

however, to overcome the presumption of voluntary resignation, either by the duress or coercion theory or by the misrepresentation theory. As Hargray's resignation was voluntary, we conclude that he was not deprived of any protected interest in his employment by the City. As such, he has no due process claim, and is entitled to neither reinstatement nor damages.

REVERSED.



In re GPAC INC.

No. 93-1216.

United States Court of Appeals,
Federal Circuit.

June 20, 1995.

Reexamination was sought as to patent for method and system of controlling airborne asbestos contamination during course of asbestos removal from existing building. The Patent and Trademark Office Board of Patent Appeals and Interferences rejected on grounds of obviousness, and patent assignee appealed. The Court of Appeals, Edward S. Smith, Senior Circuit Judge, held that: (1) secondary references from art of backdraft dampers in ventilation systems were relevant to obviousness inquiry; (2) determination of skill level of those involved in relevant art by appeal to references in record was not clearly erroneous; (3) licensing of patented method, acceptance and adoption of method, and failure of others to develop alternatives would be accorded little weight in obviousness determination; and (4) patent claims were obvious in light of prior art.

Affirmed.

1. Patents $\text{\textcircled{C}}$ 314(5), 324.55(4)

Whether reference or combination of references renders claimed invention obvious under patent statute is question of law subject to full and independent review in Court of Appeals. 35 U.S.C.A. § 103.

2. Patents $\text{\textcircled{C}}$ 324.55(2)

Court of Appeals reviews for clear error underlying factual findings leading to conclusion that patent is invalid for obviousness; Court of Appeals will disturb factual finding of Board of Patent Appeals, including scope and content of prior art, level of ordinary skill in the art at time of invention, objective evidence of nonobviousness, and differences between prior art and claimed subject matter, only if definitely and firmly convinced that Board has erred. 35 U.S.C.A. § 103.

3. Patents $\text{\textcircled{C}}$ 314(5), 324.55(4)

In determining scope and content of prior art, for purpose of obviousness determination, whether reference is "analogous" is fact question reviewed for clear error. 35 U.S.C.A. § 103.

4. Patents $\text{\textcircled{C}}$ 16.24

Secondary references could be included in relevant prior art for purpose of obviousness inquiry into validity of patent for method of controlling airborne asbestos contamination during course of asbestos removal from existing building; although references did not relate to field of asbestos removal/contamination, references derived from art of backdraft dampers in ventilation systems which was analogous art and logically should have come to inventor's mind in dealing with problem addressed by patented invention. 35 U.S.C.A. § 103.

5. Patents $\text{\textcircled{C}}$ 16(2)

Prior art relevant to obviousness determination necessarily encompasses not only filed of inventor's endeavor but also any analogous arts. 35 U.S.C.A. § 103.

6. Patents $\text{\textcircled{C}}$ 16(2)

In deciding whether reference is from relevant art, for purpose of obviousness inquiry into patent, court first must determine whether reference is within inventor's field of endeavor, and, if it is not, court next must

determine whether reference is reasonably pertinent to particular problem confronting inventor. 35 U.S.C.A. § 103.

7. Patents ⇐16(3)

"Person of ordinary skill in the art," for purpose of obviousness inquiry, is hypothetical person who is presumed to know relevant prior art; in determining this skill level, court may consider various factors including type of problems encountered in the art, prior art solutions to those problems, rapidly with which innovations are made, sophistication of technology, and educational level of active workers in the field, but every factor may not be present in given case and one or more factors may predominate. 35 U.S.C.A. § 103.

See publication Words and Phrases for other judicial constructions and definitions.

8. Patents ⇐324.55(4)

Approach of Board of Patent Appeals in determining level of ordinary skill in the art at time of invention, by appeal to references of record, especially book which was primary reference, for purpose of obviousness inquiry as to patent for method of controlling airborne asbestos contamination during course of asbestos removal from existing building, was not clearly erroneous, as book explained hazards associated with asbestos removal and discussed types of problems encountered as well as possible solutions. 35 U.S.C.A. § 103.

9. Patents ⇐36.1(3, 4), 36.2(1)

In obviousness determination under patent statute, objective evidence of nonobviousness must be considered if present; such evidence includes commercial success of patented invention, whether invention addresses long felt but unsolved needs, and failure of others to produce alternatives to patented invention. 35 U.S.C.A. § 103.

10. Patents ⇐36(1)

For objective evidence to be accorded substantial weight in obviousness determination, its proponent must establish nexus between evidence and merits of claimed invention; to extent that patentee demonstrates required nexus, objective evidence of nonob-

viousness will be accorded more or less weight. 35 U.S.C.A. § 103.

11. Patents ⇐31.1

Licenses taken under patent in suit may constitute evidence of nonobviousness, but only little weight can be attributed to such evidence if patentee does not demonstrate nexus between merits of invention and licenses of record. 35 U.S.C.A. § 103.

12. Patents ⇐31.1

Patentee's licensing of patented method of controlling airborne asbestos contamination during course of asbestos removal from existing building, industry's adoption of method, and failure of others to develop alternatives to patent would be accorded little weight in determining whether patent was invalid as obvious, absent evidence that such occurrences related to subject matter claimed in patent. 35 U.S.C.A. § 103.

13. Patents ⇐16.24

Claims of patent for method of controlling airborne asbestos contamination during course of asbestos removal from existing building were invalid for obviousness, as subject matter implicitly suggested to one of ordinary skill in the art, by teachings of book on need for containing airborne asbestos within enclosed work space upon loss of negative air pressure, backdraft damper art teachings concerning objectionable backflow, and camping tent art teachings involving oversized ventilation flaps. 35 U.S.C.A. § 103.

14. Patents ⇐16(2)

To invalidate claimed subject matter of patent for obviousness, combined teachings of prior art references must suggest, expressly or by implication, improvements embodied by invention. 35 U.S.C.A. § 103.

15. Patents ⇐16.24

Claim of patent for method of controlling airborne asbestos contamination during course of asbestos removal from existing building, which included feature whereby air flow path in work space swept by and picked up dangerous fibers on way to filters, was invalid for obviousness, in light of prior art patent disclosing contamination control sys-

tem that employed sweeping air flow created by diffuser plates located near air inlet. 35 U.S.C.A. § 103.

16. Patents ⇐16.24

Claims of patent for system of controlling airborne asbestos contamination during course of asbestos removal from existing building which related to inlet to enclosed work space with at least one opening large enough for person to walk through that was sealed upon loss of negative air pressure by flexible film flap was invalid for obviousness in view of book teaching use of ventilation flaps in asbestos removal situations and prior patent teaching use of flexible film flap, at air inlet to enclosed space, that allowed for human ingress and egress and that remained open while pressure gradient existed across inlet but which sealed internal pressurized environment upon loss of gradient. 35 U.S.C.A. § 103.

17. Patents ⇐16.24

Claims of patent for method of controlling airborne asbestos contamination during course of asbestos removal from existing building which established at least one flow path for "substantial volumes of air" to move through enclosed space were invalid for obviousness, in light of prior art patent describing ultraclean room invention disclosing contamination control system that operated by circulating large amount of air in manner performing "sweeping" function. 35 U.S.C.A. § 103.

Harry B. Jacobson, Jr., Jacobson, Price, Holman & Stern, Washington, DC, argued, for appellant. With him on the brief were Michael R. Slobasky and Jonathan L. Scherer.

Murriel E. Crawford, Associate Sol., Office of Sol., Arlington, VA, argued, for appellee. With her on the brief were Fred E. McKelvey, Sol. and Albin F. Drost, Deputy Sol.

Before MICHEL, Circuit Judge, SMITH, Senior Circuit Judge, and PLAGER, Circuit Judge.

EDWARD S. SMITH, Senior Circuit Judge.

GPAC, Inc., assignee of United States Patent No. 4,604,111 (the '111 patent), appeals the decision of the Patent and Trademark Office (PTO) Board of Patent Appeals and Interferences (Board) dated January 26, 1993 affirming the examiner's final rejection of claims 1-43, in a second reexamination of the '111 patent, for obviousness under 35 U.S.C. § 103 (1988). We affirm the Board's rejection of claims 1-43, with certain modifications involving the Whitfield reference which was relied upon by the examiner.

Background

On August 5, 1986 the '111 patent was issued in the name of the inventor, Anthony Natale, and subsequently was assigned to GPAC. The '111 patent is directed to a method and system for controlling airborne asbestos contamination during the course of asbestos removal from an existing building. Prior to the introduction of the '111 patent technology, traditional asbestos control systems passively enclosed and sealed the asbestos removal area to prevent airborne fibers from escaping into the outside environment. These passive control systems not only encountered difficulty in maintaining airtight seals, thereby resulting in contamination leakage, but also subjected workers to excessively high concentrations of airborne asbestos fibers.

The Natale system employs a more dynamic approach to asbestos removal by intentionally opening the sealed work area to provide a large air inlet for continuous movement of substantial volumes of air through the enclosed space. In conjunction with air filtering means located at the downstream end of the work area, this continuous air flow creates negative pressure that retains the airborne asbestos within the enclosed space as it is expelled through the filters. In the event of loss of negative pressure within the asbestos removal area, the Natale system utilizes an automatically sealing flap that covers the air inlet, thereby preventing contamination of the outside environment.

On April 22, 1987 John Conrad filed the first reexamination request questioning the

validity of the '111 patent. The '111 patent as issued recited claims 1 through 17; claims 18 through 29 were added by the patent owner during prosecution of the first reexamination. Upon first reexamination, the examiner rejected claims 1-29 as unpatentable under 35 U.S.C. §§ 102, 103. One basis for the examiner's rejection under section 103 was the *Asbestos* book, which is the same principal reference serving as a basis for rejection in this appeal. An alternative basis for rejection in the first reexamination that also carries over to this appeal is the MICRO-TRAP document, which the examiner determined to be a prior art printed publication.

On March 31, 1989, on appeal to the Board, the examiner's rejection of claims 1-29 was reversed as to all claims because "the examiner ha[d] not provided the requisite factual basis to support a legal conclusion of obviousness under 35 U.S.C. 103." *Ex parte Natale*, 11 USPQ2d 1222, 1226-27 (Bd.App.1989). Following the Board's decision, a reexamination certificate issued on June 6, 1989 stating that original claims 1-17 and newly added claims 18-29 were patentable.

On November 23, 1990 a second reexamination request was filed with the PTO, culminating in the examiner's initial rejection of claims 1-29 as unpatentable on July 31, 1991. During ensuing prosecution of the second reexamination, the patent owner added claims 30-43. On December 4, 1991 the examiner finally rejected claims 1-43 as unpatentable under section 103 over the *Asbestos* reference in combination with a total of twelve secondary references that the examiner believed provided the "requisite factual basis" for obviousness that was lacking in the first reexamination rejection. The examiner also cited additional evidence submitted by the reexamination requestor in support of the examiner's determination that the MICRO-TRAP document was indeed a prior art printed publication, which buttressed his final rejection of all claims.

On appeal to the Board, the examiner's final rejection of claims 1-43 was affirmed on January 26, 1993. *Ex parte GPAC, Inc.*, 29 USPQ2d 1401 (Bd.App.1993). The Board grouped the examiner's specific rejections

into six categories as follows: (1) five categories within which certain claims were rejected over the *Asbestos* principal reference in combination with various secondary references that disclosed certain limitations of the claimed subject matter and (2) a sixth category rejecting all claims over the MICRO-TRAP document as a prior art printed publication. *GPAC*, 29 USPQ2d at 1402-03.

In affirming the examiner's rejections in each of the first five categories, the Board generally concluded that, because "the overriding thought in removing asbestos per the *Asbestos* book reference is to prevent asbestos from escaping outside the enclosed space, . . . one of ordinary skill in the art in providing" the ventilation flaps disclosed in the secondary references "would use flaps that would seal their flow path against air exiting from the air space to the outside upon loss of the negative air pressure in the enclosed space in order to prevent asbestos escaping with the outgoing air." *Id.* at 1404. In response to certain other limitations recited within the claims of the '111 patent, the Board further concluded that one of ordinary skill in the art would have known: (1) to slightly oversize the ventilation flaps so as to isolate one environment from the other upon the loss of negative pressure in the enclosed space; (2) to provide directional means for guiding the inlet air to the area of highest concentration of airborne asbestos; (3) to design one of the inlet openings large enough to allow a person to step through; and (4) to require that the automatic sealing means comprise a flexible film flap.

In affirming the examiner's determination that the MICRO-TRAP document is a prior art printed publication, the Board concluded not only that the document "is a printed publication [that] can be relied upon in determining the patentability of the claimed subject matter" but also that the publication "further buttresses the case of obviousness established by the other references relied upon in the rejections." *Id.* at 1413.

Pursuant to 35 U.S.C. § 141 (1988) and 28 U.S.C. § 1295(a)(4)(A) (1988), this appeal followed. Because we conclude that our affirmation of the Board's rejection of all claims of the '111 patent over the *Asbestos* reference

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and the twelve secondary references is dispositive of the obviousness issue involved in this case, we do not reach the merits of the parties' arguments as to whether the MI-CRO-TRAP document is a prior art printed publication. See *White v. Jeffrey Mining Mach. Co.*, 723 F.2d 1553, 1560 n. 8, 220 USPQ 703, 707 n. 8 (Fed.Cir.1983), *cert. denied*, 469 U.S. 825, 105 S.Ct. 104, 83 L.Ed.2d 49 (1984).

The Claims on Appeal

Because GPAC has not separately argued the patentability of each rejected claim but, rather, has elected to argue certain representative claims with which the remaining rejected claims will either stand or fall, our review will be limited to the Board's rejection of the following claims:

- A. Representative of Claims 1-17 (the original '111 patent)
 - 1. independent method claim 1 independent system claim 8
 - 2. dependent method claim 2 dependent system claim 17
- B. Representative of Claims 18-43 (added during two reexaminations)
 - 1. independent method claim 18 independent system claim 24
 - 2. dependent method claims 23 and 35 dependent system claims 28 and 40.

See *In re King*, 801 F.2d 1324, 1325, 231 USPQ 136, 137 (Fed.Cir.1986).

Standard of Review

[1-3] Whether a reference or a combination of references renders a claimed invention obvious under 35 U.S.C. § 103 is a question of law subject to full and independent review in this court. *Gardner v. TEC Sys., Inc.*, 725 F.2d 1338, 1344, 220 USPQ 777, 782 (Fed.Cir.), *cert. denied*, 469 U.S. 830, 105 S.Ct. 116, 83 L.Ed.2d 60 (1984). We review for clear error the underlying factual findings leading to an obviousness conclusion. *In re Woodruff*, 919 F.2d 1575, 1577, 16 USPQ2d 1934, 1935 (Fed.Cir.1990). Furthermore, under this standard of review we disturb a factual finding of the Board only if definitely and firmly convinced that the Board has erred. *In re Caveney*, 761 F.2d

671, 674, 226 USPQ 1, 3 (Fed.Cir.1985); see *United States v. United States Gypsum Co.*, 333 U.S. 364, 395, 68 S.Ct. 525, 541-42, 76 USPQ 430, 443 (1948). These factual findings include: (1) the scope and content of the prior art; (2) the level of ordinary skill in the art at the time of the invention; (3) objective evidence of nonobviousness; and (4) the differences between the prior art and the claimed subject matter. *Specialty Composites v. Cabot Corp.*, 845 F.2d 981, 989, 6 USPQ2d 1601, 1607 (Fed.Cir.1988) (citing *Graham v. John Deere Co.*, 383 U.S. 1, 17-18, 86 S.Ct. 684, 693-94, 148 USPQ 459, 467 (1966)). In determining the scope and content of the prior art, "[w]hether a reference ... is 'analogous' is a fact question" that we review for clear error. *In re Clay*, 966 F.2d 656, 658, 23 USPQ2d 1058, 1060 (Fed.Cir. 1992).

Scope and Content of the Prior Art

[4] The Board upheld the validity of the '111 patent in the first reexamination; however, it invalidated the '111 patent on obviousness grounds in the second reexamination. The Board's change in position was due in large part to the examiner's reliance on twelve secondary references, in the second reexamination, that he believed bridged the evidentiary gaps found to exist in the rejections in the first reexamination proceeding. Therefore, we begin our review of the Board's factual findings, relative to the above listed rejected claims, by addressing the threshold issue whether these secondary references legitimately fall within the scope of the relevant prior art. See *Pentec, Inc. v. Graphic Controls Corp.*, 776 F.2d 309, 313, 227 USPQ 766, 768 (Fed.Cir.1985) (citing 35 U.S.C. § 103, construed in *Graham*, 383 U.S. at 17, 86 S.Ct. at 693-94, 148 USPQ at 467).

[5, 6] We have recognized the scope of the relevant prior art as including that "reasonably pertinent to the particular problem with which the inventor was involved." *Stratoflex, Inc. v. Aeroquip Corp.*, 713 F.2d 1530, 1535, 218 USPQ 871, 876 (Fed.Cir.1983) (quoting *In re Wood*, 599 F.2d 1032, 1036, 202 USPQ 171, 174 (CCPA 1979)). Therefore, the prior art relevant to an obviousness determination necessarily encompasses not

only the field of the inventor's endeavor but also any analogous arts. See *Wood*, 599 F.2d at 1036, 202 USPQ at 174; *Heidelberger Druckmaschinen v. Hantscho Commercial*, 21 F.3d 1068, 1071, 30 USPQ2d 1377, 1379 (Fed.Cir.1994) ("References that are not within the field of the inventor's endeavor may also be relied on in patentability determinations, and thus are described as 'analogous art', when a person of ordinary skill would reasonably have consulted those references and applied their teachings in seeking a solution to the problem that the inventor was attempting to solve." (citation omitted)). In deciding whether a reference is from a relevant art, we first must determine whether the reference is within the inventor's field of endeavor, and if it is not we next must determine whether the reference is reasonably pertinent to the particular problem confronting the inventor. *Wood*, 599 F.2d at 1036, 202 USPQ at 174.

The inventor's field of endeavor in this case is asbestos removal with attendant asbestos contamination control. In the second reexamination, the examiner relied on the *Asbestos* primary reference and twelve secondary references, exclusive of the MICRO-TRAP document, in rejecting all claims of the '111 patent. These secondary references include U.S. Patent Nos. 3,254,457 (Gedney); 3,384,000 (Fuller); 1,623,286 (Strahan); 3,111,301 (Ruegsegger); 2,252,784 (Powers); 3,682,084 (Tarnoff); 323,587 (Merriman); 3,500,655 (Lyons); 1,813,703 (Kattmann); 1,699,094 (Chadirjian); 1,531,473 (Barbour); and 3,158,457 (Whitfield). Fuller, Strahan, Ruegsegger, Powers, Tarnoff, Merriman, and Lyons are all directed to backdraft dampers in ventilation systems that automatically prevent undesirable air flow from one environment into another environment upon the loss of a pressure gradient between the environments. Gedney describes an equilibrium air door that maintains the pressurized state of an enclosure while allowing for human ingress and egress. Whitfield describes an ultraclean room within which high flow rate, continuously circulated air performs a sweeping function over the work area to remove dust from the air. Kattmann, Chadirjian, and Barbour are directed to tent ventilation flaps that seal the inside of a tent because

the flaps are slightly oversized with respect to the openings with which they are associated. Because none of these references specifically pertains to Natale's field of endeavor, we agree with GPAC that "the asbestos removal/contamination art of the Natale patent is in an entirely different field of endeavor than the arts of the secondary references . . . relied upon by the Board." [Appellant Br. at 26].

To support a finding that these twelve references are within the scope of the relevant prior art, we must therefore determine that they are analogous art that is "reasonably pertinent to the particular problem with which the inventor was involved." *Wood*, 599 F.2d at 1036, 202 USPQ at 174. "A reference is reasonably pertinent if, even though it may be in a different field of endeavor, it is one which, because of the matter with which it deals, logically would have commended itself to an inventor's attention in considering his problem." *Clay*, 966 F.2d at 659, 23 USPQ2d at 1061. If a reference disclosure relates to the same problem as that addressed by the claimed invention, "that fact supports use of that reference in an obviousness rejection. An inventor may well have been motivated to consider the reference when making his invention." *Id.*

In its brief, GPAC acknowledges that Natale "recognized the problem that if, for any reason, the negative air pressure conditions were lost in the work area, some means would be required to automatically seal the air inlets to prevent asbestos contamination from escaping." [Appellant Br. at 27]. The problem that GPAC describes here—objectionable backflow of contaminated air—is precisely the same problem that backdraft dampers in ventilation systems are designed to eliminate. Therefore, each of the above references from backdraft damper art, which were relied upon by the Board in rejecting the '111 patent claims, would be reasonably pertinent to the particular problem acknowledged by GPAC because each such reference "logically would have commended itself to [Natale's] attention in considering his problem." *Id.*

Also with respect to the problem of “seal[ing] the air inlets to prevent asbestos contamination from escaping,” we conclude that Kattmann, Chadirjian, and Barbour are analogous art because the camping tent ventilation flaps in these references address the same basic sealing problem in the same fashion—oversizing the flaps so as to overlap the opening and seal off the inside air from the outside air—as do the enclosure ventilation flaps in the '111 patent. Consequently, these references are reasonably pertinent because they logically should have come to mind as Natale pondered the sealing problem. *See id.*

GPAC further acknowledges in its brief that the overall problem confronting Natale “was the removal of asbestos materials from existing buildings without contaminating the outside environment.” [Appellant Br. at 27]. Because asbestos removal was to be effected by humans, this problem necessarily entailed allowing for human ingress and egress without compromising the integrity of the negative pressure environment created to contain airborne asbestos within the enclosed work space. Because Gedney is directed to essentially the same problem—maintaining a pressurized environment while allowing for human ingress and egress—we conclude that this reference also satisfies the *Clay* test for reasonable pertinence and is therefore analogous art. *See id.*

GPAC also recognizes that the problem confronting Natale of removing high concentrations of asbestos would be most effectively addressed “if substantial air flow was drawn through the work area to cleanse and remove the dangerous asbestos fibers.” [Appellant Br. at 27]. Because Whitfield is directed to essentially the same problem in a dust-contaminated environment, akin to the asbestos dust-contaminated environment addressed by the '111 patent, and because Whitfield employs essentially the same method for resolving this problem, we conclude that this reference is reasonably pertinent to the problem facing Natale and is therefore analogous art. *See id.*

For the foregoing reasons, we find no clear error in the Board’s inclusion of these twelve secondary references in the relevant prior

art in its obviousness inquiry into the validity of the '111 patent.

Level of Ordinary Skill in the Art

[7] The person of ordinary skill in the art is a hypothetical person who is presumed to know the relevant prior art. *Custom Accessories, Inc. v. Jeffrey-Allan Indus., Inc.*, 807 F.2d 955, 962, 1 USPQ2d 1196, 1201 (Fed. Cir.1986). In determining this skill level, the court may consider various factors including “type of problems encountered in the art; prior art solutions to those problems; rapidity with which innovations are made; sophistication of the technology; and educational level of active workers in the field.” *Id.* In a given case, every factor may not be present, and one or more factors may predominate. *Id.* at 962–63, 1 USPQ2d at 1201.

[8] Although the Board did not make a specific finding on skill level, it did conclude that the level of ordinary skill in the art of asbestos removal and contamination control was best determined by appeal to the references of record, especially *Asbestos*. We do not believe that the Board clearly erred in adopting this approach because it offers valuable insight in considering the *Custom Accessories* factors. *Asbestos* explains the hazards associated with asbestos removal and discusses in detail the types of problems encountered in the art as well as possible solutions. Our reading of *Asbestos* indicates that the types of problems and potential solutions encountered in the art are somewhat sophisticated, if for no other reason than airborne asbestos dust is highly hazardous and extremely difficult to contain. The design, operation, and maintenance of an asbestos removal system demands a technical sophistication and a level of professional skill commensurate with the hazardous nature of the work. Furthermore, in keeping with the hazard involved, the asbestos removal art is heavily regulated thereby placing a premium on professional competence in ensuring regulatory compliance.

GPAC offered evidence from experts stating that persons of ordinary skill in the art possess hands-on experience and little formal engineering education. Although this evi-

dence certainly warrants inclusion in the analysis at hand, it is not dispositive of the skill level inquiry here in light of significant evidence to the contrary. As a result, we detect no clear error in the Board's skill level determination.

Objective Evidence of Nonobviousness

[9, 10] In a section 103 obviousness determination, objective evidence of nonobviousness must be considered if present. *Pentec*, 776 F.2d at 315, 227 USPQ at 770. Such evidence includes the commercial success of the patented invention, whether the invention addresses "long felt but unsolved needs," and the failure of others to produce alternatives to the patented invention. *Graham*, 383 U.S. at 17-18, 86 S.Ct. at 693-94. For objective evidence to be accorded substantial weight, its proponent must establish a nexus between the evidence and the merits of the claimed invention. *Stratoflex*, 713 F.2d at 1539, 218 USPQ at 879. "A prima facie case of nexus is generally made out when the patentee shows both that there is commercial success, and that the thing (product or method) that is commercially successful is the invention disclosed and claimed in the patent." *Demaco Corp. v. F. Von Langsdorff Licensing Ltd.*, 851 F.2d 1387, 1392, 7 USPQ2d 1222, 1226 (Fed.Cir.), cert. denied, 488 U.S. 956, 109 S.Ct. 395, 102 L.Ed.2d 383 (1988). To the extent that the patentee demonstrates the required nexus, his objective evidence of nonobviousness will be accorded more or less weight. See *Ashland Oil, Inc. v. Delta Resins & Refractories, Inc.*, 776 F.2d 281, 306, 227 USPQ 657, 674 (Fed.Cir.1985), cert. denied, 475 U.S. 1017, 106 S.Ct. 1201, 89 L.Ed.2d 315 (1986).

[11, 12] GPAC claims commercial success of the '111 patent because of extensive licensing of Natale's invention. Licenses taken under the patent in suit may constitute evidence of nonobviousness; however, only little weight can be attributed to such evidence if the patentee does not demonstrate "a nexus between the merits of the invention and the licenses of record." *Stratoflex*, 713 F.2d at 1539, 218 USPQ at 879; see *Demaco*, 851 F.2d at 1392, 7 USPQ2d at 1226. Because, in affidavits reciting the licensing history of

the '111 patent, GPAC did not establish which claim(s) of the patent the licensing program incorporates, GPAC has not shown that licensing of Natale's invention arose out of recognition and acceptance of the subject matter claimed in the '111 patent. With respect to the licensing program, GPAC therefore has not established that "the thing (product or method) that is commercially successful is the invention disclosed and claimed in the patent." *Demaco*, 851 F.2d at 1392. We therefore agree with the Board that licensing as evidence of nonobviousness should be accorded little weight in this case.

Additionally, GPAC identifies the widespread acceptance and adoption of the Natale invention by the asbestos removal industry as evidence of nonobviousness. Again, however, GPAC's affidavits did not detail what aspect(s) of the invention claimed in the '111 patent was (were) targeted by industry copyists. As we noted in *Cable Electric Products v. Genmark, Inc.*, "more than the mere fact of copying by an accused infringer is needed to make that action significant to a determination of the obviousness issue." *Cable Electric Prods. v. Genmark, Inc.* 770 F.2d 1015, 1028, 226 U.S.P.Q. 881, 889 (Fed.Cir.1985). Consequently, we attribute little weight to this particular evidence of nonobviousness.

Finally, GPAC points to the widespread failure of others to develop alternatives to the Natale patent as evidence of nonobviousness. Once again, however, GPAC offers no evidence that this inability or unwillingness of competitors to respond to Natale's invention in the marketplace is rooted in the subject matter claimed in the '111 patent. Accordingly, this secondary consideration can be accorded only little weight as evidence of nonobviousness.

Because GPAC has not met its burden under *Demaco* to demonstrate that the commercial success of Natale's invention resulted directly from the subject matter claimed in the '111 patent, we conclude that the nexus requirement of *Stratoflex* is not satisfied and, therefore, detect no clear error in the Board's attribution of little weight to GPAC's objective evidence of nonobviousness and no legal error in the Board's ultimate finding that the overall weight of such evidence does

not outweigh the evidence of obviousness relied upon by the examiner.

*Differences Between the Prior Art
and the Claimed Invention*

A. *Claims 1, 2, and 8*¹

[13] Claims 1, 2, and 8 of the '111 patent stand rejected over the *Asbestos* reference in view of any or all of Gedney, Fuller, Strahan, Ruegsegger, Powers, Tarnoff, Merriman, Lyons, Kattman, Chadirjian, or Barbour. Claims 1 and 8 disclose a method and system for enclosing a work space that is maintained at negative pressure by providing at least one air flow inlet path and one air flow outlet through a filtering means and that is sealed from the external environment upon loss of negative pressure. The *Asbestos* reference, which existed at the time of the claimed invention, provides meaningful background information on the problems and potential solutions associated with asbestos removal and contamination control. As such, *Asbestos* is relevant prior art as being within Natale's field of endeavor, see *Wood*, 599 F.2d at 1036, 202 USPQ at 174, and the parties do not dispute this point.

The Board determined that *Asbestos* discloses all limitations of claims 1 and 8 except the sealing function. The Board further determined that, in view of secondary references from analogous arts, one of ordinary skill in the art would know to use the ventilation flaps disclosed in *Asbestos* in a manner

1. Claims 1, 2, and 8 read as follows:

1. A method of establishing a negative pressure environment within an existing building for removing dangerous solid materials from the building, said method comprising:

(1) defining an enclosed space within said building using existing wall structure to define at least a portion of said enclosed space;

(2) establishing at least one flow path for air to enter said enclosed space;

(3) continuously evacuating air from said enclosed space through a filter means to remove dangerous solid materials from said evacuated air and to establish a negative air pressure in said enclosed space so that air exiting said space passes through said filter means; and

(4) sealing said flow path against air exiting from said air space to the exterior of said enclosed space in the event of loss of negative air pressure in said enclosed space.

2. The method of claim 1, wherein the air evacuated from said enclosed space passes adjacent

that would seal against objectionable backflow of airborne asbestos into the external environment upon loss of negative pressure. We agree. The backdraft damper art (Fuller, Strahan, Ruegsegger, Powers, Tarnoff, Merriman, and Lyons) teaches a method for sealing against objectionable backflow that is eminently suitable to providing the sealing function claimed by Natale's invention. Furthermore, the camping tent art (Kattmann, Chadirjian, and Barbour) teaches the need for oversizing the ventilation flaps in effectively sealing off the external environment as claimed by the '111 patent.

[14] In determining whether obviousness is established by combining the teachings of the prior art, "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 *In re Keller*, 642 F.2d 413, 425, 208 USPQ 871, 881 (CCPA 1981)). Furthermore, to invalidate claimed subject matter for obviousness, the combined teachings of the prior art references must suggest, expressly or by implication, the improvements embodied by the invention. *In re Sernaker*, 702 F.2d 989, 217 USPQ 1 (Fed. Cir.1983). Because the subject matter in claims 1 and 8 is implicitly suggested to one of ordinary skill in the art by the teachings of *Asbestos*, on the need for containing airborne asbestos within the enclosed work space

to a high level of dangerous solid materials within said enclosed space.

* * * * *

8. A system for establishing a favorable environment for removing dangerous solid materials, said system comprising:

wall means enclosing a defined air space within a building, said wall means including at least one inlet for air to enter said air space and an outlet for air to exit from said air space;

filter means for filtering air in said air space;

air moving means for producing a negative air pressure within said air space and for drawing air into said space through said inlet and for moving air through said filter means in advance of moving air through said outlet; and

sealing means for sealing said inlet against air exiting from said air space to the exterior of said air space in the event of loss of negative air pressure in said air space.

upon loss of negative air pressure, in combination with the backdraft damper art teachings concerning objectionable backflow and the camping tent art teachings involving oversized ventilation flaps, we affirm the Board's rejection of claims 1 and 8 for obviousness.

[15] Claim 2 depends from independent method claim 1 and adds the feature whereby "the air flow path in the work space sweeps by and picks up the dangerous fibers on the way to the filters." [Appellant Br. at 9]. GPAC asserts that this sweeping feature is not suggested by the prior art; however, the Board, in its only commentary directed specifically to claim 2, disagreed with GPAC and relied solely on *Asbestos* in stating that "evacuated air would of necessity pass adjacent the asbestos material being removed." GPAC, 29 USPQ2d at 1408.

We believe that this statement by the Board in support of its rejection of claim 2 is conclusory and lacks the factual basis required to validate a claim rejection under section 103. See *In re Warner*, 379 F.2d 1011, 1017, 154 USPQ 173, 178 (CCPA 1967) ("A rejection based on section 103 must rest on a factual basis, and these facts must be interpreted without hindsight reconstruction of the invention from the prior art. . . . [The Board] may not . . . resort to speculation, unfounded assumptions or hindsight reconstruction to supply deficiencies in its factual basis."), cert. denied, 389 U.S. 1057, 88 S.Ct. 811 (1968). Furthermore, the Board's reliance solely on *Asbestos* in formulating its rejection is misplaced.

2. Claims 17, 28, and 40 read as follows:

17. The system of claim 16, wherein the inlet includes at least one opening of a size and shape to allow a person to step through said inlet covered by said flexible film flap.

* * * * *

28. The system of claim 27, wherein the inlet includes at least one opening of a size and shape to allow a person to step through said inlet covered by said flexible film flap.

* * * * *

40. The system of claim 36, wherein the inlet includes at least one opening of a size and shape to allow a person to step through said inlet.

Nonetheless, we affirm the Board's rejection of claim 2 as obvious, but with certain modifications involving the Whitfield reference. We conclude that the subject matter of claim 2 would have been obvious over *Asbestos* in view of Whitfield. *Asbestos* merely teaches to exhaust the contaminated air inside the enclosed work space through the filtering means to remove the airborne asbestos. *Asbestos* offers no particular motivation for providing a sweeping air flow through the work space. However, Whitfield discloses a contamination control system that employs a sweeping air flow created by diffuser plates located near the air inlet. Because the combined teachings of *Asbestos* and Whitfield implicitly suggest, to one of ordinary skill in the art, the subject matter of claim 2, we affirm the Board's rejection of claim 2 for obviousness.

B. Claims 17, 28, and 40²

[16] Claims 17, 28³, and 40 stand rejected over *Asbestos* in view of Gedney. These claims are directed to providing the inlet to the enclosed work space with at least one opening that is large enough for a person to walk through and that is sealed upon loss of negative air pressure by a flexible film flap. *Asbestos* teaches the use of ventilation flaps in asbestos removal situations; Gedney teaches the use of a flexible film flap, at an air inlet to an enclosed space, that allows for human ingress and egress and that remains open while a pressure gradient exists across the inlet but which seals the internal pressurized environment upon loss of the gradient. Because the subject matter of claims 17, 28,

3. Rejection IV on page 5 of the Board's January 26, 1993 decision indicates that claim 18, rather than claim 28, was rejected for obviousness over *Asbestos* in view of Gedney. GPAC, 29 USPQ2d at 1402. However, detailed discussion of this particular rejection on pages 34-37 of the decision, *id.* at 1410-11, indicates that claim 28 was the subject of the examiner's rejection here on the basis of the combined teachings of *Asbestos* and Gedney. Pages 15-16 of the examiner's final rejection also reveal that claim 28, not claim 18, was rejected in unison with claims 17 and 40. Therefore, we conclude that the Board's substitution of claim 18 for claim 28 in Rejection IV on page 5 of its decision is inadvertent error.

and 40 would be impliedly suggested to one of ordinary skill in the art by the combined teachings of *Asbestos* and Gedney, we affirm the Board's rejection of claims 17, 28, and 40 for obviousness.

C. Claims 18, 23, 24, and 35⁴

[17] Claims 18, 23, 24, and 35 stand rejected over *Asbestos* in view of any or all of Gedney, Fuller, Strahan, Ruegsegger, Powers, Tarnoff, Merriman, or Lyons. With respect to these claims, the particular issue on appeal is whether the recitation of "substantial volumes of air" flowing through the work space is disclosed in the prior art so as to render these claims obvious to one skilled in the art. In rejecting GPAC's argument that the prior art contains "no suggestion of continuously evacuating substantial volumes of air through a filter means from the enclosed space to remove the airborne, dangerous asbestos solid materials," the Board relied solely on *Asbestos* in concluding that the prior art disclosed that "high extraction rates can

be used in a tent system containing asbestos in order to remove airborne asbestos contaminants within that enclosed space." *GPAC*, 29 USPQ2d at 1408.

We agree with the Board that the "substantial volumes of air" limitation in these claims is disclosed in the prior art; however, the Board's finding that the *Asbestos* reference is the source of this disclosure was clearly erroneous. *Asbestos* does not provide the requisite factual basis for properly disclosing this limitation. Additionally, the secondary references relied on by the Board in rejecting these particular claims do not disclose this limitation.

Notwithstanding the Board's misplaced reliance on *Asbestos* in this regard, we affirm its conclusion that the subject matter in these claims would have been obvious to one skilled in the art because we find sufficient disclosure in Whitfield of the "substantial volumes of air" limitation. In describing an ultraclean room invention, Whitfield discloses a contamination control system that "oper-

4. Claims 18, 23, 24, and 35 read as follows:

18. A method of establishing a negative pressure environment within an existing building for removing dangerous solid asbestos materials from the building, said method comprising:

(1) defining an enclosed space within said building using existing wall structure to define at least a portion of said enclosed space;

(2) establishing at least one flow path for substantial volumes of air to enter and move through said enclosed space;

(3) disturbing the solid asbestos materials within the enclosed space whereby dangerous asbestos solid materials become airborne within the enclosed space;

(4) continuously evacuating substantial volumes of air from said enclosed space through a filter means and continuously drawing substantial volumes of air into said enclosed space to remove the airborne dangerous asbestos solid materials from said evacuated air and to establish a negative air pressure in said enclosed space so that air exiting from said space passes through said filter means; and

(5) sealing said flow path against air exiting from said air space to the exterior of said enclosed space automatically upon loss of negative air pressure in said enclosed space.

* * * * *

23. The method of claim 18, wherein the evacuating and drawing step comprises continuously evacuating and drawing the substantial volumes of air until the fiber content of the airborne

dangerous asbestos solid material is no greater than 0.01 fibers per cubic centimeter.

24. A system for establishing a favorable environment for removing dangerous solid asbestos materials from an existing building, said system comprising:

wall means enclosing a defined air space containing asbestos contamination within said building, said air space also containing airborne asbestos fibers, said wall means including at least one inlet for outside air to enter said air space and an outlet for air filtered by a filter means to exit from said air space;

filter means for filtering air in said air space;

high volume air moving means for producing a negative air pressure within said air space and for drawing large volumes of outside air into said air space through said inlet and for moving the large volumes of air through said filter means in advance of moving air through said outlet, thereby reducing the level of airborne asbestos fibers in said air space; and

sealing means for sealing off said inlet against air exiting from said air space to the exterior of said air space automatically upon loss of negative air pressure in said air space.

* * * * *

35. The method of claim 30, wherein the evacuating and drawing step comprises continuously evacuating and drawing the substantial volumes of air until the fiber content of the airborne dangerous asbestos solid material is no greater than 0.01 fibers per cubic centimeter.

ates by circulating a large amount of air (about 10 changes of air per minute) through the room in such a manner that the incoming air performs a 'sweeping' function over the working areas."⁵ Whitfield further discloses the "substantial" nature of the air flow rate by referencing that "ultra-clean air circulated at about 4000 cubic feet per minute accomplishes the desired air change."⁶ In light of these disclosures, we affirm the Board's rejection of claims 18, 23, 24, and 35 with the modification of including Whitfield in the basis for rejection.

5. Col. 1, 11. 63-66.

Conclusion

The decision of the Board to reject claims 1-43 of the '111 patent for obviousness is affirmed.

Costs

Each party to bear its own costs.

AFFIRMED.



6. Col. 7, 11. 11-13.