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**Datasheet for the decision
of 4 August 2022**

Case Number: T 2567/19 - 3.5.06

Application Number: 10790057.3

Publication Number: 2443828

IPC: G06K9/20, G06K9/00

Language of the proceedings: EN

Title of invention:

LOW SETTLE TIME MICRO-SCANNING SYSTEM

Applicant:

Identix Incorporated

Headword:

Fingerprint micro-scanning/IDENTIX

Relevant legal provisions:

EPC Art. 57, 83, 84, 123(2)

Keyword:

Amendments - added subject-matter (no)

Sufficiency of disclosure - (yes)

Claims - functional features (yes) - clarity (yes)

Decisions cited:

Catchword:



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Case Number: T 2567/19 - 3.5.06

D E C I S I O N
of Technical Board of Appeal 3.5.06
of 4 August 2022

Appellant: Identix Incorporated
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Decision under appeal: **Decision of the Examining Division of the
European Patent Office posted on 26 March 2019
refusing European patent application No.
10790057.3 pursuant to Article 97(2) EPC.**

Composition of the Board:

Chairman M. Müller
Members: T. Alecu
K. Kerber-Zubrzycka

Summary of Facts and Submissions

- I. The appeal is against the decision of the Examining Division to refuse the application for lack of compliance with the provisions of Articles 123(2), 83, 57 and 84 EPC.
- II. The appellant requested, with its grounds of appeal, that the decision be set aside and that a patent be granted on the basis of the set of claims of the main request, which is identical to the one rejected by the Examining Division, and *"in the event that a patent according to the enclosed Main Request cannot be granted, to summon us to Oral Proceedings"*. After a communication from the Board announcing its intention to set aside the decision under appeal and to remit the case to the Examining Division for further prosecution, the appellant withdrew its request for oral proceedings.
- III. The independent claims of the sole request define:
- 1. An apparatus configured to micro-scan a fingerprint image, comprising:
an image sensor configured to capture fingerprint images;
a first actuator (232) configured to produce a linear translation;
a second actuator (234) configured to produce a linear translation that is substantially orthogonal to the linear translation produced by the first actuator; and
an assembly, the assembly including:
a mounting point (218) configured to hold the image sensor,
a first mounting region (212, 213) configured to hold the first actuator,*

a second mounting region (214, 215) configured to hold the second actuator, and
a stiffening device (216) coupled to the mounting point, the first actuator, and the second actuator, wherein the stiffening device has a geometry configured to establish the resistance of the mounting point to a force induced by the first actuator configured to produce a linear translation of the mounting point, and to establish the resistance of the mounting point to a force induced by the second actuator configured to produce a linear translation of the mounting point.

9. A system configured to micro-scan a fingerprint image, comprising:

an image sensor configured to capture fingerprint images;

a first actuator (232);

a second actuator (234);

an assembly, the assembly including:

a mounting point (218) configured to hold the image sensor,

a first mounting region (212, 213) configured to hold the first actuator,

a second mounting region (214, 215) configured to hold the second actuator,

a stiffening device (216) coupled to the mounting point, the first actuator, and the second actuator, and a plurality of parallelogram structures (272, 273, 274, 275, 276, 277), the plurality of parallelogram structures configured to define a first linear translation of the mounting point due to a force induced by the first actuator and a second linear translation of the mounting point due to a force induced by the second actuator, wherein the first linear translation is substantially orthogonal to the second linear translation, and wherein the plurality of

parallelogram structures substantially prevent rotation of the mounting point in the plane of the assembly; and a control unit configured to drive the first actuator and the second actuator with a drive signal.

*10. A micro-scanning method (400) of generating a fingerprint image, comprising:
collecting (402) light from a finger with an image sensor at a first position to capture a first image;
translating (404) the image sensor from the first position to a second position, wherein the translation from the first position to the second position is substantially along a first diagonal of a substantially rectangular set of four vertices;
collecting (406) light from the finger with the image sensor at the second position to capture a second image, wherein the second image is captured within less than about 20 milliseconds of capturing the first image;
translating (408) the image sensor from the second position to a third position, wherein the translation from the second position to the third position is substantially along a first side of the substantially rectangular set of four vertices;
collecting (410) light from the finger with the image sensor at the third position to capture a third image, wherein the third image is captured within less than about 20 milliseconds of capturing the second image;
translating (412) the image sensor from the third position to a fourth position, wherein the translation from the third position to the fourth position is substantially along a second diagonal of the substantially rectangular set of four vertices;
collecting (414) light from the finger with the image sensor at the fourth position to capture a fourth image, wherein the fourth image is captured within less*

than about 20 milliseconds of capturing the third image; and combining the first, second, third, and fourth images in a composite image, wherein the composite image has a higher resolution than a resolution of the first, second, third, and fourth images.

Reasons for the Decision

The application

1. The application relates to a method and system for micro-scanning a rolled fingerprint (page 4, lines 19 to 25). An image sensor is (micro-)displaced in a sequence of positions using two actuators translating the sensor linearly in orthogonal directions. The transmission of the movement from the actuators to the sensor uses parallelogram structures avoiding rotations during translation (page 12, lines 3-12).
 - 1.1 To increase the overall stiffness of the apparatus, and thereby increase the resonant frequency largely above the actuator driving frequencies (page 13, middle paragraph), a stiffening device is coupled to both actuators and the mounting point of the image sensor. This way the sensor stabilises quicker at the desired positions (see e.g. page 6, page 11). This configuration allows one-time calibration (paragraph bridging pages 12-13) and open-loop control (page 6 lines 5-10).
 - 1.2 The sensor acquires four (or more, depending on the movement schema - see figure 2C) images at each position, and these images are combined to form an image of higher resolution than that of the sensor

itself (e.g. 1000dpi instead of 500dpi - page 5 lines 5 to 17). The sensor takes one image every 20ms (page 3 middle paragraph).

Article 123(2) EPC

2. The Examining Division found (decision 2.1 to 2.6) that the amendment from "*the first, second, third, and fourth images can be combined in a composite image*" (as contained in original method claim 18) to *combining* the four images (as contained in present method claim 10) adds matter, it was not unambiguously clear in the original text whether the images were combined or not.
3. As the appellant pointed out, the original expression already provides basis for the amendment. Firstly, the Board considers that the formulation that the images "can be" combined also discloses that these images "are" combined. Moreover, it is also inherent to the micro-scanning technique in general - and hence also to the specifically claimed application to fingerprinting - that images are combined to increase the effective sensor resolution, as is also disclosed in the current application at page 5, lines 5-6. Thus the Board disagrees with the Examining Division regarding this objection.

Article 83 EPC and Article 57 EPC

4. The Examining Division was of the opinion that the invention was insufficiently disclosed (points 3 to 5) and, therefore, not industrially applicable (point 6).
5. The first invoked reason (point 3) is that the micro displacements of the finger skin caused by the blood flow prevent accurate micro-scanning, because the

requirement of immobility is not fulfilled. Furthermore, according to the computations of the Examining Division, the time necessary to micro-scan a fingerprint image pixel by pixel would be of 56 minutes, in which time the user will move its finger, and in which time anyway micro motion due to blood flow will occur.

6. The appellant argues (grounds of appeal, pages 4 to 7) that the Examining Division has misunderstood the functioning of the sensor. The image is not scanned pixel by pixel, but the whole sensor is moved. Each image acquisition takes 20 ms (at 50 Hz, for which technology was available). The time-scale needed to acquire an image is therefore much shorter than the one in which blood flow causes skin motions to occur (1 or 0.2 Hz).
7. The Board agrees with the appellant. The application makes clear that the image sensor is a CCD device acquiring a full image (see page 5 as cited above). Moving a 500 dpi sensor in four positions as in figure 2C results in an image of 1000 dpi. The time necessary to acquire a composite image is then only 80 ms (thus a sampling rate of 12.5 Hz), sufficiently short so that the resulting image is not influenced by micro motions of the finger.
8. Similar considerations apply to the reasons invoked by the Examining Division in section 4, wherein it is argued that natural tremor would prevent focusing (for touchless devices) or that pressure on the device (for touch devices) would modify the mechanical properties of the system and influence the micro displacements, which cannot be considered reliable. The Board has no reason to doubt the appellant's submission (grounds of appeal, pages 8 to 10) that the mentioned sampling

frequency is significantly higher than that of the mentioned influences which, hence, do not negatively affect the imaging accuracy.

9. The Examining Division also considered (5.1 to 5.7) that the application lacked any details specific to fingerprinting techniques. As micro-scanning specifically fingerprints was not commonly known, the missing aspects could not be filled by way of common knowledge.
10. The appellant submits (grounds of appeal, page 11) that it is not necessary for the application to provide ancillary details or basic information regarding fingerprint imaging.
11. The Board agrees with the appellant that the application did not have to provide details, which, at the filing date of the application belonged to the common general knowledge of the skilled person. The proposed micro-scanning system can be used to replace the standard camera within any standard optical fingerprint sensor. The Board does not see any difficulties for the skilled person to do this, and so no further details are necessary here.
12. Finally, the Examining Division is of the opinion (5.8) that the application does not disclose the "*formula and parameters required for achieving this necessary accurate determination of these relative positions*", i.e. of the micro-scanning positions.
13. The Board agrees with the appellant (grounds of appeal, page 12) that this determination is disclosed by the mechanical configuration of the sensor. As the application explains, the control of the sensor positioning is performed in an open loop relying on the accuracy of

the actuators, on the calibration, and on the mechanical stability due inter alia to the dampening of resonant behavior through the stiffening device.

Article 84 EPC

14. The Examining Division objected (point 7.1) to a (considerable) number of functional formulations in the claims as being unclear. However, it did not specify what the lack of clarity was.
- 14.1 It stated that the functional features could not be implemented by way of common knowledge, or without undue burden (see 7.1.2.1, 7.1.5.1, 7.1.7.1, 7.1.9.1, 7.1.11.1, 7.1.12.1). The Board notes that this is an objection under lack of support - or lack of disclosure - objection, not a lack of clarity.
- 14.2 As the Examining Division remained generic in its objections, the Board cannot but see them as being substantially identical to the previous objections of a lack of disclosure, which were discussed above.
- 14.3 Regarding the clarity of the functional forms alone, the Board is of the following opinion: the features in contention mostly define mechanical parts (geometry, actuators, stiffening device, parallelogram structures) with functions clear to the pertinent skilled person, who must also be versed in mechanics. The parallelogram structures, which were extensively discussed during examination, are self-explanatory from figure 1 of the application. The function of the stiffening device and its influence on the resonant frequency is clear from the structural constraints claimed (its mechanical couplings). The positioning of the sensor for micro-scanning and the obtention of the 1000 dpi resolution

is obtained by the open-loop control as discussed above. Thus the Board disagrees with the objections of the Examining Division.

15. The Examining Division also objected (point 7.2) to the use of the term "*substantially*" as being unclear, but did not explain what the ambiguity was. The mere use of the term does not render a claim unclear. Here, the term indicates tolerances that are well understood by the skilled person given their use context (positioning along two orthogonal axes), as the appellant also submitted (grounds of appeal page 21).

Conclusion

16. The Board thus comes to the conclusion that the objections raised in the decision under Articles 57, 83, 84 and 123(2) EPC are incorrect and so do not carry the refusal of the application. The decision must therefore be set aside.
 - 16.1 However, the Examining Division has not carried out any examination as to patentability under Article 52 EPC for novelty or inventive step. It appears to the Board that the search itself did not cite prior art relevant in this respect, but merely documents of category "T", relevant only for the matter of (in)sufficient disclosure under Article 83 EPC, so an additional search may be necessary.
 - 16.2 The Board considers these circumstances to constitute special reasons justifying the remittal of the case for further prosecution (Article 11 RPBA 2020, Article 111(1) EPC).

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.

The Registrar:

The Chairman:



L. Stridde

Martin Müller

Decision electronically authenticated