

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte AARON L. MILLS
and MICHAEL PATRICK LOPEZ

Appeal No. 2004-1966
Application No. 09/683,703

ON BRIEF

Before FRANKFORT, MCQUADE, and BAHR, Administrative Patent Judges.

MCQUADE, Administrative Patent Judge.

DECISION ON APPEAL

Aaron L. Mills et al. appeal from the final rejection of claims 1 through 3, 5, 6, 9 through 12, 14 through 18 and 20. Claims 4, 7, 8, 13 and 19, the only other claims pending in the application, stand allowed.

THE INVENTION

The invention relates to a steer-by-wire vehicle steering system "in which there is no direct mechanical linkage between the hand-operated input (e.g., steering wheel) and the road wheels" (specification, page 1). Claim 1, which is representative of the subject matter on appeal, reads as follows:

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1. A steer-by-wire steering system for steering one or more road wheels on a vehicle, said steering system comprising:

a steering input device rotatable by an operator to command steering of the one or more road wheels;

a steering input shaft mechanically connected to the steering input device and rotatable in response to rotation of the steering input device, wherein the steering input shaft is not mechanically linked to the steered one or more road wheels;

a support member disposed proximate the steering input shaft;

a male member provided on one of the steering input shaft and the support member;

a female receptacle provided on the other of the steering input shaft and the support member for receiving the male member, wherein the female receptacle comprises at least one stop position for limiting rotational travel of the steering input shaft; and

an actuator for rotating one or more wheels in the vehicle in response to rotation of the steering input device.

THE REJECTION

Claims 1 through 3, 5, 6, 9 through 12, 14 through 18 and 20 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 1,083,399 to Hanger, Jr. (Hanger).

Attention is directed to the main and reply briefs filed on March 8, 2004 and July 2, 2004 and to the answer mailed on April 29, 2004 for the respective positions of the appellants and the examiner regarding the merits of this rejection.

DISCUSSION

Hanger discloses a vehicle steering mechanism which is designed

to provide a safety steering device which will prevent the wheels attached thereto from being swerved, turned,

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"jolted" or otherwise directed out of their proper course through encountering stones, ruts or other obstructions in the road, which will at all times prevent such shocks from being transmitted to the operator of the vehicle through the steering post, and which will remain in a locked position as regards the vehicle until changed by the operator [page 1, lines 11 through 22].

In general, the steering mechanism comprises a steering wheel 1 which is mechanically linked to the road wheels through a chain of interconnected elements including a steering post 2, a plate-like extension 4, a casing 6, a gear post 10, a disk-like extension 14, an arm 11^a, a worm gear 11 and a cooperating gear sector (see Figure 1). The safety features described above, which are not germane to the issues presented in this appeal, stem from the structural relationship between the casing 6, the plate-like extension 4 and the disk-like extension 14.

The appellants contend that the appealed rejection is unsound because Hanger does not teach, and would not have suggested, a device meeting the limitations in independent claim 1, and the corresponding limitations in independent claims 9 and 16, requiring (1) a steer-by-wire steering system, (2) a steering input shaft that is not mechanically linked to the steered wheels and (3) a female receptacle that comprises at least one stop

position for limiting rotational travel of the steering input shaft.¹

The examiner's finding that the Hanger mechanism comprises a steering input shaft in the form of gear post 10 and a female receptacle in the form of the worm gear 11 is reasonable on its face and is not disputed by the appellants.

With regard to the claim limitations calling for the female receptacle to have at least one stop position for limiting rotational travel of the steering input shaft, the examiner submits that

[f]irstly, the phrase "for limiting rotational travel of a steering input shaft" is merely intended use and presents no structural limitation. Secondly the limitation "stop position" is not [a] physical object. A position is a location. . . . Any object will have a position. The female receptacle of [Hanger], in the threaded portion of worm gear 11, inherently has a "stop position" when it stops [answer, page 4].

As for the claim limitations calling for a steer-by-wire steering system and a steering input shaft that is not mechanically linked to the steered wheels, the examiner, recognizing that the Hanger mechanism does not embody such a

¹ The appellants' specification indicates that "[a] steering system which has no direct mechanical linkage between the steering wheel and the steered road wheels is commonly referred to as a steer-by-wire steering system" (page 1). Hence, the first two claim limitations argued by the appellants are, in essence, mutually dependent.

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system or steering input shaft, contends that "it would clearly be obvious to one of ordinary skill in the art that [Hanger's] input shaft would not be mechanically linked to the steered road wheels during assembly of the vehicle and/or during repair or salvage of the vehicle" (answer, page 3).

Although this highly imaginative and entertaining analysis cries out for a more colorful response, suffice to say that it falls well short of justifying the examiner's conclusion of obviousness. Hanger's female receptacle, worm gear 11, does not include anything which would be viewed by one of ordinary skill in the art as a stop position for limiting rotational travel of the steering input shaft. The examiner's finding to the contrary rests on a manifestly unreasonable parsing and interpretation of the claim language in question. The further proposition that the unassembled component parts of Hanger's steering mechanism would embody a steer-by-wire system having a steering input shaft that is not mechanically linked to the steered wheels is similarly ill founded. Such unassembled parts do not comprise a steering system of any sort, let alone a steer-by-wire system having a steering input shaft that is not mechanically linked to the steered wheels.

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Thus, the fair teachings of Hanger do not warrant a conclusion that the differences between the subject matter recited in independent claims 1, 9 and 16 and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art. Hence, we shall not sustain the standing 35 U.S.C. § 103(a) rejection of claims 1, 9 and 16, and dependent claims 2, 3, 5, 6, 10 through 12, 14, 15, 17, 18 and 20, as being unpatentable over Hanger.

SUMMARY

The decision of the examiner to reject claims 1 through 3, 5, 6, 9 through 12, 14 through 18 and 20 is reversed.

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REVERSED

CHARLES E. FRANKFORT)	
Administrative Patent Judge)	
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JOHN P. MCQUADE)	
Administrative Patent Judge)	INTERFERENCES
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JENNIFER D. BAHR)	
Administrative Patent Judge)	

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PRICE, HENEVELD, COOPER,
DEWITT & LITTON, LLP
695 KENMOOR S.E.
P. O. BOX 2567
GRAND RAPIDS, MI 49501-2567