

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opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.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. 18

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte ROBERT F. MOLL, WILLIAM C. PEARSON,
JOHN R. ROGERS and
JACKY M. WIENER

Appeal No. 97-0507
Application 08/202,609¹

ON BRIEF

Before THOMAS, BARRETT and CARMICHAEL, Administrative Patent Judges.

THOMAS, Administrative Patent Judge.

¹ Application for patent filed February 28, 1994. According to the appellants, this application is a continuation of Application 07/783,016, filed October 25, 1991, now U.S. Patent No. 5,355,313, issued October 11, 1994.

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DECISION ON APPEAL

Appellants have appealed to the Board from the examiner's final rejection of claims 25 to 30, which constitute all the claims remaining in the application.

Claim 25 is reproduced below:

25. A system for determining the existence of subsurface earth structural anomalies using aeromagnetically measured data representative of magnetic field strength at known positions above the surface of the earth as input data, and for producing processed output data comprising plots of depth to basement rock at corresponding known positions above the surface of the earth, said system comprising:

a programmed digital computer having a memory and forming a neural network having a multiple element input layer each element of which is capable of receiving input digital data comprising representations of magnetic field strengths at known positions above the surface of the earth and for producing output signals, each element of which is connected to plural elements of a hidden layer of elements via a first weighted system or interconnections, the weights of which are adjustable under program control, and said hidden layer elements each having a sum function and a transfer function associated therewith for summing all input signals to each element and for applying said transfer function to such sum to produce an output signal from each element, and an output layer of elements each of which has an input connected to plural hidden layer elements via a second weighted system of interconnections, the weights of which are adjustable under program control, said output layer elements each having a sum function and a transfer function associated therewith for summing all input signals to each element and for applying said transfer function to such sum to produce an output signal representative of depth to basement rock at known positions above the surface of the earth; and

program means stored in said computer memory for training said programmed digital computer forming a neural network by

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having the same effective filing date as the present application "has now issued as U.S. Patent 5,355,313 and contains claims to the invention in method format." In contrast, the present claims on appeal are all apparatus claims.

For the reasons set forth by the examiner in the answer, we will sustain the rejection of claims 25 to 30 under 35 U.S.C. § 102 as being clearly anticipated by Reilly and the separate rejection of the same claims under 35 U.S.C. § 102 as being clearly anticipated by McCormack. We do so even though we conclude that the more persuasive argumentative approach for the examiner to have taken on the facts presented in this case would have been to reject the claims under 35 U.S.C. § 103 in each instance since it clearly would have been obvious for the artisan to have programmed a neural network to process any type of data whether it be aeromagnetic input data, the seismic trace-type of data as in McCormack or generic types of data to solve real world problems in a particular environment as in Reilly's INTRODUCTION. In an analogous manner, the nature of neural networks is such that they are enabled to process all types of data, inherently within 35 U.S.C. § 102, even the claimed aeromagnetic data.

Contrary to appellants' initial position in the brief, the examiner does not appear to us to dissect representative

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independent claim 25 by disregarding the preamble. A brief study of independent claim 25 yields that the features relating to aeromagnetic data in the preamble find corresponding language utilized in the body of this claim even though the body recitations do not utilize the word "said" to respectively and clearly refer back to the preamble recitations. The plots in the preamble are not produced by the system in the body of the claim, however.

Appellants do not argue any structural distinction per se in apparatus claim 25 over that which the examiner has argued to exist in each of the references relied upon under 35 U.S.C. § 102. Indeed, appellants' disclosure of the base neural network structure in Fig. 1 of the disclosure is shown in the respective portions of the references relied on by the examiner, namely, Fig. 11 of Reilly at page 234 of this reference and Figs. 3 and 4 of McCormack. Each reference relates to the basic neural network structure having an input, hidden and output layers, which are essentially recited in the initial long clause of the body of claim 25 on appeal.

Additionally, each reference relied upon teaches training in the form of backward propagation of error signals based upon known data through an experimentally determined number of

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iterations to reach a learned or trained state, as recited in the second clause of the body of claim 25 on appeal. Indeed, this portion of claim 25 is based upon appellants' specification statement at the top of page 8 that for the backpropagation chosen in the disclosed invention "the well known Delta Rule is used for weight adjustment during learning." This same rule is discussed at col. 7, beginning at line 31 of McCormack as referenced by the examiner in the answer. We also observe that aeromagnetic data has been recognized by appellants' statement of the prior art of the invention at page 1 and 2 of the specification as filed to have existed in the prior art.

The program means (second) clause of the body of claim 25 relating to the training operation of the programmed computer utilized to simulate a neural network (first clause of the body of claim 25) is stated to repetitively input representative aeromagnetic data above the surface of the earth over known depth to basement rock regions. This says nothing more than a neural network needs to be trained for processing new data based upon known data. Both references teach this and also teach that the weighting functions of the neural network itself are adjusted, as claimed, during this training operation.

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Therefore, we are in agreement with the examiner's (unedited) position set forth at pages 5 and 6 of the answer that we reproduce here:

Although Reilly and Cooper publication does not explicitly disclose that their neural network may be used for the purpose of analyzing aeromagnetic data, using specific data (here, aeromagnetic data) in data processing or training of a neural network does not amount to any structural or functional limitation of the claimed neural network. The preamble of claim 25 and the elements (1), (2) and (3) as stated on page 4 of the Appeal Brief, only limit the type of data used in the claimed neural network. The specific data used in a neural network does not impart structure or function beyond the functional steps normally followed in back propagation training of a neural network; the steps are the same regardless of data. That is, changing the nature of data does not change the functionality of a neural network in terms of steps of data processing, error back propagation and learning. Nor does changing the data changes the structure, architecture, and interconnection of a neural network data processing system. Therefore, Reilly and Cooper publication discloses each and every structural limitation of the neural network as claimed.

This reasoning is also repeated by the examiner at pages 6 and 7 of the answer as to the McCormack patent.

The above positions of the examiner recognize that both references relied on do not explicitly disclose that the respective neural networks may be used for the purpose of

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analyzing aeromagnetic data. Rather than disregarding or dissecting out such limitations the examiner has merely not given them patentable weight even within 35 U.S.C. § 102 because they are statements of intended use. There is adequate precedent for the examiner's view that using specific data in the processing of data and training of a neural network does not amount to any structural or functional limitation of the claimed neural network. A different intended use of the same structure as in the prior art does not prohibit a statutory anticipation rejection. Indeed, it has been stated by our reviewing court that "the absence of a disclosure relating to

function does not defeat the Board's finding of anticipation. It is well settled that the recitation of a new intended use for an old product does not make a claim to that old product patentable (case citations omitted)." In re Schreiber, 128 F.3d 1473, 1477, 44 USPQ2d 1429, 1431 (Fed. Cir. 1997). The court concludes at 128 F.3d 1477, 44 USPQ2d 1431-32, that "Schreiber's contention that his structure will be used to dispense popcorn does not have patentable weight if the structure is already known, regardless of whether it has ever been used in any way in connection with

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popcorn" (emphasis added). This reasoning also confirms the propriety of the examiner's approach not to give patentable weight to the aeromagnetic data input into the neural network claimed.

The answer does not rely upon Ex parte Masham, 2 USPQ2d 1647 (Bd. Pat. App. & Int. 1987), but the final rejection does make reference to it at the top of page 2. The examiner made reference there to this prior Board's decision indicating that this case held that a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations. Schreiber

confirms this. Appellants' rebuttal of the examiner's reliance upon Masham at page 5 of the principal Brief on appeal is misplaced. That the board affirmed a rejection of a claim based upon a patent having the same utility as that of the claim on appeal before it was not dispositive. What appears to us to have been dispositive in that case was that the recitation with respect to a different material intended to be worked upon by the claimed apparatus did not impose any structural limitation upon

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the claimed apparatus to differentiate it from prior art apparatus satisfying structural limitations of that which have been recited on the claims on appeal. In an analogous manner here, we and the examiner take the view that the nature of the data to be processed by the neural network is not dispositive or does not differentiate a prior art neural network apparatus processing different types of raw data, and particularly data that has been known and admitted to be known in the prior art by appellants here. Id. 2 USPQ2d at 1648. Accord, Ex parte Wikdahl, 10 USPQ2d 1546, 1548 (Bd. Pat. App. & Int. 1989) and In re Casey, 370 F.2d 576, 580, 152 USPQ 235, 238 (CCPA 1967).

Appellants' positions set forth at page 2 of the reply brief are also not persuasive. We are not persuaded by appellants'

reasoning that the structure of the neural network is changed when the weighting functions are changed as asserted here. As the examiner's reasoning makes clear, the references relied on make clear as well as appellants' own admission with respect to prior art neural networks makes clear, the backpropagation "trainability" of a neural network inherently requires that the weighting functions be changed in accordance with the training

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operation associated with known data before the neural network essentially is "turned loose" upon raw, new data. Changing the weighting functions associated with a training operation of a neural operation does not change the structure or the hardware of the associated electronics of the actual device. The electrical values do change but the actual electrical circuits processing the trainable data values do not change. The mathematical values or weights change during training in any neural network that is "trainable." The act of changing such weighting functions occurs inherently in any neural network that is "trainable." The specific weighting functions changed in accordance with the last clause of the body of claim 25 on appeal are not recited in the claim to be changed from one form to another. It is inherent within the nature of the devices of the prior art relied upon by the examiner that, for example, the seismic data traces processed by McCormack may have yielded identical weighting functions to those only generically recited in this clause of claim 25 on appeal. The "trainability" recited in the last clause of the body of claim 25 on appeal affecting the sum function and transfer function recited in two instances in the first clause of the body of claim 25 on appeal are inherent properties of the

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prior art structure in each reference relied upon by the examiner to reject the claims on appeal.

To further buttress all these considerations, the programmed digital computer clause is merely "capable of" receiving and producing specified data, and the program means clause is merely "for training" when aeromagnetic data is presented. Neither clause of the body of claim 25 on appeal positively recites the respective acts or functions are carried out by the "system" of the preamble. The chosen language refers to future acts or functions which may or may not occur.

Since appellants' briefs do not indicate any grouping for the claims on appeal and because there are no arguments presented as to dependent claims 26 through 30 as to each rejection of the claims on appeal, they all fall with our affirmance of both rejections of claim 25. In view of the foregoing, we have sustained both rejections of claim 25 to 30 under 35 U.S.C. § 102. Therefore, the decision of the examiner is affirmed.

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

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AFFIRMED

JAMES D. THOMAS
Administrative Patent Judge

LEE E. BARRETT
Administrative Patent Judge

JAMES T. CARMICHAEL
Administrative Patent Judge

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