

# United States Court of Appeals for the Federal Circuit

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IN RE LUTZ BIEDERMANN AND JURGEN HARMS

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2013-1080

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Appeal from the United States Patent and Trademark Office, Patent Trial and Appeal Board in Application No. 10/306,057.

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Decided: October 18, 2013

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LUKE DAUCHOT, Kirkland & Ellis, LLP, of Los Angeles, California, argued for appellant. With him on the brief were NIMALKA R. WICKRAMASEKERA and BENJAMIN A. HERBERT. Of counsel on the brief was MARK GARCIA, Christie, Parker & Hale, LLP, of Glendale, California.

MONICA B. LATEEF, Associate Solicitor, United States Patent and Trademark Office, of Alexandria, Virginia, argued for appellee. With her on the brief were NATHAN K. KELLEY, Deputy Solicitor, and AMY J. NELSON, Associate Solicitor.

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Before MOORE, LINN, and O'MALLEY, *Circuit Judges*.

LINN, *Circuit Judge*.

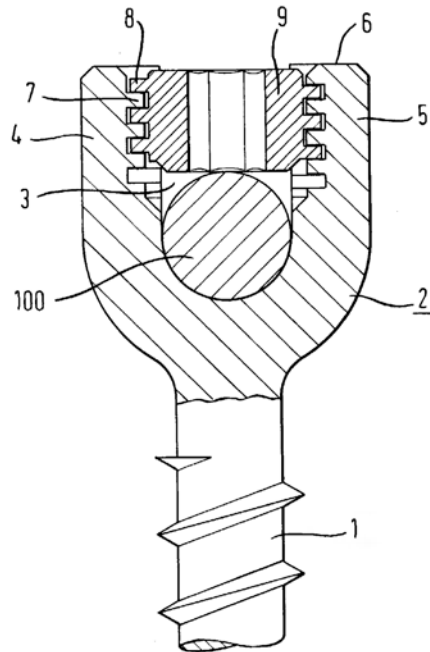
Lutz Biedermann and Jurgen Harms (collectively “Biedermann”) appeal a decision of the Board of Patent Appeals and Interferences (“Board”), now the Patent Trial and Appeal Board, affirming the rejection of claims 32, 33, 35–37, 37, 39, and 48 of U.S. Patent Application No. 10/306,057 (“’057 Application”) for obviousness, 35 U.S.C. § 103(a). *Ex parte Biedermann*, No. 2010-006113, Application No. 10/306,057, 2012 WL 3561836 (B.P.A.I. Aug. 16, 2012) (Decision on Request for Rehearing) (“*Decision on Rehearing*”); *Ex parte Biedermann*, No. 2010-006113, Application No. 10/306,057, 2012 WL 1979400 (B.P.A.I. May 30, 2012) (Decision on Appeal) (“*Decision on Appeal*”). Because the Board issued new grounds of rejection, this court vacates and remands for further proceedings.

## I. BACKGROUND

### A. The Patent Application

The invention in the ’057 Application, shown in the below reproduced Figure 1, is generally directed to a bone screw with a shank (1) and a holding portion with a U-shaped cross-section (2) for a rod (100) that connects to other bone screws. The two legs of the holding portion (4 and 5) have an inner thread (7) that cooperates with the outer thread (8) of a locking element or screw (9) to hold the rod securely in place. The two flat flanks of the inner thread are at a 90° angle to the central axis of the holding portion. This results in the thread having a substantially rectangular cross-section. The flanks of the outer thread of the locking element are likewise at a 90° angle to the central axis of the locking element. These threads are sometimes referred to as square threads. The crest of the outer thread on the locking element is spaced from the root of the inner thread on the holding portion. The ’057

Application describes these 90°-oriented flat threads as advantageously obviating the generation of outward radial forces. This avoids splaying of the holding portion's legs and eliminates the need for an additional element applied to the outside of the legs to avoid splaying. The application also describes these threads as advantageous because they are easy to produce.



Representative Claim 32 of the '057 Application recites:

32. A holding device comprising:

a shank portion;

a holding portion connected to the shank portion for holding a rod; and

a locking element to lock the rod in the holding portion;

wherein the holding portion comprises a recess on one end having a U-shaped cross-section and two open legs for receiving the rod, and an inner thread on the open legs;

wherein the locking element comprises an outer thread having two flanks, the outer thread cooperating with the inner thread, one of the two flanks of the outer thread facing the one end of the holding portion and the other of the two flanks of the outer thread facing away from the one end of the holding portion; and

wherein the inner thread comprises two flanks, one of the two flanks of the inner thread facing the one end of the holding portion and the other of the two flanks of the inner thread facing away from the one end of the holding portion, each of the two flanks of the inner thread enclosing an angle of 90° with a central axis (M) of the holding portion;

wherein a crest of the outer thread of the locking element is spaced from a root of the inner thread when the locking element is tightened such that an axial force acts on the holding device to prevent the legs from splaying.

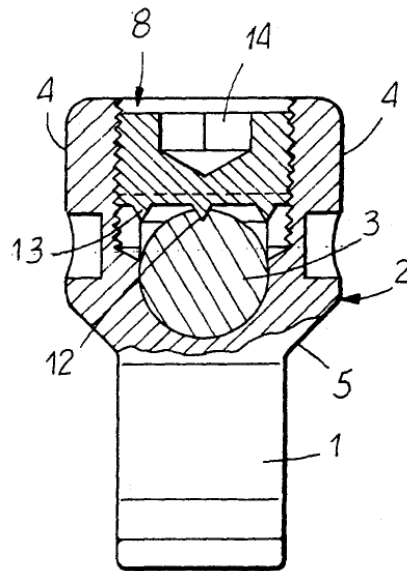
*Decision on Appeal*, at \*1.

#### B. The Examiner's Rejection

The examiner rejected claims 32, 33, 35–37, 39, and 48 of the '057 Application as being unpatentable over U.S. Patents No. 5,005,562 ("Cotrel") and No. 4,846,614

(“Steinbock”) further in view of U.S. Patent No. 4,688,832 (“Ortloff”) under 35 U.S.C. § 103(a).

Cotrel discloses a bone screw with a shank (1), a holding portion with internally threaded legs, and a locking element or screw (8) to hold a rod (3), as generally shown in Figure 3, reproduced below. Cotrel col. 2 ll. 14–34, col.



3 ll. 4–38.

Steinbock discloses a machining arrangement for moving heavy loads. In that context, it describes different thread configurations as follows:

[C]ertain threads are used to repeatedly move or *translate machine parts against heavy loads*. For these so-called translation threads a more efficient thread form is required. The most widely used thread forms for this purpose are the *Square*, the *Acme* and the *Buttress*. The *Square* thread is generally regarded as most efficient, but is diffi-

cult to cut because the thread form provides parallel sides. It also cannot be adjusted to compensate for wear. The Acme form of thread does not suffer from the disadvantages of the Square thread form; it is stronger and only slightly less efficient. The Bustress [sic] thread form is used for translation of loads in one direction only. Because of its non-symmetrical form, it combines the high efficiency of the Square thread . . . with the ease of cutting and adjustment of the Acme thread.

Steinbock col. 1 ll. 25–41 (emphasis added).

Completing the rejection, the examiner relied on the Ortloff reference for its disclosure of gaps or clearances between the crest of the outer thread and the root of the inner thread. The examiner also noted that this feature would be inherent in a device combining Cotrel and Steinbock.

The examiner considered Cotrel to disclose all elements of the claimed invention except for the orientation of the two flanks of the inner thread enclosing an angle of 90° with respect to the central axis of the holding portion. As for the missing thread configuration, the examiner relied on Steinbock, stating:

It is noted that there are a limited number of thread profile choices available to a person of ordinary skill in the art for providing a threaded connection. In this regard it is noted that Steinbock teaches different types of threads *with a square thread being the most efficient for load transfer* (col. 1, lines 14–44).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have provided threads with a

square profile on the Cotrel legs, as taught by Steinbock, *for efficient load transfer*.

Office Action at 2–3, Application No. 10/306,057 (Dec. 29, 2008) (“Final Rejection”) (emphasis added); *accord* Examiner’s Answer at 3, *Ex parte Biedermann*, No. 2010-006113, Application No. 10/306,057 (B.P.A.I. May 30, 2012) (Decision on Appeal) (“Examiner’s Answer”).

### C. The Board’s Decisions

In analyzing the propriety of the examiner’s rejection, the Board discussed the threads shown in Cotrel and Steinbock and also made reference, for the first time, to Erik Oberg et al., *Machinery’s Handbook* (Christopher J. McCauley et al. eds., 26th ed. 2000) (“*Machinery’s Handbook*”). The Board did not reach Ortloff and instead relied on the examiner’s alternative inherency rationale with respect to the gap.

With regards to the threads, Cotrel says,

The female thread of the two flanks or branches of the body of the implant and the thread of the plug can be made with a *saw-tooth pitch*, in order to avoid the *spreading of the two flanks* by completely eliminating the radial component of the load on screwing up.

Cotrel col. 2 ll. 54–58 (emphasis added) (reference numbers omitted). The *Machinery’s Handbook* at 1817 indicates that a saw-tooth thread is a buttress thread. *See Decision on Appeal*, at \*2 & n.3.

The Board specifically found that

[t]he fact that Steinbock groups square, Acme, and buttress threadforms would at least suggest

their interchangeability. . . . Cotrel already recognized the desirability of eliminating the radial component of the load on screwing and the suitability of a threadform, the saw-tooth or buttress form, that may have typically been used for translational applications to do so. Thus, one of ordinary skill in the art would have a reasonable expectation that a square threadform, which, like the buttress thread is also typically used for axial translation, would function in a manner similar to a saw-tooth or buttress thread to eliminate the radial component of a load on screwing, thereby discouraging spreading of Cotrel's flanks . . . , or splaying.

The Examiner's discussion as to the benefits that would be realized by Cotrel from improved efficiency is limited. However, this characteristic appears to be just one of several factors, including machinability, that one of ordinary skill in the art would consider when selecting an appropriate threadform. . . . Though not referred to as a saw-tooth thread, [another reference], discussed in [Biedermann's] Specification, appears to have similar characteristics to a saw-tooth and, according to [Biedermann], is difficult to produce—a problem [Biedermann] perceive[s] as *mitigated* by use of a square thread.

*Id.* at \*2 (footnotes omitted) (citations omitted) (internal quotation marks omitted). The Board thus affirmed the examiner's rejection.

Biedermann requested rehearing, arguing that the Board issued a new ground of rejection by relying on "interchangeability" instead of "efficiency" and by referring to the Machinery's Handbook, and additionally arguing that the Board failed to consider the negative



teachings of Steinbock that relate to machinability. The Board denied Biedermann's request. The Board explained that "by 'interchangability' [sic] we meant that the record demonstrates a likelihood that the threadforms grouped by Steinbock could successfully be substituted into Cotrel's device. . . . Cotrel clearly expresses the desirability of minimizing or eliminating the radial component of load on screwing up." *Decision on Rehearing*, at \*1. The Board further explained that "Steinbock's grouping was regarded as a suggestion that, in addition to a saw-tooth or buttress thread, good results may also be achieved using an Acme or Square thread which share certain characteristics that Cotrel recognized as important—the ability to eliminate or minimize radial loading." *Id.* at \*2. The Board acknowledged that "[t]he Examiner may have *specifically proposed* in the Office Action to select a thread 'for the most efficient load transfer' *as opposed* to one that minimized or eliminated radial loading due to contact or interference." *Id.* at \*1 (emphasis added).

As to the Machinery's Handbook, the Board found that "[t]he only fact detrimental to [Biedermann] based upon this extrinsic evidence was confirming that the 'saw-tooth' and 'buttress' threading described by Cotrel and Steinbock, respectively, referred to essentially the same thing," of which Biedermann was "already aware." *Id.* The Board asserted that it did not change the thrust of the rejection and instead "merely relied upon a reference akin to a technical dictionary to confirm the meaning of terms used in the references before us." *Id.*

Commenting on machinability, the Board noted that the square thread was beneficial, but that its "drawback, according to Steinbock, is difficulty cutting. The record, when considered as a whole, does not support [Biedermann's] position that difficulty cutting square threads

would lead one away from their use if one desired . . . [their] benefit.” *Id.* at \*2.

The Board denied reconsideration and again affirmed the examiner’s rejection. Biedermann appeals. This court has jurisdiction under 28 U.S.C. § 1295(a)(4)(A).

## II. DISCUSSION

### A. Standard of Review

“Whether the Board relied on a new ground of rejection is a legal question that we review *de novo*.” *In re Stepan Co.*, 660 F.3d 1341, 1343 (Fed. Cir. 2011).

### B. Analysis

“Obviousness is a question of law based on underlying findings of fact.” *In re Kubin*, 561 F.3d 1351, 1355 (Fed. Cir. 2009). The underlying factual inquiries are: (1) “the scope and content of the prior art,” (2) the “differences between the prior art and the claims at issue,” (3) “the level of ordinary skill in the pertinent art,” and (4) “secondary considerations” of nonobviousness. *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007) (quoting *Graham v. John Deere Co. of Kan. City*, 383 U.S. 1, 17–18 (1966)). In assessing the obviousness of patent claims,

[o]ften, it will be necessary for a court to look to interrelated teachings of multiple patents . . . in order to determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue. To facilitate review, this analysis should be made explicit. See *In re Kahn*, 441 F. 3d 977, 988 (CA Fed. 2006) (“[R]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with

some rational underpinning to support the legal conclusion of obviousness”).

*KSR*, 550 U.S. at 418 (alteration in internal quotation in original). The articulated reasoning and factual underpinnings of an examiner’s rejection are, thus, essential elements of any stated ground of rejection to which applicants are entitled to notice and a fair opportunity to respond.

The central question in the present case is whether the Board and the examiner properly relied on the same articulated reasoning and factual underpinnings in rejecting Biedermann’s claims or whether the Board made new findings and adopted different reasons to support a new ground of rejection, thus depriving Biedermann of both notice and an opportunity to respond.

Biedermann argues that the Board did not rely on the examiner’s efficient load transfer rationale to combine Cotrel and Steinbock, and instead issued a new ground of rejection by adopting a rationale based on newly found facts relating to the avoidance of splaying. Biedermann argues that the examiner did not find facts about Cotrel’s threads or splaying and that the Board found the thread-form of Cotrel interchangeable with the square thread-form based on the new findings that: (a) Steinbock grouped square and buttress threads; (b) the Machinery’s Handbook associated saw-tooth and buttress threads; (c) Cotrel’s threads were saw-tooth threads that avoid splaying; and (d) square threads would similarly avoid splaying. Biedermann also argues that the Board was critical of the examiner’s rationale and relied on the Machinery’s Handbook in finding a new reason to combine Cotrel and Steinbock. Moreover, Biedermann argues that the mere fact that the Board was responding to Biedermann’s arguments does not obviate the fact that the Board issued a new ground of rejection. Finally, Biedermann argues

that the Board newly and erroneously concluded that one of ordinary skill would have reason to substitute square threads for the saw-tooth threads in Cotrel because they are easier to machine.

The government argues that the Board did not issue a new ground of rejection, that Biedermann had the opportunity to respond to the thrust of the rejection, and that the Board relied on the examiner's efficient load transfer rationale and simply provided a more detailed explanation. The government also argues that the Board did not find new facts regarding Cotrel's thread type, its effect on splaying, or its relationship or similarity to other thread types because the Board was responding to or relying on Biedermann's arguments or statements. The government also argues that the Board only used the Machinery's Handbook as a technical dictionary. Finally, the government argues that the Board did not change the thrust of the rejection by referring to machinability because it was listing additional benefits in response to one of Biedermann's arguments.

The Patent and Trademark Office ("PTO") is subject to the Administrative Procedure Act ("APA"). *See Dickinson v. Zurko*, 527 U.S. 150, 154 (1999). Under the APA, the PTO "must assure that an applicant's petition is fully and fairly treated at the administrative level." *In re Kumar*, 418 F.3d 1361, 1367 (Fed. Cir. 2005). The APA requires the PTO "to provide prior notice to the applicant of all 'matters of fact and law asserted' prior to an appeal hearing before the Board." *Stepan*, 660 F.3d at 1345 (quoting 5 U.S.C. § 554(b)(3)); *see also In re Leithem*, 661 F.3d 1316, 1319 (Fed. Cir. 2011) ("Under the [APA], an applicant for a patent who appeals a rejection to the Board is entitled to notice of the factual and legal bases upon which the rejection was based." (citing 5 U.S.C. § 554(b)(3))). Accordingly, the PTO's rules "provide that when the Board relies upon a new ground of rejection not

relied upon by the examiner, the applicant is entitled to reopen prosecution or to request a rehearing.” *Leithem*, 661 F.3d at 1319 (citing 37 C.F.R. § 41.50(b)). These rights “ensure that the Board can fulfill its notice obligation to the applicant during prosecution.” *Stepan*, 660 F.3d at 1344. Failure to follow these procedures requires this court to vacate the Board’s decision. *See Rambus Inc. v. Rea*, \_\_ F.3d \_\_, No. 2012-1634, 2013 WL 5312505, at \*7 (Fed. Cir. Sept. 24, 2013).

When considering whether the Board issued a new ground of rejection, the “ultimate criterion of whether a rejection is considered ‘new’ in a decision by the Board is whether applicants have had fair opportunity to react to the thrust of the rejection.” *Leithem*, 661 F.3d at 1319 (internal quotation marks and alteration marks omitted). While “[t]he Board need not recite and agree with the examiner’s rejection *in haec verba* to avoid issuing a new ground of rejection,”

[m]ere reliance on the same statutory basis and the same prior art references, alone, is insufficient to avoid making a new ground of rejection when the Board relies on new facts and rationales not previously raised to the applicant by the examiner. This court’s predecessor long acknowledged the right of the Board to make additional findings of fact based upon the Board’s own knowledge and experience to fill in the gaps that might exist in the examiner’s evidentiary showing. But the Board’s power to do so is construed narrowly and when reliance upon such facts changes the thrust of the rejection, the Board’s action does everything but cry out for an opportunity to respond.

*Id.* (citations omitted) (internal quotation marks omitted). A new ground of rejection, however, generally will not be found based on the Board “further explain[ing] the exam-

iner's rejection" or the Board's thoroughness in responding to an applicant's argument. See *In re Jung*, 637 F.3d 1356, 1364–65 (Fed. Cir. 2011).

In *Leithem*, this court concluded that the Board issued a new ground of rejection. See 661 F.3d at 1317. The patent claim at issue in *Leithem* covered a diaper containing wood "fluff pulp" prepared by a certain method. *Id.* The examiner rejected the claim as obvious over a combination including the "Novak" reference, which the examiner explained disclosed "a method of making fluff pulp." *Id.* (internal quotation marks omitted). *Leithem* argued and the Board "agreed" that Novak "d[id] not disclose a fluffed pulp," but the Board sustained the examiner's rejection and found that Novak disclosed "a pulp which may be fluffed." *Id.* at 1317–18 (internal quotation marks omitted). This court concluded that "[t]he thrust of the Board's rejection changes when, as here, it finds facts not found by the examiner regarding the differences between the prior art and the claimed invention, and these facts are the principal evidence upon which the Board's rejection was based." *Id.* at 1320 (citation omitted).

Here, the examiner's reasoning in support of combining the square thread of Steinbock with the device of Cotrel was that there were a limited number of threads that could be used and that a square thread was the most efficient. While the examiner in the Examiner's Answer made a passing reference to splaying in relation to the gaps between the inner and outer threads, the examiner's rejection neither relied upon nor even noted the avoidance of splaying as a factor. The Board, on the other hand, found new facts as the basis for concluding that the combination of Cotrel and Steinbock would have been obvious: that Cotrel teaches avoiding splaying with saw-tooth threads; that saw-tooth threads are buttress threads; that Steinbock groups together the square threads and buttress threads; and that square threads

avoid splaying. The principal reason the examiner combined the references was the efficiency of a square thread. The principal reason the Board affirmed the combination of the references was the avoidance of splaying by using square threads. These are different grounds and form the bases or underpinnings of different rejections. Even the Board itself recognized that efficiency and avoiding splaying were different. *Decision on Rehearing*, at \*1. This is analogous to *Leithem* in which the Board distinguished fluffed pulp from pulp that could be fluffed. *See* 661 F.3d at 1318, 1320.

The government's argument that the Board was providing additional details for the examiner's reasoning, rather than changing the thrust of the rejection, is not persuasive. The thrust of the rejection changed when the Board found a new factual basis for the reason to combine. The Board went beyond filling in gaps in the examiner's reasoning because it is not clear that the examiner's reasoning survived in the Board's rejection. Unlike *Jung*, there is no indication that the Board was merely explaining the examiner's rejection. *See* 637 F.3d at 1365. The present case is similar to *Rambus*, 2013 WL 5312505, at \*7, in which the examiner made an erroneous finding in support of a combination of references and the Board made new, alternative findings to support the combination. "While the Board's findings may ultimately be correct, we will not affirm a Board rejection, like this one, which essentially provides a new motivation to combine the references." *Id.*

The government asserts that the Board was merely responding to Biedermann's arguments rather than issuing a new ground of rejection. A new ground of rejection is not negated by the fact that the Board is responding to an appellant's argument. *See Stepan*, 660 F.3d at 1345 ("[T]he mere fortuity that Stepan addressed the validity of the Declaration on its own, without the issue

being raised by the examiner, does not permit the Board to reject the Declaration as ineffective without designating its decision as a new ground of rejection.”); *Leithem*, 661 F.3d at 1317, 1320 (concluding that the Board issued a new ground of rejection despite the fact that the Board “agreed with *Leithem*” that Novak did not teach a fluffed pulp).

As to the Machinery’s Handbook, the citation of a new reference will be a new ground of rejection in some instances:

Ordinarily, citation by the board of a new reference, such as the dictionary in this case, and reliance thereon to support a rejection, will be considered as tantamount to the assertion of a new ground of rejection. This will not be the case, however, where such a reference is a standard work, cited only to support a fact judicially noticed *and . . .* the fact so noticed plays a minor role, serving only to fill in the gaps which might exist in the evidentiary showing made by the Examiner to support a particular ground for rejection.

*In re Boon*, 439 F.2d 724, 727-28 (CCPA 1971) (citation omitted) (internal quotation marks omitted).

In this case, the Board used the Machinery’s Handbook to associate buttress and saw-tooth threads. There is no clear gap in the examiner’s reasoning that would be filled by the association between saw-tooth and buttress threads, particularly since Cotrel’s threads appear irrelevant to the examiner’s reasoning. Rather, the association between saw-tooth and buttress threads played an important role, not a minor role, in the Board’s new reasoning by providing the link to associate Cotrel’s threads with one of the threadforms grouped in Steinbock. The



Machinery's Handbook, thus, was used as part of the new ground of rejection.

The Board's treatment of machinability in the *Decision on Appeal* was also a new ground of rejection. The Board treated machinability as another factor, in addition to efficiency, that one of ordinary skill would consider in selecting a threadform, making it part of the reason to combine the references. See *Decision on Appeal*, at \*2. Identifying machinability as an additional reason to combine does not mean that it is not a new ground of rejection. See *In re Waymouth*, 486 F.2d 1058, 1061 (CCPA 1973) ("To attempt to deny appellants an opportunity to provide a different and appropriate response to the board's rejection by saying that the board merely advanced 'an additional reason' for affirming the examiner begs the question and does not satisfy the administrative due process . . . ."), *modified*, 489 F.2d 1297 (CCPA 1974). There is no apparent connection between machinability and the examiner's reason to combine based on efficiency.

### III. CONCLUSION

For the foregoing reasons, this court vacates the Board's decision and remands for further proceedings.

**VACATED AND REMANDED**