Paper No. 24

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte DANIEL LEE MOORE

Appeal No. 2004-0352
Application No. 09/716,767

HEARD: March 2, 2004

Before COHEN, ABRAMS, and McQUADE, Administrative Patent Judges.

ABRAMS, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal from the examiner's final rejection of claims 1-22, which are all of the claims of record in the application.

We REVERSE and REMAND TO THE EXAMINER.

BACKGROUND

The appellant's invention relates to a force sensor rod for an aircraft actuator system (claims 1-5 and 9-22) and to a method of assembling such a force sensor (claims 6-8). An understanding of the invention can be derived from a reading of exemplary claim 1, which appears in the appendix to the Brief.

The prior art references of record relied upon by the examiner in rejecting the appealed claims are:

Ward et al. (Ward)	3,561,263	Feb. 9, 1971
Dubuque	4,097,163	Jun. 27, 1978

"Tension/Compression Load Cell TC-1500," Kulite Semiconductor Products, Inc. (Kulite)[1]

Claims 1-22 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Ward in view of Dubuque and Kulite.[2]

Rather than reiterate the conflicting viewpoints advanced by the examiner and the appellant regarding the above-noted rejection, we make reference to the Answer (Paper No. 15) for the examiner's complete reasoning in support of the rejection, and to

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[1]The effective date of this publication is not known. However, since it was provided by the appellant in an Information Disclosure Statement (Paper No. 5), it is presumed to be prior art and its use as such has not been challenged by the appellant.

[2]Throughout the prosecution of this application, the rejection was stated by the examiner as "Claims 1-5 rejected . . . as being unpatentable over . . . Ward . . .in view of Dubuque." Claims 6-22 were not included, but were separately treated in the subsequent explanations of the rejection. In addition, Kulite was applied against claims 2, 5, 9-11 and 13 in these explanations, although it was not recited in the statement of the rejection. However, in view of the fact that the appellant has not taken issue with this error and has argued the patentability of claims 6-22 and the applicability of the teachings of Kulite, we have considered the rejection as if it had been stated in this manner.

the Brief (Paper No. 14) and Reply Brief (Paper No. 17) for the appellant's arguments thereagainst.

OPINION

In reaching our decision in this appeal, we have given careful consideration to the appellant's specification and claims, to the applied prior art references, and to the respective positions articulated by the appellant and the examiner. As a consequence of our review, we make the determinations which follow.

The appellant's invention deals with sensing the force applied to a control actuator that moves in a longitudinal direction. In particular, the invention is directed to attaching a control tube to the body of a force sensing transducer in such a manner as to provide a tight, secure, and sealed juncture (specification, page 3). This is manifested in independent apparatus claim 1 by reciting that the transducer has a body with a free end from which extend external screw threads terminating in a plurality of longitudinally extending grooves "to prevent rotation," and that the tube is composed of a material that is relatively softer than the external screw threads, and is "threadedly coupled to the free end with the tube material located in the grooves."

Ward discloses a force sensing transducer having a body 20 with a rotatable shaft 24 upon which a steering wheel 10 is mounted protruding from one end. The shaft has longitudinal splines on its outer surface, which mate with complementary splines on the wheel so that when the wheel is rotated the shaft rotates with it. Ward explains that

the shaft also has external threads at its distal end, which receive a nut 25 for "connecting" the body of the force sensing transducer to the wheel (column 1, lines 39-42). In other words, from our perspective, in the Ward device the shaft is caused to rotate with the steering wheel by means of the splined connection, and the steering wheel is held in this position on the shaft by the threaded nut. Ward does not discuss the relative hardness of the various components with respect to one another.

With regard to the invention as recited in claim 1, Ward fails to disclose or teach (1) a tube threadedly coupled to the free end of the body, (2) that the tube is composed of a material relatively softer than the external threads on the body, and (3) that the tube is so coupled as to have the tube material located in the grooves on the body.

Dubuque discloses a tube 16 joined to a rod end 22. With particular reference to Figure 2, the tube end is provided with internal threads 18 located inwardly of an unthreaded entrance portion 20, and the rod has external threads 12, inward of which is a portion having longitudinal grooves 14. As shown in Figure 4 and explained in columns 2 and 3, once the rod is screwed into the tube to the extent desired, the entrance portion of the tube is swaged to the rod, thus pressing the ridges defining the longitudinal grooves into the inner surface of the tube, which prevents the two components from rotating with respect to one another. Dubuque teaches that the tube be of a softer material than the rod end, so that the swaging causes the metal in the tube to flow into the grooves of the rod (column 1, lines 64 and 65).

We agree with the appellant that the examiner has adduced no evidence which would support a conclusion that one of ordinary skill in the art would have found it obvious to modify Ward in such a manner as to meet the terms of claim 1. The examiner has not explained why an artisan would attach a tube to the end of Ward's shaft 24, and we can find no suggestion in the references to do so. In this regard, it would seem that the steering wheel would have to be discarded in order to attach the tube in the manner specified in claim 1, that is, with the tube end so coupled to the threads as to also locate tube material in the grooves, and that this would destroy or at least significantly alter the construction and operation of the Ward system and thus be a disincentive for the artisan so to do. In addition, the diameter of the threaded portion of the Ward body is less than that of the portion having the longitudinal grooves, and this would preclude the Dubuque tube, as disclosed, from being installed upon the Ward base in the manner required by claim 1. Again, to accomplish such a coupling would require significant alteration of either Ward or Dubuque.

We fail to perceive any teaching, suggestion or incentive which would have led one of ordinary skill in the art to modify the Ward force sensor in such a manner as to meet the terms of claim 1. This being the case, the combined teachings of Ward and Dubuque fail to establish a prima facie case of obviousness with regard to the subject matter recited in independent claim 1. We reach the same conclusion, for the same reasons, with regard to independent method claim 6, noting that the examiner has

explained this rejection only to the extent of stating that the method steps "are readily apparent during the operation of" the modified Ward device.

It appears from the explanation of the rejection of independent apparatus claim 9 on page 6 of the Answer that Kulite has been added to the other two references for teaching a flight recorder that records output signals. Be that as it may, Kulite does not overcome the defect we explained above with combining Ward and Dubuque. Thus, a prima facie case of obviousness also is lacking here. The same can be said about the effect of adding Kulite to Ward and Dubuque with regard to dependent claims 2, 5, 10, 11 and 13, as the examiner proposes on pages 4-7 of the Answer.

REMAND TO THE EXAMINER

The manner in which the rod end and the tube are connected in the Dubuque reference appears to be identical to that used by the appellant iN his invention. Moreover, Dubuque specifies that the tube be composed of a material that is relatively softer than the external screw threads on the rod end, and explains that this results in the rod end being "fixedly secured" to the tube (Abstract), which also is one of the objectives of the appellant's invention (specification, page 3, lines 26-30).

This application is remanded to the examiner for consideration of further review of the prior art in the field of sensing the force in systems wherein the movement of both

components is longitudinal to the axis of the force sensing transducer rather than rotary, to which the Dubuque teachings would appear to have greater relevance and applicability.

CONCLUSION

The rejection is not sustained.

The decision of the examiner is reversed.

The application is remanded to the examiner for consideration of further review of the prior art as explained above.

REVERSED AND REMANDED TO THE EXAMINER

IRWIN CHARLES COHEN Administrative Patent Judge	)
NEAL E. ABRAMS Administrative Patent Judge	) BOARD OF PATENT) APPEALS AND) INTERFERENCES
JOHN P. McQUADE Administrative Patent Judge	)

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APPEAL NO. 2004-0157 - JUDGE ABRAMS
APPLICATION NO. 09/706,771

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DECISION: **REVERSED** AND REMANDED

Prepared By: Lesley Brooks

GAU: 3600

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DRAFT TYPED: 18 Jan 05

FINAL TYPED: