [0094] to [0096], [0121], [0122]). The sensing elements are fabricated using the same semiconductor manufacturing technology, the two sensitivities being achieved by the addition of a deep P-well beneath the N-channel.

However, this hybrid sensor does not include electric field fingerprint sensing pixels and so provides no information on how to fabricate the claimed array.

The present application contains a detailed disclosure concerning the construction of an electric field sensing pixel on a substrate. The current application also indicates that IR sensors can be fabricated in existing standard CMOS silicon foundry processes. However, the application contains no teaching as to how the different manufacturing processes required for each type of sensor could be implemented on a single substrate.

In the proceedings before the Examining Division, the Appellant made reference to US-A-6 327 376 (Harkin), mentioned in paragraph [0006] of the current application. The Board notes that Harkin's sensor uses two separate sensing elements which are mounted independently in a housing. Apart from the fact that patent documents cannot be used as evidence of common general knowledge, this disclosure provides no teaching which would enable the skilled person to combine an optical dispersion sensor or an IR sensor with an electric field fingerprint sensor on the same substrate.

Hence, the Appellant has not been able to show that the manufacture of a hybrid sensor using two very different types of sensing elements, namely an electric field fingerprint sensor and an optical dispersion sensor or an IR sensor, on a single substrate has been disclosed in the application itself, or would belong to the common general knowledge of a skilled person.

1.1.6 The Board therefore comes to the conclusion that the description of the invention is indeed incomplete. It is not clear how a multi-biometric finger sensor having the construction set out in claim 1 may be practically implemented.

The invention is therefore not disclosed in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art (Art. 83 EPC 1973).

2. First auxiliary request

2.1 The first auxiliary request is identical to the first auxiliary request on which the contested decision is based.

2.2 The Examining Division held that the objection of insufficient disclosure in the main request applied equally to the first auxiliary request. As a result, the Examining Division did not consent to the amendments (R. 137(3) EPC).

2.3 R. 137(3) EPC stipulates that, once the application has been amended a first time, no further amendment may be made to the description, claims and drawings without the consent of the Examining Division. This makes the admission of further amendments a matter of discretion for the Examining Division.

2.4 In accordance with G 7/93 (point 2.6), a board of appeal should only overrule the way in which a department of first instance has exercised its discretion if it comes to the conclusion either that the first instance department, in its decision, has not exercised its discretion in accordance with the right principles, or that it has exercised its discretion in

an unreasonable way, and thus exceeded the proper limits of its discretion.

2.5 In refusing to consent to the amendments made, the Examining Division held that the optical dispersion sensing pixels had to be intermingled in the array of electric field sensing pixels. As a consequence of this arrangement, the objection raised under Art. 83 EPC 1973 against the main request applied equally to the first auxiliary request.

2.6 In the statement setting out the grounds of appeal, the Appellant did not comment directly on the application of R. 137(3) EPC with respect to the first auxiliary request, but argued instead that the substantive objections raised against it were incorrect. Specifically, the first auxiliary request was considered to meet the requirements of Art. 83 EPC 1973 for the same reasons as the main request was considered to comply with Art. 83 EPC 1973.

2.7 The Board notes that claim 1 defines that the electric field sensing pixels, the optical dispersion sensing pixels and the infrared sensing pixels are all provided "*upon*" an integrated circuit substrate. Thus, although an intermingling of sensing elements does not appear to be necessarily required, the various types of sensing elements are defined as being provided on a single integrated circuit substrate.

2.8 Hence, the Board concurs with the finding of the Examining Division that claim 1 is still directed to an arrangement in which different types of sensing elements are located on the same substrate. As shown above, the application contains no disclosure of how such a substrate may be practically implemented. The

objection raised against the main request under Art. 83 EPC 1973 therefore applies equally to the first auxiliary request. Indeed, as recorded in the minutes of the oral proceedings (page 4, line 11), even the Appellant conceded that the first auxiliary request did not overcome this problem.

2.9 As a result, the Board has no reason to overrule the way in which the Examining Division exercised its discretion in not consenting to the amendments under R. 137(3) EPC.

2.10 Art. 12(4) RPBA empowers the boards to refuse to admit requests which were not admitted in the first instance proceedings.

In the present case, admitting the request upon appeal would mean that the Examining Division's discretion would, in effect, be overruled. As shown above, the Board has no reason to overrule the way the Examining Division's exercised its discretion with respect to the first auxiliary request.

Consequently the first auxiliary request is not admitted into the appeal proceedings.

3. Second auxiliary request

3.1 The second auxiliary request is identical to the second auxiliary request on which the contested decision is based.

3.2 During the examining proceedings, the Examining Division did not consent to the amendments filed as the second auxiliary request since these amendments were not clearly allowable: a new deficiency, namely an

objection under Article 123(2) EPC was introduced by the amendments.

The Examining Division held that no basis could be found in the original application documents for a multi-biometric finger sensor apparatus comprising first and second groups of optical dispersion sensing elements flanking the array of electric field sensing pixels in combination with a processor for spatially correlating the second finger biometric data relative to the fingerprint image data, as defined in claim 1.

The second auxiliary request was therefore not admitted into the proceedings.

3.3 In the statement setting out the grounds of appeal, the Appellant submitted that paragraph [0089] of the original application indicated that Fig. 24 shows "*[a]nother possible layout of the optical dispersion sensing pixels 163b' and electric field sensing pixels 163a'*". The skilled reader would understand that this alternative layout would function in the same way as the intermingled layout of Fig. 23. In other words, the Fig. 24 embodiment differed from the Fig. 23 embodiment only in its layout, not by the processing applied. It was therefore implicit to process the two sets of biometric data from the flanked layout in the same manner as the two sets of biometric data in the intermingled layout. Specifically, this meant that the second set of biometric data derived from the flanked optical dispersion sensing pixels in Fig. 24 was spatially correlated relative to the fingerprint image data derived from the array of electric field sensing pixels.

3.4 This argument cannot be followed. Paragraphs [0090] and [0091] of the original application relate to the operation of a multi-biometric finger sensor having the pixel arrangement illustrated in Fig. 24. The light intensity is sensed at two spaced positions corresponding to the positions of the flanked sensors. Graph 217 shows that the difference between these two values is determined and then plotted against the longitudinal position along the finger as the finger slides over the sensor. Paragraph [0092] states that the optical dispersion data (i.e. the characteristic curve of local light dispersion vs. location along the finger) is unique to different individuals and may serve as a valuable biometric sensing characteristic. The statement that this data may be used in combination with the fingerprint friction ridge image implies that the two biometric characteristics may be combined to provide an improved selectivity. In fact, paragraphs [0089] to [0092] make no reference to any spatial correlation between the two sets of data so there is no reason to believe that any spatial correlation is performed. As pointed out by the Examining Division in the contested decision, because of the different nature of the data acquired using this arrangement (i.e. curves from the optical dispersion sensing pixels of Fig. 24 and images from the electric field fingerprint sensing pixels), it is not apparent how a spatial correlation between the optical dispersion data and the fingerprint image data could be carried out.

In conclusion, no basis can be found in the original application documents for the combination of the flanking arrangement of the optical dispersion sensing pixels with a processor for spatially correlating the optical dispersion data relative to the fingerprint image data. The amendments to claim 1 therefore

introduce subject-matter which goes beyond the content of the application as filed (Art. 123(2) EPC).

3.5 The Board therefore has no reason to overrule the way in which the Examining Division exercised its discretion in not consenting to the amendments under R. 137(3) EPC.

3.6 As set out above, Art. 12(4) RPBA empowers the boards to refuse to admit requests which were not admitted in the first instance proceedings.

In the present case, since the Board has no reason to overrule the Examining Division's discretionary decision under Rule 137(3) EPC, the second auxiliary request is not admitted into the appeal proceedings.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

R. Schumacher P. Fontenay

Decision electronically authenticated