UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte NARENDRA DIGAMBER JOSHI and
RICHARD LAMAR FRANTZ

Appeal 2008-1333
Application 10/604,870
Technology Center 3600

Decided: September 23, 2008

Before WILLIAM F. PATE, III, MURRIEL E. CRAWFORD and DANIEL S. SONG, *Administrative Patent Judges*.

SONG, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

The Appellants appeal under 35 U.S.C. § 134 (2002) from a Final Rejection of claims 1-12 and 14-29. Claim 13 has been indicated to be

allowable if written to be in independent form. We have jurisdiction under 35 U.S.C. § 6(b) (2002).

The Appellants claim an apparatus and method in which information relating to at least one part of an individual engine component of a turbine engine is stored in an information storage device that is permanently deployed on the individual engine component.

Independent claim 1 reads as follows:

> 1. An apparatus for recording, storing, updating, and retrieving operating, maintenance and repair information relating to at least one part of at least one individual engine component of a turbine engine, said apparatus comprising at least one information storage device permanently deployed on said at least one individual engine component said information storage device further comprising:
>
> a) identification information about said at least one part of the individual engine component stored thereon;
>
> b) at least one updatable data register having data storage capability, said data register referenced by stored identification information of said at least one part and a parameter recorded by said data register;
>
> wherein said information storage device is accessible for at least one of the following:
>
> i) recording and storing maintenance work done when the individual engine component undergoes maintenance;
>
> ii) updating said information storage device when said at least one part is exchanged for a replacement part; and
>
> iii) retrieving recorded and stored information in said information storage device under certain selected conditions.

Independent claim 20 is directed to a similar apparatus while independent claims 24 and 27 are directed to methods for recording, storing, updating and retrieving operating and maintenance information relating to a turbine engine component.

The prior art relied upon by the Examiner in rejecting the claims is:

Muehl	US 2004/0024501 A1	Feb. 5, 2004
Katayanagi	US 6,321,983 B1	Nov. 27, 2001
Vogan	5,968,107	Oct. 19, 1999
Martin	4,280,185	Jul. 21, 1981

The Examiner rejected the appealed claims under 35 U.S.C. § 103(a) as unpatentable over the prior art of record.

We AFFIRM.

ISSUES

The following issues have been raised in the present appeal.

1. Whether the Examiner erred in rejecting claims 1-10, 12, 14-17 and 19-29 as unpatentable over Martin, Muehl and Katayanagi which turns on whether it would have been obvious to one of ordinary skill in the art to provide an information storage device with information relating to a part of an engine component instead of information relating to the engine component.

2. Whether the Appellants have shown that the Examiner erred in rejecting claims 11 and 18 as unpatentable over Martin, Muehl, Katayanagi and Vogan.

FINDINGS OF FACT

The record supports the following findings of fact (FF) by a preponderance of the evidence.

1. Martin describes a life tracking system for recording, storing, updating, and retrieving information relating to at least one individual engine component 20-24 of a turbine engine 18 (col. 1, ll. 44-55; col. 3, ll. 38-49; fig. 1). The life tracking system includes at least one information storage device 30-34 permanently deployed on the engine components, the device including identification information about the individual engine component stored thereon (col. 1, ll. 44-65; col. 3, ll. 50-53; col. 6, ll. 63-68).

2. Muehl describes a method for recording, storing, updating, and retrieving operating, maintenance and repair information relating to a complex article such as a turbine engine 110 of an aircraft 100 (¶¶ [0003] and [0030]; fig. 1). The method includes permanently providing an electronically accessible tag 130 (i.e., information storage device) on a compressor 115 (i.e., an individual engine component) of a turbine engine, the tag including identification information about the engine component and accessible for recording and storing maintenance work done (¶¶ [0004], [0005], [0031] and [0034]; figs. 1, 3-5).

3. Katayanagi describes a method and system for managing the life cycle of products which records, stores, updates, and retrieves operating, maintenance and repair information relating to the product and its parts, the system including a storage device permanently deployed on the product, the storage device having identification information about the parts of the

product and being accessible to record and store information related to maintenance work (col. 2, ll. 7-18; col. 4, l. 63-col. 5, l. 3).

PRINCIPLES OF LAW

"Section 103 forbids issuance of a patent when 'the differences between the subject matter sought to be patented 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 to which said subject matter pertains.'" *KSR Int'l Co. v. Teleflex Inc.*, 127 S.Ct. 1727, 1734 (2007). The question of obviousness is resolved on the basis of underlying factual determinations including (1) the scope and content of the prior art, (2) any differences between the claimed subject matter and the prior art, (3) the level of skill in the art, and (4) where in evidence, so-called secondary considerations. *Graham v. John Deere Co.*, 383 U.S. 1, 17-18 (1966). In *KSR*, the Supreme Court also explained:

> When a work is available in one field of endeavor, design incentives and other market forces can prompt variations of it, either in the same field or a different one. If a person of ordinary skill can implement a predictable variation, §103 likely bars its patentability. For the same reason, if a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill.

KSR, 127 S.Ct. at 1740.

The Court further explained, "[o]ften, it will be necessary for a court to look to interrelated teachings of multiple patents; the effects of demands known to the design community or present in the marketplace; and the background knowledge possessed by a person having ordinary skill in the art, all in order to determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue." *Id.* at 1740-41.

The Court noted that "[t]o facilitate review, this analysis should be made explicit." *Id.* at 1741, citing *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006) ("[R]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness"). However, "the analysis need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ." *Id.* at 1741.

ANALYSIS

<u>Claims 1-10, 12, 14-17 and 19-29</u>

With the exception of dependent claim 16, the Appellants argue these claims together as a group in the Appeal Brief (App. Br. 12-16). Thus, we select representative claim 1 to decide the appeal of claims 1-10, 12, 14, 15, 17 and 19-29, these claims standing or falling together. *See* 37 C.F.R. § 41.37(c)(1)(vii).

We note that there does not appear to be any material issues of fact as to what the prior art of record discloses. The Appellants initially point out and take issue with the Examiner's inconsistent position regarding whether Muehl describes a tag (i.e. an information storage device) having information regarding the parts of a component of a turbine engine (App. Br. 12 and 13). However, this issue is moot in view of the Examiner's clarification and concession in the Examiner's Answer that the tag of Muehl includes information regarding the component of a turbine engine, but *does not* include information regarding the parts of the component (Ans. 14).

In addition, the Examiner also concedes that the Martin and Muehl, individually or in combination, *do not* teach storing information on individual parts of the components making up the turbine engine, thereby agreeing with the Appellants' position (Ans. 15). Thus, the difference between the claimed subject matter and the combination of Martin and Muehl is that the information storage device of the Appellants' invention includes maintenance and repair information relating to *a part of an individual engine component*, as opposed to the individual engine component itself which is described by the prior art combination.

The Examiner relies on Katayanagi for curing any deficiencies of the combination of Martin and Muehl, Katayanagi describing a system for managing the life cycle of a product where the product is provided with a tag that stores information about not only the product, but also the parts of the product (FF 3; Ans. 4, 5 and 15). The Examiner finds that it would have been obvious to one of ordinary skill in the art to provide an information storage device that stores identification and information about an individual

part of the larger component in view of Katayanagi, so as to improve maintenance of the engine as taught in Martin and Muehl, and to provide a more detailed tracking of the parts as taught in Katayanagi (Ans. 4, 5 and16).

The Appellants contend that the Examiner failed to establish a prima facie case of obviousness by failing to show motivation to combine the cited prior art references in the manner suggested, and further contend that the Examiner is deriving motivation for searching and combining the prior art from the Appellants' disclosure using impermissible hindsight (App. Br. 12-15).

With respect to the Appellants' argument regarding motivation, we note that the Examiner need not seek out precise teachings directed to the specific subject matter of the challenged claim. *KSR*, 127 S.Ct. at 1741. What is required is for the Examiner to articulate a rational reason for combining the references. *See In re Kahn*, 441 F.3d at 988.

In the above regard, the Examiner reasons that the combination of Martin and Muehl teaches that "storing information on the components is beneficial to track the components and store maintenance and repair histories," and also states that this reasoning "also applies to why it would have been desirable for one of ordinary skill in the art at the time of the invention to modify the system to include more detailed information on the part level, rather than just the component" as evidenced by Katayanagi (Ans. 4 and 5). In this regard, the Examiner further states that such combination is desirable to "provide for life cycle management of the products as well as an evaluation of whether a product or parts thereof should be recycled or

destroyed" (Ans. 16). In view of the record before us, we find that the Examiner has articulated rational reasons for combining Katayanagi with Martin and Muehl which are sufficient to support the conclusion of obviousness, the Appellants not providing any persuasive arguments as to why the articulated reasons are not rational.

Furthermore, as also argued by the Examiner (Ans. 16), the Appellants' invention of claim 1 merely extends the prior art technique to the part of the component. In particular, the prior art records, stores, updates and retrieves information relating to an airplane, a turbine engine, and a component of the turbine engine (i.e., compressor of a turbine engine). The Appellants' invention applies the same technique of using storage devices to provide information regarding a part of the component in order to improve maintenance and tracking life limited parts. Thus, the claimed invention merely extends the application of the prior art technique to parts of components to yield predictable results, such application being within the skill of one of ordinary skill in the art. *See KSR*, 127 S.Ct. at 1740.

The Appellants also contend that the Examiner's motivation for searching and finding Katayanagi was improperly based on Appellants' disclosure (App. Br. 13). The basis for this argument is not understood because any prior art search performed by the Examiner will necessarily be based on the Appellants' disclosure which defines the invention. In addition, the manner in which the Examiner uncovered a particular prior art reference is immaterial to the obviousness analysis.

With respect to the Appellants' argument that Katayanagi is directed to a non-analgous art (Reply Br. 2), we disagree and find that Katayanagi is

reasonably pertinent to the problem addressed by the Appellants' invention. In particular, the Appellants' invention addresses "the problem of keeping accurate repair, maintenance, and operating data for turbine engine components and the parts that make up the components" (Spec. ¶ [0016]). Katayanagi addresses a similar problem of efficiently and accurately providing parts and maintenance information using electronic tags (i.e., information storage devices) that are affixed and updated so that the life cycle of a product can be managed (FF 3). While Katayanagi does not identify a specific product, Katayanagi is directed to products with parts that have limited useful life, and does not preclude application to turbine engines. Thus, we find that Katayanagi is reasonably pertinent to the particular problem being addressed by the Appellants' invention.

In view of the above, we conclude that the Appellants have not shown that the Examiner erred in rejecting independent claim 1 as unpatentable over Martin, Muehl and Katayanagi. Thus, we also find that the Appellants have not shown that the Examiner erred in rejecting claims 2-10, 12, 14, 15, 17 and 19-29 as unpatentable.

With respect to claim 16, the Appellants contend that the prior art does not disclose or suggest information that is supplied and stored on the information storage device from a remote location as specifically recited (App. Br. 16). However, as noted by the Examiner (Ans. 6, 19 and 20), Martin teaches that the information can be supplied to the storage device by a life tracking unit mounted off of the engine (i.e., a remote location) thereby satisfying the recited limitation of claim 16 (col. 3, ll. 45-58; col. 4, ll. 29-33). Therefore, we also conclude that the Appellants have not shown that

the Examiner erred in rejecting claim 16 as unpatentable over Martin, Muehl and Katayanagi.

Claims 11 and 18

The Examiner concedes that the combination of Martin, Muehl and Katayanagi does not teach predicting future maintenance requirements from the data collected as recited in claims 11 and 18 (Ans. 13). However, the Examiner finds that parameter trending of engines is known as evidenced by Vogan which describes using stored data regarding a component to predict the future maintenance requirements of the component before a failure occurs in order to minimize downtime or repair time (Ans. 13 and 14).

The Appellants again contend that the Examiner fails to establish a prima facie case of obviousness stating that the Examiner has not identified any motivation to combine the references, and that the Examiner used hindsight to search and combine Vogan with the other cited references (App. Br. 17). The Appellants further contend that Muehl does not specifically mention the parameter trending of engines disclosed in Vogan, and thus, the Examiner's finding of obviousness in unsupported by the evidence (App. Br. 17 and 18).

With respect to motivation, the Examiner states that it would have been obvious to one of ordinary skill to use the stored information of the combination of Martin, Muehl and Katayanagi in the manner claimed, because "by collecting these engine parameters for trending[,] engine failure can be prevented or predicted and this reduces downtime" (Ans. 14 and 20). The Examiner further states that Vogan teaches that downtime can be very

expensive and "preventing this is widely recognized in the art as being a significant motivation" so that one of ordinary skill in the art "would recognize this cost savings as being beneficial" (Ans. 20).

Thus, in view of the record before us, we find that the Examiner has clearly articulated rational reasons for combining Vogan with the other references which are sufficient to support the conclusion of obviousness, the Appellants not providing any persuasive arguments as to why the articulated reasons are not rational. *See In re Kahn*, 441 F.3d at 988.

With respect to the Appellants' assertion of impermissible hindsight used in the Examiner's search, we again note that the Appellants' invention is the basis for patent examination. Furthermore, the Appellants' argument based on the fact that Muehl fails to mention parameter trending of engines as described in Vogan is not based on law and would render obviousness analysis under 35 U.S.C. § 103 unnecessary as noted by the Examiner (Ans. 21).

In view of the above, we find that the Appellants have not shown that the Examiner erred in rejecting claims 11 and 18 as unpatentable over Martin, Muehl, Katayanagi and Vogan.

CONCLUSIONS

1. The Appellants have not shown that the Examiner erred in rejecting claims 1-10, 12, 14-17 and 19-29 as unpatentable over Martin, Muehl and Katayanagi.

2. The Appellants have not shown that the Examiner erred in rejecting claims 11 and 18 as unpatentable over Martin, Muehl, Katayanagi and Vogan.

ORDER

The Examiner's rejections of claims 1-12 and 14-29 are AFFIRMED.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a). *See* 37 C.F.R. § 1.136(a)(1)(iv) (2007).

AFFIRMED

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