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D E C I S I O N
of 28 December 1999

Case Number: T 0607/99 - 3.5.1

Application Number: 96904038.5

Publication Number: 0821818

IPC: G06K 19/06

Language of the proceedings: EN

Title of invention:

Device and method for checking patterns disposed on a material strip and the material strip

Applicant:

Tetra Laval Holdings & Finance SA

Opponent:

-

Headword:

-

Relevant legal provisions:

EPC Art. 52(1), 54

Keyword:

"Novelty (no)"

Decisions cited:

-

Catchword:

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Boards of Appeal

Chambres de recours

Case Number: T 0607/99 - 3.5.1

D E C I S I O N
of the Technical Board of Appeal 3.5.1
of 28 December 1999

Appellant: Tetra Laval Holdings & Finance SA
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Decision under appeal: Decision of the Examining Division of the
European Patent Office posted 4 January 1999
refusing European patent application
No. 96 904 038.5 pursuant to Article 97(1) EPC.

Composition of the Board:

Chairman: P. K. J. van den Berg
Members: A. S. Clelland
P. H. Mühlens

Summary of Facts and Submissions

I. This appeal is against the decision of the Examining Division to refuse application No. 96 904 038.5 on the grounds that the various independent claims of the application lacked either novelty or an inventive step, Articles 54 and 56 EPC respectively. The only document cited was:

D1: EP-A-131 241,

D1 is an earlier European application by the applicant.

II. The appellant (applicant) requested in his notice of appeal that the decision under appeal be set aside; with the statement of grounds of appeal he filed a revised set of claims to replace those considered by the Examining Division.

III. In a communication in accordance with Article 11(2) of the Rules of Procedure of the Boards of Appeal the rapporteur, on behalf of the Board, drew attention to a further document:

D2: US-A-4 698 514.

D2 is a family member of D1, being based on the same priority document but with a modified Figure 2. The rapporteur raised issues of sufficiency of disclosure (Article 83 EPC), added subject-matter (Article 123(2) EPC), clarity and support (Article 84 EPC) and novelty and inventive step (Articles 54 and 56 EPC). The preliminary opinion was expressed that various of the claims, insofar as they could be understood, were not

- supported by the description and lacked novelty in view of the disclosure of D2. Oral proceedings were appointed.
- IV. Prior to the oral proceedings the appellant filed revised sets of claims of new main and auxiliary requests. Amendments to the description and drawings were also made.
- V. Oral proceedings were held on the 28 October 1999. In the course of the oral proceedings the appellant proposed various amendments to claims 1 and 8 and finally withdrew both the existing main and auxiliary requests; grant of a patent was requested on the basis of a set of claims 1 to 7.
- VI. At the close of the oral proceedings the Chairman announced that the debate was closed and that the decision was reserved until two months after the oral proceedings.
- VII. In a letter dated 10 November 1999, but received by the Board on 30 November 1999, the appellant referred to the oral proceedings and stated that the application had been divided into two parts. The "first part" was said to correspond to claims 1 to 7, the letter indicating that these claims "have been presented", which the Board understands to mean the claims on which the present decision is based. The "second part" was said to be a divisional application. A "clean photocopy" of claims 1 to 7 was said to be enclosed but did not accompany the letter.
- VIII. Claim 1, the sole independent claim, reads as follows:

"Device for checking patterns (1) disposed on a material strip (30) which patterns (1) consist of groups of dark and light areas (2, 2*; 3, 3*), wherein the position of the dark areas (2) and/or light areas (2*) of one group with respect to a related detector (9) is displaced in regard to the dark areas (3) and/or light areas (3*) of another group with respect to another related detector (8), said detectors (8, 9) detect an existence of dark areas (2, 3) and/or light areas (2*, 3*) wherein each of said detectors (8, 9) produce output signals dependent on the result of the detection, and a comparator (10) compares a sequence of output signals with a predetermined sequence of signals and creates an output signal if both sequences are equivalent, characterized in that

- a) said comparator (10) is directly connected to at least two detectors (8, 9), the output signals of said detectors (8, 9) are directly sent to said comparator (10),
- b) each of said output signals of said detectors (8, 9), being received by said comparator (10), is a binary signal relating to and distinguishing transitions from light areas (2*, 3*) to dark areas (2, 3) and from dark areas (2, 3) to light areas (2*, 3*)
- c) said comparator (10) combines both of said binary output signals of said detectors (8, 9) so as to produce said sequence of output signals which contain the information of both of said binary output signals of said detectors (8, 9) and is different from each of said output signals of said detectors (8, 9)."

IX. It was argued that the invention was of much greater

importance than appeared at first sight. Although it was clear that it was based on the same principle as D2, 10 years of detailed work had gone into its development, and contrary to the view expressed both by the Examining Division and the Rapporteur it was both novel and inventive. The difficulty which arose in the device disclosed in D2 was that printed matter could accidentally give rise to the same sequence of bits at the comparator as the pattern, giving rise to errors in the manufacturing process. The obvious modification to make, which was indeed suggested in D2, was to increase the number of bars on the pattern, which however increased the size of the pattern and caused additional complication; such an approach had not been found to be successful. Even if the skilled person had hit on the idea of using data from both detectors rather than merely clocking one detector with the other, the obvious modification to make would be to provide a duplication of the D2 apparatus and compare each output signal with a respective predetermined signal sequence, an output being given if both sequences were found to be correct. Instead, the application first combined both signals and only thereafter made use of a comparison, giving greatly enhanced accuracy as a total of 28 signal bits were available, as compared to the 8 bits available in D2. Making the obvious modification to D2 would only give rise to 6 bits from one pattern and 8 from the other, a total of 14 bits; such an arrangement was not the subject of the claim and gave only half the accuracy of the device of the invention.

Reasons for the Decision

1. *Background to the application*

- 1.1 In the manufacture of packaging material such as drink cartons, a preprinted strip is processed at high speed by for example cutting and creasing to form individual cartons. In order to ensure that the operations register correctly with the printing it is known to print fiducial marks on the cartons which are used for alignment in the subsequent processing operations.
- 1.2 It is desirable to keep such fiducial marks as small as possible, but a problem which can arise is that other printing on the carton can be mistaken for them, giving rise to inaccurate registration and processing.
- 1.3 It is common ground that the most relevant prior art document is D2, the appellant's own earlier document. D2 shows a device for checking patterns in accordance with the preamble of claim 1; in particular, it discloses detectors (I), (II) which provide output signals on detection of light and/or dark areas disposed on a material strip and displaced with respect to one another, and a comparator (11) which compares the detector signals with a predetermined sequence of signals and creates an output signal if both sequences are equivalent.
- 1.4 As shown in Figure 2 of D2 the output signals of detector I, namely pulse train 13, are amplified (10) and the pulses are modified to have a constant, short, length so as to form a pulse train 14. This pulse train 14 is then used to clock the pulse train 15 from detector II into the comparator 11.

2. *Novelty*

2.1 It was argued by the appellant that there were substantial differences between the D2 device and that used in the application. In particular, in order to solve the problem of erroneous measurements the application provided a substantially higher number of output signals than D2. This was done by making use of the information in both output signals. In D2 however one output signal was used to clock the other with the result that using a pattern as shown in Figure 1 of D2 only an 8-bit or 6-bit output signal could be obtained, depending upon which of the output signals was used to clock the other.

2.2 In accordance with the characterising part of claim 1 the invention provides the following features:

- (a) the comparator is **directly** connected to at least two detectors the output signals of which are **directly** sent to it (Board's emphasis);
- (b) the detector output signals are binary and serve to distinguish light/dark transitions and vice-versa; and
- (c) the comparator combines the detector signals to produce **a sequence of output signals containing the information of both detector output signals** and which is different from each of the detector output signals (Board's emphasis).

2.3 The Board has some difficulty in interpreting the emphasised wording. The reference in feature (a) to the

the comparator being "directly" connected to the detectors is understood as seeking to distinguish from Figure 2 of D2, which shows a device 10 in the path of one of the outputs, this device being described at column 2 lines 56 to 58 as an "operational amplifier" but apparently serving as a monostable which fixes the pulse duration. The Board notes that in D2 no components are interposed between the detector I and the comparator.

2.4 The Board however takes the view that the qualification "directly" is unable to bear the weight of the interpretation the appellant has put on it. Although the appellant asserted that "directly" should be interpreted as meaning "without intermediary", it is noted that in the described embodiments the output of the detectors are digital; given the usual analog photoelectric detector for light/dark areas this implies some form of pulse shaping such as a Schmitt trigger within the detector, casting doubt on what meaning can and should be attached to "directly" in feature (a). The Board also notes that the claim does not say, for example, that the output of one detector is compared with that of the other, merely that the signals are "combined".

2.5 These considerations lead the Board to the conclusion that the meaning of "directly" derivable from the application as a whole is that the detectors are connected to supply signals to the comparator; the arrangement shown in D2 meets this criterion. The feature (a) of claim 1 is accordingly considered to be known from D2.

2.6 In accordance with D2 at column 2, lines 39 to 43 and lines 52 to 56, and column 3, lines 3 to 8, the D2 device serves to detect transitions from light to dark areas and vice versa as required by feature (b) of the claim. The first passage cited suggests that transitions are detected directly but the subsequent passages make clear that this is a consequence of light and dark detection. The output signals can be seen from Figure 2 to be binary. Since light and dark signals can be used to distinguish transitions the Board therefore concludes that this feature (b) is known from D2.

2.7 Turning now to feature (c), this refers to an output signal "containing the information of both... signals". This wording gives rise to the question of whether it means that **all** or only **some** of the information of both detector signals is contained in the output signal. Since the wording of the claim is not clear per se the Board has in accordance with Article 69 EPC used the description and drawings to interpret it. It is noted that in the Figure 3 embodiment only signal transitions are output, light-dark transitions corresponding to logic "0" and dark-light transitions to logic "1". In Figure 4 one signal is used to clock the other by making use of signal transitions; an output arises for each transition. Figure 5 performs a double sampling, the level of both signals being recorded for each transition. In each case no distinction is made in the final output signal between samples from respective sensors, so that it is not possible to reconstitute the original signals. This means that information is lost in the sampling process. Although the application suggests at page 7 lines 11 to 17 that pulses from the two detectors could be distinguished, in the described

embodiments this is not done.

- 2.8 The Board accordingly concludes that the unclear wording in feature (c), "the information of both detector output signals", must in the light of the description be interpreted as meaning that some, but not all, information from both detector signals is used to give a sequence of output signals.
- 2.9 In D2 the comparator combines the detector signals to produce a sequence of output signals containing some information of both detector output signals and which is different from each of the detector signals; it does this inasmuch as the act of clocking one signal with another will result in an output signal which contains - albeit indirectly - information from both. Thus, interpreting the wording of feature (c) in the light of the description it can be seen that the feature is known from D2.
- 2.10 Thus, all the features of claim 1 are directly and unambiguously derivable from D2. The claim therefore lacks novelty.
3. As noted at point VI above the debate was closed at the end of the oral proceedings. Nevertheless, as noted at point VII, a further submission was made by the appellant. Since this submission was made after the debate was closed the Board has taken no account of it in arriving at its decision.
4. There being no other requests, it follows that the appeal must be dismissed.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:

M. Kiehl

P. K. J. van den Berg