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Anmeldenummer / Filing No / N<sup>o</sup> de la demande : 83 304 557.8

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Bezeichnung der Erfindung: Method of and apparatus for discriminating  
Title of invention: coins or bank notes  
Titre de l'invention :

Klassifikation / Classification / Classement : G07D 5/00, G07D 7/00, G07D 3/02

**ENTSCHEIDUNG / DECISION**

vom / of / du 18 January 1990

Anmelder / Applicant / Demandeur : Kabushiki Kaisha Universal

Patentinhaber / Proprietor of the patent /  
Titulaire du brevet :

Einsprechender / Opponent / Opposant :

Stichwort / Headword / Référence :

EPÜ / EPC / CBE Article 56 EPC

Schlagwort / Keyword / Mot clé : "Inventive step (affirmed)"

**Leitsatz / Headnote / Sommaire**

Europäisches  
Patentamt

Beschwerdekammern

European Patent  
Office

Boards of Appeal

Office européen  
des brevets

Chambres de recours



Case Number : T 514/89-3.4.1

**D E C I S I O N**  
of the Technical Board of Appeal 3.4.1  
of 18 January 1990

**Appellant :** KABUSHIKI KAISHA UNIVERSAL  
561, Oaza Arai  
Oyama-shi Tochigi-ken (JP)

**Representative :** Barlow, R. J.  
J.A. KEMP & CO.  
14 South Square  
Gray's Inn  
London, WC1R 5EU (GB)

**Decision under appeal :** Decision of Examining Division 063  
of the European Patent Office dated  
10 March 1989 refusing European  
patent application No. 83 304 557.8  
pursuant to Article 97(1) EPC

**Composition of the Board :**

**Chairman :** K. Lederer  
**Members :** E. Turrini  
L. Mancini

## Summary of Facts and Submissions

- I. European patent application No. 83 304 557.8 (publication No. 0 101 276) was refused by decision of the Examining Division.
- II. The reason given for the refusal was that the subject-matter of the effective independent Claims 1 and 7 lacked an inventive step in view of the disclosure of document DE-A-3 103 371 (D1). The Examining Division held in particular that it was clear from the content of D1 that an appropriate number of tokens had to be tested in the "read-in" mode to arrive at a reliable reference value calculation for a specific sort of coins, and that the characterizing features of Claim 1 did not go beyond the obvious teaching that the decision whether the appropriate number of coins for calculating reliable reference values had been reached could be done automatically.
- III. The Appellant lodged an appeal against the decision.
- IV. Oral proceedings were held on 18 January 1990, at the end of which the Appellant requested that the decision under appeal be set aside and that a patent be granted on the basis of Claims 1 to 14 presented at the oral proceedings, of which the independent Claims 1 and 7 read as follows:

- "1. A method of judging the authenticity of value representative tokens by measuring characteristics thereof, comprising the steps of:
  - measuring the characteristics of a number of sample tokens with sensor means;
  - calculating minimum and maximum reference values for discriminating authentic tokens from the measured values of the characteristics of said number of tokens;

storing the calculated minimum and maximum reference values;

measuring the characteristics of a token to be discriminated with said sensor means;

checking whether the measured characteristic value of the inspected token is within the minimum and maximum reference values to judge the token to be authentic if the checked value is within the two reference values and counterfeit if the checked value is outside the range between two values, characterized by the steps of: setting on switch means a predetermined number corresponding to a required sample size to be tested for calculating the reference values; and comparing the number of tokens which have had their characteristics measured with said predetermined sample size and in that the steps of calculating and storing reference values are not carried out until said number of sample tokens which have had their characteristics measured equals the predetermined sample size as set by use of the switch means.

7. An apparatus for judging the authenticity of value representative tokens by measuring the characteristics thereof, comprising:

sensor means (3,10,17) disposed on a path of transport of the tokens, for measuring the characteristics thereof;

processing control means (23,24,25,26,28) capable of providing a reference value setting mode and a discrimination mode, said processing control means being operable in said reference value setting mode to collect characteristic values of a number of tokens to calculate minimum and maximum reference values for discriminating authentic tokens from the collected characteristic values, and processing control means being operable in

said discrimination mode to check whether a measured characteristic value of a token to be discriminated is between said minimum and maximum reference values; and means for storing (28) said minimum and maximum reference values,

characterized in that it includes switch means (25) effective in use of the apparatus for setting a predetermined sample number corresponding to a required number of tokens to be tested for calculating said minimum and maximum reference values, and in that the processing control means (23,24,25,26,28) is operative, in said reference value setting mode, to compare the number of tokens tested with said predetermined sample number and not to calculate said reference values unless the number of tokens tested equals said predetermined sample number.

Claims 2 to 6 and 8 to 14 are appended respectively to Claims 1 and 7.

- V. In support of the allowability of his request the Appellant stressed that in accordance with the invention defined in the claims the number of samples to be used for reliably determining minimum and maximum reference values in a preliminary calibration mode had to be "predetermined", which meant that the appropriate number had to be determined and set on the switch means before starting of the calibration procedure.

Accordingly, the appropriate number could be determined and set at the factory, taking into consideration the kind and hence the specific dispersion of the characteristics of the tokens which the machine was intended to discriminate, whereby a single type of such machine could be manufactured

for discriminating different kinds of coins or bank notes as used in different countries.

Since furthermore calculation of the reference values was not carried out until the predetermined number of samples had been measured in the calibration mode, the invention avoided that the accuracy of the calibration be dependent on the operator's care.

The claimed invention could not be obvious since the cited prior art documents either called for the use of only one or two standardized coins or tokens for the calibration of the machine, or taught that the number of the samples to be tested in the calibration mode did not need to be precisely determined, as followed from the use of the expression "beliebig" in document D1.

#### Reasons for the Decision

1. The appeal is admissible.
2. There is no objection under Article 123(2) EPC to the present application documents.

In particular, present Claim 1 corresponds in substance to Claim 1 as originally filed with the following admissible amendments:

the original expression "coins or bank notes" has been replaced by the generic designation of "tokens" used also in the original description (page 5, line 24);

the predetermined number of sample tokens is now specified to be set on switch means, as disclosed on page 8, lines 4 to 7 and 24 to 26 of the description as originally filed; and the end portion of the claim further states that the number of tokens which have had their characteristics measured is compared with the predetermined sample size, which is supported by the flow chart of Figure 2 (see the left-hand box at the bottom of Figure 2) and that the steps of calculating and storing reference values are not carried out until the number of measured sample tokens equals the predetermined sample size, as disclosed on page 10, lines 17 to 21 of the description as originally filed in combination with Figure 2.

Corresponding amendments have been made to independent Claim 7.

In addition to the correction of evident typographical and grammatical errors, the description has only been brought into conformity with the wording of the claims as amended, and supplemented by a summary of the relevant prior art disclosed in document D1.

### 3. Novelty

- 3.1. Document D1 discloses a method of judging the authenticity of value representative tokens (coins) by measuring characteristics thereof (first ten lines of Claim 1 of document D1) which, as defined in the preamble of present Claim 1, comprises the steps of:

measuring the characteristics of a number of sample tokens with sensor means (Claim 1 of document D1, line 18);

calculating minimum and maximum reference values (Claim 1 of document D1, lines 21 and 22: "die beiden Toleranzgrenzen") for discriminating authentic tokens from the measured values of the characteristics of said number of tokens;

storing the calculated minimum and maximum reference values (page 10, original numbering, of the description, line 4);

measuring the characteristics of a token to be discriminated with said sensor means; and

checking whether the measured characteristic value of the inspected token is within the minimum and maximum reference values to judge the token to be authentic if the checked value is within the two reference values and counterfeit if the checked value is outside the range between the two reference values (this step is not explicitly disclosed in document D1, but necessarily follows from the fact that minimum and maximum reference values are calculated and stored).

In this known method, the user subjects a certain number of tokens, which is defined as a discretionary or optional plurality (Claim 1 of D1, lines 11 and 12 and page 10, original numbering, line 15: "eine an sich beliebige Vielzahl"; description page 8, line 18 and page 9, original numbering, lines 8 and 33: "eine beliebige Vielzahl") to a sampling or "read-in" procedure in which specific characteristics of the tokens are measured by the sensor means, and subsequently sets a switch means to a "read-out" position, in which minimum and maximum reference values are computed (lines 20 to 26 of Claim 1 of D1).

Thus, the subject-matter of present Claim 1 is distinguished from this known method by the features set out in the



characterizing portion of the claim, which may be summarized as follows:

(a) a predetermined number of tokens to be tested for calculating the reference values is set on switch means; and  
(b) the number of tokens which have actually been subjected to the sampling procedure is compared with the predetermined number, and calculation and storage of reference values is initiated only when the predetermined sample size as set by use of the switch means has been reached.

3.2 The remaining documents cited in the European search report do not come closer to the subject-matter of Claim 1.

In particular, document US-4 179 685, which is the sole further prior art document to relate to a method for discriminating tokens including a "learning mode" in which a large number of samples of the tokens to be discriminated is measured and used for the determination of reference values, does not disclose any detail of the determination or setting of that number (column 9, lines 25 to 33).

3.3 For these reasons, the subject-matter of Claim 1 is considered to be novel in the sense of Article 54 EPC.

#### 4. Inventive Step

4.1 In view of document D1 which undisputably discloses the nearest prior art, the technical problem to which the distinguishing features set out in the characterizing portion of Claim 1 and summarized in point 3.1 above achieve a solution is, on the one hand, to allow fully automatic initiation of the reference values calculation and storing mode when a given number of sample tokens has been measured

(feature (b)), while on the other hand permitting selective setting of this number in accordance, for instance, with the natural dispersion of the measured parameters of a specific kind of token to be discriminated (feature (a)).

- 4.2 The Board fully supports the Examining Division's opinion that no positive contribution to inventive step can be seen in the mere automatisisation of the mode switching when a given number of samples have been measured, which relieves the operator from the obviously laborious task of counting a large number of samples, and readily avoids the risks of errors inherent to such counting.

In the Board's view, however, the skilled person could not derive from the prior art any teaching that the precise number of the tokens measured in the calibration mode was of any relevance whatsoever, and thus find any hint at formulating the partial technical problem of allowing selective setting of a predetermined sample size.

- 4.3 Indeed, the designation of the number of tokens to be subjected to the calibration procedure as "eine an sich beliebige Vielzahl" or "eine beliebige Vielzahl" as consistently used throughout document D1 a priori suggests that the choice of the number of tokens is entirely left to the operator's discretion, and the document as a whole does not provide any support for a different interpretation.

In particular, the indication in the second paragraph of page 7 (original numbering) of the description that commercially available coin checkers were not capable of correctly discriminating genuine coins, which as a result of different coining dates exhibited different degrees of wear or dirtiness and could not therefore be recognized as authentic coins, merely teaches that the characteristics of actual

coins of a single kind present a certain dispersion, which justifies that the machine be calibrated with a plurality of actual coins as set out in Claim 1 of document D1, rather than according to the single standard coin method referred to in document D1. This passage however cannot without hindsight be considered to disclose that different kinds of tokens as used for instance in different countries exhibit sufficiently different distribution curves of their characteristics to justify that the number of tokens used for the calibration step be adapted to each kind of tokens to be discriminated.

Document D1 further discloses that the reference values obtained through the described method may advantageously be shifted in either direction if this appears to be useful in view of the characteristics of the coins or of further not explicitly specified practical considerations (page 8, original numbering, last paragraph) and thus teaches away from the idea underlying the invention, which is to determine the proper number of the tokens to be used in the calibration procedure before calculating reference values instead of carrying out subsequent corrections.

Also, by the statement in lines 14 to 23 of page 10, original numbering, of the description that the frequency of individual values of the measured characteristics during the calibration procedure can be monitored, whereby exceeding of permissible limits can be identified and signalled upon comparison with a theoretical distribution curve ("bei Unterstellung einer vorgebbaren Sollwertverteilung") document D1 only proposes a means for assessing whether the distribution of the values of the characteristics in the sample used for the calibration actually corresponds to the expected distribution in the tokens to be subsequently discriminated. This passage however neither hints at the

opportunity of determining the sample size in accordance with the actual distribution in the tokens to be discriminated nor even suggests that different types of tokens exhibit sufficiently different distribution curves to require subsequent modification of a once determined sample size.

Finally, the suggestions in document D1 that the frequency with which the predetermined tolerances are exceeded be recorded and evaluated during normal discrimination operation of the machine and either a warning signal be produced or the machine be stopped when the predetermined tolerances are exceeded a given number of times (page 10, original numbering, lines 23 to 35), or that the machine should be recalibrated after having been operated for a number of hours, using again an arbitrary plurality of coins (page 9, original numbering, lines 1 to 9) only show that the reference values calculated in the calibration step might need to be reactualized from time to time for coping with changing operating conditions, as a result for instance of normal wear of the sensor means. These statements however do not suggest that the number of token samples to be used in the successive calibration procedures should be modified.

The remaining prior art documents are also devoid of any information from which the skilled man could deduce the interest of selecting different values of the number of tokens used for calibration purposes.

Accordingly, straightforward automatisations of the method disclosed in document D1 could result only in a method in which the number of tokens used in the calibration procedure would be fixed once and for all. But the skilled person had no obvious reason in the light of the cited prior art to envisage instead a specific step consisting in setting, on special switch means, the value of a

predetermined number corresponding to a selected sample size, in accordance with what has been summarized in paragraph 3.1 as feature (a) of Claim 1.

- 4.4 For these reasons, the subject-matter of Claim 1 is considered to involve an inventive step in the sense of Article 56 EPC.

So does the subject-matter of independent Claim 7 which defines substantially the same invention in terms of apparatus features, and inter alia calls for the provision of switch means effective in use of the apparatus for setting a predetermined sample number corresponding to a required number of tokens to be tested, which the skilled person, for the reasons indicated above, could not have derived in an obvious manner from the cited prior art.

The subject-matter of dependent Claims 2 to 6 and 8 to 14 also define inventive subject-matter by virtue of their dependency on Claims 1 and 7.

All claims presently on file therefore define patentable subject-matter (Article 52(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 first instance with the order to grant a European patent on the basis of the following documents:

Claims 1 to 14 and description pages 1 to 4a and 5 to 13 presented at the oral proceedings, and Figures 1 to 5 of the drawings as originally filed.

The Registrar

The Chairman

S. Fabiani

K. Lederer