

# United States Court of Appeals for the Federal Circuit

---

(Serial No. 10/643,674)

**IN RE SUONG-HYU HYON AND MASANORI OKA**

---

2011-1239

---

Appeal from the United States Patent and Trademark  
Office, Board of Patent Appeals and Interferences.

---

Decided: May 24, 2012

---

GEORGE D. MOUSTAKAS, Harness, Dickey & Pierce,  
PLC., of Troy, Michigan, argued for appellant. With him  
on the brief was DAVID L. SUTER.

AMY J. NELSON, Associate Solicitor, United States  
Patent and Trademark Office, of Alexandria, Virginia,  
argued for appellee. With her on the brief were RAYMOND  
T. CHEN, Solicitor, and JANET A. GONGOLA, Associate  
Solicitor. Of counsel was SCOTT C. WEIDENFELLER, Asso-  
ciate Solicitor.

---

Before NEWMAN and BRYSON, *Circuit Judges*, and FOGEL,  
*District Judge*.<sup>1</sup>

Opinion for the court filed by *Circuit Judge* BRYSON.  
Dissenting opinion filed by *Circuit Judge* NEWMAN.

BRYSON, *Circuit Judge*.

This appeal arises from the examination of Reissue Application No. 10/643,674 (“the reissue application”), which stemmed from U.S. Patent No. 6,168,626 (“the ’626 patent”). During prosecution, the examiner rejected all claims of the reissue application on two independent grounds: (1) obviousness over U.S. Patent No. 5,030,402 (“Zachariades”) in view of U.S. Patent No. 3,886,056 (“Kitamaru”), and (2) impermissible recapture of subject matter surrendered during the original prosecution under 35 U.S.C. § 251. The Board affirmed the examiner’s rejection on both grounds. We agree with the Board that the claims of the reissue application would have been obvious in light of the prior art. We therefore affirm on that basis, and we do not address the portion of the Board’s decision regarding the recapture issue.

## I

The ’626 patent is entitled “Ultra High Molecular Weight Polyethylene [“UHMWPE”] Molded Article for Artificial Joints and Method of Preparing the Same.” As the title suggests, the claims of the ’626 patent and the reissue application are directed toward UHMWPE and, more specifically, UHMWPE for use in artificial joints.

---

<sup>1</sup> Honorable Jeremy Fogel, District Judge, United States District Court for the Northern District of California, sitting by designation.

Reissue claim 40, which is generally representative of the reissue claims on appeal, recites:

40. A method for producing an ultra high molecular weight polyethylene block, comprising:
  - (a) crosslinking an ultra high molecular weight polyethylene block having a molecular weight not less than 5 million by irradiating the block with a high energy radiation at a level of at least 1 MR;
  - (b) heating said crosslinked block up to a compression deformable temperature below the melting point of the UHMWPE;
  - (c) subjecting said heated block to pressure; and then
  - (d) cooling said block.

Reissue claim 84 is substantially the same as claim 40, except that the preamble recites “[a] method for producing an ultra high molecular weight polyethylene artificial joint component for implantation in a human or other animal,” and it adds an additional step (e), which recites “processing said cooled block to form said component.”

In rejecting the claims of the reissue application as obvious, the Board relied on the same two references invoked by the examiner: Zachariades and Kitamaru. Zachariades discloses a method for producing UHMWPE having a molecular weight of three million to six million. In particular, Zachariades teaches compression deformation of UHMWPE at a temperature between 80° C and the melting point of the polymer, applying pressure during

and after cooling to retain chain orientation, subjecting the final product to radiation crosslinking after unmolding, and then shaping the deformed UHMWPE into a final product. Kitamaru discloses a method for preparing UHMWPE by first crosslinking the UHMWPE by irradiating it with ionizing radiation, then heating the crosslinked UHMWPE to a molten state at a temperature of at least the melting point of the polyethylene while it is extended or compressed under pressure (i.e., compression deformed), and then cooling the polyethylene while maintaining it in an extended or compressed state. Kitamaru teaches that its method of crosslinking before compression results in a product that has a higher melting or softening point, improved transparency, and excellent dimensional stability.

During prosecution, the examiner found that Zachariades meets each limitation of the reissue claims except for the step of crosslinking the UHMWPE prior to compression. The examiner, however, found that Kitamaru discloses crosslinking the UHMWPE prior to compression. The examiner then found that it would have been obvious to a person of ordinary skill in the art to use crosslinked UHMWPE in the method of making the UHMWPE products disclosed by Zachariades given Kitamaru's teaching that crosslinking prior to compression deformation results in improved transparency, an increased melting point, and excellent dimensional stability. The examiner further found that one of ordinary skill in the art would have had a reasonable expectation of success in obtaining those enhanced properties by combining the techniques taught by the two references.

On appeal to the Board, Hyon<sup>2</sup> did not challenge the examiner's findings as to what the references teach, and the Board expressly adopted the examiner's findings in that respect. Instead, Hyon argued only that there would have been no motivation to combine the teachings of Zachariades and Kitamaru. The Board rejected that argument, agreeing with the examiner that a person of ordinary skill in the art would have been motivated to combine the references. Specifically, the Board found that Zachariades and Kitamaru "teach the same material (UHMWPE) and Kitamaru teaches benefits of . . . cross-linking before deformation of the UHMWPE." It also found that "Kitamaru focuses on cross-linking prior to extending as the reason for providing the improved properties," and that "the art provides the focus on using the cross-linking step prior to molding." The Board concluded that using the technique disclosed by the claims of the reissue application "appears to be nothing more than the predictable use of a prior art element (i.e., cross-linking prior to molding) according to its established function (i.e., to improve material properties such as [by increasing] the melting point)."

The Board considered and expressly rejected Hyon's arguments that a motivation to combine was lacking because the references are directed to different products (Zachariades to artificial joints; Kitamaru to films or sheets). The Board noted that both references are directed to UHMWPE, and that Zachariades teaches structures with "reduced thickness" or a "thinner load" having enhanced mechanical properties. The Board also expressly rejected Hyon's argument that one of ordinary skill in the art would not have been motivated to combine the pre-compression crosslinking step of Kitamaru with

---

<sup>2</sup> We refer to the applicants collectively as "Hyon."

Zachariades. Instead, it found that “Kitamaru provides the reason for modifying Zachariades to cross-link before extending: to provide UHMWPE articles with improved dimensional stability and transparency at high temperatures.” In addition, the Board rejected Hyon’s claim that the references fail to teach further processing to make a final product after deforming and cooling the UHMWPE. On that issue, the Board found that Zachariades teaches “machining into a final product.” Accordingly, the Board affirmed the examiner’s rejection of all the claims of the reissue application.

## II

As he did before the Board, Hyon challenges only the Board’s determination that there was a motivation to combine the references; he does not challenge the Board’s determination as to what the references teach.<sup>3</sup> The “existence of a reason for a person of ordinary skill to combine references” is a question of fact that we review for substantial evidence. *In re Constr. Equip. Co.*, 665 F.3d 1254, 1255 (Fed. Cir. 2011). Because the Board’s findings concerning motivation to combine are supported by substantial evidence, we affirm.

Hyon argues that one of ordinary skill in the art would not be motivated to combine the references because Zachariades is directed to artificial joints whereas Kitamaru is directed to films or sheets, which Hyon con-

---

<sup>3</sup> The dissent suggests that Hyon’s method requires only a “slight amount” of crosslinking, whereas Kitamaru teaches a “high dose.” However, Hyon has not raised that distinction either before the Board or on appeal to this court. In fact, Hyon explicitly noted during prosecution that the amount of crosslinking radiation “is [not] limited to any particular numerical dosage range.”

tends represent “fundamentally different material technologies.” As noted above, however, both Zachariades and Kitamaru pertain to UHMWPE. Although Zachariades primarily contemplates the use of the polyethylene for artificial joints, it generically discloses “a method for producing an UHMWPE product with enhanced planar mechanical properties.” Similarly, although Kitamaru primarily contemplates the use of the polyethylene to generate films and sheets, it generically discloses a “process for producing a high melting temperature polyethylene.” Neither reference limits the structure of the UHMWPE product that can be made; artificial joints (Zachariades) and sheets (Kitamaru) are simply embodiments of the polyethylene made by each process. Moreover, the distinction between the final products described in the two references is not as great as Hyon suggests. As the Board noted, Zachariades states that its recited method can be used to create thin products, Zachariades, col. 2, ll. 44, 66-67; col. 3, ll. 46-47, and discusses products that are “transparent,” *id.*, col. 9, ll. 29-30, 48. Accordingly, the Board’s conclusion that the references both teach processes directed to making the same class of products is supported by substantial evidence, as is its determination that differences in the UHMWPE products described by the embodiments do not negate the motivation to combine the references.

Substantial evidence also supports the Board’s determination that the fact that Zachariades teaches crosslinking after molding does not affect the motivation to combine. Zachariades does not state that UHMWPE products can be made only by crosslinking after compression deformation, nor does it state or suggest that faulty or inferior products will result from crosslinking prior to compression. The Board found that “Kitamaru teaches benefits of . . . cross-linking before deformation of the

UHMWPE.” It also found that “Kitamaru focuses on cross-linking prior to extending as the reason for providing the improved properties,” and that “the art provides the focus on using the cross-linking step prior to molding.” As noted above, Kitamaru teaches that its method results in a product that has a higher melting or softening point, improved transparency, and excellent dimensional stability.<sup>4</sup>

For similar reasons, Hyon’s argument that the Board improperly relied on the arbitrary selection of a single feature from Kitamaru (pre-compression crosslinking) while ignoring the other features is not persuasive. In support of his position, Hyon relies on *In re Wesslau*, 353 F.2d 238 (CCPA 1965), which states:

It is impermissible within the framework of section 103 to pick and choose from any one reference only as much of it as will support a given position, to the exclusion of other parts necessary to the full appreciation of what such reference fairly suggests to one of ordinary skill in the art.

353 F.2d at 241. In this case, however, the Board did not take the teachings of Kitamaru in isolation or out of context. As noted above, the Board found that one of skill in the art would appreciate that the pre-compression

---

<sup>4</sup> At oral argument, Hyon contended that Zachariades could not be combined with Kitamaru because the molding step of Zachariades would not work if the UHMWPE were crosslinked first, as the crosslinking would inhibit molding. Because that argument was not presented to the Board or in Hyon’s briefs to this court, we decline to address it. See *Sage Prods., Inc. v. Devon Indus., Inc.*, 126 F.3d 1420, 1426 (Fed. Cir. 1997). In any event, Hyon failed to adduce any evidence that crosslinking prior to molding would inhibit molding.



crosslinking step could be combined with Zachariades to obtain beneficial results. Both references involve similarly structured UHMWPE, and Zachariades does not disparage pre-compression crosslinking. Kitamaru expressly notes that crosslinking to improve the properties of UHMWPE was known in the art, but that the prior art methods did not result in increased melting point or improved transparency. Kitamaru teaches that its method results in a product with those improved properties. In addition, as found by the Board, Kitamaru “focuses on cross-linking prior to extending as the reason for providing the improved properties.” Accordingly, it is clear that the examiner and the Board selected the pre-compression crosslinking step because Kitamaru indicated that pre-compression crosslinking was responsible for the improved properties. Given Kitamaru’s discussion of crosslinking in the prior art and its focus on pre-compression crosslinking as a reason for the improved properties of polyethylene produced using its method, we cannot say that the Board “exclud[ed] . . . other parts [of the reference] necessary to the full appreciation of what such reference fairly suggests to one of ordinary skill in the art.” *Wesslau*, 353 F.2d at 241. The Board merely selected an element emphasized by the reference, relying on the reference’s suggestion that the selected element was responsible for the improved properties. Considering the references as a whole, as required by *Wesslau*, we conclude that the Board’s determination regarding motivation to combine is supported by substantial evidence.

Finally, substantial evidence supports the Board’s determination that Zachariades teaches post-processing to form a final component, as required by claim 84 of the reissue application. For example, Zachariades states that “[t]he product is simultaneously shaped into the final product”; that the compression-deformed product “can be

cut off by stamping or other process”; and that “the so-produced solid-state deformed UHMWPE can be used as a precursor for its machining into a final product.” Those statements are sufficient to support the Board’s finding that Zachariades teaches post-processing to form a final component.

### III

In sum, substantial evidence supports the Board’s finding that a person of ordinary skill in the art would have been motivated to combine the early crosslinking step of Kitamaru with the process of Zachariades to obtain the enhanced properties disclosed by Kitamaru that result from crosslinking prior to deformation. We therefore affirm the Board’s determination that the reissue claims would have been obvious in light of the prior art. Accordingly, we need not address whether the reissue claims impermissibly sought to recapture subject matter surrendered during the original prosecution in violation of 35 U.S.C. § 251.

**AFFIRMED**

# United States Court of Appeals for the Federal Circuit

---

(Serial No. 10/643,674)

IN RE SUONG-HYU HYON AND MASANORI OKA

---

2011-1239

---

Appeal from the United States Patent and Trademark  
Office, Board of Patent Appeals and Interferences.

---

NEWMAN, *Circuit Judge*, dissenting.

This case reaches us on appeal from the PTO's rejection, on the ground of obviousness, of all of the claims presented in this reissue divisional application of U.S. Patent No. 6,168,626 (the '626 patent). The patent, entitled "Ultra High Molecular Weight Polyethylene Molded Article for Artificial Joints and Method of Preparing the Same," is directed to artificial joints having low friction and improved abrasion resistance due to the molecular and crystal orientation of this ultra high molecular weight polyethylene (UHMWPE).

The Hyon procedure and its effects are not shown or suggested in any reference, despite the long history and extensive scientific studies of all forms of polyethylene. From the court's endorsement of the Board's flawed analysis, I must, respectfully, dissent.

## DISCUSSION

The '626 patent was issued on January 2, 2001 with eleven claims. On May 8, 2002, Hyon requested that the patent be reissued with 262 additional claims, stating, as the reissue statute requires, that he had, through error and without deceptive intent, claimed less than he was entitled to claim. This assertion entitled Hyon to a full examination of all of the proffered claims. *See* 37 C.F.R. §1.176(a) (“A reissue application will be examined in the same manner as a non-reissue, non-provisional application, and will be subject to all the requirements of the rules related to non-reissue applications.”); *see also* Manual of Patent Examination Procedure (MPEP) §1440 (“[A]n original claim, if represented in a reissue application, will be fully examined in the same manner, and subject to the same rules as if being presented for the first time in an original non-reissue, nonprovisional application . . .”).

The reissue claims on this appeal are directed to a method of producing a UHMWPE block or artificial joint component, whereby a controlled amount of irradiation is applied to the article to introduce a “very small amount” of cross-linking, followed by heating and compression-deformation of the molded article. The '626 patent summarizes the method as follows:

This UHMWPE molded article having molecular orientation or crystal orientation can be obtained by irradiating a low dose of a high energy ray to a raw UHMWPE molded article to introduce a very small amount of crosslinking points in polymer chains so as to be crosslinked slightly, then by compression-deforming the crosslinked UHMWPE molded article after heating up to its compression-deformable tem-

perature, and by cooling the molded article while keeping the deformed state.

'626 patent, col.2 ll.46-55. This appeal concerns twenty-seven claims of the reissue divisional application, of which claims 40, 41, and 84 can be viewed as representative:

40. A method for producing an ultra high molecular weight polyethylene block, comprising:

(a) crosslinking an ultra high molecular weight polyethylene block having a molecular weight not less than 5 million by irradiating the block with a high energy radiation at a level of at least 1 MR;

(b) heating said crosslinked block up to a compression deformable temperature below the melting point of the UHMWPE;

(c) subjecting said heated block to pressure; and then

(d) cooling said block.

41. A method for producing an ultra high molecular weight polyethylene block according to Claim 40, wherein said irradiation is gamma irradiation at a level of from 1 MR to 5 MR.

84. A method for producing an ultra high molecular weight polyethylene artificial joint component for implantation in a human or other animal, comprising:

(a) crosslinking an ultra high molecular weight polyethylene block having a molecular weight not less than 5 million by irradiating the block with a high energy radiation at a level of at least 1 MR;

(b) heating said crosslinked block up to a compression deformable temperature below the melting point of the UHMWPE;

- (c) subjecting said heated block to pressure;
- then
- (d) cooling said block; and
  - (e) processing said cooled block to form said component.

The reissue examiner, affirmed by the Board, held all of the claims unpatentable on the ground of obviousness over U.S. Patent No. 5,030,402 to Zachariades (July 9, 1991) in view of U.S. Patent No. 3,886,056 to Kitamaru et al. (May 27, 1975). The Zachariades patent, entitled “Process for Producing a New Class of Ultra-High-Molecular-Weight Polyethylene Orthopaedic Prostheses with Enhanced Mechanical Properties,” describes a process that starts with heating the polyethylene, deforming it by compression, and cooling the deformed polyethylene. Zachariades mentions the optional post-processing condition of radiation cross-linking, as follows:

The final product 19 in FIG. 2D can be separated from the perimeter mass 18 by stamping or other process after its removal from the mold 10, or after thermal (annealing) or post-processing conditions, e.g., radiation cross-linking.

'402 patent, col.6 ll.50-54. The reissue examiner acknowledged that there is a difference between Zachariades and Hyon, stating that for Zachariades cross-linking may be performed after deformation of the polymer, whereas Hyon requires a “slight amount” of cross-linking before deformation. Examiner’s Answer at 6 (Dec. 29, 2009) (“The difference from the instantly claimed method is that Zachariades does not mention crosslinking UHMWPE by irradiation before compression deformation.”). The examiner held that the Kitamaru reference filled this gap.

The Kitamaru patent, entitled “Process for Producing a High Melting Temperature Polyethylene Employing Irradiation and Orienting,” describes a process for treating polyethylene fibers and films in which radiation cross-linking is the first step, followed by melting, stretching while molten (optionally under pressure), and cooling. Kitamaru describes the process as follows:

In accordance with the present invention, the starting polyethylene is first crosslinked by irradiation with an ionizing radiation so as to produce crosslinked polyethylene having a gel content of at least one weight percent.

... [T]he crosslinked polyethylene is then extended or stretched in the molten state at a temperature of at least anisotropic melting point of the polymer. . . . Conventional extending means are applicable to the invention. For example, a conventional continuous drawing equipment may be used for stretching polyethylene fibers and films. Further, rolling and inflation apparatuses known in the art can be used for polyethylene films. If transparent polyethylene film or sheet is to be obtained, it is preferable to conduct the extending under an increased pressure. . . .

The crystallization subsequent to the extending in the molten state can be conducted at any temperature, because the rate of crystallization under the extended state is extremely rapid. Actually, after extending of crosslinked sample in the molten state, products having many advantageous properties such as very high melting temperature, excellent mechanical properties, excellent transparency and etc. are obtained independent of the condition for the crystallization.

'056 patent, col.2 ll.45-49, col.3 ll.11-43.

Kitamaru is directed to cross-linking and extending polyethylene fibers and films, and does not relate to producing a polyethylene mass suitable as an artificial joint having advantageous mechanical properties and dimensional stability. It is noteworthy that Zachariades, seeking mechanical strength and dimensional stability, did not follow the known Kitamaru processing sequence, but instead cross-linked the polyethylene after deformation, not before. Nonetheless, the examiner held that a person of ordinary skill in the field of the invention would have known to do what neither Kitamaru nor Zachariades did, and would have known or expected that this departure would produce "low friction and remarkably improved abrasion resistance," in the words of Hyon's '626 patent, col.2 ll.59-60. The examiner concluded:

It would have been obvious to one skilled in the art at the time of the invention to irradiate UHMWPE, as taught by Kitamaru et al in an analogous method, to provide a slightly crosslinked irradiated UHMWPE preform [sic: preform] as the starting UHMWPE to be used in the compression molding method steps for orienting and extending UHMWPE taught by Zachariades.

Examiner's Answer, at 6.

It is not disputed that neither Kitamaru nor Zachariades shows or suggests starting with slight cross-linking of the UHMWPE, followed by heating and compression deformation. Nonetheless, the Board found that the Hyon method "appears to be nothing more than the predictable use of a prior art element . . . according to its established



function.” Board op. at 10. The Board does not explain the source of its prediction, other than the Hyon method itself.

The Board held that a person of ordinary skill would have expected to combine aspects selected from the Zachariades and Kitamaru processes. As to which aspects to select and combine, the only guidance comes from Hyon, for the prior art contains no “apparent reason to combine the known elements in the fashion claimed by the patent at issue.” *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007). The Board reasoned backward from the Hyon method, to hold that since Kitamaru cross-linked prior to extending fibers and films, it was obvious to modify Zachariades by slightly cross-linking the bulk polymer prior to molding. The Board stated:

Kitamaru focuses on cross-linking prior to extending as the reason for providing the improved properties. Accordingly, the art provides the focus on using the cross-linking step prior to molding.

Based on the art’s focus on cross-linking prior to molding to improve the properties of the material, using such a technique appears to be nothing more than the predictable use of a prior art element (i.e., cross-linking prior to molding) according to its established function (i.e., to improve material properties such as increase the melting point).

Board op. at 10. However, Hyon stated in the ’626 patent that a high dose of radiation (as in Kitamaru) did not improve abrasion resistance: “[T]hough the irradiation of an ultra high dose of  $\gamma$ -ray was tried for improving the UHMWPE, it was made clear that coefficient of abrasion increases and abrasion loss does not decrease.” ’626 patent, col.1 ll.61-64.

The Board's suggestion that it was obvious to perform the method that neither Zachariades nor Kitamaru performed nor suggested, is supported solely by the teaching in Hyon's patent. See *In re Fritch*, 972 F.2d 1260, 1266 (Fed. Cir. 1992) ("It is impermissible to use the claimed invention as an instruction manual or 'template' to piece together the teachings of the prior art so that the claimed invention is obvious." (quoting *In re Gorman*, 933 F.2d 982, 987 (Fed. Cir. 1991)); see also *Interconnect Planning Corp. v. Feil*, 774 F.2d 1132, 1138 (Fed. Cir. 1985) ("The invention must be viewed not with the blueprint drawn by the inventor, but in the state of the art that existed at the time.").

When the technologic field is mature, apparently small changes that produce unexpected results or improved properties are of heightened significance. Nothing in the record suggests that a person of ordinary skill would have foreseen that Hyon's method of slight radiation cross-linking followed by heating and compression deformation would produce the described benefits. See *In re Gartside*, 203 F.3d 1305, 1314 (Fed. Cir. 2000) ("the Board's decision must be justified within the four corners of th[e] record").

The Board cited no reason to expect that the Hyon method would produce a superior polyethylene artificial joint. Zachariades, like Hyon, recognized the problem, and stated that "the fabrication of ultra-high-molecular-weight polyethylene products to achieve enhanced mechanical properties and good dimensional stability is a challenging task." '402 patent, col.2 ll.39-42. Zachariades commented that "it is very difficult to control this important parameter [good dimensional stability]." *Id.* at col.2 ll.28-29. Hyon in the '626 patent also pointed to the difficulty of improving UHMWPE properties, stating that "it is regarded that any improvement in dynamic properties of the UHMWPE by chemical modification reached its limitation, and it is re-

garded to be difficult to obtain a UHMWPE molded article having a more excellent abrasion resistance and lower friction.” ’626 patent, col.2 ll.5-9. The ’626 patent explains the Hyon improvement:

[T]he present inventors tried to obtain a molded article of a low friction and to improve an abrasion resistance by introducing molecular orientation or crystal orientation into a finished product by means of, not a chemical modification method, but a physical modification method.

This approach has never been attempted, not only in Japan, but also in other countries. The idea to endow the polyethylene molded article for artificial joints with molecular orientation or crystal orientation is the very creative, and it is sure that this invention, if actually carried out, will be applied to artificial joints all over the world.

*Id.* at col.2 ll.26-37. It is only after Hyon demonstrated how to achieve this improved result that the Board was able to plug the prior art steps into the template of the Hyon method. However, as explained in *Interconnect*, 774 F.2d at 1143, “[w]hen prior art references require selective combination by the court to render obvious a subsequent invention, there must be some reason for the combination other than the hindsight gleaned from the invention itself.”

The Kitamaru and Zachariades references describe different sequences and degrees of cross-linking, heating and cooling, and stretching and deformation. Zachariades compresses solid polyethylene below its melting temperature and then cross-links it, and Kitamaru cross-links fiber or film and then melts and stretches it. Neither of these references, nor any other authority, suggests that the Hyon steps would achieve the Hyon improvement. As stated in

*Life Technologies, Inc v. Clontech Laboratories, Inc.*, 224 F.3d 1320, 1326 (Fed. Cir. 2000), “[r]easonable expectation of success is assessed from the perspective of the person of ordinary skill in the art. That the inventors were ultimately successful is irrelevant to whether one of ordinary skill in the art, at the time the invention was made, would have reasonably expected success.” See also *In re Vaeck*, 947 F.2d 488, 493 (Fed. Cir. 1991) (“[T]he reasonable expectation of success must be founded in the prior art, not in the applicant’s disclosure.”).

The selective combination of aspects of Kitamaru and Zachariades is achieved only with hindsight knowledge of Hyon’s achievement, for nothing in either reference or elsewhere in the prior art suggests this modification. The Court in *KSR* cautioned that “[a] factfinder should be aware, of course, of the distortion caused by hindsight bias and must be cautious of arguments reliant upon *ex post* reasoning.” 550 U.S. at 421. The Board’s analysis is contrary to the Court’s guidance. In *In re Lee*, 277 F.3d 1338, 1344 (Fed. Cir. 2002) this court stated that “[i]t is improper, in determining whether a person of ordinary skill would have been led to this combination of references, simply to ‘[use] that which the inventor taught against its teacher.’” (quoting *W.L. Gore v. Garlock, Inc.*, 721 F.2d 1540, 1552 (Fed. Cir. 1983) (alteration in original)). See also *In re Dow Chem. Co.*, 837 F.2d 469, 472-73 (Fed. Cir. 1988).

The Board erred in its analysis, for “the factual inquiry whether to combine references must be thorough and searching.” *McGinley v. Franklin Sports, Inc.*, 262 F.3d 1339, 1351-52 (Fed. Cir. 2001). I respectfully dissent from the court's endorsement of the Board’s flawed analysis.