

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte STEPHEN D. CROMWELL,
XIANG DAI, and HAMID R. NIKZAD

Appeal 2008-0740
Application 10/447,542
Technology Center 2800

Decided: May 21, 2008

Before THOMAS A. WALTZ, ROMULO H. DELMENDO, and
KAREN M. HASTINGS, *Administrative Patent Judges*.

HASTINGS, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellants appeal under 35 U.S.C. § 134(a) from the Examiner's final rejection of claims 1-5, 7, 8, 10-21, 38-40, and 42-48. We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

BACKGROUND

The invention relates to components of hardware attach assemblies for securing Application Specific Integrated Circuits (ASIC) to a circuit board. Appellants' invention is to coat at least one component of such assemblies with a coating to protect that component from corrosion (Spec. 2, ¶ [0008]).

Claims 1 and 16 are illustrative:

1. A load plate for attaching an Application Specific Integrated Circuit (ASIC) to a circuit board in an ASIC assembly comprising:
a load plate sized and shaped to apply pressure to an ASIC in an ASIC assembly; and
a protective coating on said load plate to protect said load plate from corrosion.

16. A component of an attach hardware assembly for securing an Application Specific Integrated Circuit (ASIC) to a circuit board, said component which is configured to secure an ASIC to a circuit board as part of an hardware assembly comprising a protective coating on said component to protect said component from corrosion.

The Examiner relies upon the following prior art references in the rejections of the appealed claims:

Frankeny	5,770,891	Jun. 23, 1998
Choudhury	6,058,014	May 2, 2000
Lutkus	6,224,311 B1	May 1, 2001
Rackham	US 2003/0096133 A1	May 22, 2003
Ohashi (as translated)	JP 2-304209	Dec. 18, 1990
Hideaki ¹ (as translated)	JP 406069391A	Mar. 11, 1994

¹ JP '391 is referred to as "Hideaki" consistent with the Examiner's Answer and Appeal Brief.

The Examiner rejected claims 1, 3-5, 7, 8, 10-14, 16-21, 38-40, and 42-48 under 35 U.S.C. § 103(a) as being unpatentable over Frankeny in view of Hideaki, Lutkus, Rackham, and Ohashi. To reject claims 2 and 15, the Examiner added Choudhury.

Appellants separately argue independent claim 1 from the remaining independent claims 7, 16, 38, and 46, which are argued as a group. Thus, we will consider claims 1 and 3-5 as one group and claims 7, 8, 10-14, 16-21, 38-40, and 42-48 as a separate group within the first ground of rejection. Appellants do not argue with any reasonable specificity any of the individual dependent claims within each group (App. Br. 6-12; Reply Br. 2-6)², except for dependent claims 10, 17, and 42 (App. Br. 11)³ which we will specifically address within our discussion. With respect to the rejection of claims 2 and 15, Appellants rely on the same arguments advanced with respect to the other rejection. Therefore, we select independent claim 1 and independent claim 16 to decide the issues on appeal.

ISSUES ON APPEAL

The issues on appeal arising from the contentions of Appellants and the Examiner are whether the Appellants have shown that the Examiner reversibly erred in rejecting the claims because:

- (a) Frankeny does not disclose a load plate; and

² See 37 C.F.R. § 41.37(c)(1)(vii) (“A statement which merely points out what a claim recites will not be considered an argument for separate patentability of the claim.”).

³ Each of dependent claims 10, 17, 42, and 47 require a “load plate” as does independent claim 1. Appellants inadvertently did not include claim 47 (App. Br. 11).

(b) there is no apparent reason in the prior art to combine the references as proposed by the Examiner.

FINDINGS OF FACT

1. Frankeny describes components of an attach hardware assembly including an arch 24 for attaching an ASIC to a circuit board in an ASIC assembly (Fig. 7). Frankeny describes that compressive force is applied by a screw 26 which goes through the arch (e.g., col. 6, ll. 21-27). The arch is described as a “compression arch” (Frankeny, claim 1).
2. Appellants’ Background section of the Specification describes that it was known to secure a load plate, “typically made of steel,” “typically with a screw” to clamp the ASIC to the circuit board (Spec. 1-2; ¶ [0004]). Fig. 1 is described by Appellants as “a typical ASIC assembly” (Spec. 3, ¶ [0016]). The environmental conditions to which the hardware is exposed “typically tends to cause corrosion” (Spec. 2, Background section, ¶ [0005]).
3. Appellants describe that their invention is to provide a coating, such as a fluoropolymer coating (which may be XYLAN®), to protect the steel hardware attach elements against corrosion (*see*, e.g., p. 3, ¶ [0015]; p. 4-5, ¶ [0023]-[0024]).
4. Hideaki describes a problem of corrosion and discoloration which occurs on the metal screw stud (e.g., a steel stud) used to mount a heat-radiating fin on the base plate of a semiconductor package. To solve this problem, a protective coating is used; specifically, a coating of nickel plating (*see*, p. 4, ¶ [0011]-[0014]).

5. Lutkus describes fastener inserts (e.g., of stainless steel) coated with a fluoropolymer composition (such as XYLAN®) for protection against corrosion (col. 3, ll. 14-24). The coating will be useful in any application in which fasteners are used and corrosion is a potential problem (col. 1, ll. 4-27).
6. Rackham describes that XYLAN® is used to retard corrosion on bolts, piston rods, and other metal parts of internal combustion engines (col. 1, ¶ [0008]).
7. Ohashi describes coating tightening bolts and nuts with TEFLON® (a fluoropolymer) or nylon resin, to prevent corrosion (*see*, e.g., p. 1 claim; p. 3, first and second paragraphs).
8. Appellants base no argument upon objective evidence of nonobviousness, such as unexpected results.

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 legal 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) secondary considerations, if any. *Graham v. John Deere Co.*, 383 U.S. 1, 17-18 (1966). *See also KSR*, 127 S. Ct. at 1734.

“The combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results.” *KSR*, 127 S. Ct. at 1739. The question to be asked is “whether the improvement is more than the predictable use of prior art elements according to their established functions.” *KSR*, 127 S. Ct. at 1740.

KSR states:

Often, 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.

KSR, 127 S. Ct. at 1740-41.

Moreover, one of the ways in which a claim’s subject matter can be proven obvious is by establishing that there existed at the time of invention a known problem for which there was an obvious solution encompassed by the claims. *KSR*, 127 S. Ct. at 1742.

The Federal Circuit recently recognized that “[a]n obviousness determination is not the result of a rigid formula disassociated from the consideration of the facts of a case. Indeed, the common sense of those skilled in the art demonstrates why some combinations would have been obvious where others would not.” *Leapfrog Enter., Inc. v. Fisher-Price, Inc.*, 485 F.3d 1157, 1161 (Fed. Cir. 2007).

OPINION

We agree with the Examiner's findings of facts and legal conclusions of obviousness as set out in the Answer. We add the following primarily for emphasis.

Claims 1 and 3-5

We chose independent claim 1 to represent this grouping of claims.

Frankeny describes a compression arch 24 and loading screw for attaching an ASIC to a circuit board in an ASIC assembly (FF 1). Indeed, one of ordinary skill in the art would readily appreciate that Appellants admit that these elements are known in the prior art (FF 2). Each of Hideaki, Lutkus, Rackham, and Ohashi describes coating various components (e.g., bolts, studs, etc.) with a protective coating to prevent corrosion (FF 4-7).

We are in complete agreement with the Examiner that a person having ordinary skill in the art would have found it obvious to coat the compression arch (i.e., the load plate) and/or other components, such as the load screw, of Frankeny with a protective coating as claimed in order to prevent or retard corrosion, and thus arrive at Appellants' claimed invention (Ans. 2-12).

Appellants contend that (1) the arch 24 of Frankeny is not a load plate as claimed in claim 1, and (2) that there is no apparent reason in the prior art to combine Frankeny with the teachings of Hideaki, Lutkus, Rackham, and Ohashi as proposed by the Examiner (App. Br. 4; Reply Br. 2-5). In particular, Appellants contend that arch 24 is not a load plate because the compressive force is applied by the screw and not the arch (Reply Br. 2). Appellants further contend that the prior art fails to teach or suggest the claimed protective coating on a load plate, or on any component of an attach hardware assembly of an ASIC assembly. According to Appellants, "While

the prior art recognizes such coatings in many fields, there is no suggestion...that a protective, anti-corrosion coating be or should [be] used on the various components of an attach hardware assembly.” (App. Br. 11; Reply Br. 5). We do not find these arguments persuasive of error in the Examiner’s rejection for the following reasons.

First, we note that Frankeny describes that the arch 24 is attached to the backup plate 21 at the bottom of the assembly, and the screw 26 which applies a compressive force to the underlying elements is screwed in through the arch (*see* Fig. 7). Note the similarity to Appellants’ “typical Fig. 1” wherein a load screw 102 is connected via the load plate 101 to the bolster plate 109; indeed, Appellants admit that such a load plate was known in the prior art (FF 2).⁴ Furthermore, note claim 1 of Frankeny refers to the arch as “a compression arch” with “compression adjusting means in the compression arch.” The compression arch is “sized and shaped” to apply at least some pressure to an ASIC, which is all that is required by claim 1. Thus, we determine that a load plate as claimed does read on the compression arch of Frankeny.

Second, the four secondary references exemplify, as even Appellants concede, that the use of protective coatings on hardware components was widespread (FF 4-7; App. Br. 11). We determine that one of ordinary skill

⁴ Having acknowledged that certain claimed elements are in the prior art, Appellants cannot now defeat an obviousness rejection by asserting that the cited references fail to teach or suggest these elements. *In re Reuning*, No. 2007-1535, slip op. at 6 (Fed. Cir. April 25, 2008); *see also Constant Advanced Micro-Devices, Inc.*, 848 F.2d 1560, 1570 (Fed. Cir. 1988) (“A statement in a patent that something is in the prior art is binding on the applicant and patentee for determinations of anticipation and obviousness.”)

would have realized that one way to ensure the compression arch (load plate) or other hardware components of Frankeny are protected from corrosion would be to apply a protective coating known for that purpose thereto.

The Supreme Court noted in *KSR* that although the teaching, suggestion, motivation test “captured a helpful insight,” an obviousness 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.” *KSR*, 127 S. Ct. at 1741. The knowledge that coating hardware components in various fields, including the semiconductor package field, was a desirable way to protect such components from corrosion would have been within the ordinary skill in the art, as evidenced by Hideaki, Lutkus, Rackham, and Ohashi. Furthermore, one of ordinary skill in the art is also a person of ordinary creativity, not an automaton. *KSR*, 127 S. Ct. at 1742.

Therefore, it would have been prima facie obvious at the time the invention was made to have used the protective coating of the prior art on either the load plate or the load screw or any other of the hardware components of Frankeny, or the admitted prior art (i.e., the “typical” ASIC assembly of Appellants’ Fig. 1). This would predictably improve the corrosion resistance of these metal hardware components, a result that one of ordinary skill in the art would readily appreciate was desirable. *See KSR*, 127 S. Ct. at 1739-40 (The question to be asked is “whether the improvement is more than the predictable use of prior art elements according to their established functions.”).

The “improvement” herein appears to be no more than the predictable use of a known coating for its known purpose, for the predictable result of improved protection against corrosion for metal hardware parts.

We also determine that it would not have involved any more than common sense to one of ordinary skill in the art to have used the known coatings as exemplified in the secondary references on the metal hardware components of Frankeny, including the compression arch (i.e., load plate), to prevent the known problem of corrosion of metal parts. Furthermore, Appellants have presented no evidence that the inclusion of a corrosion-preventing coating in the prior art attach hardware assembly was “uniquely challenging or difficult for one of ordinary skill in the art” or “represented an unobvious step over the prior art.” *See, e.g., Leapfrog Enter., Inc.*, 485 F.3d at 1162 (citing *KSR*, 127 S.Ct. at 1741).

Thus, we sustain the Examiner’s § 103 rejection of claims 1, and 3-5 based on Frankeny with Hideaki, Lutkus, Rackham, and Ohashi.

Claims 7, 8, 10-14, 16-21, 38-40, and 42-48

We chose claim 16 to represent this grouping of claims.

It is well established that “[a] claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.” *Verdegaal Bros. v. Union Oil Co.*, 814 F.2d 628, 631 (Fed. Cir. 1987). However, the law of anticipation does not require that the reference ‘teach’ what the subject patent teaches. Assuming that a reference is properly ‘prior art,’ it is only necessary that the claims under attack, as construed, ‘read on’ something disclosed in the reference, i.e., all limitations of the claim are found in the

reference, or ‘fully met’ by it. *See Kalman v. Kimberly-Clark Corp.*, 713 F.2d 760, 772 (Fed. Cir. 1983).

It is axiomatic that claims are given their broadest reasonable interpretation in light of the specification as they would be interpreted by one of ordinary skill in the art. *In re Am. Acad. of Sci. Tech. Ctr.*, 367 F.3d 1359, 1364 (Fed. Cir. 2004).

Claim 16 is directed to “a component of an attach hardware assembly” which is “configured to secure an ASIC to a circuit board.” We interpret this claim as being drawn to the component *per se*, capable of being used as a component of an attach assembly to secure an ASIC to a circuit board⁵.

With this claim interpretation in mind, we note that at least the screw stud 5 of Hideaki, which was used in a semiconductor package (*see* FF 4), appears to be sized and shaped such that it reasonably appears capable of being used as a component of the hardware to secure an ASIC to a circuit board.

We, therefore, conclude that the component of claim 16 reads on the prior art of Hideaki. Thus, the claimed invention lacks novelty. A lack of novelty is the ultimate or epitome of obviousness. *See In re Fracalossi*, 681 F.2d 792, 794 (CCPA 1982). For this reason alone, we affirm the Examiner’s legal conclusion of obviousness.

Even assuming, *arguendo*, that the component recited in claim 16 is part of a combination of elements, the analysis set forth above with respect to claim 1 applies equally to these claims. Indeed, dependent claims 10, 17,

⁵ This interpretation of claim 16 is also supported by the presence of independent claim 7 which recites the combination of a circuit board, an ASIC, and an attach hardware assembly.

42, and 47 each recite that the coated component of the respective independent claim from which each claim depends (i.e., claims 7, 16, 38 and 46) is a “load plate”, as is required by claim 1. Thus, these claims are prima facie obvious for the same reasons we set forth above with respect to claim 1.

Again, we have determined that it would not have involved any more than ordinary skill, or common sense, to have used the known coatings as exemplified in the secondary references on any or all of the metal hardware components of Frankeny, or the admitted prior art of “typical” Fig. 1, to prevent the known problem of corrosion of metal parts.

We have considered Appellants’ other arguments in the Appeal Brief and Reply Brief, but do not find any of them persuasive.

Thus, for the foregoing reasons, and those stated in the Answer, we sustain the Examiner’s § 103 rejection of claims 7-8, 10-14, 16-21, 38-40, and 42-48 based on Frankeny with Hideaki, Lutkus, Rackham, and Ohashi.

Dependent Claims 2 and 15

Appellants do not separately argue the § 103 rejection of dependent claims 2 and 15 over Frankeny with Hideaki, Lutkus, Rackham, and Ohashi, further in view of Choudhury. Rather, Appellants contend that the rejection is improper for the same reasons that the combination of Frankeny with Hideaki, Lutkus, Rackham, and Ohashi was improper (App. Br. 12). However, we are unpersuaded by Appellants’ arguments regarding that combination for the reasons above.

Accordingly, we sustain the Examiner’s § 103 rejection of claims 2 and 15 based on the combined teachings of Frankeny with Hideaki, Lutkus, Rackham, and Ohashi, further in view of Choudhury.

CONCLUSION

Accordingly, based on our consideration of the totality of the record before us, we have weighed the evidence of obviousness found in the combined teachings of the applied references, with Appellants' countervailing arguments for nonobviousness and conclude that the claimed invention encompassed by appealed claims 1-5, 7-8, 10-21, 38-40, and 42-48 would have been obvious as a matter of law under 35 U.S.C. § 103(a).

The Primary Examiner's decision is affirmed.

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

AFFIRMED

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HEWLETT PACKARD COMPANY
P O BOX 272400
3403 E. HARMONY ROAD
INTELLECTUAL PROPERTY ADMIN.
FORT COLLINS, CO 80527-2400