

UNITED STATES PATENT AND TRADEMARK OFFICE

**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Ex parte NICHOLAS C. TALBOT and MICHAEL V. McCUSKER

Appeal No. 2002-2169
Application No. 09/163,286

ON BRIEF

Before FLEMING, BARRY, and BLANKENSHIP, *Administrative Patent Judges*.
BARRY, *Administrative Patent Judge*.

DECISION ON APPEAL

A patent examiner rejected claims 1-7 and 12. The appellants appeal therefrom under 35 U.S.C. § 134(a). We affirm-in-part.

BACKGROUND

The invention at issue on appeal relates to calibrating surveying instruments. According to the appellants, electronic distance measuring ("EDM") equipment became commercially available after World War-II and has since been used for surveying. (Spec. at 1-2.) Miniaturization lead to mounting EDM equipment on theodolites, which

have telescopes for sighting angles to targets. Such electro-optical hybrids are called "total stations." (*Id.* at 2.)

An EDM equipment meter derives its accuracy from an internal frequency source such as a crystal oscillator. The frequency of the oscillator, however, can drift over time and with age. Exposure to extreme environments can also upset delicate calibrations of the frequency source. (*Id.* at 3.)

Accordingly, the invention aims to calibrate a total station automatically and precisely. The total station includes a global positioning system ("GPS") receiver, an oscillator, and an EDM meter. When the receiver is locked onto and tracking GPS satellites, cesium-rubidium clocks in the satellites are used to calibrate the oscillator, which drives the meter. The appellants assert that baseline measurements made by the meter are "not subject to mis-calibrations and drift as long as the satellite navigation receiver is locked onto and tracking the orbiting navigation satellites." (*Id.* at 5.)

A further understanding of the invention can be achieved by reading the following claim.

1. A surveying instrument, comprising:

a satellite navigation receiver with a pulse-per-second output derived from an atomic time standard used in a related orbiting navigation satellite;

a reference oscillator controlled by said pulse-per-second output and providing a reference frequency with a timing accuracy directly related to a timing accuracy of said atomic time standard;

an electronic distance meter having an EDM transmitter for launching an out-bound signal to a distant target and an EDM receiver for receiving a reflected signal from said distant target; and

a phase measurement device connected to the reference oscillator, said EDM transmitter and said EDM receiver, and providing for a time measurement of the difference between said out-bound signal and said reflected signal using said reference frequency;

wherein, a distance-to-target measurement is computed with an accuracy dependant on said timing accuracy of said atomic time standard.

Claims 5, 6, and 12 stand rejected under 35 U.S.C. § 112, ¶ 2, as indefinite. Claims 6 and 12 stand rejected under 35 U.S.C. § 112, ¶ 1, as lacking an adequate written description. Claims 6 and 12 also stand rejected under § 112, ¶ 1, as nonenabled. Claims 1-7 stand rejected under 35 U.S.C. § 103(a) as obvious over U.S. Patent No. 5,430,537 ("Liessner") and *Using a New GPS Frequency Reference in Frequency Calibration Operations*, 1993 IEEE Int'l Frequency Control Symp., pp. 33-39 ("Osterdock").

OPINION

When claims have been rejected under the first and second paragraphs of 35 U.S.C. § 112, analysis "should begin with the determination of whether the claims satisfy the requirements of the second paragraph." *In re Moore*, 439 F.2d 1232, 1235, 169 USPQ 236, 238 (CCPA 1971). Accordingly, our opinion addresses the rejections in the following order:

- indefiniteness rejections of claims 5, 6, and 12
- written description rejections of claims 6 and 12
- nonenablement rejections of claims 6 and 12
- obviousness rejection of claims 1-7.

Indefiniteness Rejections of Claims 5, 6, and 12

Rather than reiterate the positions of the examiner or the appellants *in toto*, we address the three points of contention therebetween. First, the examiner asserts, "in claims 5 and 6, 'said time phase difference' is indefinite since (1) it lacks a proper antecedent basis and (2) it is unclear what meaning is attributed thereto." (Examiner's Answer at 4.) The appellants argue, "[t]he mentioning of 'said time phase differences, in claims 5 and 6 has antecedent basis in claim 4 with 'measuring a time difference.'" (Reply Br. at 3.)

A claim is indefinite "where the language 'said lever' appears in a dependent claim where no such 'lever' has been previously recited in a parent claim to that

dependent claim" *Ex parte Moelands*, 3 USPQ2d 1474, 1476 (Bd. Pat. App. & Int. 1987).

Here, dependent claims 5 and 6 include the language "said time phase difference. . . ." No such "time phase difference" has been previously recited in parent claim 4. To the contrary, claim 4 merely specifies "a time difference. . . ." Therefore, we affirm the indefiniteness rejection of claims 5 and 6.

Second, the examiner asserts, "[i]n claim 12, the language 'a reference oscillator with a frequency offset' is not clear. An oscillator outputs a frequency signal; what is the offset and to what does it refer?" (Examiner's Answer at 4.) The appellants argue, "[t]he claim itself explains the frequency offset 'is determined by the use of satellite transmissions received by the satellite navigation receiver, and wherein a determination of said frequency offset is used later in software to correct for frequency errors'." (Appeal Br.¹ at 5.)

"For each rejection under 35 U.S.C. 112, second paragraph, the argument shall specify the errors in the rejection and how the claims particularly point out and distinctly

¹We rely on and refer to the supplemental appeal brief, (Paper No. 17), in lieu of the original appeal brief, (Paper No. 11), because the latter was defective. (Paper No. 15.) The original appeal brief was not considered in deciding this appeal.

claim the subject matter which applicant regards as the invention." 37 C.F.R.

§ 1.192(c)(8)(ii) (2002).

Here, the appellants' argument is not responsive to the examiner's rejection. More specifically, although the examiner asserts that the meaning of the claim's "frequency offset" is unclear, the appellants argue that the claim specifies how the offset is determined and how it is used. The argument does not allege, let alone show, that the meaning of "frequency offset" is clear.

Third, the examiner asserts that in claim 12, "[i]t is unclear to what the language 'provide a calibration signal' refers. Is the calibration signal related to the frequency offset?" (Examiner's Answer at 4.) The appellants argue, "[a] free running local oscillator can either be phase locked to a sub-harmonic of the atomic clock based satellite carrier transmissions, or those transmissions can be used to measure the local clock errors." (Reply Br. at 3.)

Again, the appellants' argument is not responsive to the examiner's rejection. More specifically, although the examiner asserts that the claimed providing of a calibration signal is unclear, the appellants argue that a local oscillator can either be phase locked to a sub-harmonic of an atomic clock based satellite carrier

transmissions, or those transmissions can be used to measure the local clock's errors. The argument does not allege, let alone show, that the meaning of "provide a calibration signal" is clear. Therefore, we affirm the indefiniteness rejection of claim 12.

Written Description Rejections of Claims 6 and 12

Regarding claim 6, the examiner asserts, "the specification does not make clear how the 'observations of a plurality of phase differences . . . at a plurality of . . . signal frequencies' provides a limitation to 'measuring a time difference . . . using a reference time base obtained from said local reference clock'." (Examiner's Answer at 3.) He further asserts, "[r]egarding claim 12, the specification does not sufficiently describe how a phase measurement device operates on the time difference from which a distance to target measurement can be computed **after correcting for frequency offset determined in software.**" (*Id.*)

"The claims as filed are part of the specification, and may provide or contribute to compliance with Section 112." *Hyatt v. Boone*, 146 F.3d 1348, 1352, 47 USPQ2d 1128, 1130 (Fed. Cir. 1998) (citing *Northern Telecom, Inc. v. Datapoint Corp.*, 908 F.2d 931, 938, 15 USPQ2d 1321, 1326 (Fed. Cir. 1990); *In re Benno*, 768 F.2d 1340, 1346, 226 USPQ 683, 686-87 (Fed. Cir. 1985); *In re Frey*, 166 F.2d 572, 575, 77 USPQ 116, 119 (CCPA 1948)). More specifically, "disclosure in an originally filed claim satisfies the

written description requirement." *Union Oil Co. of California v. Atlantic Richfield Co.*, 208 F3d 989, 998 n.4, 54 USPQ2d 1227, 1234 n.4 (Fed. Cir. 2000) (citing *In re Gardner*, 480 F.2d 879, 880, 178 USPQ 149 (CCPA 1973)).

Here, the originally filed claims disclose the limitations at issue. More specifically, originally filed claim 6 discloses that "the step of measuring said time phase difference includes observations of a plurality of phase differences observed by said electronic distance meter at a plurality of out-bound and in-bound signal frequencies." For its part, originally filed claim 12 discloses "a phase measurement device . . . providing for a measurement of the difference in time between said out-bound signal and said reflected signal from which a distance-to-target measurement can be computed after using said determination of said frequency offset in software to correct for errors. . . ." Therefore, we reverse the written description rejection of claims 6 and 12.

Nonenablement Rejections of Claims 6 and 12

We address the two points of contention between the examiner and the appellants. First, the examiner asserts, "[r]egarding claim 6, the specification is non-

enabling with respect to a step of measuring time differences using a time-based clock (parent claim 4 limitation) by observing phase differences at a plurality of frequencies (dependent claim further limiting the step of the parent claim)." (Examiner's Answer at 4.) The appellants argue, "[a] person of ordinary skill in the field knows that signals that are reflected have the same frequency as the original out-bound one and that their traveled distance will have a phase delay that is a function of that distance." (Reply Br. at 2.)

"For each rejection under 35 U.S.C. 112, first paragraph, the argument shall specify the errors in the rejection and how the first paragraph of 35 U.S.C. 112 is complied with, including, as appropriate, how the specification and drawings . . . [e]nable any person skilled in the art to make and use the subject matter defined by each of the rejected claims. . . ." 37 C.F.R. § 1.192(c)(8)(i)(B).

Here, the appellants' argument is not responsive to the examiner's rejection. More specifically, although the examiner asserts a failure to enable the measuring of time differences using a time-based clock by observing phase differences at plural frequencies, the appellants argue that reflected signals have a phase delay that is a function of traveled distance. The argument does not allege, let alone show, that the specification and drawings enable any person skilled in the art to measure time

differences using a time-based clock by observing phase differences at plural frequencies. Therefore, we affirm the nonenablement rejection of claim 6.

Second, regarding claim 12, the examiner asserts that the specification "says nothing about using satellite transmissions to determine the offsets; in fact, the reference oscillator (GPS master reference oscillator) merely provides a precise reference frequency, it is not controlled and it does not provide any calibration signal to the phase measurement device." (Examiner's Answer at 4.) The appellants argue, "[a] free running local oscillator can either be phase locked to a sub-harmonic of the atomic clock based satellite carrier transmissions, or those transmissions can be used to measure the local clock errors." (Reply Br. at 3.)

"Analysis begins with a key legal question -- *what is the invention claimed?*" *Panduit Corp. v. Dennison Mfg. Co.*, 810 F.2d 1561, 1567, 1 USPQ2d 1593, 1597 (Fed. Cir. 1987). "Claim interpretation, in light of the specification, claim language, other claims, and prosecution history, . . . will normally control the remainder of the decisional process." *Id.*, 1 USPQ2d at 1597.

Here, contrary to the examiner's assertion, claim 12 does not require that the claimed satellite transmissions include the claimed calibration signal. Instead, the claim

allows the signal to be derived from the transmissions via post processing. Therefore, we reverse the nonenablement rejection of claim 12.

Obviousness Rejection of Claims 1-7

"[T]o assure separate review by the Board of individual claims within each group of claims subject to a common ground of rejection, an appellant's brief to the Board must contain a clear statement for each rejection: (a) asserting that the patentability of claims within the group of claims subject to this rejection do not stand or fall together, and (b) identifying which individual claim or claims within the group are separately patentable and the reasons why the examiner's rejection should not be sustained." *In re McDaniel*, 293 F.3d 1379, 1383, 63 USPQ2d 1462, 1465 (Fed. Cir. 2002 (citing 37 C.F.R. §1.192(c)(7) (2001))). "Merely pointing out differences in what the claims cover is not an argument as to why the claims are separately patentable." 37 C.F.R. § 1.192(c)(7) (2002). "If the brief fails to meet either requirement, the Board is free to select a single claim from each group of claims subject to a common ground of rejection as representative of all claims in that group and to decide the appeal of that rejection based solely on the selected representative claim." *McDaniel*, 293 F.3d at 1383, 63 USPQ2d at 1465.

Here, the appellants fail to meet the second requirement. They expressly group claims 4-7 together, stating that "claims 4-7 are drawn to a method of automatically calibrating an electronic distance meter." (Appeal Br. at 3.) Rather than arguing the patentability of claims 4-7 separately from claim 1, moreover, the appellants allege, "[t]he cited references fail to teach or suggest the combination of elements and steps of the pending claims." (Reply Br. at 5.) Therefore, claims 4-7 stand or fall with representative claim 1.

With this representation in mind, we address the obviousness of the claims in the following order:

- claims 1 and 4-7
- claim 2
- claim 3.

Claims 1 and 4-7

We address the two points of contention between the examiner and the appellants. First, the examiner makes the following assertion.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Liessner et al by providing the required calibration of the reference oscillator by using the teachings of Osterdock et al who suggest the use of a GPS receiver to disseminate frequency and time standards of unprecedented accuracies, and which are locked to the satellites' atomic standards, thereby providing very accurate and traceable frequency and time very inexpensively.

(Examiner's Answer at 5.) The appellants argue, "[t]he motivations offered have been shallow and of little technical merit, e.g., 'all secondary frequency sources require periodic calibration'." (Appeal Br. at 8.)

"The presence or absence of a motivation to combine references in an obviousness determination is a pure question of fact." *In re Gartside*, 203 F.3d 1305, 1316, 53 USPQ2d 1769, 1776 (Fed. Cir. 2000) (citing *In re Dembiczak*, 175 F.3d 994, 1000, 50 USPQ2d 1614, 1617 (Fed. Cir. 1999)). "[T]he question is whether there is something in the prior art as a whole to suggest the desirability, and thus the obviousness, of making the combination." *In re Beattie*, 974 F.2d 1309, 1311-12, 24 USPQ2d 1040, 1042 (Fed. Cir. 1992) (quoting *Lindemann Maschinenfabrik GMBH v. American Hoist & Derrick Co.*, 730 F.2d 1452, 1462, 221 USPQ 481, 488 (Fed. Cir. 1984)). "[E]vidence of a suggestion, teaching, or motivation to combine may flow from the prior art references themselves, the knowledge of one of ordinary skill in the art, or, in some cases, from the nature of the problem to be solved. . . ." *Dembiczak*, 175 F.3d at 999, 50 USPQ2d at 1617 (citing *Pro-Mold & Tool Co. v. Great Lakes Plastics, Inc.*, 75 F.3d 1568, 1573, 37 USPQ2d 1626, 1630 (Fed. Cir. 1996); *Para-Ordnance Mfg. v. SGS Imports Int'l, Inc.*, 73 F.3d 1085, 1088, 37 USPQ2d 1237, 1240 (Fed. Cir. 1995)).

Here, we find that evidence of a suggestion, teaching, or motivation to combine flows from the references themselves. Although Liessner does not describe using a time standard in an orbiting navigation satellite to control its "reference oscillator 12 for providing a reference oscillator signal f_1 ," col. 3, ll. 64-65, the reference emphasizes that its "description is not intended to limit the invention. . . ." Col. 8, ll. 47-48. To the contrary, we find that Liessner invites "[o]ther modifications and implementations" to its invention. *Id.* at l. 44.

Turning to Osterdock, we find that the reference recognizes a requirement of oscillators. Specifically, "[a]ll secondary frequency sources, such as Rubidium frequency standards and quartz **oscillators**, require periodic calibration. . . ." P. 34, col. 1 (emphasis added). We further find that Osterdock meets the requirement in an advantageous manner. Specifically, the "use of GPS receivers which are locked to the satellites can provide the user with very accurate, and traceable, frequency and time very inexpensively." P. 38, col. 1. "One such GPS receiver is the Stellar GPS Corporation Model 100 GPS Clock. It is a small, lightweight, low cost, GPS receiver that has a unique frequency-based architecture offering and easy-to-use precise, accurate, and stable frequency, as well as time, that can be used directly in calibration operations." *Id.* Because Liessner employs an oscillator to provide a reference signal, and Osterdock meets a requirement of oscillators in a manner that is accurate,

traceable, and stable, we find that a suggestion, teaching, or motivation to use a time standard in a GPS satellite to control Liessner's reference oscillator flows from the references themselves.

Second, the examiner asserts, "the proposed combination would include a reference oscillator calibrated by a GPS signal, and an EDM device and a phase measurement device that utilizes the EDM timing information and the GPS-calibrated reference oscillator signal to provide timing information used for determining distance information." (Examiner's Answer at 9.) The appellants argue, "[t]he reference oscillator mentioned in the reference is not 'controlled by said pulse-per-second output and providing a reference frequency with a timing accuracy directly related to a timing accuracy of said atomic time standard'." (Appeal Br. at 8.)

"[T]he Board must give claims their broadest reasonable construction. . . ." *In re Hyatt*, 211 F.3d 1367, 1372, 54 USPQ2d 1664, 1668 (Fed. Cir. 2000). "Moreover, limitations are not to be read into the claims from the specification." *In re Van Geuns*, 988 F.2d 1181, 1184, 26 USPQ2d 1057, 1059 (Fed. Cir. 1993) (citing *In re Zletz*, 893 F.2d 319, 321, 13 USPQ2d 1320, 1322 (Fed. Cir. 1989)).

Here, claim 1 specifies in pertinent part the following limitations: "a reference oscillator controlled by said pulse-per-second output and providing a reference frequency with a timing accuracy directly related to a timing accuracy of said atomic time standard. . . ." Giving the representative claim its broadest, reasonable construction, the limitations require using a pulse-per-second ("PPS") output to control a reference oscillator in order to impart a timing accuracy directly related to that of an atomic time standard.

The question of obviousness is "based on underlying factual determinations including . . . what th[e] prior art teaches explicitly and inherently. . . ." *In re Zurko*, 258 F.3d 1379, 1386, 59 USPQ2d 1693, 1697 (Fed. Cir. 2001) (citing *Graham v. John Deere Co.*, 383 U.S. 1, 17-18, 148 USPQ 459, 467 (1966); *In re Dembiczak*, 175 F.3d 994, 998, 50 USPQ 1614, 1616 (Fed. Cir. 1999); *In re Napier*, 55 F.3d 610, 613, 34 USPQ2d 1782, 1784 (Fed. Cir. 1995)). "Non-obviousness cannot be established by attacking references individually where the rejection is based upon the teachings of a combination of references." *In re Merck*, 800 F.2d, 1091, 1097, 231 USPQ 375, 380 (Fed. Cir. 1986) (citing *In re Keller*, 642 F.2d 413, 425, 208 USPQ 871, 881 (CCPA 1981)). "Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art." *Cable Elec. Prods., Inc. v. Genmark*,

Inc., 770 F.2d 1015, 1025, 226 USPQ 881, 886-87 (Fed. Cir. 1985) (quoting *Keller*, 642 F.2d at 425, 208 USPQ at 881).

Here, the rejection is based on the combined teachings of Liessner and Osterdock. The appellants' argument that Liessner **individually** does not anticipate the aforementioned limitations overlooks what the combined teachings of the references would have suggested to those of ordinary skill in the art. Specifically, when a GPS receiver as taught by Osterdock was used to control Liessner's reference oscillator, we find that the receiver would have "provide[d] a 1 PPS output." Osterdock, p. 38, col. 2. We further find that the timing accuracy imparted by such a receiver would relate directly to "atomic standards on board each of the [GPS] satellites. . . ." *Id.*, col. 1. Therefore, we affirm the obviousness rejection of claim 1 and of claims 4-7, which fall therewith.

Claim 2

The examiner asserts, "[t]he features of the theodolites are conventional in the art." (Examiner's Answer at 5.) The appellants argue, "[t]he cited references fail to teach or suggest," (Reply Br. at 5), an "additional interconnected theodolite navigation computer and servo activator with specified interconnection." (Reply Br. at 5.)

"[T]he main purpose of the examination, to which every application is subjected, is to try to make sure that what each claim defines is patentable. *[T]he name of the game is the claim. . . .*" *In re Hiniker Co.*, 150 F.3d 1362, 1369, 47 USPQ2d 1523, 1529 (Fed. Cir. 1998) (quoting Giles S. Rich, *The Extent of the Protection and Interpretation of Claims --American Perspectives*, 21 Int'l Rev. Indus. Prop. & Copyright L. 497, 499, 501 (1990)). Here, besides a theodolite, claim 2 specifies in pertinent part the following limitations: "a navigation computer disposed within the satellite navigation receiver and connected to receive a target-position seed value related to said distant target; and a servo actuator connected to mechanically manipulate the theodolite in azimuth and elevation; wherein, the navigation computer is connected to the servo actuator and provides a signal that will reposition the theodolite. . . ."

"In rejecting claims under 35 U.S.C. Section 103, the examiner bears the initial burden of presenting a *prima facie* case of obviousness." *In re Rijckaert*, 9 F.3d 1531, 1532, 28 USPQ2d 1955, 1956 (Fed. Cir. 1993)(citing *In re Oetiker*, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992)). "A *prima facie* case of obviousness is established when the teachings from the prior art itself would . . . have suggested the claimed subject matter to a person of ordinary skill in the art." *In re Bell*, 991 F.2d 781, 783, 26 USPQ2d 1529, 1531 (Fed. Cir. 1993) (quoting *In re Rinehart*, 531 F.2d 1048, 1051, 189 USPQ 143, 147 (CCPA 1976)).

Here, although we do not disagree that some features of theodolites are conventional in the art, the examiner fails to allege, let alone show, that the combined teachings of the references would have suggested the aforementioned limitations. We will not "resort to speculation," *In re Warner*, 379 F.2d 1011, 1017, 154 USPQ 173, 178 (CCPA 1967), as to such a suggestion. Therefore, we reverse the obviousness rejection of claim 2.

Claim 3

The appellants argue, "[t]he cited references fail to teach or suggest," (Reply Br. at 5), "further limitations regarding location of the satellite navigation receiver with a radio link communication to the reference oscillator." (Reply Br. at 5.) The examiner offers no response to the argument.

Claim 3 specifies in pertinent part the following limitations: "the satellite navigation receiver is remotely located and communicates via a radio link to the reference oscillator. . . ." The examiner fails to allege, let alone show, that the combined teachings of the references would have suggested the aforementioned limitations. Again, we will not "resort to speculation," *Warner*, 379 F.2d at 1017, 154 USPQ at 178, as to such a suggestion. Therefore, we reverse the obviousness rejection of claim 3.

CONCLUSION

In summary, the rejections of claims 5, 6, and 12 under 35 U.S.C. § 112, ¶ 2; the rejection of claim 6 under § 112, ¶ 1, as nonenabled; and the rejection of claims 1 and 4-7 under § 103(a) are affirmed. The rejections of claims 6 and 12 under § 112, ¶ 1, as lacking a written description; the rejection of claim 12 under § 112, ¶ 1, as nonenabled; and the rejections of claims 2 and 3 under § 103(a), however, are reversed. "Any arguments or authorities not included in the brief will be refused consideration by the Board of Patent Appeals and Interferences. . . ." 37 C.F.R. § 1.192(a)(2002).

Accordingly, our affirmance is based only on the arguments made in the brief(s). Any arguments or authorities not included therein are neither before us nor at issue but are considered waived. No time for taking any action connected with this appeal may be extended under 37 C.F.R. § 1.136(a).

AFFIRMED-IN-PART

MICHAEL R. FLEMING)
Administrative Patent Judge)
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) BOARD OF PATENT
LANCE LEONARD BARRY) APPEALS
Administrative Patent Judge) AND
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