

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opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.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. 42

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

MAILED

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PAT. & T.M. OFFICE
BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte SUNAO TAKATORI, RYOHEI KUMAGAI,
KOJI MATSUMOTO and MAKOTO YAMAMOTO

Appeal No. 95-1900
Application 07/989,503¹

ON BRIEF

Before KRASS, HAIRSTON, and LEE, Administrative Patent Judges.
KRASS, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal from the final rejection of claims 3 through 23. Claims 1 and 2 have been cancelled.

The invention is directed to a data processing system having a neural network. More particularly, the invention is directed to improving the training efficiency of the neural network by

¹ Application for patent filed December 10, 1992. According to the appellants, the application is a continuation of Application 07/528,319, filed May 25, 1990, abandoned.

Appeal No. 95-1900
Application 07/989,503

overcoming the problem of unequal ignition distribution in the network due to a local minimum. A "local minimum" is said to occur when the standard identification ration TP, an index that indicates the ability of the neural network to recognize input phenomenon, does not decrease to a relatively low value but, instead, levels off to a relatively high value because a particular neuron or group of neurons may be unevenly influenced by a particular input during the training process. In accordance with the invention, this neuron or group of neurons are essentially "shut off" by increasing the threshold thereof or decreasing the weight multiplied to the input(s) of the neuron or group of neurons.

Representative independent claim 21 is reproduced as follows:

21. A method for maximizing an efficiency of a data processing system receiving training data, said method comprising the steps of:

inputting said training data to said system, said system comprising a neural network having a plurality of neurons each of which is capable of outputting a signal when a weighted sum of inputs has a predetermined relationship to a threshold;

determining a first neuron which outputs a signal in response to said training data, and compulsorily increasing a threshold of said first neuron up to a maximum value;

determining a second neuron which did not output a signal in response to said training data, and adapting weights of said second neuron so that weights to be multiplied to inputs of the second neuron are increased when said threshold of said first neuron is increased; and

Appeal No. 95-1900
Application 07/989,503

decreasing said threshold of said first neuron after adapting said weights of said second neuron, thereby adapting said neural network to provide an even ignition pattern without generating a local minimum.

Claims 3 through 23 stand rejected under the first paragraph of 35 U.S.C. § 112.

Reference is made to the briefs and answer for the respective details of the positions of appellants and the examiner.

OPINION

At the outset, we note that appellants' grouping of the claims, at page 6 of the principal brief, indicates that claims 3 through 22 will stand or fall together while claim 23 will stand or fall on its own.

Before proceeding further, it is instructive to point out that the first paragraph of 35 U.S.C. § 112 contains three separate and distinct requirements for sufficiency of disclosure, i.e., the written description, enablement and best mode requirements. See In re Barker, 559 F.2d 588, 593, 194 USPQ 470, 474 (CCPA 1977), In re Gay, 309 F.2d 769, 772, 135 USPQ 311, 315 (CCPA 1962).

The examiner's answer has not maintained a clear distinction among these requirements. Page 3 of the answer refers us to the final rejection, Paper No. 29, of January 21, 1994 for the details of the rejection. The answer itself merely states, at

Appeal No. 95-1900
Application 07/989,503

page 3, that "Claims 3-23 are rejected under 35 USC 112 first," giving no details as to on which section of the first paragraph of 35 U.S.C. § 112 the rejection is based.

Reference to the final rejection indicates that

The specification is objected to under 35 U.S.C. 112, first paragraph, as failing to adequately teach how to make and/or use the invention, i.e. failing to provide an enabling disclosure

and that

Claims 3-23 are rejected under 35 U.S.C. 112, first paragraph, for the reasons set forth in the objection to the specification.

From the clear language of the statement of rejection, it would appear that the examiner bases the rejection on the **enablement clause** of the first paragraph of 35 U.S.C. § 112. This is borne out, at page 2 of the final rejection wherein the examiner states that

The issue is whether the extend [sic, extent] of the disclosure in the specification is sufficient to enable one of ordinary skill in the art to make and use the invention.

However, in explaining the objection to the specification, at pages 2-3 of the final rejection, the examiner merely compares phrases found in the instant claims to phrases employed in the specification and concludes that they are "different."

The examiner's reasoning, in toto, is as follows:

The disclosure presents an invention as shown in the specification, page 2, lines 13-15, the phrase "a threshold of a neuron which has output a significant

Appeal No. 95-1900
Application 07/989,503

output at a point of time is compulsary increased once to a maximal value" and page 8, lines 20-25, the phrase "the threshold 0 of neuron which has associatively ignited at a point of time "to" on learning process is raised to the maximal value 0 max(for example, to the infinite) in step 52 for a predetermined period "ta" after the ignition. This corresponds to absolute refractory period". The above phrases in the specification are different from the Applicants claimed invention, claims 21 and 22, the phrases "determining a first neuron and determining a second neuron" and claim 23, the phrase "inputting a second training signal into the data processing network". [pages 2-3 of the Final Rejection].

The examiner then concludes [page 3 of the Final Rejection]:

In summery [sic, summary] the language claimed in the specification does not meet or provide support to the language claimed in claims 21-23.

Clearly then, although the examiner's statement of rejection would appear to be based, unequivocally, on the enablement portion of the first paragraph of 35 U.S.C. § 112, the reasoning upon which the rejection is based would appear to indicate that it is, in reality, the "written description" part of the first paragraph of 35 U.S.C. § 112 upon which the examiner bases the rejection because the gist of the rejection is that there is allegedly no support in the specification for that which is now claimed.

Accordingly, we treat the outstanding rejection as one based on the written description portion of the first paragraph of 35 U.S.C. § 112.

Appeal No. 95-1900
Application 07/989,503

With regard to the "written description" requirement, the inquiry to be made pertains to whether the disclosure (specification, claims and drawings) as originally filed reasonably conveys to the journeyman practitioner in the art that the inventor had possession at that time of that which he now claims. See In re Wertheim, 541 F.2d 257, 261, 191 USPQ 90, 96 (CCPA 1976). Literal support in the disclosure for the terms of the claims challenged by the examiner is not necessary in order to show such possession. See In re Wright, 866 F.2d 422, 424, 9 USPQ2d 1649, 1650 (Fed. Cir. 1989); In re Kaslow, 707 F.2d 1366, 1375, 217 USPQ 1089, 1096 (Fed. Cir. 1983); In re Herschler, 591 F.2d 693, 700, 200 USPQ 711, 717 (CCPA 1979); and In re Lukach, 442 F.2d 967, 968, 169 USPQ 795, 796 (CCPA 1971).

We will not sustain the rejection of claims 2 through 23 under the written description portion of 35 U.S.C. § 112 because, in our view, the rejection, on its face, is not a reasonable one.

Based on appellants' arguments that there is clear support for the portions of the claims cited by the examiner, the examiner's response is merely to contend, without support, or basis in law, that the word "determining" does not appear in the specification, as in "determining a first neuron..." and "determining a second neuron..." and that there is "no evidence...to support claim 23, the phrase "inputting a second training signal." These responses evidence clearly that the

Appeal No. 95-1900
Application 07/989,503

examiner seeks literal appearance in the specification of the terms appearing in the claims. This is clearly contrary to law which does not require such literal support. See supra.

In any event, with regard to claims 21 and 22, the examiner complains of a lack of support for the recitation of "determining a first neuron" and "determining a second neuron." As appellants point out, such support is clear from the Figure 4 and the text on pages 7-8 describing the learning ability of the neural network and the ignition or non-ignition of certain neurons. We agree with appellants that although the word "determining" is not literally employed, it is clear, and would have been understood to be clear by artisans at the time of filing the instant disclosure, that the classification of a neuron as either ignited or not ignited necessarily requires a "determination" of whether that neuron outputs a signal in response to training data.

With regard to claim 23, the examiner complains that the term "inputting a second training signal into the data processing network" has no support in the specification as originally filed. Again we agree with appellants that while this phrase is not literally used in the specification, the teaching, at the bottom of page 8 of the specification, that the "learning is continued" for "the neuron which does not ignite" is a clear indication of the claimed "inputting a second training signal" because, as those skilled in the art would have readily understood, the

Appeal No. 95-1900
Application 07/989,503

continuation of the learning process in the neurons which did not ignite necessarily requires inputting training signals to these neurons. As appellants state [bottom of page 12 of the principal brief], and we agree, "learning could not continue in the neurons unless at least a second training signal was provided to the neural network."

Since there is clear support in the originally filed disclosure for the claimed terms objected to by the examiner, the examiner's decision rejecting claims 3 through 23 under the first paragraph of 35 U.S.C. § 112 is reversed.

REVERSED

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KENNETH W. HAIRSTON)	
Administrative Patent Judge)	
)	
)	BOARD OF PATENT
ERROL A. KRASS)	
Administrative Patent Judge)	APPEALS AND
)	
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JAMESON LEE)	
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Appeal No. 95-1900
Application 07/989,503

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