

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opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.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. 30

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte TAKUMI TATSUMI
and MITSUHARU MORISHITA

Appeal No. 95-0744
Application 07/758,460¹

ON BRIEF

Before KRASS, BARRETT, and FLEMING, Administrative Patent Judges.

¹ Application for patent filed September 6, 1991, entitled "Motor-Driven Power Steering System For A Vehicle And A Method For Controlling Same," which is a continuation of Application 07/672,789, filed March 21, 1991, now abandoned, which is a continuation of Application 07/265,674, filed October 31, 1988, now abandoned, which claims the priority benefit under 35 U.S.C. § 119 of PCT Application PCT/JP/88/00238, filed March 4, 1988, and Japanese Application 49678/1987, filed March 4, 1987.

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BARRETT, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal under 35 U.S.C. § 134 from the final rejection of claims 19, 20, 23, and 24. Claims 4-8, 13-18, and 25-33 have been allowed, and claims 21 and 22 have been objected to as depending on a rejected base claim. Claims 1-3 and 9-12 have been cancelled.

We reverse.

The disclosed invention is directed to a method for controlling a motor-driven power steering system as may be understood from claim 19, reproduced below.

19. A control method for a motor-driven power steering system of a vehicle, the system having a motor connected to a steering gear by a clutch, the method comprising:

testing the motor for mechanical restriction with the clutch disengaged; and

engaging the clutch only if the testing determines that the motor is not mechanically restricted.

The examiner relies on the following references:

Yabe et al. (Yabe)	4,786,866	November 22, 1988 (filed June 26, 1984)
O'Neil et al. (O'Neil) (European Patent Application)	0,174,137	March 12, 1986

Yabe discloses a method and apparatus for confirming an operating condition of a power steering device, the power steering device including a steering mechanism driven by an electric actuator constituted, for example, by an oil pump and an electric motor or an electric motor alone. The motor is temporarily operated with a quasi (test) current and an alarm light is turned on. The motor current is measured to determine the state of the power steering system. If the current is above a certain value, such as 5 A, the test current is interrupted and the alarm light is turned off and presumably the system is operating normally, whereas if the current is below the value the test signal and alarm light remain on (figure 3). Alternatively, it can be determined whether the steering system is operating properly by measuring the variation in the oil pressure with a load sensor or by measuring the load on the steering mechanism with a strain gauge (col. 4, line 46, to col. 5, line 18).

O'Neil discloses a fail-safe mechanism for an electrical power assisted steering system. A clutch is interposed between the electric motor and the gear reduction assembly. A control system monitors the operation of the system. When the

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system is diagnosed to be operating improperly, the clutch is disengaged and the motor is isolated from the steering shaft.

Claims 19, 20, 23, and 24 stand rejected under 35 U.S.C. § 103 as being unpatentable over O'Neil and Yabe.

The examiner's rejection is contained in the Examiner's Answer (Paper No. 25) and appellants' position is contained in the Brief (Paper No. 24).

OPINION

The claims stand or fall together (Brief, page 5).

The examiner admits that O'Neil does not teach testing the motor with the clutch disengaged and then engaging the clutch if the motor is determined to be operating properly (Examiner's Answer, page 3). O'Neil appears to fall in the same category as the discussed prior art where the clutch is disconnected upon sensing of an extraordinarily large steering torque or other conditions indicating that the motor has failed or is mechanically restricted (specification, page 2). The electric actuator of Yabe does not include a clutch and, thus, in each embodiment, the electric actuator is tested in its loaded state, i.e., with the electric motor operating the oil pump to drive steering mechanism (figures 1 and 4) or directly driving the steering mechanism (figure 5). Thus, Yabe also does not teach testing the motor with the clutch disengaged (it has no clutch) and then engaging the clutch if the motor is determined to be operating properly.

The examiner finds that Yabe teaches the following
(Examiner's Answer, page 4):

Based on the magnitude of the monitored current, a determination is made as to whether the electric motor is

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operating properly. High current values would have indicated mechanical restriction of the motor. . . . The reference as a whole suggests that an abnormal load could produce higher than normal currents flowing in the electric motor.

Actually, Yabe determines whether the power steering system (not just the electric motor itself) is operating properly based on the magnitude of the monitored current. Yabe also appears to work contrary to the examiner's understanding of the reference. Yabe determines whether the steering system produces sufficient load to assist the steering, as determined by measuring the current through the electric motor (col. 4, lines 5-31) or the oil pressure (col. 4, lines 46-58) or the strain produced in the steering mechanism by the motor (col. 5, lines 3-18; figure 5). For example, a high current value in the electric motor indicates that the system is working properly since the test current and the alarm light are turned off if the motor current is larger than a set limit of 5 A (figure 3, step 107): high current does not indicate a mechanical restriction in the motor as stated by the examiner. Perhaps the larger current indicates that the electric motor is working normally to pump oil, whereas a low current would indicate that the electric motor is doing less work because of

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some malfunction, e.g., no oil in the system. Thus, we also disagree with the examiner's statement that "Yabe et al. suggest that abnormalities in motor current may result from higher than normal loads, i.e. mechanical restriction caused by the steering mechanism, and that such loads should be considered in evaluating the operation of the electric motor" (Examiner's Answer, page 4). While it is true that Yabe senses an "abnormal load" as stated in the last sentence quoted above, the abnormal load is a load which is insufficient to assist the steering.

The examiner further finds (Examiner's Answer, page 4): "Yabe et al. further discuss in column 5, lines 6-18 that the load of the electric motor, i.e. steering mechanism, should be considered to see if the load presented to the electric pump is higher than a set value." The embodiment of figure 5 referred to at column 5, lines 6-18, determines whether the steering system is operating normally by detecting the load on the steering system with a strain gauge and, thus, appears to determine mechanical restriction or motor failure by sensing that the load provided to the steering mechanism is insufficient. However, since the embodiment of figure 5 does

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not detect the current through the electric motor as in the embodiments of figures 1-4, it appears to be of little relevance in the rejection. The steering system in figure 5 presumably operates normally if the load produced by the electric motor, as measured by the strain gauge, is above a certain amount, i.e., if the electric motor is producing sufficient load to assist the steering.

Neither O'Neil nor Yabe discloses or suggests testing a motor for mechanical restriction with the clutch engaged and then engaging the clutch if the motor is determined to be operating properly in either of the references. O'Neil detects improper operation of the motor (page 8, lines 8-9), but does not test the motor for restriction. Yabe does not "suggest that abnormalities in motor current may result from higher than normal loads, i.e. mechanical restriction caused by the steering mechanism" (Examiner's Answer, page 4), as stated by the examiner, because high motor currents are a sign of normal operation. Therefore, we do not find any motivation expressly or implicitly in the references to make the proposed modification.

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The reason, suggestion, or motivation for a modification may come from what is known to the person of ordinary skill as well as from a specific teaching in a reference.

See In re Oetiker, 977 F.2d 1443, 1447-48, 24 USPQ2d 1443, 1446-47 (Fed. Cir. 1992) (Nies, C.J., concurring). The examiner attempts to analogize the problem/solution in this case to isolating a portion of an electrical circuit for test purposes. Appellants consider these methods to be from nonanalogous art (Brief, pages 8-9). We agree with the examiner that it is a fundamental engineering technique in many fields (electrical, mechanical, and even chemical) to isolate portions of a system for test purposes. However, absent some indication in the references that there was a need to test the motor for restriction before connecting it to the power steering mechanism, it appears that the examiner is using hindsight to work backwards towards appellants' solution using appellants' disclosure as a guide. "The mere fact that the prior art may be modified in the manner suggested by the Examiner does not make the modification obvious unless the prior art suggested the desirability of the modification."
In re Fritch, 972 F.2d 1260, 1266, 23 USPQ2d 1780, 1783-84

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(Fed. Cir. 1982), citing In re Gordon, 733 F.2d 900. 902, 221 USPQ 1125, 1127 (Fed. Cir. 1984). It does not appear, based on the references before us in this rejection, that the prior art recognized the need to test a motor before connecting it to the steering system. The references apparently found it adequate to test the power steering system with the motor connected to the steering gear. For these reasons, we conclude that the examiner has failed to establish a prima facie case of obviousness. The rejection of claims 19, 20, 23, and 24 is reversed.

REVERSED

ERROL A. KRASS)	
Administrative	Patent Judge)
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)	BOARD OF PATENT
LEE E. BARRETT)	APPEALS
Administrative Patent Judge)	AND
)	INTERFERENCES
)	
)	
MICHAEL R. FLEMING)	

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Administrative Patent Judge)

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