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Datasheet for the decision of 19 May 2016

Case Number: T 1402/12 - 3.4.02

Application Number: 09170844.6

Publication Number: 2199779

IPC: G01N21/35, G07G1/00

Language of the proceedings: EN

Title of invention:
Method and apparatus for automated product identification in point of sale applications using terahertz radiation

Applicant:
NCR Corporation

Headword:

Relevant legal provisions:
EPC Art. 56

Keyword:
Inventive step - (yes)

Decisions cited:

Catchword:

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Beschwerdekammern
Boards of Appeal
Chambres de recours

European Patent Office
D-80298 MUNICH
GERMANY
Tel. +49 (0) 89 2399-0
Fax +49 (0) 89 2399-4465

Case Number: T 1402/12 - 3.4.02

D E C I S I O N
of Technical Board of Appeal 3.4.02
of 19 May 2016

Appellant: (Applicant)	NCR Corporation 3097 Satellite Blvd. Duluth, GA 30096 (US)
Representative:	MacLeod, Roderick William NCR Limited Intellectual Property Section Discovery Centre 3 Fulton Road Dundee Tayside, DD2 4SW (GB)
Decision under appeal:	**Decision of the Examining Division of the European Patent Office posted on 19 April 2012 refusing European patent application No. 09170844.6 pursuant to Article 97(2) EPC.**

Composition of the Board:

Chairman	B. Müller
Members:	H. von Gronau
	F. Maaswinkel

Summary of Facts and Submissions

I. The appeal of the applicant is directed against the decision to refuse the European patent application. The examining division refused the application in particular on the ground that the subject-matter of independent claim 1 filed on 16 September 2011 did not involve an inventive step and that claim 9 filed on 16 September 2011 was not clear. Furthermore the examining division did not admit claims 1 to 8 filed on 24 February 2012 into the proceedings because they could not prima facie overcome the objections raised with respect to the claims filed on 16 September 2011.

II. With the statement of grounds of appeal the appellant filed an amended set of claims 1 to 7 and put forward that the subject-matter of independent claim 1 did involve an inventive step. The appellant requested grant of a patent on the basis of these claims.

III. In a communication of 15 April 2016 the board introduced document D8 which was cited in the examining proceedings relating to the corresponding US patent application and considered it to be the closest prior art document. The board recognized an inventive step in the particular identification of products at a point of sale terminal. However, the board had clarity objections regarding independent claims 1 (typing error) and 7 (missing processing step) and also drew the attention to certain deficiencies in the description.

IV. With a letter dated 27 April 2016 the appellant filed an amended set of claims 1 to 7 and amended pages 2 and 3 of the description to meet the requirements of Article 84 EPC and Rule 42(1) EPC.

V. The current independent claims 1 and 7 on file read as follows:

"1. A point of sale terminal (100) comprising:

a user interface (108) for receiving inputs from a user and furnishing information to a user to conduct a point of sale transaction;

a terahertz radiation source (136) operative to illuminate an area under consideration with terahertz radiation;

a terahertz radiation detector (138) to detect terahertz radiation reflected by one or more products (140) under the area under illumination, and to generate a detector signal based on the detected terahertz radiation;

a processor (142) operative to process the detector signal to generate image information to indicate the presence and location of the one or more products,

characterised in that:

the processor (142) is further operative to process the image information to generate targeting information which is used by the terahertz radiation source (136) to direct radiation targeted at each of the products (140) to generate a detector signal for each product (140) so as to generate a spectral signature characteristic of the product (140); and

wherein the spectral signature for each product (140) is compared against stored spectral information

signatures associated with products to identify the product whose associated spectral signature matches the spectral signature generated by the product identification unit."

"7. A method of point of sale management, comprising the steps of:

illuminating an area of interest in the vicinity of a point of sale terminal with terahertz frequency radiation;

detecting terahertz frequency radiation reflected from one or more products within the area of interest as a result of the illumination to produce a detection signal based on the detected radiation;

processing the detection signal to generate image information to indicate the presence and location of the one or more of the products;

characterised by the further steps of:

processing the image information to generate targeting information;

using the targeting information to direct terahertz frequency radiation targeted at each of the products to generate a detector signal for each product so as to generate a spectral signature characteristic of the product; and

comparing the spectral signature of each product against stored spectral information signatures associated with products to identify the product whose

associated spectral signature matches the stored spectral signature."

VI. The following documents are of relevance to the present decision:

D1: US 2008/179527 A1
D2: US 5 182 764 A
D5: Mearini G T: "High Power Miniature CVD Diamond-Based Submillimeter/Terahertz Signal Sources", Teraphysics Corporation, INTERNET ARTICLE, 3 November 2008 (2008-11-03), Retrieved from the Internet: URL: https://mentor.ieee.org/802.15/dcn/08/15-08-0741-00-0thz-high-power-miniature-cvd-diamond-based-submillimeter-terahertz-signal-sources.ppt [retrieved on 2011-05-09]
D8: US 7 275 690 A

Reasons for the Decision

1. Amendments (Article 123(2) EPC)

1.1 Independent claim 1 is based on original claims 11, 9 and 10 in combination with the description, page 13, line 21 to page 14, line 12. Claims 2 and 3 correspond to original claims 12 and 13, respectively, and claims 4 to 6 correspond to original claims 3 to 5, respectively. Independent claim 7 is a corresponding method claim based on original claim 14. The board therefore sees support for the amended claims in the application as filed.

2. Clarity of the independent claims (Article 84 EPC)

2.1 The board is satisfied that lack of clarity has been removed by amendment. Claim 1 now clearly states that the targeting information is used by the terahertz radiation source "to direct radiation targeted at each of the products", and claim 7 now comprises a step of "using the targeting information to direct terahertz frequency radiation targeted at each of the products to generate a detector signal for each product so as to generate a spectral signature characteristic of the product".

3. Independent claim 1 - inventive step (Article 56 EPC)

3.1 The examining division in the contested decision essentially objected to lack of inventive step starting from document D1 and combining it with document D5 and general knowledge. The appellant, in its grounds of appeal, was of the opinion that document D5 should be considered as closest prior art document because it also referred to a point of sales terminal, albeit implicitly (cf. point 2.9 of the grounds of appeal).

3.2 The board however considers neither document D1 nor document D5 to constitute the closest prior art in relation to current claim 1. Document D1 is directed to an apparatus for analysing and identifying an object with pulsed signals in the range of terahertz frequencies. This document does not disclose a point of sale terminal. Document D5 relates mainly to terahertz radiation sources in general and only on page 37, under the heading "potential applications", it mentions the application in a point of sale situation.

3.3 The board considers document D8 to be the closest prior art document. This document is directed to a

transaction processing system. It discloses in particular a point of sale terminal 10, 50 comprising:

a user interface 74, 76 for receiving inputs from a user and furnishing information to a user to conduct a point of sale transaction;

a terahertz radiation source 14 operative to illuminate an area under consideration with terahertz radiation (cf. column 2, lines 8-11);

a terahertz radiation detector 30 to detect terahertz radiation reflected by one or more products 20, 52 under the area under illumination, and to generate a detector signal based on the detected terahertz radiation;

a processor 16, 70 operative to process the detector signal to generate image information to indicate the presence and location of the one or more products (cf. column 2, lines 50-65, the imaging device determines the number of items in a container to determine whether the RFID tags of all items in a container have been processed).

3.4 The subject-matter of claim 1 differs from the disclosure of document D8 in that the processor in the terminal is operative to process the image information to generate targeting information which is used by the terahertz radiation source to direct radiation targeted at each of the products to generate a detector signal for each product so as to generate a spectral signature characteristic of the product; and
wherein the spectral signature for each product is compared against stored spectral information signatures associated with products to identify the product whose

associated spectral signature matches the spectral signature generated by the product identification unit.

3.5 These differing features allow identifying each product by its spectral signature even if there are more products in the area of interest.

3.6 The problem to be solved starting from the closest prior art as disclosed in document D8 is identifying the one or more products in the area of interest in a different way.

3.7 None of the available prior art documents suggests using terahertz radiation to first identify the presence and location of objects and then to generate a spectral signature of the located objects for comparison in a data base to identify the product.

Document D1 discloses an apparatus that allows analysing the composition of an object with terahertz radiation (*The frequency response presents a signature or frequency spectrum capable of differentiating between different materials, chemical compositions, or molecules in the target*, cf. paragraph [33]). This document does not teach to identify a particular product from a plurality of products. It does not locate one or more products with the help of terahertz radiation and direct the terahertz radiation at each of the products to get the spectral signature of each of them which is compared with spectral signatures of a database. Document D1 does not even address the problem mentioned above.

Document D5, page 37 also discloses the idea to analyse a product in an area of interest in order to identify counterfeit drugs and provide quality assurance. This

document does not deal with the question of identifying a product from among other products. The person skilled in the art would therefore not consider this document in order to solve the above problem.

Document D2 generally relates to the detection of concealed objects in closed containers (luggage). More particularly, the document relates to an efficient method and apparatus for detecting concealed objects by using computerized tomography. The method uses a two step procedure to inspect objects. First an X-ray line scanner scans the containers (luggage) to locate objects of interest that have a mass greater than a target mass. If an object of interest has been located, this object is inspected with the help of CT scans. With such CT scans it is possible to determine the mass, size and shape of the object in question. Also, the texture of the object may be analysed in case of drugs or explosives. During an identification step critical objects can be highlighted on a screen and further inspected by an operator. In applying the teaching of D2 to the point of sale terminal of document D8 the person skilled in the art would use the scanning method of D2 in the verification system 14. D8 already suggests including an X-ray machine in the verification system (cf. column 2, lines 8-9). The skilled person would then implement the two step scanning system with an X-ray pre-scan and a CT-scan to identify more precisely the number and kind of products due to the mass, size and shape. But this does not result in the claimed invention.

3.8 The board concludes therefore that the subject-matter of claim 1 involves an inventive step.

4. Independent claim 7 defines a corresponding method of point of sale management which likewise involves an inventive step.

5. Claims 2 to 6 are dependent on claim 1 and their subject-matter therefore also involves an inventive step.

6. The description meets the requirements of Rule 42(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 department of first instance with the order to grant a patent in the following version:

Description:
Pages 1, 4-18 as originally filed.
Pages 2, 3 filed with a letter of 27 April 2016.

Claims:
No. 1-7 filed with a letter of 27 April 2016.

Drawings:
Sheets 1/3 - 3/3 as originally filed.

The Registrar: The Chairman:

S. Sánchez Chiquero B. Müller

Decision electronically authenticated