

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opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.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. 24

UNITED STATES PATENT AND TRADEMARK OFFICE

---

BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

---

Ex parte GINTARAS V. PUSKORIUS,  
LEE A. FELDKAMP  
and LEIGHTON I. DAVIS

---

Appeal No. 99-0717  
Application No. 08/597,095<sup>1</sup>

---

ON BRIEF

---

Before HAIRSTON, FLEMING, and BARRY, Administrative Patent Judges.

BARRY, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on the appeal under 35 U.S.C. § 134 from the final rejection of claims 1-10. The appellants filed

---

<sup>1</sup> The application, entitled "Trained Neural Network Engine Idle Speed Control System," was filed February 5, 1996.

Appeal No. 99-0717  
Application No. 08/597,095

an amendment after final rejection on April 14, 1998, which  
was entered. We affirm-in-part.

BACKGROUND

The invention at issue in this appeal controls the idle speed of an engine. More specifically, it employs an electronic engine control module executing a neural network program to control an internal combustion engine. An external training processor derives weight values, which determine the manner in which network signals are combined. The weights are stored in a data structure.

Claim 1, which is representative for our purposes, follows:

1. Apparatus for controlling the idle speed of an internal combustion engine, said engine including an ignition timing control and a throttle, said apparatus comprising, in combination:
  - sensing means coupled to said engine for producing a plurality of input signal values, each of which is indicative of a corresponding one of a plurality of engine operation conditions, said conditions including engine speed and the rate at which intake air is being delivered to said engine,
  - data storage means for storing a neural network definition data structure which defines a neural network, said structure including:
    - signal value data defining said input signal values and the values of signals being processed by said neural network, and
    - weight values governing the manner in which signals are combined within said neural network,
    - and

processing means consisting of a electronic engine control microprocessor and program storage means for storing instructions executable by said processor, said processing means including:

means responsive to said signal value data in said data structure for performing a generic neural network routine for combining selected signal values to produce and store new signal values in said data structure in accordance with said weight values in said data structure, and

output means coupled to said throttle and responsive to one or more of said new signal values for controlling the speed of said engine, and

second output means coupled to said ignition timing control and responsive to one or more of said new signals for generating a second output signal for controlling the ignition timing of said engine.

The references relied on by the patent examiner in rejecting the claims follow:

Onari et al. (Onari)	4,899,280	Feb. 6,
		1990
Ishii et al. (Ishii)	5,410,477	Apr. 25,
		1995.

Claims 1-10 stand rejected under 35 U.S.C. § 103 as obvious over Ishii in view of Onari. Rather than repeat the arguments of the appellants or examiner in toto, we refer the

reader to the appeal and reply briefs and the examiner's answer for the respective details thereof.

OPINION

In reaching our decision in this appeal, we considered the subject matter on appeal and the rejection and evidence advanced by the examiner. We also considered the appellants' and examiner's arguments. After considering the record before us, it is our view that the evidence and level of skill in the art would have suggested to one of ordinary skill in the art the invention of claim 1 but not that of claims 2-10. Accordingly, we affirm- in-part.

We begin our consideration of the obviousness of the claims by finding that the references represent the level of ordinary skill in the art. See In re GPAC Inc., 57 F.3d 1573, 1579, 35 USPQ2d 1116, 1121 (Fed. Cir. 1995) (finding that the Board of Patent Appeals and Interference did not err in concluding that the level of ordinary skill in the art was best determined by the references of record); In re Oelrich, 579

F.2d 86, 91, 198 USPQ 210, 214 (CCPA 1978) ("[T]he PTO usually must evaluate ... the level of ordinary skill solely on the cold words of the literature."). Of course, every patent application and reference relies to some extent upon knowledge of persons skilled in the art to complement that which is disclosed therein. In re Bode, 550 F.2d 656, 660, 193 USPQ 12, 16 (CCPA 1977). Persons skilled in the art, moreover, must be presumed to know something about the art apart from what the references disclose. In re Jacoby, 309 F.2d 513, 516, 135 USPQ 317, 319 (CCPA 1962). With this in mind, we address the appellants' arguments regarding the obviousness of claim 1 and of claims 2-10.

#### Obviousness of Claim 1

The appellants make two basic arguments regarding claim 1. These will be addressed seriatim. First, the appellants allege that there is "no disclosure whatever in Ishii concerning the use of a data structure to define and implement the neural network." (Appeal Br. at 10.) During patent examination, pending claims must be given their broadest

reasonable interpretation. Limitations from the specification are not to be read into the claims. In re Van Geuns, 988 F.2d 1181, 1184, 26 USPQ2d 1057, 1059 (Fed. Cir. 1993); In re Prater, 415 F.2d 1393, 1404, 162 USPQ 541, 550 (CCPA 1969). Giving the claim its broadest reasonable interpretation, we find that the prior art would have suggested the data structure. A data structure is merely “[a]n organizational scheme, such as a record or an array, applied to data so that it can be interpreted and so that specific operations can be performed upon that data.” Microsoft Press Computer Dictionary: The Comprehensive Standard for Business, School, Library, and Home 110 (2d ed. 1994).

Ishii discloses a control system for an automotive vehicle. Col. 1, ll. 8-9. As recognized by the appellants, (Appeal Br. at 9), the system can be used to control the vehicle’s engine. The appellants admit that the system’s driving environment index predicting section “is implemented with a neural network ....” (Id.)

Like most neural networks, Ishii's neural network is defined and implemented by an array of weight data  $w_1 - w_n$ . Fig. 3B (depicting weights  $w_1 - w_3$ ). The array is a data structure.

Operations are performed upon the array to alter, i.e., learn, the value of the weight data. Col. 5, ll. 3-7, 20-22. The array is stored in a read-only-memory to be handled within the control system, col. 8, ll. 59-61, i.e., to be interpreted and to have specific operations can be performed upon the data. Alternatively, as recognized by the appellants, (Appeal Br. at 10), the array can be stored in a flash memory. Therefore, we find that the references would have suggested the data structure to define and implement the neural network.

Second, although they recognize that Ishii teaches the driving environment index predicting section, the appellants opine that it "appears" that the section is not implemented with an "electronic engine control microprocessor." (Appeal Br. at 10.) We find that the prior art would have suggested the electronic engine control microprocessor.

As recognized by the appellants, (Id. at 9), Ishii teaches that a "dedicated arithmetic chip for neuron or digital signal processor may be employed" to perform environmental index prediction in the control system. Col. 5, ll. 40-41. The reference invites substitution for the dedicated hardware, however, by teaching that "other means for high speed arithmetic operation is [sic] also effective." Id. at 42-43.

Official notice is taken that the use of microprocessors to perform high speed arithmetic operations was old and well known at the time the invention was made in the art of control systems. At that time, it would have been obvious to a person having ordinary skill in the art to substitute a microprocessor for the dedicated arithmetic chip or digital signal processor of Ishii. The motivation to do so would have been to facilitate frequent changes to, i.e., reprogramming of, the control system. Therefore, we find that the prior art would have suggested the electronic engine control microprocessor. Accordingly, we affirm the rejection of claim 1 under 35 U.S.C. § 103.

Obviousness of Claims 2-10

Regarding claims 2-10, the appellants assert that there is "nothing which teaches, suggests, or implies Applicants' 'external training processor' ...." (Appeal Br. at 11.) In rejecting claims under 35 U.S.C. § 103, the patent examiner bears the initial burden of establishing a prima facie case of obviousness. A prima facie case is established when the teachings from the prior art itself would appear to have suggested the claimed subject matter to a person of ordinary skill in the art. If the examiner fails to establish a prima facie case, an obviousness rejection is improper and will be overturned. In re Rijckaert, 9 F.3d 1531, 1532, 28 USPQ2d 1955, 1956 (Fed. Cir. 1993).

Here, the examiner fails to identify any teaching or suggestion of an external training processor in the prior art. In fact, the examiner does not even mention the term "external training processor" in his rejection. Although Ishii teaches

"an environment index learning section," col. 5, ll. 13-15, it is unclear whether the section is implemented external to the electronic engine control microprocessor. It is also unclear whether the section is implemented as a processor.

Therefore, we find the examiner's rejection does not amount to a prima facie case of obviousness. Because the examiner has not established a prima facie case, the rejection of the claims is improper. Accordingly, we reverse the rejection of claims 2-10 under 35 U.S.C. § 103.

We end our consideration of the obviousness of the claims by concluding we are not required to raise or consider any issues not argued by the appellants. Our reviewing court stated, "[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." In re Baxter Travenol Labs., 952 F.2d 388, 391, 21 USPQ2d 1281, 1285 (Fed. Cir. 1991).

37 C.F.R. § 1.192(a), as amended at 62 Fed. Reg. 53131 (Oct. 10, 1997), effective Dec. 1, 1997, was controlling when the appeal brief was filed. Section 1.192(a) stated 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, unless good cause is shown.

Also at the time of the brief, 37 C.F.R. § 1.192(c)(8)(iv) stated as follows.

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.

In summary, section 1.192 provides that just as the court is not under any burden to raise or consider issues not argued by the appellants, the Board of Patent Appeals And Interferences is also not under any such burden.

CONCLUSION

To summarize, the decision of the examiner to reject claim 1 under 35 U.S.C. § 103 is affirmed. His decision to reject claims 2-10 under § 103 is reversed. Accordingly, we affirm-in-part.

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

AFFIRMED-IN-PART

KENNETH W. HAIRSTON	)	
Administrative Patent Judge	)	
	)	
	)	
	)	
	)	BOARD OF PATENT
MICHAEL R. FLEMING	)	APPEALS
Administrative Patent Judge	)	AND
	)	INTERFERENCES
	)	
	)	
	)	
LANCE LEONARD BARRY	)	
Administrative Patent Judge	)	

Appeal No. 99-0717  
Application No. 08/597,095

Page 15

LLB/kis  
CHARLES G. CALL  
BANNER & ALLEGRETTI, LTD.  
TEN SOUTH WACKER DRIVE  
CHICAGO, IL 60606

