***THIS OPINION WAS NOT WRITTEN FOR PUBLICATION***

The opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.

Paper No. 34

UNITED STATES PATENT AND TRADEMARK OFFICE

_____

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

_____

***Ex parte*** BRENDA S. BAKER,
KENNETH W. CHURCH, JONATHAN I. HELFMAN
and
BRIAN W. KERNIGHAN

_____

Appeal No. 95-1682
Application 07/853,459[1]

_____

ON BRIEF

_____

Before JERRY SMITH, BARRETT and FLEMING, ***Administrative Patent Judges***.

_____

[1] Application for patent filed March 18, 1992.

FLEMING, ***Administrative Patent Judge***.

***DECISION ON APPEAL***

This is a decision on appeal from the final rejection of claims 4, 6, 8, 9, 13, 16 and 18 through 22. Claims 1 through 3, 7 and 17 have been canceled. Claims 5, 10, 11, 12, 14, 15 and 23 through 27 have been allowed.[2]

Appellants' invention relates to apparatus and methods for interactively studying similarities of values in very large bodies of data.

Independent claims 4 and 8 are reproduced as follows:

4. Apparatus for displaying similarities between lines of text in a sequence of n lines of text, the apparatus comprising:

means for representing a n x n matrix whether there is a first mark in element (i,j) of the matrix if a comparison of line (i) with line (j) indicates that line (i) and line (j) have similar values; and

means for mapping the n x n matrix onto a display matrix, the mapping being done such that second marks indicating significant first marks are displayed in the display matrix.

[2] Supplemental Examiner's answer, paper 26, mailed October 23, 1995, page 2.

8. Apparatus for displaying similarities between sequences of tokens on a display device comprising:

means (702) for producing the tokens in the sequences from data; and

means (704) for receiving the tokens and making a dotplot (405) representing a comparison of each of the tokens in one of the sequences with all of the tokens in another of the sequences and providing the dotplot to the display device,

the apparatus being characterized in that:

the means for making the dotplot is able to make a dotplot wherein each sequence of tokens being compared contains at least n tokens, where n >> 10,000; and

the means for making the dotplot makes the dotplot of a size such that the dotplot fits in its entirety on the display device.

The references relied on by the Examiner are as follows:

James Pustell et al. (Pustell), "A high speed, high capacity homology matrix: zooming through SV40 and polyoma," 10 ***Nucleic Acids Research***, no. 15, 4765-4782 (1982)

Jacob V. Maizel, Jr. et al. (Maizel), "Enhanced graphic matrix analysis of nucleic acid and protein sequences," 78 ***Proc. Natl. Acad. Sci. USA***, no. 12, 7665-7669 (December 1981)

Alfred V. Aho et al. (Aho), "Compilers - Principles, Techniques, and Tools," 83-88 (Addison-Wesley Publishing Co., 1986)

Gerard Salton, ***Automatic Text Processing - The Transformation, Analysis, and Retrieval of Information by Computer***, 238-240, 284-289 (Addison-Wesley Publishing Co., 1989)

Edward M. McCreight, "A Space-Economical Suffix Tree Construction Algorithm," 23 ***Journal of the Assoc. for Computing Machinery***, no. 2, 262-272 (April 1976)

Claims 4, 8, 13 and 16 stand rejected under 35 U.S.C. § 103 as being unpatentable over Pustell and Maizel. Claims 6 and 9 stand rejected under 35 U.S.C. § 103 as being unpatentable over Pustell, Maizel and Aho. Claims 18 through 20 stand rejected under 35 U.S.C. § 103 as being unpatentable over Pustell, Maizel, Aho and Salton. Claims 21 and 22 stand rejected under 35 U.S.C. § 103 as being unpatentable over Pustell, Maizel, Aho, Salton and McCreight.

Rather than repeat the arguments of Appellants or the Examiner, we make reference to the briefs[3] and the answers[4] for the details thereof.

***OPINION***

After a careful review of the evidence before us, we agree with the Examiner that claims 4, 8, 13 and 16 are properly rejected under 35 U.S.C. § 103. Thus, we will sustain the rejection of these claims but we will reverse the rejection of the remaining claims on appeal for the reasons set forth ***infra***.

---

[3] Appellants filed an appeal brief on April 8, 1994. We will refer to this appeal brief as simply the brief. Appellants filed a reply appeal brief on September 12, 1994. We will refer to this reply appeal brief as the reply brief. The Examiner responded to the reply brief in the supplemental Examiner's answer and thereby entered and considered the reply brief. Appellants filed a supplemental reply appeal brief on December 26, 1995. We will refer to this reply appeal brief as the supplemental reply brief. The Examiner stated in the Examiner’s letter, mailed March 14, 1996, that the supplemental reply brief has been entered and considered and a response by the Examiner is not deemed necessary.

[4] The Examiner responded to the brief with an Examiner's answer, mailed July 12, 1994. We will refer to the Examiner's answer as simply the answer. The Examiner responded to the reply brief with a supplemental Examiner's answer dated October 23, 1995. We will refer to the Supplemental Examiner's answer as simply the supplemental answer.

On pages 8-10 of the brief, pages 3-4 of the reply brief and pages 2 and 3 of the supplemental reply brief, Appellants argue that the Examiner's rejection of claim 8 as being unpatentable is improper because Maizel and Pustell cannot handle many more than 10,000 bases. We note that Appellants' claim 8 recites "the means for making the dotplot is able to make a dotplot wherein each sequence of tokens being compared contains at least n tokens, where n >> 10,000."

On page 2 of the supplemental reply brief, Appellants state that they do not doubt that the Maizel program can handle sequences of more than 10,000 bases. However, the Appellants argue that Maizel and Pustell cannot in fact handle many more than 10,000 bases as recited in Appellants' claim 8.

We find that the Examiner has established a ***prima facie*** case. Maizel teaches on page 7665 that these programs enable the approach to be used with sequences of more than 10,000 bases. Appellants have not shown how the claim language of "n >> 10,000" distinguishes over the teachings of Maizel. Furthermore, Appellants have not shown that the Maizel programs are not enabled to be used with sequences of

many more that 10,000 bases. We note that Appellants state on page 4 of the reply brief that claims 13 and 16 stand or fall with claim 8. There- fore, we will sustain the Examiner's rejection of Appellants' claims 8, 13 and 16.

In regard to claim 4, Appellants argue on pages 4-6 of the reply brief and pages 3-4 of the supplemental reply brief that claim 4 distinguishes the teachings of Maizel and Pustell by claiming "[a]pparatus for displaying similarities between lines of text in a sequence of n lines of text." Appellants argue that Pustell and Maizel compare elements that are single characters (G,C,T,A) while Appellants' claim 4 requires the elements to be lines of text.

However, the Examiner points out in the answer that Pustell and Maizel teach the comparison of bases (G,C,T,A) which are nucleotides. The Examiner argues that these nucleo- tides are a sequence of characters that are a line of text.

We note that a claimed "line of text" does not require that the line be made of words. Furthermore, Appel- lants' claim language does not preclude the Examiner's inter- pretation that a base (G,C,T or A) is a token repesenting a

line of text and thereby, Pustell and Maizel teach an apparatus for displaying similarities between "lines of text in a sequence of n lines of text" as recited in Appellants' claim 4. Thus, we find that the Examiner's interpretation of Appellants' claim 4 language is reasonable. Therefore, we will sustain the Examiner's rejection of Appellants' claim 4.

Claims 6 and 9 stand rejected under 35 U.S.C. § 103 as being unpatentable over Pustell, Maizel and Aho. Appellants argue on pages 6 and 7 of the reply brief that Pustell, Maizel and Aho fail to teach means for modifying the data to produce tokens which are more easily comparable than the tokens of the data as recited in Appellants' claims 6 and 9.

It is the burden of the Examiner to establish why one having ordinary skill in the art would have been led to the claimed invention by the reasonable teachings or suggestions found in the prior art, or by a reasonable inference to the

artisan contained in such teachings or suggestions. ***In re Sernaker***, 702 F.2d 989, 995, 217 USPQ 1, 6 (Fed. Cir. 1983).

In addition, the Federal Circuit states that "[t]he mere fact that the prior art may be modified in the manner suggested by the Examiner does not make the modification obvious unless the prior art suggested the desirability of the modification." ***In re Fritch***, 972 F.2d 1260, 1266 n.14, 23 USPQ2d 1780, 1783-84 n.14 (Fed. Cir. 1992), ***citing In re Gordon***, 733 F.2d 900, 902, 221 USPQ 1125, 1127 (Fed. Cir. 1984). "Additionally, when deter-mining obviousness, the claimed invention should be considered as a whole; there is no legally recognizable 'heart' of the invention." ***Para-Ordnance Mfg., Inc. v. SGS Importers Int'l, Inc.***, 73 F.3d 1085, 1087, 37 USPQ2d 1237, 1239 (Fed. Cir. 1995), ***cert. denied***, 117 S.Ct. 80 (1996), ***citing W. L. Gore & Assocs., Inc. v. Garlock, Inc.***, 721 F.2d 1540, 1548, 220 USPQ 303, 309 (Fed. Cir. 1983), ***cert. denied***, 469 U.S. 851 (1984).

After a careful review of Pustell, Maizel and Aho, we fail to find any teachings or suggestions of a means for modifying the data to produce tokens which are more easily

comparable than the tokens of the data. Maizel shows tokens but does not show the process of modifying the original data to produce the tokens or aggregating the bases into other tokens. Therefore, we will not sustain the Examiner's rejection of claims 6 and 9.

Claims 18 through 20 stand rejected under 35 U.S.C. § 103 as being unpatentable over Pustell, Maizel, Aho and Salton. Appellants argue on page 9 of the reply brief that Pustell, Maizel, Aho and Salton fail to teach or suggest that the tokens of claim 8 are "values of an attribute of records in a sequence thereof" as recited in claim 18, that the tokens of claim 8 are "words in a text" as recited in claim 19 and that the tokens of claim 20 are "lines in a text."

After a careful review of Pustell, Maizel, Aho and Salton, we fail to find that these references teach modifying the Pustell homology matrix program for scoring sequences of DNA bases to provide tokens that are values of an attribute of records in a sequence or words of a text. However, we do find as we have pointed out for claim 4, Pustell and Maizel teach

that the tokens are bases and that these tokens are lines in a text.

Therefore, we will sustain the Examiner's rejection of claim 20 but will not sustain the Examiner's rejection of claims 18 and 19.

Claims 21 and 22 stand rejected under 35 U.S.C. § 103 as being unpatentable over Pustell, Maizel, Aho, Salton and McCreight. Appellants's only argument is found on page 10 of the reply brief. There, Appellants argue that since there is nothing in claims 21 and 22 that has anything to do with the term weighting, Salton adds nothing to the rejection. The Appellants then state that because claim 8 is patentable over Pustell and Maizel and claim 20 is patentable over Pustell, Maizel and Aho, then claims 21 and 22 are patentable as well.

As we have sustained the Examiner's rejection of claims 8 and 20, we will sustain the Examiner's rejection of claims 21 and 22 for the same reason. Appellants have chosen not to argue any of the specific limitations of claims 21 and 22 as a basis for patentability. We are not required to raise

and/or consider such issues. As stated by our reviewing court in ***In re Baxter Travenol Labs.***, 952 F.2d 388, 391, 21 USPQ2d 1281, 1285 (Fed. Cir. 1991), "[i]t is not the function of this court to

examine the claims in greater detail than argued by an appellant, looking for nonobvious distinctions over the prior art." 37 CFR § 1.192(a) as amended at 58 Fed. Reg. 54510, Oct. 22, 1993, which

was controlling at the time of Appellants filing the brief, states as follows:

> The brief . . . must set forth the authorities and arguments on which the appellant will rely to maintain the appeal. Any arguments or authorities not included in the brief may be refused consideration by the Board of Patent Appeals and Interferences.

Also, 37 CFR § 1.192(c)(6)(iv) states:

> For each rejection under 35 U.S.C. 103, the argument shall specify the errors in the rejection and, if appropriate, the specific limitations in the rejected claims which are not described in the prior art relied on in the rejection, and shall explain how such limitations render the claimed subject matter unobvious over the prior art. If

> the rejection is based upon a combination of references, the argument shall explain why the references, taken as a whole, do not suggest the claimed subject matter, and shall include, as may be appropriate, an explanation of why features disclosed in one reference may not properly be combined with features disclosed in another reference. A general argument that all the limitations are not described in a single reference does not satisfy the requirements of this paragraph.

Thus, 37 CFR § 1.192 provides that this board is not under any greater burden than the court which is not under any burden to raise and/or consider such issues.

In view of the foregoing, the decision of the Examiner rejecting claims 4, 8, 13, 16 and 20 through 22 under 35 U.S.C. § 103 is affirmed; however, the decision of the Examiner rejecting claims 6, 9, 18 and 19 under 35 U.S.C. § 103 is reversed.

No time period for taking any subsequent action in con- nection with this appeal may be extended under 37 CFR § 1.136(a). ***AFFIRMED-IN-PART***

| | | |
|---|---|---|
| JERRY SMITH<br>Administrative Patent Judge | ) | |
| LEE E. BARRETT<br>Administrative Patent Judge | ) | BOARD OF PATENT APPEALS AND INTERFERENCES |
| MICHAEL R. FLEMING<br>Administrative Patent Judge | ) | |

psb

P.V.D. Wilde
AT&T Bell Laboratories
600 Mountain Avenue
P.O. Box 636
Murray Hill, NJ 07974-0636