

**IN THE DISTRICT COURT OF THE UNITED STATES
FOR THE WESTERN DISTRICT OF NORTH CAROLINA
ASHEVILLE DIVISION**

CIVIL CASE NO. 1:07cv184

BORGWARNER, INC. and)
BORGWARNER TURBO)
SYSTEMS, INC.,)
)
Plaintiffs,)
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vs.)
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HONEYWELL INTERNATIONAL, INC.,)
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Defendant.)
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**MEMORANDUM OF
DECISION AND ORDER**

THIS MATTER is before the Court on the Plaintiffs’ Motion for Summary Judgment [Doc. 100] and the Defendant’s Motion for Summary Judgment of Invalidity of the Patents-In-Suit [Doc. 109].

I. PROCEDURAL BACKGROUND

This is an action brought by the Plaintiffs BorgWarner, Inc. and BorgWarner Turbo Systems, Inc. (collectively “BorgWarner”) against the Defendant Honeywell International, Inc. (“Honeywell”) for patent infringement of U.S. Patent Nos. 6,663,347 (“the ‘347 Patent”); 6,629,556

(“the ‘556 Patent”); and 6,904,949 (“the ‘949 Patent”).¹ [Second Amended Complaint, Doc. 65]. Honeywell denies engaging in any infringement and asserts, among other things, the affirmative defenses of invalidity, unenforceability, inequitable conduct, and license and/or ownership of the patents-in-suit. Honeywell further seeks a declaratory judgment that it has not infringed any valid or enforceable claim asserted in the patents-in-suit; that the asserted claims are invalid; that the patents are unenforceable pursuant to 37 C.F.R. § 1.56 and the doctrine of inequitable conduct; that the claims are invalid for failure to name Brent Robinson as a co-inventor; and that Honeywell is a licensee and/or owner of the patents-in-suit by virtue of Robinson’s assignment of his patent rights to Honeywell. [Doc. 87].

BorgWarner now moves the Court for summary judgment on the grounds that the doctrines of assignor estoppel and equitable estoppel bar Honeywell from maintaining its defenses of licenses and/or ownership of the patents-in-suit, its claim for correction of inventorship under 35 U.S.C. § 256, and its claim for declaratory judgments of invalidity and unenforceability. [Doc. 100]. Honeywell in turn moves for summary

¹The patents-in-suit are owned by Plaintiff BorgWarner, Inc. and exclusively licensed to Plaintiff BorgWarner Turbo Systems, Inc. [Doc. 65 at 3].

judgment on the grounds that the claims at issue are invalid as anticipated and/or obvious pursuant to 35 U.S.C. §§ 102 and 103. [Doc. 109].

II. STANDARD OF REVIEW

Summary judgment is proper “if the pleadings, the discovery and disclosure materials on file, and any affidavits show that there is no genuine issue as to any material fact and that the movant is entitled to judgment as a matter of law.” Fed. R. Civ. P. 56(c). “As the Supreme Court has observed, ‘this standard provides that the mere existence of *some* alleged factual dispute between the parties will not defeat an otherwise properly supported motion for summary judgment; the requirement is that there be no *genuine* issue of *material* fact.’” Bouchat v. Baltimore Ravens Football Club, Inc., 346 F.3d 514, 519 (4th Cir. 2003) (quoting Anderson v. Liberty Lobby, Inc., 477 U.S. 242, 247-48, 106 S.Ct. 2505, 91 L.Ed.2d (1986)) (emphasis in original).

A genuine issue of fact exists if a reasonable jury considering the evidence could return a verdict for the nonmoving party. Shaw v. Stroud, 13 F.3d 791, 798 (4th Cir. 1994). “Regardless of whether he may ultimately be responsible for proof and persuasion, the party seeking

summary judgment bears an initial burden of demonstrating the absence of a genuine issue of material fact.” Bouchat, 346 F.3d at 522. If this showing is made, the burden then shifts to the non-moving party who must convince the Court that a triable issue does exist. Id.

A party opposing a properly supported motion for summary judgment may not rest upon the mere allegations or denials of his pleadings, but rather must set forth specific facts showing that there is a genuine issue for trial. Furthermore, neither unsupported speculation, nor evidence that is merely colorable or not significantly probative, will suffice to defeat a motion for summary judgment; rather, if the adverse party fails to bring forth facts showing that reasonable minds could differ on a material point, then, regardless of any proof or evidentiary requirements imposed by the substantive law, summary judgment, if appropriate, shall be entered.

Id. (internal citations and quotation marks omitted). Nonetheless, in considering the facts for the purposes of a summary judgment motion, the Court will view the pleadings and material presented in the light most favorable to the nonmoving party. Matsushita Elec. Industrial Co. v. Zenith Radio Corp., 475 U.S. 574, 587-88, 106 S.Ct. 1348, 89 L.Ed.2d 538 (1986).

III. THE PATENTS AT ISSUE

The patents at issue concern an investment cast titanium compressor wheel. [See Claim Construction Order, Doc. 79-2 at 3-7]. All three patents claim priority to June 6, 2001, and all share a generally common specification.²

The independent claims of the patents-in-suit claim both the method of making the inventive titanium compressor wheel, see '556 Patent, Claims 1 and 7; the wheel itself, see '347 Patent, Claims 1, 5, and 7; and a method for making a complete air boost device containing such a wheel, see '949 Patent, Claims 1 and 10. Various dependent claims recite additional details regarding, among other things, the number of die inserts used in forming air passages, see, e.g., '347 Patent, Claims 2-3; the manner in which the tooling is to be actuated, see, e.g., '556 Patent, Claim 3; and the particular titanium alloy to be used in casting the wheel, see, e.g., '949 Patent, Claims 12-14.

As described in the specification, in order to investment cast a titanium wheel using an injection molded wax pattern, the die inserts that surround and form the wax pattern must be able to be withdrawn radially or

²To avoid unnecessary duplication, citations will be to the '347 Patent specification for those instances where the specifications are identical.

along a curved path in a simple manner so as to render the pattern easily removable from the die. See '347 Patent, Col. 4, lines 65-67; Col. 5, lines 1-7; Col. 8, line 67 to Col. 9, line 5. The inventors considered their wheel novel because its blades are essentially straight, having no dips or humps, thus allowing such an extraction. See id. at Col. 5, lines 1-7. The inventors referred to this particular feature of the wheel as “pullability” (i.e., the die inserts are easily “pulled”).

During prosecution of the application that led to the patents-in-suit, the inventors explained that “pullability” was the novelty of their invention:

[T]he point of novelty of the claims is in the “pullable” feature. . . . The strength of the claims resides in Applicants['] position that there are no prior art pullable cast titanium centrifugal compressor wheels If Applicants are mistaken in their belief that the state of the art does not include pullable cast titanium compressor wheels, then the claims will be easily invalidated by competitors.

[Prosecution History, Doc. 111-6 at 7].

IV. BORGWARNER'S MOTION FOR SUMMARY JUDGMENT

A. Facts Relevant to Motion

Viewing the evidence in the light most favorable to Honeywell as the non-moving party, the following is a recitation of the forecast of evidence relevant to BorgWarner's summary judgment motion.

In the spring of 2000, David Decker, a BorgWarner employee and one of the named inventors of the patents-in-suit, contacted Brent Robinson, the owner and president of B&R Mold, regarding the manufacture of a die assembly to produce patterns for use in investment casting titanium compressor wheels. [Roby Memorandum, Doc. 124-7; Deposition of David Decker ("Decker Dep."), Doc. 145-3 at 126-27; Deposition of Brent Robinson ("Robinson Dep."), Doc. 145-2 at 90-91]. During a meeting in April 2000, Decker provided Robinson with a CAD model of BorgWarner's compressor wheel. [Decker Dep., Doc. 145-3 at 136-38]. Robinson identified two areas on the blades of the wheel which would cause die inserts to become "backlocked," meaning that the inserts could not be withdrawn. [*Id.* at 121-126, 146-48; Robinson Dep., Doc. 145-2 at 107-108, 208-10; Deposition of Steve Roby ("Roby Dep."), Doc. 145-5 at 157; Roby Memorandum, Doc. 145-5 at 3]. Robinson recommended a

redesign of the die assembly in order to make a tool that was “pullable.” [Roby Memorandum, Doc. 145-5 at 1; Declaration of Brent Robinson (“Robinson Decl.”), Doc. 117 at ¶22]. These proposed changes subsequently were incorporated into BorgWarner’s compressor wheel design. [BorgWarner Product Change Notice, Doc. 124-9 at 1; Decker Dep., Doc. 145-3 at 90, 92-93, 161-62, 179-180].

During the April 2000 meeting, Robinson told Decker that he previously had made a similar tooling for Precision Castparts Corporation (“PCC”), which used the tooling to manufacture an investment cast titanium compressor wheel for Holset Engineering, Ltd. (“Holset Wheel”). [Decker Dep., Doc. 145-3 at 126-27, 138-39, 223, 224; Robinson Dep., Doc. 145-2 at 244]. Decker understood that the Holset Wheel was “pullable.” [Decker Dep., Doc. 145-3 at 140].

On June 6, 2001, Decker filed an application directed to an investment cast titanium compressor wheel, naming himself and another BorgWarner employee, Steven Roby, as the inventors. Decker and Roby assigned their entire interest in the patents to BorgWarner in a June 4, 2001 assignment. [PTO Communications, Docs. 144-3 at 3; 144-4 at 1; 144-5 at 3]. During the prosecution of the patents, Decker did not tell the

Patent Office about Robinson's contributions to the invention or about Robinson's prior work on the Holset Wheel. [Decker Dep., Doc. 145-3 at 224, 241].

In April 2002, while the patent applications were pending, B&R Mold entered into an agreement with BorgWarner, which recited that "since March 2000 and earlier," BorgWarner had "been working on the development of commercially viable turbocharger compressor wheels fabricated primarily from Titanium," and had been compensating B&R Mold for its services in connection with that project. [Confidentiality Agreement, Doc. 103-11]. This Agreement further provided, in pertinent part, as follows:

Should the work performed by [B&R Mold] for [BorgWarner] under this Agreement or any purchase order or the like issued by [BorgWarner] result in any invention or work of authorship, whether patentable, copyrightable, or not, regarding any [BorgWarner] component or assembly (in production or otherwise), or the manufacture or use thereof, [B&R Mold] hereby assigns and shall assign to BorgWarner all right, title and interest to such invention

[Id. at ¶6].

In July 2003, before any of the patents had issued, and knowing that he had not been named as an inventor on the patent applications,

Robinson entered into an agreement with Honeywell whereby Robinson assigned to Honeywell “whatever rights, titles, and/or interests [he] may have” in the applications related to the patents-in-suit. [Assignment and License Back Doc. 103-12]. Robinson believed from the beginning that the patents were invalid based on the prior art (namely, the Holset Wheel), and he shared this belief with Honeywell prior to making this assignment. [Robinson Dep., Doc. 145-2 at 98-100, 140-41, 150, 188-89, 305].

The ‘556 Patent issued on October 7, 2003, and the ‘347 Patent issued on December 16, 2003.³ At some point in December 2003, Robinson contacted Decker concerning the patents. [Robinson Dep. at 94]. Specifically, Robinson told Decker: “I don’t think this is patentable, and the ideas obviously you patented, a lot of them you got from us.” [Robinson Dep. at 395].⁴ Decker refused to discuss the matter with Robinson and referred him to BorgWarner’s attorneys. [Decker email dated Dec. 5, 2003, Doc. 145-14].

³The third patent-in-suit, the ‘949 Patent, did not issue until June 14, 2005.

⁴BorgWarner disputes that Robinson ever made such an allegation to any BorgWarner employee. [Doc. 101 at 8-9].

B. Analysis

1. Assignor Estoppel

BorgWarner first contends that the doctrine of assignor estoppel prevents Honeywell from challenging the validity or enforceability of the patents-in-suit.

“Assignor estoppel is an equitable doctrine that prevents one who has assigned the rights to a patent (or patent application) from later contending that what was assigned is a nullity.” Diamond Scientific Co. v. Ambico, Inc., 848 F.2d 1220, 1224 (Fed. Cir. 1988). “Thus, an assignor and parties in privity with the assignor are estopped or barred from asserting invalidity defenses.” Pandrol USA, LP v. Airboss Ry. Prods., Inc., 424 F.3d 1161, 1167 (Fed. Cir. 2005). Application of assignor estoppel “is a matter requiring a ‘balancing of the equities’ and is within the ‘sound discretion’ of the trial court.” Checkpoint Sys., Inc. v. All-Tag Sec. S.A., 412 F.3d 1331, 1337 (4th Cir. 2005) (quoting Carroll Touch, Inc. v. Electro Mech. Sys., 15 F.3d 1573, 1579 (Fed. Cir. 1993)).

Four justifications frequently mentioned for the application of the doctrine of assignor estoppel are: “(1) to prevent unfairness and injustice; (2) to prevent one from benefiting from his own wrong; (3) to adopt the

analogy of estoppel by deed in real estate; and (4) to adopt the analogy to a landlord-tenant relationship.” Id. (quoting Diamond Scientific, 848 F.2d at 1224). “Courts that have expressed the estoppel doctrine in terms of unfairness and injustice have reasoned that an assignor should not be permitted to sell something and later to assert that what was sold is worthless, *all to the detriment of the assignee.*” Diamond Scientific, 848 F.2d at 1224 (emphasis added).

As the above-quoted caselaw makes clear, the doctrine of assignor estoppel is designed to protect the interests *of an assignee* against subsequent challenges to a patent’s validity *by the assignor.*⁵ In the present case, Robinson was the purported assignor of patent rights to Honeywell, the assignee. Thus, if the doctrine of assignor estoppel were to have any application in this case, it would be for the purpose of protecting *Honeywell* from a claim *by Robinson* that what he assigned was worthless. In this case, however, Robinson does not assert a claim of invalidity to the

⁵BorgWarner contends that courts have applied assignor estoppel not only to prevent unfairness and injustice to assignees, but also to third parties. In support of this contention, BorgWarner cites Q.G. Products, Inc. v. Shorty, Inc., 992 F.2d 1211 (Fed. Cir. 1993). Contrary to BorgWarner’s suggestion, however, Shorty does not hold that a non-party to an assignment may assert assignor estoppel. Rather, in that case, the Federal Circuit applied the doctrine in order to protect a subsequent purchaser of the patent rights. See id. at 1212, 1213. Thus, the beneficiary of the doctrine was not a third party unrelated to the assignment, but rather a subsequent assignee.

detriment of Honeywell. Indeed, Honeywell does not dispute that the patent rights that Robinson purported to assign had no value. Rather, Robinson and Honeywell are both of the view that the patents at issue are, and always have been, invalid. Under these circumstances, the Court concludes that the doctrine of assignor estoppel has no applicability in this case. Thus, BorgWarner's motion for summary judgment on this issue must be denied.

2. Equitable Estoppel

Next, BorgWarner contends that the doctrine of equitable estoppel precludes Honeywell from challenging the inventorship of the patents-in-suit.

In order for the doctrine of equitable estoppel to apply, the Court must find three elements: (1) a misleading communication, whether by words, conduct or silence, that would support an inference that the actor does not intend to assert a claim of inventorship; (2) substantial reliance upon that communication by the party asserting estoppel; and (3) material prejudice to the party asserting estoppel if the claim is allowed to proceed. A.C. Aukerman Co. v. R.L. Chaides Constr. Co., 960 F.2d 1020, 1041-43 (Fed. Cir. 1992). The doctrine of equitable estoppel applies not just to the

purported inventor, but also to any party attempting to assert incorrect inventorship on his behalf. “A finding that a claimed co-inventor has waived the patent right, or is otherwise equitably estopped to claim the right is binding on third parties.” Pannu v. Iolab Corp., 96 F.Supp.2d 1359, 1369 (S.D. Fla. 2000). The application of equitable estoppel is a matter “committed to the sound discretion of the trial judge” A.C. Aukerman, 960 F.2d at 1028.

In order to prevail on summary judgment, BorgWarner first must establish as a matter of law that Robinson engaged in misleading conduct that led BorgWarner reasonably to infer that he did not intend to raise an inventorship claim. In that regard, BorgWarner claims that Robinson never alleged to anyone at BorgWarner that he should be added as an inventor to the patents-in-suit, despite having had countless opportunities over the years to do so.

Assuming that BorgWarner is correct and Robinson never claimed to be a co-inventor of the patents-in-suit, Robinson’s silence, without more, is not sufficient to give rise to estoppel. Silence constitutes a misleading communication only “where there was an obligation to speak.” Meyers v. Asics Corp., 974 F.2d 1304, 1308 (Fed. Cir. 1992); A.C. Aukerman, 960

F.2d at 1028. Thus, “mere silence must be accompanied by some other factor which indicates that the silence was sufficiently misleading as to amount to bad faith.” Hemstreet v. Computer Entry Sys. Corp., 972 F.2d 1290, 1295 (Fed. Cir. 1992).

In the present case, BorgWarner has not established that Robinson had an obligation to inform BorgWarner that he claimed to be an inventor of the subject patents. BorgWarner has made no allegation of any contractual duty on Robinson’s part, nor has it alleged that it ever discussed the issue of inventorship with Robinson and that Robinson stayed silent. By contrast, Honeywell has presented a forecast of evidence from which a reasonable jury could conclude that Robinson did not remain silent about his claim of inventorship. Specifically, Robinson testified that once he learned of BorgWarner’s patent applications, he contacted Decker to discuss them. During this conversation, Robinson told Decker that he did not believe the invention was patentable and that some of the ideas contained in the patents were obtained from him and B&R Mold. BorgWarner disputes that Robinson ever made such an allegation to any BorgWarner employee, but argues that even if he did, such a statement would not be sufficient to put BorgWarner on notice that Robinson actually

claimed to be an inventor. Whether Robinson in fact made such a statement and whether that statement was sufficient to put BorgWarner on notice that Robinson claimed inventorship rights in the patents-in-suit are factual issues that are inappropriate to resolve on a summary judgment motion and must be left for a jury to decide.

For these reasons, the Court concludes that the doctrine of equitable estoppel cannot be applied as a matter of law to preclude Honeywell from challenging the inventorship of the patents-in-suit. BorgWarner's motion for summary judgment, therefore, must be denied.

V. HONEYWELL'S MOTION FOR SUMMARY JUDGMENT

A. Facts Relevant to Motion

Viewing the evidence in the light most favorable to BorgWarner as the non-moving party, the following is a recitation of the forecast of evidence relevant to Honeywell's summary judgment motion.

In 1996, Holset contracted with PCC to manufacture an investment cast titanium compressor wheel for Holset's turbochargers. [Declaration of Jacqueline Kearey ("Kearey Decl."), Doc. 115 at ¶¶9-16]. At that time, Holset understood that PCC would procure "[p]ermanent tooling" in which

“aluminium/steel segments” were to be inserted and removed “in two scroll (or iris) configurations”—i.e., by a type of mechanism, rather than by hand.⁶ [Holset Internal Memorandum, Doc. 115-4 at 6]. Holset later explained that its “[i]nitial intention with this [permanent] tool was to design so that the wax could be scrolled out of the mould in one action.” [Visit Report, Doc. 130-3 at 2].

When PCC contacted toolmakers for price quotes, PCC specified that the permanent tooling for the Holset project was to be fully scrolled tooling, with a “split scroll to form upper portion of the blades and lower portion with the splitters.” [Declaration of Sid Dyche (“Dyche Decl.”), Doc. 113-3 at 2]. Some toolmakers responded that Holset’s complex compressor wheel design precluded the kind of simple extraction paths required in typical scrolled tooling. For example, Camano Mold wrote to PCC that “[b]ased on the electronic data [for the Holset Wheel design], it appears that the tool will require 8 manually operated loose pieces above the splitter and a two piece assembly around the splitter which may be able to be scrolled away

⁶In a tool with an iris configuration, the inserts are retracted concurrently and automatically, such that the tool opens like an iris. [Deposition of John K. Thorne (“Thorne Dep.”), Doc. 130-1 at 80]. In a scroll-type tool, the segments are retracted via a cam mechanism. [Robinson Dep., Doc. 130-2 at 159-60].

from the part.” [Camano Mold Letter, Doc. 130-4; Deposition of Sidney Dyche (“Dyche Dep.”), Doc. 130-6 at 109].

On September 19, 1996, B&R Mold sent PCC a fax with “an early tool concept for the [Holset Die],” based on “the way we usually build this type of tooling.” [Robinson Decl., Doc. 117 at ¶6; B&R Mold Facsimile, Doc. 117-5 at 2]. Consistent with B&R Mold’s price quote, this fax showed a hypothetical fully scrolled tool, containing “T slot tracks” along which the die inserts would move from open to closed positions, as actuated by a handle operated cam plate and a series of “Cam tracks.” [B&R Mold Facsimile, Doc. 117-5 at 4].

When B&R Mold actually tried to build the tool, however, it had to abandon this early concept because the Holset compressor wheel design was too complex. On September 26, 1996, B&R Mold employee Stephen Reigel wrote to B&R’s owner, Brent Robinson, to say that the tool could not be built as planned:

I’m throwing up the big “RED FLAG”. We’ve got some serious problems on this tool. I have not come up with an answer yet. Our typical approaches don’t look like they’ll work in this case. . . .

[Robinson Facsimile dated Sep. 26, 1996, Doc. 130-7; Robinson Dep., Doc. 130-2 at 170-71]. Four days later, Mr. Reigel wrote to PCC that

“we’ve had to make some fundamental changes to the preliminary tool concept submitted earlier,” and that these changes were necessary due to the complexity of the blade design of the Holset Wheel. [PCC Facsimile dated Sep. 30, 1996, Doc. 117-6 at 2]. While B&R Mold recommended changing the wheel design to make the tooling easier to build, Holset declined to do so. [Robinson Dep., Doc. 130-2 at 173]. Because Holset would not change the complex design of its wheel, B&R Mold had to make fundamental changes to the tooling. One fundamental change made was that the actual “[w]ax removal sequence” now would require several additional manual steps, which Mr. Reigel described as follows:

- a) Open Press
- b) Rotate (2) “clam shells” open
- c) Retract short segments (“finger pulls”) 8 PL’s
- d) Operate scroll mechanism
- e) Shear injection runner with “shear box” and remove wax

[PCC Facsimile, Doc. 117-6 at 2].

B&R Mold completed the Holset Die and delivered it to PCC on November 5, 1996. [Dyche Decl., Doc. 113 at ¶11; Robinson Decl., Doc. 117 at ¶7; Robinson Dep., Doc. 112-2 at 287-88]. In November 1996,

Holset purchased the Holset Die from PCC along with the first 32 Holset Wheels. [Dyche Decl., Doc. 113 at ¶¶13, 17]. Using the Holset Die, PCC manufactured and sold titanium compressor wheels to Holset beginning in January 1997. [Kearey Decl., Doc. 115 at ¶38; Dyche Decl. at ¶¶13, 17].

The process of removing a wax pattern from the actual tool built by B&R Mold and delivered to PCC requires many distinct operations over the course of several minutes, as is discernable from the video submitted by Honeywell, beginning at about timestamp 01:08:22. [Video, Doc. 111-4]. To open the die, the operator first must manually remove retainer pins that hold the clam shells together. As Honeywell's expert agreed, this manual operation would not be necessary in an automated tool. [Deposition of Nicholas Cumpsty ("Cumpsty Dep."), Doc. 130-8 at 141]. Next, the operator must manually open the set of upper clam shells. [Video, Doc. 111-4; Rebuttal Expert Report of Dr. Nicholas Baines ("Baines Rebuttal Report"), Doc. 132-3 at ¶¶39-41; Rebuttal Expert Report of Paul Novak ("Novak Rebuttal Report"), Doc. 134-4 at ¶¶33-36].

Next, the operator must use a threaded wrench to assist in manually withdrawing the sixteen "finger pull" inserts, which form the spaces between adjacent full and splitter blades in the wax pattern, from their fully

closed position to a partially retracted position, where they rest on the lower clam shells. As the operator manually withdraws these finger pulls, several of them get stuck in place, and (as Honeywell's expert agrees) the operator has to wiggle or "jiggle" the inserts back and forth as part of this partial withdrawal step. [Video, Doc. 111-4; Cumpsty Dep., Doc. 130-8 at 138 ("there was some wiggling and jiggling, yes"); *id.* at 141 (acknowledging wiggling of insert at timestamp 1:09:08:13); Baines Rebuttal Report, Doc. 132-3 at ¶42; Novak Rebuttal Report, Doc. 134-4 at ¶¶37-38]. As BorgWarner's experts explained, this kind of wiggling is undesirable because it may risk bending or deforming the wax pattern, and can lead to inaccurate dimensions and inconsistencies between multiple wax patterns made from the same pattern die. [Baines Rebuttal Report, Doc. 132-3 at ¶42 n.4; Novak Rebuttal Report, Doc. 134-4 at ¶39]. Moreover, this wiggling affects the retraction paths of the inserts, giving the path up to this point a zig-zag shape. [Baines Rebuttal Report, Doc. 132-3 at ¶42; Novak Rebuttal Report, Doc. 134-4 at ¶39].

As the operator manually withdraws eight of the sixteen finger pull inserts -- specifically, the ones labeled as "1A" through "8A" on the Holset Die -- he must twist or swivel each of these inserts in a counterclockwise

direction as it nears the outer perimeter of the lower clam shell, where there is a notch in order to accommodate this twisting motion. In the video, the operator knocks several of these inserts out of place after twisting them, and must replace them before he is able to retract the other inserts that are spaced between these eight twisting inserts. [Video, Doc. 111-4 (see, e.g., timestamps 01:09:34:02, 01:09:44:00, 01:10:25:00); Baines Rebuttal Report, Doc. 132-3 at ¶43; Novak Rebuttal Report, Doc. 134-4 at ¶40; Cumpsty Dep., Doc. 130-8 at 139-40, 142-43 (agreeing that “[h]e knocked it, yes”)]. Like the wiggling motion referred to above, this twisting motion affects the retraction paths of the “A” inserts, making those paths even more complicated. [Baines Rebuttal Report, Doc. 132-3 at ¶43 (explaining with illustration); Novak Rebuttal Report, Doc. 134-4 at ¶40; Rebuttal Expert Report of Dr. John K. Thorne (“Thorne Rebuttal Report”), Doc. 133-2 at ¶22]. Even after all these operations, the operator still cannot easily remove the wax pattern from the die. Rather, the operator must continue to withdraw the finger pull inserts by moving the entire lower clam shells, which pivot on pivot arms attached to the base of the die, as shown in the video at timestamp 01:10:36:00 to 01:10:43:00. The movement of the inserts as they ride on the lower clam shells is thus part of

their retraction paths. [Video, Doc. 111-4; Baines Rebuttal Report, Doc. 132-3 at ¶44 (explaining with annotations); Novak Rebuttal Report, Doc. 134-4 at ¶¶41-42]; Thorne Rebuttal Report, Doc. 133-2 at ¶22]. Once the operator has finished moving the finger pull inserts, the operator then must use a lever to operate a set of scrolled inserts that form the spaces between the main blades of the wax pattern (where the splitter blades are not present), using one hand to operate the lever while using the other hand to hold the wax pattern so as to avoid breaking the wax. [Doc. 111-4 (at timestamp 01:10:51:00); Baines Rebuttal Report, Doc. 132-3 at ¶¶45-46; Novak Rebuttal Report, Doc. 134-4 at ¶43].

BorgWarner has practiced the patents-in-suit, making cost-effective titanium compressor wheels for turbochargers. [Opening Expert Report of Dr. Nicholas C. Baines (“Baines Report”), Doc. 132-1 at ¶¶177-242]. For example, in the die used to make BorgWarner’s compressor wheel casting number 673577, the inserts are retracted radially and automatically (with no manual labor required to open the die) to produce the backswept wax pattern -- a process that takes about one second. [Expert Report of Paul Novak Regarding Secondary Considerations of Nonobviousness (“Novak Nonobviousness Report”), Doc. 134-3 at ¶¶22-24].

Honeywell also uses a fully automated die to manufacture the accused products. Honeywell's die operates by retracting die inserts radially or along a curve from between the blades of backswept wax patterns, a process which takes approximately one second. [Baines Report, Doc. 132-1 at ¶¶43, 84-87; Novak Rebuttal Report, Doc. 134-3 at ¶¶26-28]. The operation of Honeywell's die, as compared to the operation of the 1996 Holset Die, is illustrated in a demonstrative video exhibit BorgWarner has lodged with the Court [Video, Doc. 130-12], which shows the two dies operated in sequence and then side by side.

B. Analysis

A patent is presumed to be valid. 35 U.S.C. § 282. "To overcome this presumption of validity, the party challenging a patent must prove facts supporting a determination of invalidity by clear and convincing evidence." Schumer v. Lab. Computer Sys., Inc., 308 F.3d 1304, 1315 (Fed. Cir. 2002). In order to prove invalidity, a party must show that the subject invention was "anticipated," 35 U.S.C. § 102, or that it was "obvious" to one of ordinary skill in the pertinent art, 35 U.S.C. § 103. A claim is anticipated if all of its limitations are found in a single reference in the prior art. In re Skvorecz, 580 F.3d 1262, 1266 (Fed. Cir. 2009); Finnigan Corp. v. Int'l

Trade Comm'n, 180 F.3d 1354, 1365 (Fed. Cir. 1999). A claim is obvious if the alleged invention would have been obvious to one of ordinary skill in the art in light of one or more prior art references. KSR Int'l Co. v. Teleflex Inc., 550 U.S. 398, 420, 127 S.Ct. 1727, 167 L.Ed.2d 705 (2007). While anticipation is a question of fact, obviousness is a question of law based on the resolution of underlying factual inquiries, including “the scope and content of the prior art, the differences between the prior art and the claims at issue, the level of ordinary skill in the pertinent art, and secondary considerations, otherwise known as objective indicia of nonobviousness.” Finisar Corp. v. DirecTV Group, Inc., 523 F.3d 1323, 1334, 1338-39 (Fed. Cir.) (citing Graham v. John Deere Co., 383 U.S. 1, 17-18, 86 S.Ct. 684, 15 L.Ed.2d 545 (1966)), cert. denied, 129 S.Ct. 754, 172 L.Ed.2d 727 (2008); Medical Instrumentation and Diagnostics Corp. v. Elekta AB, 344 F.3d 1205, 1220 (Fed. Cir. 2003).

1. Anticipation Under 35 U.S.C. § 102

Section 102 defines numerous ways that an invention can be anticipated. As relevant here, a patent is invalid if its claimed invention (1) was known or used by others before invention by the patentee, 35 U.S.C. § 102(a); (2) was in public use, on sale, or offered for sale in this country

more than a year before the filing date, 35 U.S.C. § 102(b); or (3) was first invented by another, 35 U.S.C. § 102(g)(2).

In the present case, BorgWarner alleges an invention date of March 31, 2000. For the purposes of Honeywell's motion, this date shall serve as the invention date for sections 102(a) and 102(g)(2) prior art. The effective filing date for the patents-in-suit is June 6, 2001, so any offers for sale on or before June 5, 2000 qualify as section 102(b) prior art. Honeywell contends that the prior Holset Wheel was designed, manufactured, and sold no later than January 1997, well in advance of these critical dates, and that the undisputed evidence establishes that the Holset Wheel anticipates every claim asserted by BorgWarner in this case. After carefully reviewing the forecast of evidence, however, the Court must conclude that Honeywell cannot establish by the high degree of proof required on summary judgment that the Holset Wheel anticipated the present invention, thereby rendering the patents-in-suit invalid.

BorgWarner has presented a forecast of evidence from which a reasonable jury could conclude that the Holset Die and Wheel are not "pullable." As construed by the Court, the asserted claims require that each of the die inserts be capable of being "pulled" radially or along a

curve. As explained by Dr. Nicholas Baines, an expert in compressor wheel design, the finger pull inserts in the Holset Die “are not extracted radially or along a curve, but along more complicated paths to render the pattern easily removable from the die.” [Baines Rebuttal Report, Doc. 132-3 at ¶¶49, 54-56, 59-62]. These “complicated paths” include the zig-zag shape caused by the operator’s intentional wiggling of the inserts, the sharp turn caused by the twisting of the “A” inserts, and the second sharp turn as the operator moves the entire lower clam shells. [Id.]. Similarly, Dr. John Thorne, an expert in investment casting, writes: “I have seen or operated hundreds of tools used to make wax patterns in my experience at investment casting foundries, and I am confident that the hand-moved inserts in the [Holset Die] are not extracted radially or along a curve to render the wax pattern easily removable from the die.” [Thorne Rebuttal Report, Doc. 133-2 at ¶¶22-25]. Mr. Paul Novak, an expert in making wax-injection tools, agrees that “the manually withdrawn inserts in the [Holset Die] are not extracted radially or along a curve” because these retraction paths require “wiggling the inserts as the operator begins to withdraw them,” “swiveling . . . 8 of the inserts,” and “[t]raveling on the lower clam shells as they are pivoted,” all before removal of the wax.

[Novak Rebuttal Report, Doc. 134-4 at ¶44]. Even Honeywell's expert in compressor wheel design, Dr. Nicholas Cumpsty, concedes that the retraction paths of these inserts include a wiggle [Cumpsty Dep., Doc. 130-8 at 138, 141], a twist [Id. at 139-40, 142], and even a second twist if the operator has "knocked" the insert out of place and has to re-set it. [Id. at 142-43].

Honeywell argues that BorgWarner is attempting to redefine the Court's construction of "pulled" by arguing that the retraction of the die inserts must be along a "simple or compound curve," rather than just "along a curve" as construed by the Court. Specifically, Honeywell contends that the Holset Wheel satisfies this claim limitation as construed by the Court because the complex series of curves (which BorgWarner refers to as a "zig zag pattern") required for the retraction of the Holset Wheel die inserts nevertheless constitutes retraction "along a curve." Additionally, Honeywell argues that the retraction of the Holset die inserts must be considered "along a curve" because the curved metal tracks of the tool physically restrict the inserts to a curved withdrawal. By arguing that the zig zag withdrawal of the inserts satisfies this claim limitation, it appears that it is Honeywell, not BorgWarner, which is attempting to redefine the Court's

construction of “pulled.” The Court construed this term to mean that the inserts were “withdrawn radially or along a curvature,” not a *series* of curvatures, as now contended by Honeywell. Additionally, as the claims themselves make clear, it is the path of the *inserts*, not the track grooves of the tool in which their guide pins travel during retraction, that is relevant to determining whether retraction of the inserts is “along a curve.”

Based upon the documentary evidence presented (including the video footage of the Holset Die in operation), along with the expert and factual testimony recited above, the Court concludes that a reasonable jury could determine that the wiggling and twisting of the finger pulls in the Holset Die make the retraction paths far more complicated than the curved path called for by the claims at issue. Summary judgment, therefore, must be denied.

Additionally, based on the forecast of evidence presented, a reasonable jury could conclude that the Holset Die was not automated. Many of the asserted claims require that the retraction of die inserts happen “automatically,” or “by an automated process.” See ‘556 Patent, Claims 2, 7, 9; ‘949 Patent, Claims 4-5, 10, 12-14. The Court has construed these limitations to mean “by a mechanism simultaneously

and/or in an ordered sequence.” [Claim Construction Order, Doc. 79-1 at 50]. Like the “pullability” limitations discussed above, these automation limitations apply to each die insert. See, e.g., ‘556 Patent, Col. 11, lines 3-4 (“said die insert retraction is by an automated process”). By contrast, the Holset Die involves the “finger pull” inserts, which as their name suggests, are retracted by hand, not by “a mechanism.” Additionally, these finger pulls are not retracted in an “ordered sequence,” but in whatever sequence the operator chooses to employ, which need not be the same from wax pattern to wax pattern. [See Novak Rebuttal Report Doc. 134-4 at ¶44 (noting inserts are “retracted manually and individually, in the order chosen by the operator”); Baines Rebuttal Report, Doc. 132-3 at ¶50 (“the operator can choose which way to proceed around the tool as he works on the ‘finger pulls’ . . . and does not need to repeat the same exact sequence every time he opens the tool”); see also id. at ¶¶54-60]. Based on this evidence, a reasonable jury could conclude that the Holset Die cannot meet the “automated process”/“automatically” limitations as construed by the Court. [See also Thorne Rebuttal Report, Doc. 133-2 at ¶¶28-29].

Further, two of the asserted claims require that the die inserts be retracted by a “hydraulic, pneumatic, or electric process.” See ‘556 Patent,

Claim 3; '949 Patent, Claim 5. BorgWarner has presented a forecast of evidence to demonstrate that this limitation is plainly absent from the Holset Die. [See Baines Ex. C ¶ 53; Novak Rebuttal Report, Doc. 134-4 at ¶¶44; Thorne Rebuttal Report, Doc. 133-2 at ¶¶29]. While such limitation may have been available generally in the prior art, anticipation requires that *all* of the limitations of an asserted claim be shown in a *single* prior art reference. See In re Skvorecz, 580 F.3d at 1266. Because the trier of fact could conclude that the Holset Wheel does not encompass this limitation, summary judgment must be denied.

Furthermore, the forecast of evidence presented demonstrates a genuine dispute of material fact regarding whether the Holset Die comprised two die inserts per air passage between adjacent blades, as required by three of the asserted claims. While Mr. Dyche initially declared that two inserts were required [Dyche Decl., Doc. 113 at ¶18], he later testified that “someone could say it’s one and a half” [Dyche Dep., Doc. 130-6 at 234]. By contrast, Honeywell’s compressor wheel expert, Dr. Nicholas Cumpsty, gave testimony suggesting that only one insert was required per air passage. [See Cumpsty Dep., Doc. 130-8 at 46-47 and

49-50]. This conflicting testimony is sufficient to create a genuine issue of fact which precludes summary judgment on the issue of anticipation.

For the foregoing reasons, the Court will deny Honeywell's motion for summary judgment as to its claim of anticipation under 35 U.S.C. §§ 102(a), (b), and (g)(2).

2. Obviousness Under 35 U.S.C. § 103

A patent claim is invalid as obvious under Section 103 if it “unites old elements with no change in their respective functions.” KSR, 550 U.S. at 415-16, 127 S.Ct. 1727. A “combination of familiar elements according to known methods” that “does no more than yield predictable results” is likely to be invalid as obvious. Id. at 416, 127 S.Ct. 1727. In KSR, the Supreme Court embraced an “expansive and flexible approach” to obviousness, rejecting the rigid test previously employed by the Federal Circuit that there must be some demonstrated past “teaching,” “suggestion,” or “motivation” to combine the prior art references in question. Id. at 415, 418, 127 S.Ct. 1727 (“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”).

In the present case, Honeywell contends that the automation limitations of the patents-in-suit would have been obvious. [Doc. 110 at 26]. The issue here is not, however, whether *automation* itself is a novel or desirable concept, but whether it would have been obvious to a person skilled in the art to design a titanium compressor wheel that could be produced by an automated process. See Sanofi-Synthelabo v. Apotex, Inc., 550 F.3d 1075, 1086 (Fed. Cir. 2008) (“The determination of obviousness is made with respect to the subject matter as a whole, not separate pieces of the claim.”), cert. denied, 130 S.Ct. 493, 175 L.Ed.2d 346 (2009).

In the present case, the inventors of the patents-in-suit did not claim to have invented the general idea of using titanium -- the patents admit on their face that “titanium compressor wheels have in fact long been used in turbojet and jet engines.” ‘347 Patent, Col. 2, lines 14-17. Nor did they claim to have invented the idea of making a titanium compressor wheel by investment casting it from a wax pattern of a wheel. Rather, they claimed a *better* design for a cast titanium compressor wheel, and a *better* process for making the wax patterns necessary for casting the wheel, which was

less laborious and expensive than the prior art. [Prosecution History, Doc. 130-11 at 10].

BorgWarner has presented a forecast of evidence to show that before the patents-in-suit, conventional wisdom dictated that to meet aerodynamic performance requirements, automotive compressor wheels and the wax patterns used to investment cast those wheels needed to have complex blade shapes. [Baines Report, Doc. 132-1 at ¶¶13-16, 27-30; Report of Dr. Nicholas C. Baines Regarding Secondary Considerations of Non-Obviousness (“Baines Nonobviousness Report”), Doc. 132-2 at ¶¶23-28]. It was further believed that the retraction paths of the die inserts were simply too complicated to automate in an economical fashion. [Baines Report, Doc. 132-1 at ¶¶31-33; Baines Nonobviousness Report, Doc. 132-2 at ¶23]. Instead, “complex manufacturing techniques” involving intricate manual operations had to be used, which was neither consistent nor economical enough for the purpose of mass production. [’347 Patent Prosecution History, Doc. 130-11 at 10; ’347 Patent, Col. 3, lines 30-54; Baines Report, Doc. 132-1 at ¶33].

To address this problem, the inventors simplified the complex blade shapes of the compressor wheel in such a way as to allow the wax patterns

to be produced by a typical automated tool -- making the investment casting process both consistent and economical -- but without sacrificing the necessary aerodynamic performance characteristics of the wheel. '347 Patent, Col. 4, lines 8-57. [Baines Nonobviousness Report, Dec. 132-2 at ¶¶25-26; Thorne Report, Doc. 133-1 at ¶27]. The claims of the patents-in-suit reflect this insight by reciting that the blades of the new wheel are “backswept” and “aerodynamic,” but also that the die inserts could be “pulled” or retracted “radially or along a curve” from between the blades, so that automated tooling for the wax patterns could be built at a reasonable cost. [See Baines Report, Doc. 132-1 at ¶34; Novak Nonobviousness Report, Doc. Doc. 134-3 at ¶19 (explaining that radial or curved paths make it “much easier and much less expensive to automate the operation of a pattern die”)].

Honeywell points to evidence that automated tooling was known generally in the prior art for the making of patterns for turbine wheels. [Doc. 110 at 26]. Turbine wheels, however, do not have “backswept aerodynamic blades” or the complex blade designs of the compressor wheels at issue in this case. [Baines Rebuttal Report, Doc. 132-3 at ¶115, 208-213; '347 Patent Prosecution History, Doc. 130-11 at 16-17; Cumpsty

Dep., Doc. 130-8 at 22-23]. Therefore, the fact that turbine wheel patterns were made using automated tooling does not establish as a matter of law that it would have been obvious to design a turbocharger compressor wheel with complex backswept blades with an automated pattern tooling.⁷

For these reasons, Honeywell's motion for summary judgment based on obviousness will be denied.⁸

VI. ORDER

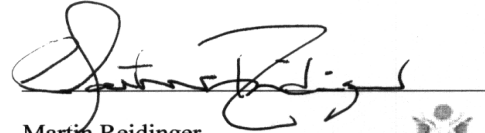
Accordingly, **IT IS, THEREFORE, ORDERED** that the Plaintiffs' Motion for Summary Judgment [Doc. 100] and the Defendant's Motion for Summary Judgment of Invalidity of the Patents-In-Suit [Doc. 109] are both **DENIED**.

⁷Indeed, as noted by BorgWarner [Doc. 129 at 28], the Patent Office allowed the BorgWarner patents even in light of prior art disclosing tools for the manufacture of turbine wheels using an automated process. [See Boyle Reference, Doc. 130-17 at 1 (disclosing that "a one-piece wax pattern . . . may be constructed using retractable inserts for the spaces between blades" where there are no "twisted blades")].

⁸Having determined that summary judgment is inappropriate as to the obviousness claim, the Court need not address BorgWarner's contention that secondary considerations of nonobviousness weigh heavily in BorgWarner's favor. [See Doc. 129 at 28-29].

IT IS SO ORDERED.

Signed: September 25, 2010

A handwritten signature in black ink, appearing to read "Martin Reidinger", written over a horizontal line.

Martin Reidinger
United States District Judge

