The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.

Paper No. 10

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte WILLIAM M. SILVIS

Appeal No. 1998-2958
Application No. 08/671,516

ON BRIEF

Before THOMAS, KRASS and DIXON, Administrative Patent Judges.

KRASS, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal from the final rejection of claims 1-14, all of the claims pending in the application.

The invention is directed to the determination of air/fuel ratio of an engine combustion process from exhaust emissions.

Representative independent claim 1 is reproduced as follows:

1. A computer-implemented method for determining air/fuel ratio of an engine's combustion process from its exhaust emissions, the method comprising the steps of:

taking a sample of the exhaust emissions from an operating engine to obtain exhaust gases and water;

measuring concentration of the exhaust gases in the sample, and providing corresponding exhaust gas concentration data;

selecting a calculation type from a predetermined set of calculation types stored in a computer system, including a computer;

calculating with the computer an amount of water produced in the combustion process based on the selected calculation type and the exhaust concentration data;

calculating with the computer an amount of oxygen used in the combustion process based on the amount of water produced in the combustion process and the exhaust gas concentration data;

calculating with the computer the air/fuel ratio based on the calculated amount of oxygen; and

displaying the air/fuel ratio on a display coupled to the computer.

The examiner relies on the following reference:

Yamamoto et al. (Yamamoto)	4,751,907	Jun. 21, 1988

Additionally, the examiner relies on admitted prior art [APA] in the background of the specification related to well-known chemical equations for calculating air/fuel ratio.

Claims 1-14 stand rejected under 35 U.S.C. § 101 as being drawn to non-statutory subject matter. Claims 1-14 stand further rejected under 35 U.S.C. § 103 as unpatentable over APA in view of Yamamoto.

Reference is made to the brief and answer for the respective positions of appellant and the examiner.

OPINION

Turning first to the rejection of claims 1-14 under 35 U.S.C. § 101, we will not sustain this rejection.

The examiner claims that the claimed subject matter is non-statutory because it is directed to a law of nature in that chemical equations describe/control a process of reacting fuel and air to yield water and carbon dioxide. The examiner contends that a patent on such subject matter would preempt others from using the chemical equations described by the instant claims.

The examiner's view is clearly contrary to law. The instant claims are not directed to any law of nature but are directed, instead, to a computer-implemented method for determining air/fuel ratio of an engine's combustion process (a "process," within the meaning of 35 U.S.C. §101) and to a system for determining same (a "machine," within the meaning of 35 U.S.C. § 101). Each of the claims requires measurement of a physical quantity and an analysis of the measured quantities in order to provide data for subsequent calculations. While chemical equations may be descriptions of how certain elements naturally combine, the instant claims are not directed, as a whole, to such equations. Rather, the claimed subject matter is directed to a practical use of the equations where measurements are made, analyses are made and data is input to a processor which employs the equations to reach desired results. Moreover, each of the claims has a step of or means for selecting a calculation type so there is even an additional step wherein a choice of which calculation type to employ must be made. Such a selection, in and of itself, would preclude any rejection of the claims under 35 U.S.C. § 101 as being directed to a "law of nature."

The rejection of claims 1-14 under 35 U.S.C. § 101 is reversed.

We turn now to the rejection of the claims under 35 U.S.C. § 103.

While appellant's response to this rejection is barely substantive, we will, nevertheless, not sustain the rejection because, in our view, the examiner has simply failed to set forth a prima facie case of obviousness.

The examiner's basis for the rejection under 35 U.S.C. § 103 is that Yamamoto provides an example of calculating air/fuel ratio in internal combustion engines from data provided by exhaust gas sensors and that it would have been obvious to employ the well-known calculations described in the instant specification in Yamamoto. However, the examiner never applies the references or the "well-known" calculations to the instant claim language, so it is difficult to understand how certain claim limitations are alleged to have been met by the applied references. For example, the examiner does not indicate what, exactly, is being relied on for the teaching or suggestion of calculating an amount of water produced by the combustion process based on a selected calculation type and exhaust concentration data and then calculating an amount of oxygen used in the combustion process based on the amount of water from the previous calculation and the exhaust gas concentration data and, finally calculating the air/fuel ratio based on the calculated amount of oxygen.

Moreover, the claims each require the selection of a calculation type from a predetermined set of calculation types. The examiner alleges (Paper No. 4-page 3) that since each of these "calculation

types" was well known, "it would have involved only routine skill to select which one to use based upon the data available as well as the ease of solving a particular 'calculation type.'" It appears to us that the examiner's reasoning amounts to impermissible hindsight since only appellant's disclosure teaches the desirability of having the predetermined set of calculation types stored in the computer system to allow selection of a calculation type. As explained by appellant, at page 4 of the brief, and supported by the Summary Of The Invention section of the instant specification, this permits appellant to calculate the air/fuel ratio "according to the measurement situation or the preference of the user" and can be "especially valuable in a situation where initially an oxygen gas measurement is previously available, but is no longer available for whatever reason..." Thus, the instant claims specifically require the selection of a calculation type from a predetermined set of calculation types and the claim limitation is explained to be for a specific purpose. Yet, the evidence relied on by the examiner for a showing of obviousness fails to teach the explicit claim limitation of such a selection and there is no suggestion by any evidence proffered by the examiner as to why the artisan might want to have the capability of selecting a calculation type from a predetermined set of calculation types stored in a computer system.

Accordingly, we hold that the examiner has failed to present a prima facie case of obviousness under 35 U.S.C. § 103 with regard to the instant claimed subject matter.

We have sustained neither the rejection of claims 1-14 under 35 U.S.C. § 101 nor the rejection of claims 1-14 under 35 U.S.C. § 103.

Accordingly, the examiner's decision is reversed.

REVERSED

JAMES D. THOMAS Administrative Patent Judge	)	
ERROL A. KRASS Administrative Patent Judge	)	BOARD OF PATENT APPEALS AND INTERFERENCES
JOSEPH DIXON Administrative Patent Judge	)	

EAK:clm

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