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Datasheet for the decision of 4 November 2020

Case Number: T 1969/16 - 3.4.03

Application Number: 03728904.8

Publication Number: 1514227

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Language of the proceedings: EN

Title of invention:
VISIBLE AUTHENTICATION PATTERNS FOR PRINTED DOCUMENT

Patent Proprietor:
Advanced Track & Trace

Opponent:
Advanced Track & Trace

Headword:

Relevant legal provisions:
EPC R. 84(2)
EPC Art. 83, 100(b)
RPBA 2020 Art. 13

Keyword:
Withdrawal of opposition - continuation of the proceedings on own motion
Sufficiency of disclosure - (no)
Late filed requests - admitted (no) - not addressing outstanding issues

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Catchword:

Europäisches Patentamt
European Patent Office
Office européen des brevets

Beschwerdekammern

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Case Number: T 1969/16 - 3.4.03

D E C I S I O N
of Technical Board of Appeal 3.4.03
of 4 November 2020

Appellant: (Patent Proprietor)	Advanced Track & Trace 75 Avenue Victor Hugo 92500 Rueil-Malmaison (FR)
Representative:	Cassiopi 230, avenue de l'Aube Rouge 34170 Castelnau-le-Lez (FR)
Respondent: (Opponent)	Advanced Track & Trace 75 avenue Victor Hugo CS10156 92563 Rueil-Malmaison (FR)
Representative:	Cornuejols, Georges Cassiopi 230 Avenue de l'Aube Rouge 34170 Castelnau-le-Lez (FR)
Decision under appeal:	**Decision of the Opposition Division of the European Patent Office posted on 12 July 2016 revoking European patent No. 1514227 pursuant to Article 101(3)(b) EPC.**

Composition of the Board:

Chairman	W. Van der Eijk
Members:	M. Papastefanou
	G. Eliasson

Summary of Facts and Submissions

I. The appeal of the patent proprietor is against the decision of the opposition division revoking European patent 1 514 227 B1 on the ground that it did not disclose the invention in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art (Article 100(b) EPC 1973).

II. The opposition was based on the grounds of lack of novelty and inventive step (Articles 100(a), 54(1) and 56 EPC 1973), insufficiency of disclosure (Articles 100(b) and 83 EPC 1973) and added subject matter (Articles 100(c) EPC 1973 and 123(2) EPC).

III. The appellant – patent proprietor requested initially that the decision under appeal be set aside and that the patent be maintained as granted (Main Request) or according to one of the first to seventh Auxiliary Requests, which were all filed with the statement of the grounds of appeal.

IV. The respondent – opponent's initial main request was that the appeal be dismissed.

V. After the board issued summons to oral proceedings and its preliminary opinion, agreeing with the opposition division that the claimed invention was not sufficiently disclosed in the patent, the EPO was informed that the opponent had acquired the opposed patent.

This led to a situation, where the appellant (proprietor) and the respondent (opponent) were the same (legal) person, represented also by the same

representative.

VI. With a letter dated 16 September 2020, a new main request and three auxiliary requests were filed, while all other previously submitted requests were withdrawn. The proprietor and the opponent commonly requested that the patent be maintained on the basis of the new Main Request or one of the first to third Auxiliary Requests.

VII. At the beginning of the oral proceedings before the board, which were held via video conference at the request of the parties, the opposition was withdrawn and the appellant-proprietor remained thus the sole party in the appeal proceedings. At a later stage of the oral proceedings the appellant withdrew the first Auxiliary Request.

VIII. At the end of the oral proceedings before the board, the appellant's requests were that the decision under appeal be set aside and that the patent be maintained on the basis of the Main Request or one of the second or third Auxiliary Requests, as filed with the letter of 16 September 2020.

IX. Claim 1 of the Main Request is worded as follows:

A method of determining whether an analog form of an object is an original analog form, the method comprising:
A/ generating an original digital representation of an authentication pattern, the authentication pattern being a visible authentication pattern; then producing a plurality of original analog forms, each original analog form including the authentication pattern from the original digital

representation, causing first losses of information [sic] the original analog forms;
making a digital recording from the authentication pattern of each original analog form form [sic], causing second losses of information in the digital recordings;
comparing the digital recordings with the original digital representation to determine degrees of dissimilarity between the digital recordings made and the original digital representation;
statistically computing said dissimilarities to determine a statistical range of the sum of first and second losses;

B/ making a test digital recording from a test authentication pattern of an analog form; and
comparing the test digital recording with the original digital representation to determine a test degree of dissimilarity between the test digital recording made and the original digital representation; and
using the test degree of dissimilarity being equal to one sum of the first and second loss of information in the statistical range to determine that the digital recording was made from the at least one original analog form and using the test degree of dissimilarity being larger than the sums of the first and second loss [sic] of information in the statistical range to determine that the digital recording was made from a non-original analog form;

wherein, during the steps of comparing, the comparison is done pixel-by-pixel or block by block.

X. Claim 1 of the second Auxiliary Request has the same wording as claim 1 of the Main Request with the

addition, at the end of the claim, of the following feature:
"and the degrees of similarities are determined in a plurality of bands of frequencies and when using the test degree of dissimilarity being larger than the sums of the first and second loss [sic] of information in the statistical range to determine that the digital recording was made from a non-original analog form, the comparison of the degrees of dissimilarity is performed in a plurality of bands of frequencies."

XI. Claim 1 of the third Auxiliary Request has the same wording as claim 1 of the second Auxiliary Request with the addition, after the part of the claim designated with "A/", of the following feature (designated with "B/"):
"making another digital recording of the authentication pattern of each one of said other original analog form, comparing the other digital recording with the original digital representation to determine another degree of dissimilarity between the test digital recording made and the other original digital representation and discarding the other original analog form if the other degree of dissimilarity is larger than the sums of the first and second loss [sic] of information in the statistical range,...".

The part designated with "B/" in claim 1 of the second Auxiliary Request is designated with "C/" in claim 1 of the third Auxiliary Request.

XII. The appellant's arguments were essentially that with the amendments carried out in the claims, the skilled person was in a position to carry out the claimed invention based on the patent disclosure and common

general knowledge. The appellant's arguments are dealt with in the reasons for the decision.

Reasons for the Decision

1. The appeal is admissible.

2. The claimed invention

2.1 The claimed invention relates to a method for determining whether an analog form of an object is an original analog form or not.

2.2 A digital representation of a visible authentication pattern (VAP) is generated initially; this is the *original digital representation* of the VAP. From this original digital representation of the VAP, an *original analog form* of the VAP is produced (e. g. the VAP is printed on a document). There is a first loss of information (degradation) that occurs in the VAP with the production of the original analog form (*loss1*).

An analog form of the VAP is considered to be original when it is produced from an original digital representation of the VAP.

2.3 When it is required to determine whether an analog form of the VAP is an original analog form or not, a digital recording (e. g. scan) of the analog form of the VAP is made. A second loss of information (degradation) occurs when the digital recording of the analog form of the VAP is made *(loss2)*.

2.4 The digital recording of the analog form of the VAP (which is being tested) is then compared to the original digital representation of the VAP and a degree

of dissimilarity (i. e. difference) between the two is determined. If the determined degree of dissimilarity is equal to the sum of the first and second losses of information (loss1+loss2), the analog form of the VAP is considered to be an original analog form. In case the degree of dissimilarity is larger (greater) than the sum of the first and second losses of information (loss1+loss2), the analog form of the VAP is regarded as not original.

2.5 The idea behind the invention is that when an analog form of the VAP is produced from a digital representation of the VAP, a certain loss of information (loss1) is inevitable. In the same way, every time a digital recording of an analog form of the VAP is made it is inevitable that a further loss of information (loss2) will occur.

An *original analog form* is produced directly from an *original digital representation* of the VAP. Hence, a digital recording of an original analog form will show a loss of information equal to the sum of the first and second losses of information (loss1+loss2).

If, however, an analog form of the VAP is made from the *original analog form* (e. g. through photocopying of the original analog form), there will be additional loss of information (degradation). Similarly, if an unauthorised digital recording of the *original analog form* is made (e. g. scanning of the original analog form) and a new analog form is produced from this unauthorised digital recording (e. g. second printing), there will be further losses of information.

Hence, when a digital recording of the unauthorised analog form is made for the authentication process, the

comparison with the original digital representation will show a degree of dissimilarity (difference) that would be greater than the sum of the first and second losses of information (loss1+loss2), which is considered as inevitable loss of information. It can thus be determined that additional stages of (unauthorised) digital recording or copying took place and the analog form of the VAP which is being tested is not original (see also paragraphs [0055] to [0058] of the patent).

3. It is uncontested that the requests filed with the appellant's letter of 16 September 2020 contain amendments to the appellant's case that are to be admitted at the board's discretion (Article 13 Rules of procedure of the Boards of Appeal, as in force since 1 January 2020 (RPBA 2020); see also Article 25(3) RPBA 2020).

3.1 The board's exercise of discretion is based on the criterion of *prima facie* allowability, starting from the question whether the submitted amendments address the outstanding issues, and in particular the issue of insufficient disclosure of the claimed invention.

3.2 For the sake of completeness and ease of understanding, the board reiterates first its preliminary opinion, issued in preparation for oral proceedings.

4. The board's preliminary opinion

4.1 According to the claimed method, the determination of whether a digital recording is made from an original analog form of a VAP or not is based on a comparison of the degree of dissimilarity between the digital

recording of the analog form of the VAP (which is being tested/authenticated) and the original digital representation of the VAP to the sum of the first and second losses of information (loss1+loss2).

Therefore, the skilled person, in order to carry out the claimed method, must be in a position to:

- know (or at least be able to obtain) the values of the first loss (loss1) and the second loss (loss2) of information; and
- determine/measure the degree of dissimilarity between the digital recording of the analog form of the VAP being tested and the original digital representation of the VAP.

4.2 Regarding the losses of information, paragraph [0056] of the patent describes that the first loss (loss1) occurs when the original analog form of the VAP is produced from the original digital representation of it. The second loss of information (loss2) occurs when a digital recording of the analog form of the VAP is made. There is no information or indication in the patent, however, about how these first and second losses of information are to be measured or determined.

Moreover, in both cases the loss of information depends on the equipment used for the production of the analog form and digital recording of the VAP, as well as the content and the form of the VAP itself. It is common knowledge that the quality (and the corresponding loss of information) of the analog form of the VAP (e. g. printed image) depends on the equipment used (e. g. printer, paper etc.) and the content/form of the VAP itself (text, shapes, colours etc.). In a similar way, the quality of the digital recording of the VAP (e. g. a digital scan of a printed image) depends on the the

equipment used (e. g. scanner) as well as the content/ form of the VAP itself.

4.2.1 Since the skilled person would not be in a position to know what equipment was used for the production of the analog form and/or the digital recording of the VAP and what losses of information occurred during each process, they would not be able to determine the total loss of information (loss1 and loss2).

4.2.2 The patent also acknowledges this as it mentions that the first and second losses of information (loss1 and loss2) do not have fixed values and a *"statistical approach to the detection should be employed"* (paragraph [0059]). However, there is no information at all in the patent about any such statistical approach.

4.2.3 An argument of the patent proprietor is that the threshold for the determination whether an analog form of a VAP is original or not could be established through training software (statement of grounds of appeal, point 1).

4.2.4 Indeed, the patent mentions training software in two occasions.

The first mention is in paragraph [0063], which states that the training process relates to the algorithm for comparing a digital recording of an analog form of a copy detection pattern (CDP) to the original digital representation of the CDP. The algorithm is described in the following paragraphs, and paragraphs [0072] to [0082] relate to the comparison of the original VAP and the recorded VAP (or CDP).

The board notes that the described algorithm determines

whether the digital recording is made from an original analog form of the CDP (VAP) or not, using comparison of the determined degree of dissimilarity (S) with two threshold values, T1 and T2 (paragraph [0081]). This method is, thus, different from the one in claim 1, where there is only one threshold value used (loss1+loss2).

4.2.5 The second mention of training software is in paragraph [0125]. There are no further details in the patent about the training software mentioned in this paragraph, besides the statement that training could be done automatically by printing a number of VAPs on a sheet of paper, scanning the sheet and providing the scan to training software. The same paragraph states that *"[t]he meaning of the threshold will of course depend on the kind of alteration that VAP is being used to detect".* And further that *"[r]etraining is required whenever the manner in which the original documents are printed varies in a manner which affects the VAP comparison."*

The board's understanding from these passage is that there are parameters to be considered in the training software (kind of alteration the VAP is being used to detect, effect of the printing on the VAP) for which there is no information on how they were to be determined or set. Moreover, it is not apparent, for example, how the skilled person, who needs to test an analog form of VAP (i. e. a printed image), without any knowledge of how/where this analog form was produced, could have any idea of the effects of the printing on the analog form of the VAP in order to configure the training software accordingly.

4.3 Regarding the degree of dissimilarity, the board accepts that a skilled person at the priority date of the patent would know how to compare two digital images (representations) and define a difference (or dissimilarity) based only on common general knowledge.

4.3.1 The measurements used in the claimed invention in order to determine the degree of dissimilarity, however, go beyond the generally known methods.

Paragraph [0060], for example, states that *"[t]he measurement method chosen must be based on the properties of the VAP that are affected by the process of making a non-original document and must clearly distinguish an original from a non-original document"*. There is no information or suggestion in the patent which properties of the VAP these might be, however.

Paragraph [0061] mentions selecting the appropriate frequencies, without any apparent indication of which frequencies these might be, either.

4.3.2 The patent proposes training software in this case as well: *"The selection of frequencies for comparison... is typically done by training the comparison software on VAPs from original documents"* (last lines of paragraph [0061]).

The board's observations regarding the use of training software presented above (points 4.2.4 and 4.2.5) are valid in this case, as well. The skilled person would not know in advance which type of VAP or CDP would have to be authenticated in order to use the training software accordingly.

4.3.3 In addition, the description of the measurements carried out in the determination of the dissimilarity raises more questions. The algorithm carrying out the measurement of dissimilarity (comparison) is described in paragraphs [0072] to [0077] of the patent. There is mention of 192 measurements to be carried out (point 6 in paragraph [0074]). As it is explained in point 7 (of the same paragraph), the measurements are collected and combined. The combination function *"can be any function that combines different inputs, for example that combines similarity measures by assigning more weight or importance to features that are better discriminants between the original CDP and the test CDP"* (last lines of paragraph [0074]).

In this case as well, there is no indication in the patent about which features were to be assigned with more weight, especially since their selection depended on the type of the CDP (VAP).

4.4 The preliminary opinion of the board expressed in its communication was, thus, that the skilled person would not find sufficient information in the patent, in order to set the threshold for the comparison and measure the degree of dissimilarity between the digital representation of the VAP being authenticated and the original digital representation of the VAP. The patent, therefore, does not disclose the claimed invention in a manner sufficient for the skilled person to carry it out (see also point 4.1 above).

5. Main Request

5.1 The appellant argued that, in the method of claim 1 of the Main Request, an initial "training phase" was included (part "A/" of the claim). During this phase,

which corresponded to the implementation of the training software described in paragraph [0125], analog forms of the VAP which were known to be original, were scanned (recorded digitally) and the degree of dissimilarity of those digital recordings from the original representation of the VAP were determined. A statistical computing of these dissimilarities was then carried out in order to determine a statistical range of the sum of first and second losses, which was then used as threshold for the authentication of test digital recordings.

According to the appellant, the skilled person did not need to know the values of the first and second losses of information (loss1 and loss2) separately, as from the training carried out they would be able to determine the sum of the first and second loss of information as one value (loss1+loss2), which corresponded to the dissimilarity between an original digital representation and the digital recording of a known original analog form of a VAP.

Hence, there was no need for the skilled person to be aware of the equipment or the parameters used to produce the original analog form and its digital recording. The important thing was to be able to determine the total loss of information (degree of dissimilarity) in order to set a threshold for the authentication step, something that was achieved in the "training phase" of the claimed method. Moreover, the original digital recording of the VAP could be regenerated using a key (see paragraphs [0062] and [0065]) and it was not necessary for the skilled person to have the original digital representation of the VAP, either.

In addition, the indication in the claim that this threshold was computed as a statistical range of the total loss of information, allowed for the differences that may be caused by the use of different equipment or different settings to be taken into account. A statistical approach of the comparison, with the selection of the appropriate measurements to be carried out was also mentioned in the patent (paragraph [0075]). As it could also be seen in Figures 6 and 7, the threshold values were ranges of values.

Finally, the patent also mentioned a "quality control" of the original analog forms of the VAP. Each printed VAP would be checked to determine if it had a minimum quality for it to be recognised as original. If it did not, then it would be reprinted and the printing equipment would be verified for errors (paragraph [0113]). This process could also be used to determine the threshold for the authentication phase.

5.2 Regarding the determination of the degree of dissimilarity between a test digital recording and the original digital representation of the VAP, the appellant referred to paragraphs [0081] to [0092], where the process of comparing a digital recording of a CDP (VAP) with the original digital representation was described. The appellant pointed out that the claimed method called for a comparison pixel by pixel, which implied a simple procedure, in which there was no need for complicated measurements, selection and/or weighing of frequencies, etc. The skilled person could thus carry out this step based only on common general knowledge.

5.3 The board does not find the appellant's argument convincing.

5.3.1 Regarding the "training phase" of the claimed method, the board notes at first that the training software mentioned in the patent does not correspond to the steps of the "training phase" defined in claim 1. As explained previously (see points 4.2.4 and 4.2.5), the board's opinion is that the training software described in the patent either is using a different method with two threshold values (T1 and T2; paragraph [0081]) or is not disclosed sufficiently.

The appellant's argument that in the claimed method only one of the two thresholds mentioned in paragraph [0081] was needed in order to decide on the authentication of a test analog form of a VAP cannot be followed by the board, since the paragraph [0081] clearly states that *[i]f S>T1 then output is ORIGINAL, else if S>T2 then output is NON_ORIGINAL...* (last lines of the paragraph). Hence, in the method described in that part of the patent there are two thresholds used in the authentication, contrary to the method in claim 1, which uses only one (loss1+loss2).

5.3.2 The "quality control" (paragraph [0113]) mentioned by the appellant does not seem to play any role in the definition of the threshold values, either. The board understands this process as an effort to guarantee a minimum print quality of the original analog forms of the VAP set in circulation, which is unrelated to the training or the authentication phase of the claimed method, other than maybe eliminating the possibility of falsely determining that original analog forms of the VAP are not authentic (original) due to bad printing quality in their production. Furthermore the paragraph

mentions an "automatic verification process", without any mention of producing a digital recording of the printed VAP, determining a degree of dissimilarity, etc. In the board's view, there is no indication that this "automatic verification process" corresponds to the authentication method of claim 1.

5.3.3 Most importantly, the board notes that claim 1 calls for *"statistically computing said dissimilarities to determine a statistical range of the sum of first and second losses"*.

The claim defines a step of *statistically computing* the measured dissimilarities to determine *a statistical range* of the sum of first and second losses, without any further information about what this "statistical range" might be or how it will be "statistically computed".

As already mentioned previously (point 4.2.2), the patent makes only a vague statement that *a statistical approach to the detection should be employed* (last line of paragraph [0059]) without any further details.

The board accepts that the skilled person would have some basic general knowledge of statistics. However, the vague generic statements in the claim and the absence of any relevant information in the patent as a whole, leave the skilled person faced with a very broad field of possible implementations from which they have to find the appropriate one for this case. In the board's view such a step goes beyond what the skilled person can implement without undue burden. The board considers, thus, that the patent does not disclose this step of the claimed method sufficiently, in the sense

of Article 83 EPC 1973 .

5.3.4 Regarding the determination of the degree of dissimilarity, the board first notes that the claim also includes the possibility of comparing the images block by block and not only pixel by pixel. The board considers that the appellant's argument that a pixel by pixel comparison is straightforward does not apply to a comparison block (i. e. a number/plurality of pixels taken together) by block. In a comparison block by block, the board's observations in its preliminary opinion (point 4.3 above) apply, i. e. the patent does not provide sufficient information regarding frequency selection and/or weighing, measurements to be carried out, etc.

In addition, to those observations, the board points to the last line of paragraph [0075] according to which *due to statistical variations, an adequate selection and combinations of the different measures can be more effective in determining whether a test CDP is recorded from an original analog form or from a non-original analog form.* In the board's view this passage is another indication that aspects of the determination of the degree of dissimilarity ("adequate selection and combinations of measures") are not sufficiently disclosed in the patent.

The board considers further that even a pixel by pixel comparison is not sufficiently disclosed in the patent. In the board's view it is common general knowledge that comparing two digital images is usually done after a mathematical transformation of the images, like for example with a Fourier transform. The frequencies mentioned in the patent refer to the resolution of the image, for example, with areas of the pattern (VAP)

with higher resolution having higher frequencies after the transformation. Even if a comparison pixel by pixel is carried out, pixels in areas of higher resolution may not have the same frequency as pixels in the lower resolution areas. Hence, even in a comparison pixel by pixel other factors, such as frequencies, have to be taken into account, as indicated by the patent. As previously explained (see point 4.3), the board holds that the patent does not provide sufficient information for carrying out these measurements (comparisons).

Hence, the board's opinion is that the patent does not sufficiently disclose the step of the determination of the dissimilarity, either.

5.4 The board's conclusion is, therefore, that the patent does not disclose the invention defined in claim 1 of the Main Request in a manner sufficiently clear and complete for the skilled person to carry it out without undue burden. Since the amended Main Request does not address the outstanding issues, the board, exercising its discretion under Article 13 RPBA 2020, does not admit it in the procedure.

6. Second and Third Auxiliary Requests

6.1 The problems identified above in relation to the Main Request persist also in the second and third Auxiliary Requests, as the respective claim 1 comprises all the features of claim 1 of the Main Request.

6.2 Arguing mainly for the admittance of the second Auxiliary Request, the appellant pointed to the additional features of claim 1 (with respect to claim 1 of the Main Request; see point X above) according to which the degrees of similarities were determined in a

plurality of bands of frequencies and the comparison with the original digital representation was also performed in a plurality of bands of frequencies.

Making reference to paragraphs [0061], [0073], [0074] and [0076] as well as Figures 6 and 7 of the patent, the appellant argued that the patent provided sufficient information for the skilled person to carry out the measurements and the comparison in a plurality of bands of frequencies. Mathematical tools such as the Fourier transform were part of the common general knowledge in the technical field of signal/image processing and the skilled person would be in a position to carry out this method step without undue burden.

6.3 The board is not persuaded by this argument of the appellant. The patent describes a method which is more complex than a generally known Fourier transform. As already explained previously (point 4.3.5), the patent indicated that different (bands of) frequencies had to be appropriately selected and be given different weights (paragraph [0061]). There is mention of 192 different measurements to be performed and then different importance (weight) to be given to different measurements in the determination of the dissimilarity (paragraph [0074], points 6 and 7).

In the board's view the problems related to insufficient information identified in point 5.4 above, apply for this request as well, even more as the plurality of bands of frequencies are now included in claim 1.

6.4 The appellant did not provide any additional arguments regarding the third Auxiliary Request.

6.5 The board's view is, hence, that claim 1 of the second Auxiliary Request and third Auxiliary Request define an invention that is not sufficiently disclosed in the patent in the sense of Article 83 EPC 1973.

Since the second and third Auxiliary Requests do not *prima facie* address the outstanding issue of insufficiency of disclosure, the board, exercising its discretion under Article 13 RPBA 2020, decides not to admit them into the procedure, either.

7. Since none of the appellant's requests is found to be admissible, the appeal must fail.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

B. Atienza Vivancos W. Van der Eijk

Decision electronically authenticated