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**Datasheet for the decision
of 14 February 2008**

Case Number: T 0592/05 - 3.4.02

Application Number: 02445049.6

Publication Number: 1348946

IPC: G01N 21/88

Language of the proceedings: EN

Title of invention:

Device and method for optical inspection

Applicant:

Svante Björk AB

Opponent:

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Headword:

-

Relevant legal provisions:

EPC Art. 56

Relevant legal provisions (EPC 1973):

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Keyword:

"Inventive step - claim 1, 13 (yes)"

Decisions cited:

-

Catchword:

-



Case Number: T 0592/05 - 3.4.02

D E C I S I O N
of the Technical Board of Appeal 3.4.02
of 14 February 2008

Appellant: Svante Björk AB
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Decision under appeal: Decision of the Examining Division of the
European Patent Office posted 25 January 2005
refusing European application No. 02445049.6
pursuant to Article 97(1) EPC.

Composition of the Board:

Chairman: A. Klein
Members: M. Rayner
M. J. Vogel

Summary of Facts and Submissions

I. The present appeal is against the decision of the examining division refusing European patent application number 02 445 049.6 relating to a device and method for optical inspection. In such optical inspection a scanner is arranged for detecting and measuring defects in or on a material extending along a longitudinal direction and a transverse direction. The inspection takes place in successive sweeps essentially in the transverse direction, a respective sweep corresponding to a plurality of pixels of the scanner. In the decision under appeal, reference was made to the following document

D1 WO-A-00/62045.

II. The examining division considered novelty of the subject matter of the claims presented was given because identification either of an image memory with a processor disclosed in document D1 or of a rolling buffer memory with a comparator unit did not appear straightforward. With respect to the assessment of the inventive step, the examining division considered that, according to document D1, a first unit (comprising a comparator with a reference forming unit) selects an "area of interest" and sends this "area of interest" to a second unit (a buffer). The division concluded from page 5, lines 29-33 of document D1 that the first unit must also have a memory for holding scanning lines which have been detected before a defect scanning line is identified. Although not explicitly stated in document D1, the processing in the first unit is very similar to processing done in a rolling buffer memory.

A skilled person confronted with the objective technical problem of finding a suitable memory means for performing processing according to D1, would simply choose a suitable memory from the types of memory available. Using a "rolling buffer memory", as a solution to the problem, is merely one of several straightforward possibilities from which the skilled person would select, in accordance with the circumstances, without the exercise of inventive skill. Therefore, the examining division came to the conclusion that neither the subject-matter of claim 1, nor, for corresponding reasons, the subject matter of claim 13, can be regarded as involving an inventive step within the meaning of Article 56 EPC.

III. The appellant requests that the decision under appeal be set aside and that a patent be granted on the basis of application papers as specified during the appeal proceedings, of which independent claims 1 and 13 are worded as follows:

"1. Method for optical inspection using a scanner (3) which is arranged for detecting and measuring defects (13a-c) in or on a material (1) which is being inspected, said material (1) extending along a longitudinal direction (y) and a transverse direction (x), with said inspection taking place in successive sweeps essentially in the transverse direction (x) of the material (1), with the respective sweep corresponding to a plurality of pixels of said scanner (3), said method furthermore comprising: storing sweeps in a rolling buffer memory (5b) comprising at least one sweep which precedes the sweep which is stored by means of at least one pixel

indicating triggering corresponding to a detected defect (13a-c) in the material, transferring information related to said sweeps in the rolling buffer (5b) to an image memory (5a) when a triggering has occurred in a sweep, storing further information related to further sweeps in said image memory (5a) as long as said triggering exists, and storing information related to at least one additional sweep in said image memory (5a) when the triggering condition is no longer fulfilled.

13. Device for optical inspection comprising a scanner (3) which is arranged for detection and measurement of defects (13a-c) in or on a material (1) which is inspected, said material (1) extending along a longitudinal direction (y) and a transverse direction (x), with said inspection taking place in successive sweeps essentially in the transverse direction (x) of the material (1), with each respective sweep corresponding to a plurality of pixels of said scanner (3), said device furthermore comprising a central computer unit (5) with an image memory (5a) and a rolling buffer memory (5b), the computer unit (5) being arranged for storage in said buffer memory (5b) of a rolling buffer comprising at least one sweep which precedes the sweep which is stored by means of at least one pixel indicating triggering corresponding to a detected defect (13a-c) in the material, and that furthermore the computer unit (5) is arranged for transferring information related to said sweeps in the rolling buffer (5b) to an image memory (5a) when a triggering has occurred in a sweep, that the computer unit (5) is arranged for storing further information

related to further sweeps in said image memory (5a) as long as said triggering exists, and that the computer unit (5) also is arranged for storing information related to at least one additional sweep in said image memory when the triggering condition is no longer fulfilled."

IV. The case in support of the appeal can be summarised as follows.

The problem addressed by the invention is not finding a suitable memory means as argued by the examining division, but relates to the demand for information corresponding to the edges of certain areas presenting a density below the limits of detection (reference level) or even noise. The phrase "area of interest" as mentioned in document D1 and referred to in the decision relates to whether a detected impurity should be classified as a gel-type impurity and has nothing to do with sweeps below the reference level. Document D1 does not teach that a first unit (comparator 8 and reference 16) must have a memory especially for holding scanning lines, but that data regarding areas of interest are stored in a buffer memory. Moreover as gels can be distinguished using no more than one memory, document D1 does not lead to two separate memory units as provided in the invention. In the disclosure of document D1, a reason for using certain sweeps occurring before a triggering point is to define a reference for a triggering condition, i.e. not for providing actual information on sweeps before detected lines.

- V. In a communication issued during the appeal proceedings, the board discussed the case and observed that no rolling buffer memory is disclosed in document D1. Although document D1 uses eight terms for signal levels, it appeared to the board that there are two signal levels used, for determining areas of interest and for analysing these areas.

Reasons for the Decision

1. The appeal is admissible.
2. *Document D1*
 - 2.1 According to the board's understanding of the terminology used, this document can, in overview, be considered to relate to detecting impurities especially gels in an extruded polyethylene material and addresses use of a high, constant pixel frequency from a camera which does not allow direct data processing in a conventional computer. The teaching therefore envisages gearing down of data speed by first determining "areas of interest" in the material using hardware in a comparator 8 to compare the pixel values from the camera 6 with a reference value provided by a reference-forming unit 16. The "areas of interest" selected by this procedure are stored in a buffer memory 10. Sensitivity of detection of the system can be addressed in that the reference-forming unit can provide a value to the comparator which can be fixed, produced from the value or values of previous pixels, calculated as the mean value of previous pixels or be a selected line.

2.2 The buffer memory 10 is read by a digital signal processor which is a rapid processor that normally manages the required calculations at the geared down speed, it being possible to arrange several such processors in parallel if necessary. The signal processor comprises a further comparator to compare the pixel values supplied with a base value, representing usually higher light transmission through the material, in order to determine the shape and extent of the impurity. The result of this analysis is then transferred to a system computer for classification of the scanned material.

2.3 There is also an intriguing passage in the description on page 5, line 13 to 17, which can be fitted to the rest of the disclosure in a number of ways. The passage is as follows.

"Thus, when a spot appears on the transparent material which decreases the light transmission sufficiently, signals are emitted from a number of scanning lines before the trigger point, from all lines as long as the light transmission lies below the reference value, and from a number of scanning lines after the transmission level has again exceeded the reference value, to the buffer memory and the signal processor."

3. *Substantive Patentability (Articles 54, 56 EPC)*

3.1 The examining division got into difficulty in its novelty analysis of the claim 1 as it could not straightforwardly identify either an image memory with a processor or a rolling buffer with a comparator unit.

A more reasonable first approach to take is, for example, that the image memory can be argued to be similar to the buffer memory disclosed in document D1. After all, in both the application and document D1, this is where the "reduced" or "geared down" data arrives.

- 3.2 Taking the line indicated in point 3.1 means that subject matter in claim 1 relating at least to features involving the rolling buffer memory and transfer of data therefrom is novel. The examining division likewise considered a rolling buffer memory to be novel but then went on to introduce a "unit" terminology not used in document D1 in its analysis thereof. This terminology led to it concluding that there must be a memory in a first unit comprising the comparator and reference unit, which was said to send an area of interest to a second unit comprising the buffer. However, this disclosure is not present in document D1, where all that is disclosed is that the pixel values are compared with a reference. It may be that the unit terminology allows some confusion of the comparator with the reference-forming unit which latter can store preceding reference values. However, while the reference-forming unit, shown connected to the comparator not the buffer memory, may enhance sensitivity, it is nevertheless a different item because the values there stored define only the setting of the reference, they are not used as actual information on sweeps preceding the triggering. Thus, even supposing a rolling buffer memory is involved in the case of non-fixed values produced by the reference-forming unit, this cannot, without hindsight, be relevant to the at least one pre-triggering sweep

transferred from the rolling buffer memory to the image memory. Page 5, lines 29-33 of document D1 concern classification of an impurity as a gel type by the processor and do not concern the comparator and are not therefore pertinent. The board was not therefore convinced by the approach of the examining division.

3.3 The problem addressed by the novel subject matter of claim 1 is not therefore providing a suitable memory as stated by the examining division, but that stated by the appellant, i.e. meeting demand for information. It can be seen that this demand is met without increasing processing power by providing information corresponding to the edges of certain areas presenting a density below the limits of detection (reference level) or even noise.

3.4 A question that remains is whether the references to "lines before the trigger point" and "lines after the transmission level has again exceeded the reference value" as mentioned in point 2.3 above in document D1 mean that edge data is also provided according to the teaching of document D1. The document is confusingly drafted because it redundantly uses several terms for signal levels, but there are two trigger levels defined relative to one another, one for determining the areas of interest and the other of normally higher light transmission for indicating the size and shape of an impurity (see page 4, lines 19-23) principally by detecting lighter pixels surrounded by darker pixels. However, since there is always either a reference or base value, however unfavourably the document might be interpreted, the disclosure does not detract from inventive step, because any sweeps coincidentally

- falling between either of these values are not transferred from a rolling buffer to an image memory, one is enough for impurity analysis by the processor(s).
- 3.5 Of course, various memory configurations are known to the skilled person, but the board sees no reason in the light of the disclosure of document D1 for the skilled person to provide two memories involving a rolling buffer memory and transferring to an image memory as claimed in the application. If more capacity is needed because of data load, then document D1 teaches several processors can be arranged in parallel. Moreover, various techniques for setting the reference levels are disclosed. Why then should a further memory be needed? There is thus no convincing challenge that the subject matter of claim 1 is obvious in the light of the teaching of document D1. Accordingly, the board is satisfied that an inventive step can be considered involved in the subject matter of claim 1 having regard to document D1. A similar conclusion applies to apparatus claim 13 in view of correspondence of features.
- 3.6 The other prior art in the file does not call inventive step into question. Therefore, the board reached the conclusion that the requirements of Article 56 EPC can be considered satisfied by the subject matter of claims 1 and 13. A similar conclusion applies to the dependent claims in view of their dependence.
4. The application also meets the requirements of the Convention in other respects. The appeal therefore succeeds.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the department of first instance with the order to grant a patent based on the following application documents:

Description

Pages 1-3, 5-10 as originally filed,
Page 4, 4a (to be inserted after line 20 of
page 4), 11 and 12 received with the letter
dated 04.12.2007

Claims 1-15 received with the letter dated
04.12.2007

Drawings Sheets 1/2-2/2 as originally filed

The Registrar

The Chairman

M Kiehl

A. G. Klein