Paper No. 13

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte DARYL L. MCCALL and DONALD A. STRATTON

Appeal No. 2002-0767
Application No. 09/382,381

ON BRIEF

Before COHEN, FRANKFORT, and NASE, Administrative Patent Judges.

FRANKFORT, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal from the examiner's final rejection of claims 1 through 8 and 10 through 20, all of the claims remaining in the application. Claim 9 has been canceled.

Appellants' invention relates to a high precision global landing system (GLS) wherein precise computation of glideslope and localizer deviation signals are performed within the GLS, and to a method of utilizing such a system. A broad understanding of

the invention is more particularly set forth in the following passages from pages 4 and 5 of the specification:

> [i]t is another feature to utilize a method of simultaneously measuring, with GPS receivers, the displacement of ILS receiver antennas from installed GPS antenna locations on the aircraft.
>
> It is another advantage of the present invention to provide a quick and cost-effective method for establishing the guidance control points and the necessary corrections resulting from the frequent separation of GPS antennas, which are often midship and on the top of the aircraft, from ILS antenna locations, which are often in the nose or tail sections.
>
> The present invention is an apparatus and method for retrofitting GLSs on aircraft previously fitted with ILSs and A/Ps or FCCs, which is designed to satisfy the aforementioned needs, provide the previously stated objects, include the above-listed features and achieve the already articulated advantages. The present invention is carried out in an "antenna separation error-less" manner in a sense that the errors introduced by the physical separation of GPS antennas from glideslope and localizer antennas have been greatly reduced.
>
> Accordingly, the present invention is a GLS which uses guidance control points and the separation of these points from installed GPS antennas, to generate and utilize precise glideslope and localizer deviation signals.

Independent claims 1, 14 and 18 are representative of the subject matter on appeal. A copy of those claims may be found in the Appendix to appellants' brief.

The sole reference of record relied upon by the examiner in rejecting the appealed claims is:

Denninger	5,952,961	Sep. 14, 1999 (filed Jan. 30, 1998)

Claims 1 through 8, 10 through 13, 19 and 20 stand rejected under 35 U.S.C. § 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.[1]

Claims 1 through 8 and 10 through 20 stand rejected under 35 U.S.C. § 102(e) as being anticipated by Denninger.

Rather than reiterate the examiner's full commentary with regard to the above-noted rejections and the conflicting viewpoints advanced by the examiner and appellants regarding those rejections, we make reference to the examiner's answer (Paper No. 12, mailed November 21, 2001) for the examiner's

[1] As pointed out by the examiner on page 13 of the answer, the rejection of claims 14 through 17 under 35 U.S.C. § 112, first paragraph, in the final rejection has now been withdrawn.

reasoning in support of the rejections, and to appellants' brief (Paper No. 11, filed October 16, 2001) for the arguments thereagainst.

OPINION

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

We turn first to the examiner's rejection of claims 1 through 8, 10 through 13, 19 and 20 under 35 U.S.C. § 112, first paragraph, wherein the examiner has urged that the specification fails to provide an enabling disclosure. It is by now well-established law that the test for compliance with the enablement requirement in the first paragraph of 35 U.S.C. § 112 is whether the disclosure, as filed, is sufficiently complete to enable one of ordinary skill in the art to make and use the claimed invention without undue experimentation. In re Moore, 439 F.2d 1232, 1235, 169 USPQ 236, 238-39 (CCPA 1971). See also In re

Scarborough, 500 F.2d 560, 566, 182 USPQ 298, 302-03 (CCPA 1974). Moreover, in rejecting a claim for lack of enablement, it is also well settled that the examiner has the initial burden of advancing acceptable reasoning inconsistent with enablement in order to substantiate the rejection. See In re Strahilevitz, 668 F.2d 1229, 1232, 212 USPQ 561, 563 (CCPA 1982); In re Marzocchi, 439 F.2d 220, 223, 169 USPQ 367, 369 (CCPA 1971). Once this is done, the burden shifts to appellants to rebut this conclusion by presenting evidence to prove that the disclosure in the specification is enabling. See In re Doyle, 482 F.2d 1385, 1392, 179 USPQ 227, 232 (CCPA 1973); In re Eynde, 480 F.2d 1364, 1370, 178 USPQ 470, 474 (CCPA 1973).

In the present case, after reviewing the disclosure as set forth in the specification and the invention as seen in the drawings of the application from the perspective of one of ordinary skill in the art, and having considered the examiner's position as set forth on pages 4 and 5 of the answer, we are of the opinion that the examiner has not met the burden of advancing acceptable reasoning inconsistent with enablement. The examiner's mere assertion that certain limitations of the claims on appeal (e.g., the last clause of claim 1) are not expressly

set forth in the specification and drawings of the application, and are therefore purportedly not enabled, overlooks the examiner's responsibility to explain why one of ordinary skill in the art would have been unable to understand and implement the invention claimed in the present application when the disclosure of the application is considered as a whole. In that regard, we note that we see no discussion by the examiner as to exactly why the rather straight-forward invention disclosed and claimed in the present application would be beyond the capability of one of ordinary skill in the art (i.e., would require undue experimentation to implement) given a full consideration of appellants' disclosure.

Appellants' contribution to the art recognizes the need for a correction factor to be used in the determination of glideslope and localizer deviation signals used by instrument landing systems (ILSs) and/or autopilots (A/Ps), particularly during the critical final stages of approach and landing, wherein the correction factor represents the separation distance of the GPS antennas, which are often located midship and on top of the aircraft, from ILS antenna locations, which are usually in the nose or tail section of the aircraft. On page 9 of the

specification, appellants emphasize that instead of changing the A/P software to handle the above-noted antenna separation error (which would require recertification), the present invention uses the concepts of vertical guidance point (102) and vertical lever arm correction vectors (110, 130) to address the error introduced by the physical separation of the GPS and ILS antennas. As noted on page 10, this calibration or measurement is done once at the time the aircraft is being retrofit with the present GLS system, and then (as noted on page 12) the lever arm correction vector data is programmed in the aircraft personality module (APM) and made available to the GLS precision approach navigator (PAN), or programmed directly into the PAN. Thus, in our view, it would have been clear to one skilled in the art that the "means for generating enhanced position signals" of claim 1 and the "means for generating a deviation signal" of claim 18 are both computer processors (e.g., in the PAN) executing predetermined computer software including a correction for the antenna location separation distance error noted by appellants.

As an alternative to the foregoing, appellants note (specification, page 12) that the APM programming and computation of the enhanced deviation/position signals can be done within the

GPS receiver itself, which typically includes a computer processor designed to support such flight control computations. As indicated on page 2 of the specification, the GPS receiver would typically be integrated with the A/Ps or flight control computers (FCCs) of the aircraft, which systems, along with the control surfaces and engines of the aircraft, constitute means for controlling the aircraft in response to the deviation signals.

With regard to the other make and/or use issues raised by the examiner in the answer, we share appellants' views as expressed on pages 7 through 10 of the brief, noting that the application need not teach, and preferably omits, what is well known in the art.

Thus, after a careful consideration of appellants' disclosure and of the arguments on both sides, it is our opinion that the level of skill in this art is sufficiently high that the ordinarily skilled artisan would have been able to make and use appellants' claimed invention as set forth in the claims before us on appeal, based on appellants' disclosure, without the exercise of undue experimentation.

For the above reasons, we will not sustain the examiner's rejection of claims 1 through 8, 10 through 13, 19 and 20 under 35 U.S.C. § 112, first paragraph, as being based on a non-enabling disclosure.

We next look to the examiner's rejection of claims 1 through 8 and 10 through 20 under 35 U.S.C. § 102(e) as being anticipated by Denninger. In this instance, we are in full agreement with appellants' arguments as set forth on pages 11 through 14 of the brief. While it is true that Denninger is concerned with providing a radar altimeter augmented GPS aircraft navigation system that uses the AGL (above ground level) altitude information from the radar altimeter to provide more accurate navigation information to the pilot during the approach and landing phases, and thus provides an added degree of redundancy and an additional source of navigational information for use in conjunction with other pre-existing aircraft navigation instruments (e.g., inertial, ILS, TACAN, etc.) which permits the aircraft to execute precision approaches and landings, we find nothing in Denninger which recognizes or addresses the specific antenna spacing problem confronted and solved by appellants.

In that regard, even if the aircraft in Denninger includes a first positioning system antenna and receiver (i.e., GPS) and a landing system antenna and receiver (i.e., ILS) that work together to provide more accurate positioning information for use in precision approaches and landings, there is no teaching or suggestion in the Denninger patent of a "means" like that set forth in the last clause of claim 1 on appeal, wherein the enhanced position signal generated by that means includes a correction factor based on "a vector representative of a separation characteristic between said first positioning system antenna and said first landing system antenna location." At best, it would appear that Denninger discloses integrated multi-mode receivers of the type mentioned by appellants on page 2 of the specification, with an added radar altimeter input (AGL) to provide more precise aircraft position information.

The examiner's theory that the attitude solution computer (402) of Denninger corresponds to the means clause of claim 1 on appeal is in error. As is made clear in the portion of Denninger beginning at column 6, line 24 and continuing to column 7, line 17, the computer (402) of the attitude sensor (201) determines the attitude of the aircraft in an earth-centered, earth-fixed

coordinate system based on the relative phase differences of the GPS signals received at the various antennas (407-410), and does not, as the examiner urges, appear to perform any calculations or determination with respect to a predetermined landing system vector. Moreover, as we noted above, there is no indication in Denninger that the attitude solution computer utilizes "a vector representative of a separation characteristic between said first positioning system antenna and said first landing system antenna location," as in claim 1 on appeal, to provide precise computation of glideslope and localizer deviation signals.

As for the remaining claims subject to this ground of rejection, the examiner has simply not made out a *prima facie* case of anticipation by clearly setting forth facts and an explanation of exactly how the system of Denninger performs or teaches a method as set forth in appellants' claim 14 on appeal, or that Denninger's system includes an apparatus like that defined in claim 18 on appeal. The examiner's mere assertion (answer, pages 8 and 9) that the attitude sensor (201) of Denninger performs the method of appellants' claim 14 and that this sensor also corresponds to the apparatus of claim 18 on appeal does not come close to meeting the examiner's burden of

establishing a *prima facie* case. To the extent that the examiner may be relying on inherency to establish anticipation, we note that it is well settled that inherency may not be established by probabilities or possibilities, but must instead be "the natural result flowing from the operation as taught." See In re Oelrich, 666 F.2d 578, 581-82, 212 USPQ 323, 326 (CCPA 1981). In the present case, the disclosure of Denninger does not appear to provide an adequate factual basis to clearly establish that the natural result flowing from following the teachings of that reference would be a method as in appellants' claim 14 on appeal, or an apparatus like that of appellants' claim 18 including "means for determining a location separation distance between said first location and said second location" and "means for generating a deviation signal of said second location with respect to a predetermined aircraft flight path vector, wherein said deviation signal is a function of said first signal and said location separation distance."

It follows from the foregoing that we will not sustain the examiner's rejection of claims 1 through 8 and 10 through 20 on appeal under 35 U.S.C. § 102(e) based on Denninger.

To summarize our decision, we note that a) the examiner's rejection of claims 1 through 8, 10 through 13, 19 and 20 under 35 U.S.C. § 112, first paragraph, on the basis of lack of enablement has not been sustained and b) the examiner's rejection of claims 1 through 8 and 10 through 20 on appeal under 35 U.S.C. § 102(e) based on Denninger has likewise not been sustained.

In light of the foregoing, the decision of the examiner is REVERSED.

REVERSED

IRWIN CHARLES COHEN Administrative Patent Judge	)	
CHARLES E. FRANKFORT Administrative Patent Judge	)	BOARD OF PATENT APPEALS AND INTERFERENCES
JEFFREY V. NASE Administrative Patent Judge	)	

CEF/lbg

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