The opinion in support of the decision being entered today was *not* written
for publication and is *not* binding precedent of the Board.

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte Ulf Dahl

Appeal No. 2006-2937
Application No. 09/840,188
Technology Center 2100

Decided: January 26, 2007

Before KENNETH W. HAIRSTON, JOSEPH L. DIXON, and MAHSHID D. SAADAT, *Administrative Patent Judges.*

DIXON, *Administrative Patent Judge.*

DECISION ON APPEAL

This is a decision on appeal under 35 U.S.C. § 134 from the Examiner's final rejection of claims 18-54 and 56-92, which are all of the claims pending in this application. Claims 1-17, 55, and 93 have been canceled. This application is a continuation of Serial number 09/027,585, filed on Feb.

23, 1998, now US Patent 6,321,201 which is a § 371 filing of

PCT/SE97/01089 06/18/1997

We AFFIRM.

BACKGROUND

Appellant's invention relates to a data security system for a database. An understanding of the invention can be derived from a reading of exemplary claims 18 and 41, which are reproduced below.

> 18. A data processing method comprising:
>
> maintaining a database containing a table of data in row and column format, at least a portion of the data being encrypted;
>
> maintaining, separate from the table of data, information for controlling access to a specified proper subset of data in the table; and
>
> controlling access to the specified proper subset of data in the table according to the separately maintained information.

> 41. A method comprising:
>
> providing a database containing a table having at least two columns of data;
>
> encrypting data in a first column using first cryptographic information;
>
> encrypting data in a second column using second cryptographic information;
>
> storing first and second cryptographic information outside of the table;

controlling access to data in the first column using the first cryptographic information stored outside of the table; and

controlling access to data in the second column using the second cryptographic information stored outside of the table.

PRIOR ART

The prior art references of record relied upon by the Examiner in rejecting the appealed claims are:

Thomson	US 5,751,949	May 12,1998
Abraham	US 5,148,481	Sep. 15, 1992

Denning, D. E., "Field Encryption and Authentication" Advances in Cryptography, Proceedings of Crypto 83, pp 231-247 (1983).

Pfleeger, C. P., Security in Computer, Chapter 8, Database Security, PTR Prentice Hall, (1989).

Gaskell et al. "-Improved Security for Smart Card Use in DCE," February, 1995, Open Software Foundation, Request For Comments 71.0.

Johansson et al. International Publication No. Wo 9515628, International Publication Date: June 8, 1995.

REJECTIONS

Rather than reiterate the conflicting viewpoints advanced by the Examiner and the Appellant regarding the above-noted rejections, we make reference to the Examiner's answer (mailed Mar. 28, 2006) for the reasoning

in support of the rejection, and to Appellant's Brief (filed Feb. 02, 2006) and Reply Brief (filed May 30, 2006) for the arguments thereagainst.

Claims 18, 19, 21, 28, 29, 31, 33, 37, 41, 42, 48, 49, 56, 57, 59, 66-68, 70, 74, 75, 79, 80, 86, and 87 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Thomson in view of Denning. Claims 20, 22, 43, 50, 58, 60, 81, and 88 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Thomson in view of Denning, and further in view of Pfleeger. Claims 23-27, 34-36, 38-40, 45-47, 52-54, 61-65, 71-73, 76-78, 83-85, and 90-92 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Thomson in view of Denning, and further in view of Gaskell. Claim 30 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Thomson in view of Denning, and further in view of Johansson. Claims 32, 44, 51, 69, 82, and 89 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Thomson in view of Denning, and further in view of Abraham.

Claims 86-92 and 48-54 are rejected under [Section] 101 as claiming a data structure that does not define any structural and functional interrelationships between a database and other claimed aspects of the invention which permit the data structure's functionality to be realized. The claims define in substance a database having a table with at least one column of encrypted data, and information for controlling access to at least one column wherein the information includes cryptographic information associated with the encrypted column of data. However, no functional interrelationship between the data structure and the information is defined.

The portion of the claim "for controlling access to at least one column of data" merely describes an intended use and does not narrow the scope of the claim. Also, the portion of the claim "the information including cryptographic information associated with the encrypted column of data" does not disclose any functional interrelationship, only an association. For these reasons, the subject matter of these claims are deemed to be nonstatutory.

OPINION

In reaching our decision in this appeal, we have given careful consideration to Appellant's specification and claims, to the applied prior art references, and to the respective positions articulated by Appellant and the Examiner. As a consequence of our review, we make the determinations that follow.

At the outset, we note that Appellant's Brief is non-compliant with 37 C.F.R. § 41.37 wherein the Summary of the Claimed Invention does not include a summary of each of the independent claims. Rather than remand the case at this time or immediately prior to the oral hearing, we will address Appellant's Brief in the present condition.

35 U.S.C. § 101

While Appellant's arguments in response to the Examiner's rejection are brief, Appellant factually distinguishes the factual situations in In re Warmerdam, 33 F.3d 1354, 31 USPQ2d 1754 (Fed. Cir. 1994) and In re Lowry, 32 F.3d 1579, 32 USPQ2d 1031 (Fed. Cir. 1994). Appellant's argue that the database management system is more than merely a database. From

our review of the rejected claims and in light to the Examiner's brief analysis and statement of the rejection in the Answer, we find that the Examiner has not established a prima facie case of non-statutory subject matter. We find that the Examiner has not shown that the database management system as recited in independent claims 48 and 86 are not machines that perform a "useful, concrete and tangible result" of managing access to the data in the database. Therefore, we find that the database management system of independent claims 48 and 86 is eligible to be patented under 35 U.S.C. § 101. Therefore, we cannot sustain the rejection under 35 U.S.C. § 101.

35 U.S.C. § 103

In rejecting claims under 35 U.S.C. § 103, the examiner bears the initial burden of presenting a prima facie case of obviousness. See In re Rijckaert, 9 F.3d 1531, 1532, 28 USPQ2d 1955, 1956 (Fed. Cir. 1993). A prima facie case of obviousness is established by presenting evidence that the reference teachings would appear to be sufficient for one of ordinary skill in the relevant art having the references before him to make the proposed combination or other modification. See In re Lintner, 458 F.2d 1013, 1016, 173 USPQ 560, 562 (CCPA 1972). Furthermore, the conclusion that the claimed subject matter is prima facie obvious must be supported by evidence, as shown by some objective teaching in the prior art or by knowledge generally available to one of ordinary skill in the art that would have led that individual to combine the relevant teachings of the references to arrive at the claimed invention. See In re Fine, 837 F.2d 1071, 1074, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988). Rejections based on § 103

must rest on a factual basis with these facts being interpreted without hindsight reconstruction of the invention from the prior art. The examiner may not, because of doubt that the invention is patentable, resort to speculation, unfounded assumption or hindsight reconstruction to supply deficiencies in the factual basis for the rejection. See In re Warner, 379 F.2d 1011, 1017, 154 USPQ 173, 177 (CCPA 1967). Our reviewing court has repeatedly cautioned against employing hindsight by using the Appellant's disclosure as a blueprint to reconstruct the claimed invention from the isolated teachings of the prior art. See, *e.g.*, Grain Processing Corp. v. American Maize-Prods. Co., 840 F.2d 902, 907, 5 USPQ2d 1788, 1792 (Fed. Cir. 1988).

When determining obviousness, "the [E]xaminer can satisfy the burden of showing obviousness of the combination 'only by showing some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings of the references.'" In re Lee, 277 F.3d 1338, 1343, 61 USPQ2d 1430, 1434 (Fed. Cir. 2002), citing In re Fritch, 972 F.2d 1260, 1265, 23 USPQ2d 1780, 1783 (Fed. Cir. 1992). "Broad conclusory statements regarding the teaching of multiple references, standing alone, are not 'evidence.'" In re Dembiczak, 175 F.3d 994, 999, 50 USPQ2d 1614, 1617 (Fed. Cir. 1999). "Mere denials and conclusory statements, however, are not sufficient to establish a genuine issue of material fact." Dembiczak, 175 F.3d at 999-1000, 50 USPQ2d at 1617, citing McElmurry v. Arkansas Power & Light Co., 995 F.2d 1576, 1578, 27 USPQ2d 1129, 1131 (Fed. Cir. 1993).

Further, as pointed out by our reviewing court, we must first determine the scope of the claim. "[T]he name of the game is the claim." In re Hiniker Co., 150 F.3d 1362,1369, 47 USPQ2d 1523, 1529 (Fed. Cir. 1998). Therefore, we look to the limitations as recited in independent claim 18. Here, we find that independent claim 18 recites:

> A data processing method comprising:
>
> maintaining a database containing a table of data in row and column format, at least a portion of the data being encrypted;
>
> maintaining, separate from the table of data, information for controlling access to a specified proper subset of data in the table; and
>
> controlling access to the specified proper subset of data in the table according to the separately maintained information.

The examiner maintains that Thomson teaches almost the entire claim, but for the data being stored in encrypted form. The Examiner maintains that Denning teaches this field encrypting and that the encryption technique ciphers each field of a record with a distinct encryption key to prevent information from being ascertained without the requisite key (Answer 3-4). We agree with the Examiner and find that the Examiner has established a prima facie case of obviousness of the invention as recited in independent claim 18.

Appellant argues that Thomson does not teach or suggest "maintaining, separate from the table of data, … information for controlling access to a specified proper subset of data" (Br. 12). Appellant argues that the master key of Denning is stored separate from the table of data, but that is used for the entire table and not for a

proper subset of the table. Appellant further argues that the field key of Denning is used to access a proper subset of the table, but that the field key is calculated rather than stored (Br. 12).

We agree with the individual differences which Appellant identifies for each reference, but when viewed in the totality of the teachings and suggestions in the prior art, we do not find Appellant's argument to be persuasive. We find that while the Examiner has provided varied positions in the answer as to the claim interpretations and teachings, we find that the combination of Thomson and Denning would have fairly suggested the invention as recited in independent claim 18. Thomson teaches "A data processing method comprising: maintaining a database containing a table of data in row and column format," but not necessarily "at least a portion of the data being encrypted." We find that Denning clearly teaches storing data in encrypted form for limited access to portions of the data. Thomson teaches "maintaining, separate from the table of data, information for controlling access to a specified [proper] subset of data in the table," but arguably not a "proper" subset. We find that Denning clearly teaches maintaining a master key which would clearly access the entire data, but less than the entire data if desired. We find that if the master can access all then it can also access less than all or be used to generate/calculate field keys for the individual fields.

Here we find the language of independent claim 18 to be broader than requiring the key to be maintained. The language of independent claim 18 recites merely "information" where the master being maintained and used to generate a field key would meet the

recited limitations. Both Thomson and Denning teach accessing the data in the table therefore, they both teach "controlling access to the specified proper subset of data in the table according to the separately maintained information." The Examiner has provided at page 4 of the Answer a convincing line of reasoning as to why it would have been obvious to one of ordinary skill in the relevant art at the time of the invention to have combined the teachings of Thomson and Denning to limit access to the data, which we do not find controverted by Appellant in the Brief or the Reply Brief. Therefore, we find that the Examiner has set forth a prima facie case of obviousness which has not been adequately rebutted nor has Appellant shown error therein. Therefore, Appellant's argument is not persuasive, and we will sustain the rejection of independent claim 18. Additionally, we will sustain the rejection of independent claims 48, 56, and 86 and dependent claims which Appellant has grouped therewith in the heading on page 10 of the Brief.

With respect to independent claims 41 and 79, Appellant argues that neither Thomson nor Denning discloses "storing first and second cryptographic information outside of the table" (Br. 7). Appellant maintains that the Examiner's reliance upon the field key as the second cryptographic information outside of the table is in error since the field key is generated from the stored master along with other information. We disagree with Appellant and find that the language of independent claim 41 only requires "second cryptographic information outside of the table" and not a key. Arguably the unique field identifier, primary key, which is not a cryptographic key

(Denning at p. 233, last paragraph), and the element key, which are used to generate the field key, are all "cryptographic information outside of the table" which may be used to control access to the data in the columns as clearly taught and suggested by Denning.

Additionally, we find that it would have been obvious to one skilled in the art at the time of the invention to have stored each of the field keys if the database were not too large. Here, the language of independent claim 41 only recites a first and second column which is quite small and manageable. At the oral hearing, Appellant's representative opined that to store the field keys of every column would be too much data to store and retrieve and that Denning suggests the generation of the keys on the fly. We agree, but that is not what is recited in the language of independent claim 41. Therefore, Appellant's argument is not persuasive.

Additionally, we note that Denning discusses the need to evaluate key generation functions to consider the effort required to generate all of the element keys in one record to decrypt an entire record. (Denning at p. 234, last paragraph.) We find this to be a recognition that some functions may demand too much data processing for decrypting an entire record which would suggest the storage rather than the calculation for those functions which are demanding. Therefore, Appellant's argument is not persuasive.

Furthermore, we find that the first and second cryptographic information may be the same since the claim language does not require that the first information be different than the second

cryptographic information and there is only one step of storing the information outside the table rather than two steps of storing which would arguable imply that they are different information.

Here, we find that Appellant's arguments go well beyond the scope of the literal language in the claims, and we do not find any argument or citation to the specification which would further limit the broad interpretation given by the examiner. We note that the two cryptographic informations are not necessarily different nor are they required to be cryptographic keys, they are only stored cryptographic information. Therefore, we accept the Examiner's interpretation as reasonable in light of Appellant's specification.

With respect to Appellant's arguments with respect to inherency in Denning and the location of storage of data, we find as discussed above, that it would have been obvious to one skilled in the art at the time of the invention to either store the field keys or generate them as needed. This would have been a consideration in the end use of the table and system as applied to a field of endeavor, which is not recited in the instant claims. We find that in light of the teachings of Thomson to store the master outside the table, it would have been obvious to one skilled in the art at the time of the invention to similarly store the master and field keys outside the table for ease of access. Therefore, Appellant's argument is not persuasive, and we will sustain the Examiner's rejection of independent claim 41 over Thomson and Denning and independent claim 79 and the dependent claims which Appellant has elected to group therewith on page 7 of the Brief.

With respect to dependent claim 32, Appellant argues that Abraham is inconclusive whether the key in encrypted form is stored with the table or not (Br. 13). Here the Examiner merely relies upon Abraham to teach that the key is in encrypted format and the base combination teaches and fairly suggests that the key is stored outside the table. Therefore, Appellant’s argument is not persuasive, and we will sustain the Examiner’s rejection of dependent claim 32 over Thomson, Denning, and Abraham and the dependent claims which Appellant has elected to group therewith on page 13 of the Brief.

With respect to dependent claim 44, Appellant relies upon the arguments made with respect to dependent claim 32 which we did not find persuasive. Therefore, Appellant's argument is not persuasive, and we will sustain the Examiner’s rejection of dependent claim 44 over Thomson, Denning, and Abraham and the dependent claims which Appellant has elected to group therewith on page 14 of the Brief.

With respect to dependent claim 51, Appellant relies upon the arguments made with respect to dependent claim 32 which we did not find persuasive. Therefore, Appellant's argument is not persuasive, and we will sustain the Examiner’s rejection of dependent claim 51 over Thomson, Denning, and Abraham and the dependent claims which Appellant has elected to group therewith on page 14 of the Brief.

With respect to dependent claim 44, Appellant relies upon the arguments made with respect to dependent claim 32 which we did not

find persuasive. Therefore, Appellant's argument is not persuasive, and we will sustain the Examiner's rejection of dependent claim 44 over Thomson, Denning, and Abraham and the dependent claims which Appellant has elected to group therewith on page 14 of the Brief.

With respect to dependent claim 69, Appellant relies upon the arguments made with respect to dependent claim 32 which we did not find persuasive. Therefore, Appellant's argument is not persuasive, and we will sustain the Examiner's rejection of dependent claim 69 over Thomson, Denning and Abraham and the dependent claims which Appellant has elected to group therewith on page 14 of the Brief.

With respect to dependent claim 82, Appellant relies upon the arguments made with respect to dependent claim 32, which was grouped with independent claim 18, which we did not find persuasive. Therefore, Appellant's argument is not persuasive, and we will sustain the Examiner's rejection of dependent claim 82 over Thomson, Denning, and Abraham.

With respect to dependent claim 23, Appellant reiterates the language of the claim and maintains that Gaskells fails to teach using a smart card for a proper subset rather than accessing the entire system. Here, we agree with the Examiner that the use of smart cards was well known as evidenced by Gaskell and that in the combination of Thomson and Denning, it would have been obvious to one skilled in the art at the time of the invention to store the key for cryptographic

operations on the card as recited in claim 23. (Answer 22). Therefore, Appellant's argument is not persuasive, and we will sustain the Examiner’s rejection of dependent claim 23 over Thomson, Denning, and Gaskell and the dependent claims which Appellant has elected to group therewith on page 15 of the Brief.

With respect to dependent claim 24, Appellant reiterates the language of the claim and maintains that Gaskell fails to teach using a smart card for a proper subset which is in row and column format but teaches ticket granting. Here, we agree with the Examiner that the use of smart cards was well known as evidenced by Gaskell and that in the combination of Thomson and Denning with data in row and column format, it would have been obvious to one skilled in the art at the time of the invention to store the key for cryptographic operations on the card as recited in claim 24 which would access only a portion of the data. (Answer 22). Therefore, Appellant's argument is not persuasive, and we will sustain the Examiner’s rejection of dependent claim 23 over Thomson, Denning, and Gaskell and the dependent claims which Appellant has elected to group therewith on page 15 of the Brief.

With respect to dependent claim 34, Appellant relies upon the arguments made with respect to dependent claim 24 which we did not find persuasive. Therefore, Appellant's argument is not persuasive, and we will sustain the Examiner’s rejection of dependent claim 34 over Thomson, Denning, and Gaskell and the dependent claims which Appellant has elected to group therewith on page 16 of the Brief.

With respect to dependent claim 38, Appellant relies upon the arguments made with respect to dependent claim 24 which we did not find persuasive. Therefore, Appellant's argument is not persuasive, and we will sustain the Examiner's rejection of dependent claim 38 over Thomson, Denning, and Gaskell and the dependent claims which Appellant has elected to group therewith on page 16 of the Brief.

With respect to dependent claim 52, Appellant relies upon the arguments made with respect to dependent claim 24 which we did not find persuasive. Additionally, we find that the combination of Thomson and Denning would have had data in plural rows and columns, as discussed above, which would teach the at least two columns. Therefore, Appellant's argument is not persuasive, and we will sustain the Examiner's rejection of dependent claim 52 over Thomson, Denning, and Gaskell and the dependent claims which Appellant has elected to group therewith on page 17 of the Brief.

With respect to dependent claim 62, Appellant relies upon the arguments made with respect to dependent claim 24 which we did not find persuasive. Additionally, we find that the combination of Thomson and Denning would have had data in plural rows and columns which is a collection of records maintained as fields, as disclosed by Denning. Therefore, Appellant's argument is not persuasive, and we will sustain the Examiner's rejection of dependent claim 62 over Thomson, Denning, and Gaskell and the dependent claims which Appellant has elected to group therewith on page 17 of the Brief.

With respect to dependent claim 71, Appellant relies upon the arguments made with respect to dependent claim 24 which we did not find persuasive. Additionally, we find that the combination of Thomson and Denning would have had data in plural rows and columns which is a collection of records maintained as fields, as disclosed by Denning. Therefore, Appellant's argument is not persuasive, and we will sustain the Examiner’s rejection of dependent claim 71 over Thomson, Denning, and Gaskell and the dependent claims which Appellant has elected to group therewith on pages 17-18 of the Brief.

With respect to dependent claim 25, Appellant relies upon the arguments made with respect to independent claim 18 and dependent claim 23 which we did not find persuasive. Therefore, Appellant's argument is not persuasive, and we will sustain the Examiner’s rejection of dependent claim 25 over Thomson, Denning, and Gaskell and the dependent claims which Appellant has elected to group therewith on page 18 of the Brief.

With respect to dependent claim 45, Appellant relies upon the arguments made with respect to dependent claim 52 which we did not find persuasive. Additionally, we find that the combination of Thomson and Denning would have had data in plural rows and columns, as discussed above, which would teach the at least two columns. Therefore, Appellant's argument is not persuasive, and we will sustain the Examiner’s rejection of dependent claim 45 over Thomson, Denning, and Gaskell and the dependent claims which Appellant has elected to group therewith on pages 18-19 of the Brief.

With respect to dependent claim 20 and dependent claim 30 and claims grouped therewith at page 19 of the Brief, Appellant merely relies upon the earlier stated arguments and does not set forth a separate argument for patentability. Therefore, we will group these claims with the identified claims. Since we did not find those earlier arguments persuasive, we do not find the arguments persuasive here. Therefore, Appellant's arguments are not persuasive, and we will sustain the rejection of dependent claims 20 and 30 and those grouped therewith at page 19 of the Brief.

CONCLUSION

To summarize, we have reversed the rejection of claims 86-92 and 48-54 under 35 U.S.C. § 101, and we have affirmed the rejection of claims 18-54 and 56-92 under 35 U.S.C. § 103(a).

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a).

AFFIRMED

ELD

EDWARDS & ANGELL, LLP
P.O. BOX 55874
BOSTON MA 02205