

Appeal No. 1997-0961  
Application No. 08/254,654

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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. 28

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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Ex parte KARL G. GOMES and VITO LIANTONIO

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Appeal No. 1997-0961  
Application No. 08/254,654

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ON BRIEF

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Before MCCANDLISH, Senior Administrative Patent Judges, COHEN and LAZARUS, Administrative Patent Judges.

MCCANDLISH, Senior Administrative Patent Judge.

DECISION ON APPEAL  
AND  
REMAND TO THE EXAMINER

This is a decision on an appeal from the examiner's final rejection of claims 2 through 11. No other claims are pending in the application.

Appellants' invention relates to a control system for an adjustable, solenoid operated valve. On page 2 of the brief, appellants describe the invention as follows:

The invention relates to a precision valve control for an hermetically

sealed hydraulic valve system which operates with a solenoid driven magnetic actuator. The magnetic actuator effects controlled movements of a core rod linked to a pilot. The pilot, in turn, causes actuation of the main valve. Actual valve position is remotely ascertained by the position of the core within the magnetic field by means of a linear variable differential transformer (LVDT). The LVDT generates a signal predeterminedly related to the position of the driver rod within the magnetic field. The LVDT signal is compared by an electronic comparator to an input command signal calibrated to a specific valve position. Deviation between the LDVT [sic: LVDT] feedback signal and input command signal generates an error signal which is amplified and applied to the solenoid to vary the magnetic field to correct the valve position. The fast continuous feedback control permits constant accurate positioning of the main valve to an accuracy within 0.5% of the valve=s command position.

A copy of the appealed claims is appended to appellants= brief.

The following references are relied upon by the examiner as evidence of obviousness in

support of his rejection under 35 U.S.C. ' 103:

|         |           |               |
|---------|-----------|---------------|
| Fales   | 3,850,196 | Nov. 26, 1974 |
| Schwelm | 5,178,358 | Jan. 12, 1993 |

Claims 2 through 11 stand rejected under 35 U.S.C. ' 103 as being unpatentable over Schwelm in view of Fales.

According to the examiner=s findings (see page 2 of the final office action (Paper No. 20 mailed April 14, 1995) and pages 3 and 4 of the examiner=s answer (Paper No. 27 mailed September 10, 1998)), Schwelm=s valve control system comprises an inductive displacement transducer 14 having an output signal that indicates the actual position of the main valve 8, a control valve 6 for operating the main valve 8, a proportional magnet 4 for controlling the control valve 6 and a closed loop circuit between transducer 14 and magnet 4. In his answer (see page 4), the examiner has taken the position that Schwelm=s closed loop circuit inherently includes a comparator means and deviation control means.@

The Schwelm patent lacks an express disclosure that the inductive displacement

transducer 14 is a linear variable differential transformer (LVDT). The examiner nevertheless takes the position that he is not familiar with any other inductive displacement transducers other than an LVDT (final office action, page 2). He also takes the position that it would have been obvious in view of Fales that the inductive displacement transducer of Schwelm would have been [sic, is?] an LVDT, since the LVDT is the most widely used form of inductive displacement transducer known in the valve position sensing art (final office action, page 2).

Even if it is assumed for the sake of argument that Schwelm's transducer 14 is not an LVDT, we are satisfied that the teachings of Fales would have made it obvious to substitute an LVDT for Schwelm's transducer 14 because of the known advantages of an LVDT. Furthermore, we are satisfied that, as described in column 2, lines 11-31 of the Schwelm specification, transducer 14 forms a part of a closed loop circuit, presumably to supply the disclosed input signal to magnet 4. We nonetheless cannot sustain the '103 rejection of the appealed claims.

In the present case, the examiner does not take the position that it would have been obvious to provide Schwelm's closed loop circuit with a comparator means and a deviation control means to meet the terms of claim 2. Instead, as noted *supra*, the examiner contends that Schwelm's closed loop control circuit inherently includes such a comparator means and a deviation control means.

In relying upon the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent features necessarily flow from the teachings of the applied reference. See *Ex parte Levy*, 17 USPQ2d 1461, 1464 (BPAI 1990) and cases cited therein.

Even if it is assumed for the sake of argument that closed loop control circuits having comparator and deviation control circuits are well known as asserted by the examiner on page 4

of the answer, it does not necessarily follow that all closed loop control circuits necessarily have comparator and deviation control circuits corresponding to appellants' claimed comparator means and deviation control means. In fact, Fales discloses a closed loop valve control circuit which lacks a comparator. In Fales valve control circuit, the LVDT (80, 81, 83) has a movable spool 75 attached to the valve member 68 to produce a signal that is representative of the valve position. The LVDT signal is rectified by a rectifier circuit 87, and the rectified LVDT signal is fed back by circuit connections to adjust the power applied to energize the valve's solenoid coil 78.

In view of the foregoing, the examiner has not made a sufficient factual showing or advanced sufficient technical reasoning to support his position of inherency about the comparator means. Based on the prior art applied by the examiner we are therefore constrained to reverse his decision rejecting appealed claims 2 through 11.

On remand to the examiner, the examiner should give due consideration to the following matters.

First, the examiner should review the U.S. Patent No. 4,790,511 issued to Norbert Gehrig et al. and possibly other patents of record in the file wrapper for supporting an art rejection under 35 U.S.C. § 102(b) or § 103. In the Gehrig patent, a comparator circuit 7 (called an amplifier) compares a signal representing the desired valve position with a feedback signal representing the actual valve position to produce an error signal that is used to control the current supplied to energize the valve control solenoid 6. See column 2, lines 25-37, of the Gehrig specification.

The second matter requiring the examiner's attention relates to the recitation in claim 2 of "electronic input signals" in the plural and "electronic feedback signals" in the plural. In contrast, appellants' summary of the invention on page 2 of the brief refers to an "input

command signal@ in the singular and also to an ALVDT feedback signal@ in the singular. Appellants= specification also refers at various places to an Ainput signal@ in the singular (see, for example, page 6 of the specification) and to a Afeedback signal@ in the singular (see, for example, page 2 of the specification). These discrepancies create confusion as to whether appellants intended to limit the claimed invention to (1) a plurality of distinct input signals or just one input signal of variable magnitude and (2) a plurality of distinct feedback signals or just one feedback signal of variable magnitude.

The single signal line at the output of the LVDT for transmitting a single item of intelligence (namely the actual position of the valve) suggests that the LVDT supplies a single feedback signal of variable magnitude, not two or more feedback signals. The single input signal source (i.e., circuit 30) suggests that there is a single input signal of variable magnitude. The inconsistencies with the recitation of plural input signals and plural feedback signals in claim 2 requires clarification and may warrant a 35 U.S.C.

' 112, second paragraph, rejection in the absence of a satisfactory explanation.

The third matter requiring the examiner=s consideration relates to the recitation in claim 2 that the input and feedback signals are Aelectronic@ signals. It is not clear whether appellants simply sought to use a more sophisticated term for an ordinary electrical signal or whether appellants intended to somehow define a special form of an electrical signal. Again, a 35 U.S.C. ' 112, second paragraph, rejection may be warranted in the absence of a satisfactory explanation concerning the meaning of an Aelectronic signal.@

The fourth matter requiring the examiner=s consideration relates to the recitation of Adeviation control means@ in claim 2. This means embodies the individual circuits between the comparator 25 and the solenoid 11, namely the Aopto-coupler@ and the Asolenoid power amplifier@ as evidenced by Figure 2 of the drawings and by exhibit A, which is attached to

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appellants= brief. If the meaning of Aopto-coupler@ is not clear to the skilled artisan, it may not be possible to determine the corresponding structure covered by the claimed means as required under 35 U.S.C. ' 112, sixth paragraph. In such a case, a ' 112, second paragraph rejection may be warranted. Furthermore, it appears that the power amplifier performs more than just an amplifying function in that the error signal is required to somehow adjust the magnitude of the current for energizing the solenoid.

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In summary, the examiner's decision to reject claims 2-11 is reversed, and this application is remanded for consideration of the matters discussed *supra*.

**REVERSED AND REMANDED**

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| HARRISON E. MCCANDLISH             | ) |                 |
| Senior Administrative Patent Judge | ) |                 |
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|                                    | ) | BOARD OF PATENT |
| IRWIN CHARLES COHEN                | ) | APPEALS AND     |
| Administrative Patent Judge        | ) | INTERFERENCES   |
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| RICHARD B. LAZARUS                 | ) |                 |
| Administrative Patent Judge        | ) |                 |

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