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**Datasheet for the decision
of 12 February 2015**

Case Number: T 1437/10 - 3.5.02

Application Number: 99943715.5

Publication Number: 1046236

IPC: H03M13/27, H03M13/29

Language of the proceedings: EN

Title of invention:

TURBO CODE INTERLEAVER WITH NEAR OPTIMAL PERFORMANCE

Applicant:

DTVG LICENSING, INC

Headword:

Relevant legal provisions:

EPC Art. 87(1)

Keyword:

Priority - main request (yes)

Decisions cited:

Catchword:

see points 1. (admissibility of auxiliary requests 1 and 2)
and 2. (priority documents without claims)



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Case Number: T 1437/10 - 3.5.02

D E C I S I O N
of Technical Board of Appeal 3.5.02
of 12 February 2015

Appellant: DTVG LICENSING, INC
(Applicant) 2230 East Imperial Highway
El Segundo CA 90245 (US)

Representative: Brunner, John Michael Owen
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Decision under appeal: **Decision of the Examining Division of the
European Patent Office posted on 8 February 2010
refusing European patent application No.
99943715.5 pursuant to Article 97(2) EPC.**

Composition of the Board:

Chairman M. Ruggiu
Members: H. Bronold
P. Mühlens

Summary of Facts and Submissions

- I. The appeal concerns the decision of the examining division, refusing the application, posted on 8 February 2010.
- II. In its decision, the examining division reasoned that the right to priority of the present application was invalid and as a consequence the subject-matter of the main and auxiliary request was not novel over the disclosure of document D1 ("On the Design of Prunable Interleavers for Turbo Codes" by M. Eroz and A. Hammons Jr.), being published within the priority period.
- III. In a communication sent together with the summons to oral proceedings the board had informed the appellant about its concerns as to the validity of the right to priority.
- IV. Oral proceedings before the board were held on 12 February 2015.
- V. At the beginning of the oral proceedings the appellant filed a new main request and two new auxiliary requests. The board admitted the new main request but did not admit the two new auxiliary requests.
- VI. As its final request, the appellant requested that the decision under appeal be set aside and that a patent be granted based on claims 1 to 5 of a Revised New Main Request filed during the oral proceedings of 12 February 2015, or, as auxiliary requests 1 to 3, that a patent be granted on the basis of the (previous) main request filed with the grounds of appeal dated 18 June 2010, or on the basis of one of the (previous)

auxiliary requests 1 or 2 filed with letter dated 12 January 2015, and to remit the case to the department of first instance for further prosecution.

VII. Independent claim 1 of the Revised New Main Request reads:

"A method of turbo-interleaving blocks of indexed data having indices, the blocks having a varying length, the method including the steps of:
providing a set of basic turbo interleavers comprising permutations of the indexed data;
selecting one of the basic turbo interleavers of length 2^m based upon a desired interleaver length L , wherein m is the smallest integer for which $2^m \geq L$ such that the selected interleaver has the shortest length 2^m which is greater than or equal to the desired interleaver length L ; and
adapting the selected basic turbo interleaver to produce a new interleaver having the desired interleaver length L ,
wherein the selected basic turbo interleaver defines mappings of positions of indexed data to new mapped positions,
wherein each mapping is of a position of indexed data to a new mapped position, and
wherein for each mapping, the mapping of the selected basic turbo interleaver is retained, if the position of indexed data in the selected basic turbo interleaver is less than L , otherwise the mapping is rejected,
wherein the step of adapting comprises puncturing the selected interleaver by only accepting mappings of positions of indexed data into the desired interleaver from the selected interleaver if each position of indexed data is smaller than the number of elements in the smaller interleaver."

VIII. Independent system claim 5 relates to a system configured to perform the steps of any one of claims 1 to 4.

IX. The appellant essentially argued as follows:

The priority document was disclosing at least two inventions. The first one being the general design rule for an interleaver of any size N as disclosed in section 2 of the priority document. Other inventions were to be seen in the sections dealing with the details and with the optimisation of the general design rule as disclosed in section 4 and 5 of the priority document, respectively. In section 2 of the priority document, it was explicitly stated that sections 4 and 5 merely were disclosing the details and the optimisation of the broader invention of section 2. Thus, a separate right to priority was existing for the general interleaver design rule of section 2 of the priority document. Hence, claim 1 according to the main request was entitled to the right of priority.

Reasons for the Decision

1. Admissibility of the amended requests

The Revised New Main Request includes the feature that the turbo interleaver is of size 2^m . Thus, this request at least partially overcomes an objection of the decision under appeal and was therefore admitted into the procedure.

New auxiliary requests 1 and 2 filed during the oral proceedings claim, in alternative wording, subject-matter essentially identical to the scope of protection of the granted European Patent EP 2 173 036 B1 for which the appellant is the proprietor and for which the present application is the earlier application in accordance with Article 76(1) EPC. Consequently, the subject-matter of new auxiliary requests 1 and 2 is already decided in favour of the appellant and a second decision on the same subject-matter is superfluous. The board therefore exercised its discretion under Article 13(1) RPBA to not admit new auxiliary requests 1 and 2 into the procedure.

2. Right to priority - Article 87 EPC

2.1 In assessing whether a claimed subject-matter is entitled to a right to priority it needs to be established whether the claimed subject-matter concerns the same invention as disclosed in the priority document.

According to opinion G 0002/98 the right to priority is to be acknowledged only if the skilled person can derive the subject-matter of the claim directly and unambiguously, using common general knowledge, from the previous application as a whole.

2.2 In the present case, the priority document is US provisional application US60/096,807 which was filed without patent claims. Where no claims are present, it may be more difficult to establish whether the priority document discloses the same invention since a comparison of the subject-matter of the claims is not

possible. Nevertheless, the above identified principles equally apply to an application filed without claims.

2.3 The priority document is structured in five sections. The first section being an introduction and the second section being the disclosure of a "General Turbo Interleaver Design Procedure". The first section identifies as driver to the disclosure that the known interleaver methods "lack a general rule that can be used to specify a turbo interleaver of any size N". Thus, the overall aim of the disclosure of the priority document is to produce a general rule that can deliver interleavers of any size N. This aim maybe regarded as the statement of the problem underlying the invention. A solution to this problem is offered in section 2, where the priority document discloses how to design interleavers of any size N by puncturing pre-designed interleavers of size 2^m . Section 2 also provides an example starting from a pre-designed interleaver of size 2^m , without any indication that it should be based on Galois field arithmetic.

2.4 Section 4 of the priority document does not contain any further detail regarding the method of puncturing defined in section 2. Thus, it is clear that section 4 does in fact not provide further details to the method of puncturing defined in section 2 but delivers details of other aspects of the turbo interleaver which are unrelated to puncturing. The other aspects are that the interleaver is two-dimensional, that the interleaver is filled row by row, that the intra-row permutation of each row is based on Galois Field arithmetic, that the shuffling of the rows is carried out by bit-reversal indexing, and that the content of the interleaver is read out column by column.

In practice there exist a plurality of possibilities to perform the intra-row permutations of an interleaver, Galois field arithmetic being merely one of those possibilities. The same is true for the shuffling of the rows of an interleaver or the way of writing or reading the data into and from the interleaver. Consequently, the features of section 4 do not form part of the invention disclosed in section 4 nor are they technically necessary for carrying out the invention of section 2. The same argumentation applies even more to the optimisation disclosed in section 5, which is based on the details of the interleaver of section 4.

2.5 Therefore, the additional features in sections 4 and 5 do not contain any details as to how the puncturing is carried out and thus do not limit the method of puncturing according to section 2 of the priority document.

2.6 The board is therefore satisfied that sections 1 and 2 of the priority document disclose an invention in the sense of Article 87(1) EPC, namely to provide interleavers of any size N by puncturing pre-designed interleavers of size 2^m according to design steps 1 and 2 specified on pages 2 and 3 of the priority document.

As a consequence, the right to priority according to Article 87(1) EPC for the subject matter claimed in claim 1 of the main request is valid. Therefore, claim 1 enjoys the effect of the right of priority according to Article 89 EPC. Thus, document D1, whose date of publication is after the filing date of the priority document US60/096,807, does not constitute prior art under Article 54(2) EPC for the subject matter of claim 1 of the main request.

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 for further prosecution.

The Registrar:

The Chairman:



C. Vodz

M. Ruggiu

Decision electronically authenticated