

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

HANDI QUILTER, INC. and TACONY CORPORATION,
Petitioners,

v.

BERNINA INTERNATIONAL AG,
Patent Owner.

Case IPR2013-00364
Patent 6,883,446 B2

Before JENNIFER S. BISK, MICHAEL J. FITZPATRICK, and
GEORGIANNA W. BRADEN, *Administrative Patent Judges*.

FITZPATRICK, *Administrative Patent Judge*.

FINAL WRITTEN DECISION
35 U.S.C. § 318 and 37 C.F.R. § 42.73

I. BACKGROUND

Handi Quilter, Inc. and Tacony Corporation (collectively, “Petitioner”) filed a Petition for an *inter partes* review of claims 1–34 of U.S. Patent No. 6,883,446 B2 (“the ’446 patent”). Paper 1, “Pet.” The Patent Owner, Berina International AG, filed a Preliminary Response pursuant to 35 U.S.C. § 313. Paper 9, “Prelim. Resp.” In a November 5, 2013, Decision (“Institution Decision”), we granted the Petition and instituted trial on a subset of the claims on the following grounds:

claims 1, 2, 5–7, 10, 12, 13, 17–21, 23–29, 31, 33, and 34 as anticipated by Watabe;¹ and

claims 1, 2, 5–7, and 23–27 as obvious over Watabe and Reed.² Paper 12 (“Dec.”), 26.

After institution, Patent Owner filed a Patent Owner Response (Paper 17, “PO Resp.”), and Petitioner filed a Reply (Paper 22, “Pet. Reply”). Petitioner filed a Motion to Exclude (Paper 20) certain evidence relied upon by Patent Owner in its Response.

Oral hearing was held on June 25, 2014.³

The Board has jurisdiction under 35 U.S.C. § 6(c). This final written Decision, issued pursuant to 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73, addresses

¹ Japanese Published Patent Application No. 2002/292175 (Oct. 8, 2002). Petitioner submitted the Japanese language reference (Ex. 1006) as well as a translation (Ex. 1004).

² U.S. Patent No. 4,192,241, issued Mar. 11, 1980 (Ex. 1009).

³ A transcript of the oral hearing is included in the record. Paper 38.

issues and arguments raised during the trial.

As discussed below, Petitioner has shown by a preponderance of the evidence that claims 1, 2, 5–7, 10, 12, 13, 17–21, 23–29, 31, 33, and 34 of the '446 patent are unpatentable. Petitioner's Motion to Exclude is dismissed as moot.

A. Related Proceedings

Patent Owner asserted the '446 patent in separate lawsuits against each of the petitioners as follows: *Bernina International AG v. Handi Quilter, Inc.*, Case No. 2:12-cv-07079-JD (E.D. Pa.), and *Bernina International AG v. Tacony Corp.*, Case No. 2:13-cv-01787-JD (E.D. Pa.). Pet. 1; Paper 8, 1–2.

B. The '446 Patent

The '446 patent relates “to a method and apparatus for stitching together two or more fabric layers, as in quilting.” Ex. 1001, 1:11–12. “A general goal of the quilting process is to produce precise consistent stitches that are closely and uniformly spaced.” *Id.* at 1:31–33. Both parties agree the prior art included the use of a large frame that helps a user to produce consistent stitches. Pet. 12; Prelim Resp. 22; *see also* Ex. 1001, 1:65–67 (describing prior art use of “a frame and a quilting/sewing machine”).

The '446 patent employs a motion detector to detect movement of the fabric stack in order to synchronize automatically the delivery of stitch strokes with the user's movement of the stack. *Id.* at 2:20–26. Figure 2 of the '446 patent is reproduced below.

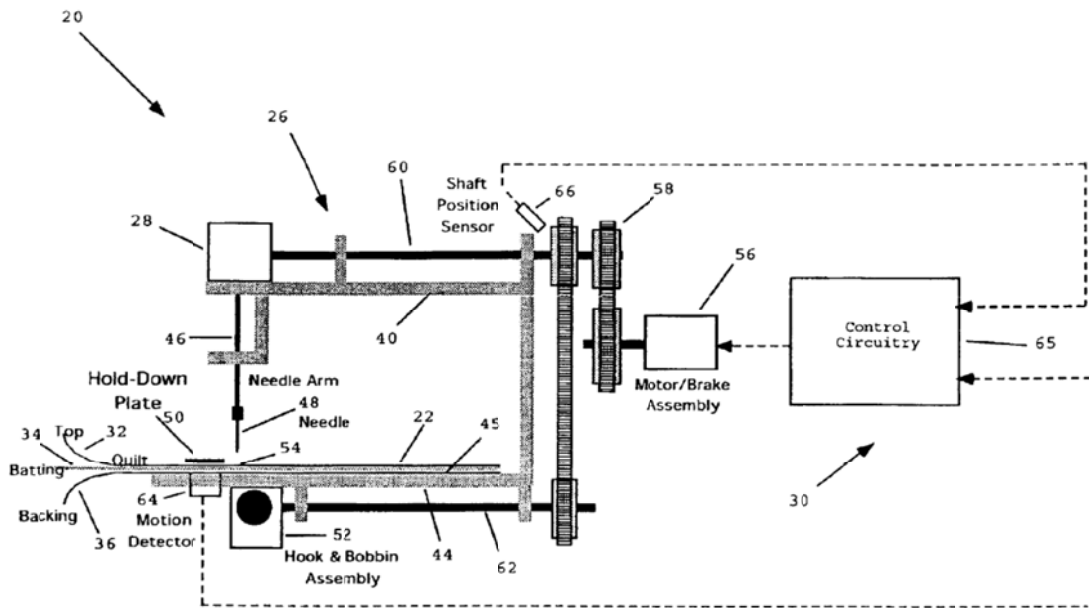


Figure 2 illustrates preferred embodiment 20 of a quilting system for stitching together fabric layers of stack 22. Ex. 1001, 4:14–16. The system comprises mechanical machine portion 26 that includes actuable stitch head 28 including needle bar 46 supporting needle 48. *Id.* at 4:16–18, 4:29–31. The system also includes electronic control subsystem 30 for actuating the stitch head in response to movement of the stack. *Id.* at 4:18–20.

II. ANALYSIS

Claims 1, 2, 5–7, 10, 12, 13, 17–21, 23–29, 31, 33, and 34 of the '446 patent (the “instituted claims”) are the subject of this *inter partes* review. Of those, claims 1, 10, 21, 23, 28, and 31 are independent. Claim 1 is illustrative and is reproduced as follows:

1. An apparatus for stitching together two or more stacked planar layers, said apparatus including:

a stitch head mounted at a fixed location and actuatable to insert a stitch through a stack of two or more planar layers located beneath said stitch head;

a substantially horizontally oriented bed for supporting said stack of planar layers for manually guided movement across said bed beneath said stitch head;

detector means for detecting movement of a surface of said stack oriented parallel to said bed and proximate to said stitch head for producing signals representing the magnitude of stack surface movement; and

control circuit means responsive to said signals indicating stack surface movement exceeding a certain threshold for actuating said stitch head to insert a stitch through said stack.

A. Claim Construction

In our Institution Decision, we expressly construed several claim terms. Dec. 6–15. Neither party disputes those constructions. *See* PO Resp. 3 (“Patent Owner does not agree with the Board’s preliminary claim construction, but accepts it for the purposes of this response.”); *see generally* Pet. Reply. We adopt those constructions in this final Decision.

B. Watabe as Prior Art

Both grounds instituted for *inter partes* review rely on Watabe, but Patent Owner contends that Watabe is not prior art to the instituted claims of the ’446

patent. PO Resp. 4–23. Indeed, that is the main focus of Patent Owner’s Response. *Id.*

1. Watabe as Prior Art Under 35 U.S.C. § 102(b)

Watabe was published on October 8, 2002. Ex. 1004, 1. The ’446 patent issued from an application filed on February 11, 2004, but claims priority to provisional application no. 60/447,159 (Ex. 1013), which was filed February 12, 2003. Ex. 1001, 1:4–5. Thus, Watabe potentially is prior art to the instituted claims under either 35 U.S.C. § 102(a) or (b) (2002).⁴ Petitioner, however, asserted Watabe as prior art under only § 102(a). *See* Pet. 3–4.

Petitioner purported to “reserve[] the right” to assert Watabe as prior art also under § 102(b). *Id.* at 4. A petition for an *inter partes* review, however, must identify “[t]he specific statutory grounds under 35 U.S.C. 102 or 103 on which the challenge to the claim is based.” 37 C.F.R. § 42.104(b)(2). Further, a petition also must show how the challenged claims are unpatentable under each identified statutory ground. 37 C.F.R. § 42.104(b)(4). As part of that showing, a petition needs to show that a relied-upon reference qualifies as prior art under the identified

⁴ The America Invents Act (“AIA”), Pub.L. No. 112–29, took effect on March 18, 2013. Because the application from which the ’446 patent issued was filed before that date, our citations to 35 U.S.C. § 102 are to its pre-AIA version. The same is true of our citations below to 35 U.S.C. § 112.

statutory ground(s). *Id.* The Petition in this proceeding does not show, let alone assert, that Watabe is prior art to the instituted claims under 35 U.S.C. § 102(b).⁵

2. *Watabe as Prior Art Under 35 U.S.C. § 102(a)*

As discussed above, Petitioner contends that Watabe is prior art to the instituted claims under 35 U.S.C. § 102(a). Pet 3–4. That subsection provides: “A person shall be entitled to a patent unless– (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for patent.” 35 U.S.C. § 102(a). Patent Owner argues that Watabe is not § 102(a)-prior art because the named inventor of the ’446 patent, Ralph J. Koerner, invented the subject matter of the instituted claims before Watabe was published on October 8, 2002. PO Resp. 5; *see Mahurkar v. C.R. Bard, Inc.*, 79 F.3d 1572, 1576 (Fed. Cir. 1996) (“Thus, under section 102(a), a document is prior art only when published before the invention date.”).

⁵ We do not presume challenged claims are entitled, under 35 U.S.C. § 120, to the benefit of an earlier filing date of a priority application that does not share the same disclosure as the application from which the claims issued. But, in such circumstances, the issue has to be raised by a petitioner in its petition, by identifying the claims (including their specific limitations) allegedly lacking 35 U.S.C. § 112, first paragraph, written description and enabling disclosure in the priority application. Only then, would a patent owner have to make a sufficient showing of entitlement to the earlier filing date, in a manner that is commensurate in scope with the specific points and contentions raised by the petitioner. *See Polaris Wireless, Inc. v. Trueposition, Inc.*, No. IPR2013-00323, 2013 WL 8563953, at *17 (PTAB Nov. 15, 2013).

To show prior invention, Patent Owner must show that either (1) Mr. Koerner reduced his invention to practice before October 8, 2002, or (2) he conceived of the invention before October 8, 2002, and exercised reasonable diligence in reducing that invention to practice. *See Teva Pharm. Indus. Ltd. v. AstraZeneca Pharms. LP*, 661 F.3d 1378, 1383 (Fed. Cir. 2011). Patent Owner argues the latter. PO Resp. 5. Thus, Patent Owner must prove both prior conception and reasonable diligence. *Teva*, 661 F.3d at 1383.

With respect to the first prong, the Court of Appeals for the Federal Circuit has held:

Conception is the touchstone of inventorship, the completion of the mental part of invention. *Sewall v. Walters*, 21 F.3d 411, 415 (Fed. Cir. 1994). It is “the formation in the mind of the inventor, of a definite and permanent idea of the complete and operative invention, as it is hereafter to be applied in practice.” *Hybritech Inc. v. Monoclonal Antibodies, Inc.*, 802 F.2d 1367, 1376 (Fed. Cir. 1986) (citation omitted). Conception is complete only when the idea is so clearly defined in the inventor’s mind that only ordinary skill would be necessary to reduce the invention to practice, without extensive research or experimentation. *Sewall*, 21 F.3d at 415; *see also Coleman v. Dines*, 754 F.2d 353, 359 (Fed. Cir. 1985) (conception must include every feature of claimed invention). Because it is a mental act, courts require corroborating evidence of a contemporaneous disclosure that would enable one skilled in the art to make the invention. *Coleman v. Dines*, 754 F.2d at 359.

Burroughs Wellcome Co. v. Barr Labs., Inc., 40 F.3d 1223, 1228 (Fed. Cir. 1994) (parallel citations omitted). Although it is based on underlying facts, conception is a question of law. *Price v. Symsek*, 988 F.2d 1187, 1190 (Fed. Cir. 1993); *Hybritech*, 802 F.2d at 1376.

The '446 patent issued on April 26, 2005. Ex. 1001. Mr. Koerner, the named inventor, died in October 2012. Ex. 2002 ¶ 2; Ex. 2015 ¶ 3. He was informed, however, of the existence of Watabe in 2008 by his patent attorney and personal friend, Art Freilich. Ex. 2015 ¶¶ 3, 9. More specifically, Mr. Freilich learned of Watabe's existence around September or October 2008, and thereafter discussed it with Mr. Koerner and asked him to "investigate his records and develop a timeline of the events surrounding his invention" as claimed in the '446 patent. *Id.* at ¶¶ 9–10. As a result of that investigation, Mr. Koerner allegedly found four documents that bear dates prior to the publication of Watabe on October 8, 2002. *Id.* at ¶¶ 11, 15.

Mr. Koerner did not execute an affidavit or declaration, but, according to Mr. Freilich, he did prepare an April 16, 2009-dated document titled "Free Motion Switch Regulator Invention Timeline" (Ex. 2032), and, with the help of Mr. Freilich, a May 4, 2009-dated letter to the licensee of the '446 patent, "Bernina/Fritz Gegauf AG," discussing conception and diligence of the invention (Ex. 2033). Ex. 2015 ¶¶ 12–13.

The four documents that bear dates prior to October 8, 2002, are Exhibits 2003–2006. *See* PO Resp. 6; *see also id.* at 8 (citing Exs. 2039, 2029, 2030, and 2038, which, respectively, are copies of the same documents constituting

Exs. 2003–2006).⁶ Patent Owner relies on three of these documents, Exhibits 2004–2006, to establish conception prior to October 8, 2002, by mapping them to “representative apparatus claims, 1, 10, and 21.” PO Resp. 13. The documents, however, fail to show conception of the claimed inventions.

Claim 1 requires a “control circuit means responsive to said signals indicating stack surface movement exceeding a certain threshold for actuating said stitch head to insert a stitch through said stack.” Claim 10 requires “control circuitry responsive to detected movement of said fabric layer surface for controlling actuation of said needle arm.” Claim 21 requires “control means responsive to a translational movement of said stack of a magnitude exceeding a certain threshold for causing said needle to execute said cyclic movement.” These are key limitations of the independent claims that are directed to the allegedly novel integration of prior art-motion detectors with prior art-apparatuses for stitching, sewing, or quilting.

To show conception for these limitations, Patent Owner relies on Exhibit 2006. *See* PO Resp. 16, 19, 23. Exhibit 2006 bears a date of September 29, 2002. Ex. 2006. Mrs. Koerner testified that she recognizes the document to be in her husband’s handwriting. Ex. 2002 ¶ 15; *see also* Ex. 2015 ¶ 15 (Mr. Freilich

⁶ Exhibits 2003-2006 are copies of the documents as collected by Mr. Koerner’s widow sometime after his death (*see* Ex. 2002 (Declaration of Dorothy Koerner) ¶¶ 12–15), whereas Exhibits 2039, 2029, 2030, and 2038 are copies of the same documents as sent by Mr. Koerner to Mr. Freilich in 2009. *See* Ex. 2015 ¶¶ 11, 15. Patent Owner should not have filed duplicate documents. *See* 37 C.F.R. § 42.6(d).

testifying that he received a copy of this document from the inventor via email in 2009). Exhibit 2006 is reproduced below.

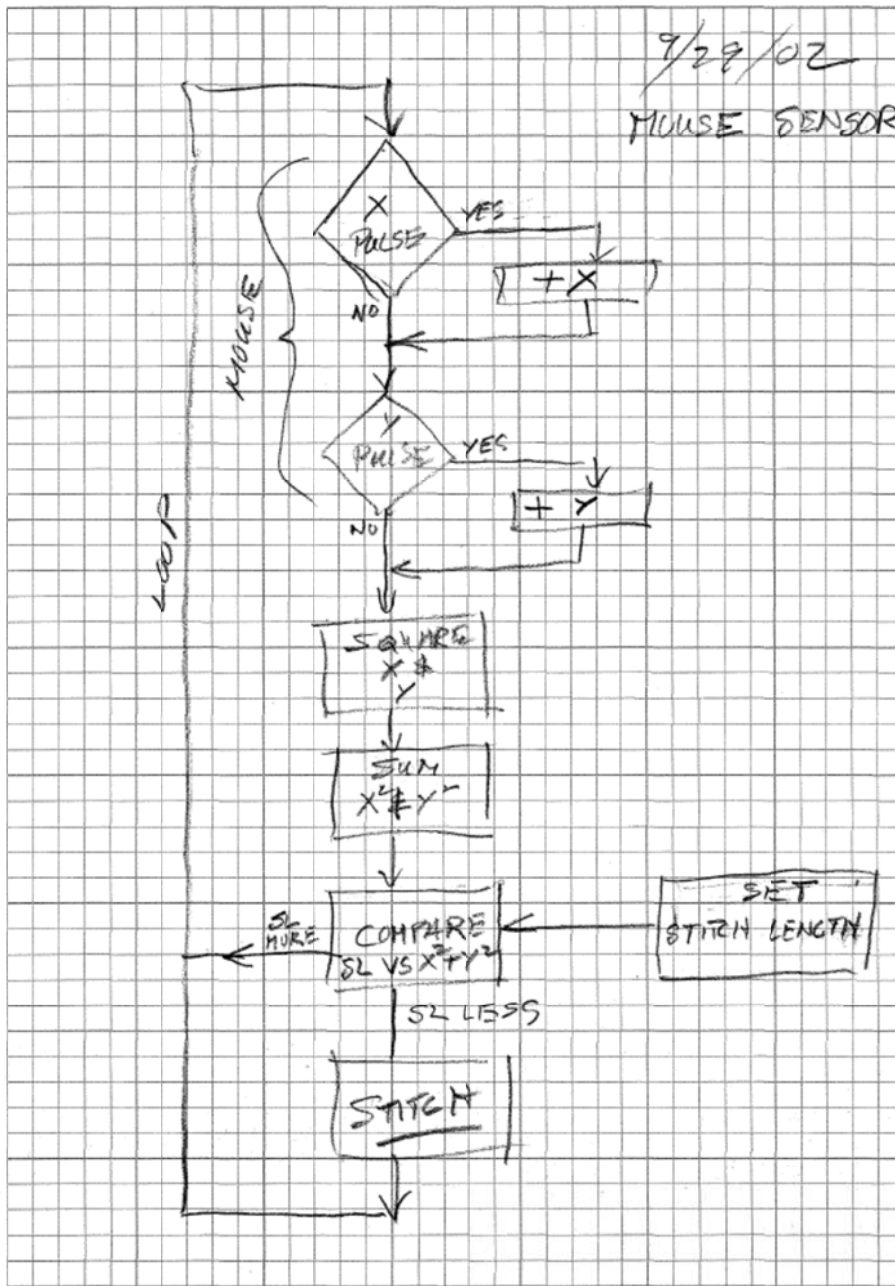


Exhibit 2006 illustrates, in flow diagram format, a basic algorithm in which x and y pulses are inputted to a “mouse” or “mouse sensor,”⁷ calculations are made based on those x and y pulses, and a comparison is made to a “set stitch length” to decide whether to stitch. Ex. 2006. The document does not show conception of how to control a sewing machine’s stitch head or needle arm so that it actuates in response to detected movement. Further, Patent Owner has not presented evidence that mere ordinary skill in the art would have been required to reduce to practice the invention, as ultimately claimed, which requires controlling the stitch head or needle arm so that it actuates in response to detected movement. *See Burroughs*, 40 F.3d at 1228 (“Conception is complete only when the idea is so clearly defined in the inventor’s mind that only ordinary skill would be necessary to reduce the invention to practice, without extensive research or experimentation.”). Patent Owner has not presented sufficient evidence that the inventor had “a definite and permanent idea of the complete and operative invention,” prior to October 8, 2002. *See, e.g., Hybritech*, 802 F.2d at 1376. In fact, Mr. Koerner stated that it wasn’t until November 25, 2002, that he “[s]ettled on control circuit for prototype machine.” Ex. 2032; *see Burroughs*, 40 F.3d at 1228 (“An idea is definite and permanent when the inventor has a specific, settled idea, a particular solution to the problem at hand, not just a general goal or research plan he hopes to pursue.”).

⁷ Based on another submission in the record, it appears that “mouse” or “mouse sensor” refers to a computer mouse, which, of course, detects its own movement across a surface, but which Mr. Koerner stated in 2009 he had turned upside down so that it was “arranged to ‘look up’ at a fabric surface.” *See* Ex. 2033 ¶ 5.

In addition to finding the content of the purported evidence insufficient, we are not satisfied that the evidence is reliable. First, Patent Owner has not persuaded us that the document (Ex. 2006) was created on the date that it bears, September 29, 2002. It may have been, but perhaps not. The record lacks inventor testimony. We have only an unsworn statement from the inventor that was made years later. *See* Ex. 2033 (letter dated May 4, 2009 from Mr. Koerner to Bernina/Fritz Gegauf AG); *see also Price*, 988 F.2d at 1195 n.3 (“Factors bearing on the inventor’s credibility . . . are: (1) delay between the event and the trial . . .”). Also, in his statement, Mr. Koerner does not state that he prepared the document on September 29, 2002. He says he prepared it “on or before September 29, 2002.” Ex. 2033 ¶ 5. Thus, according to Mr. Koerner, the date appearing on his document was not necessarily the date the document was created or last-modified.⁸

The record lacks any evidence, apart from Mr. Koerner, that this document existed on (or before) September 29, 2002. *See Burroughs*, 40 F.3d at 1228 (“[T]he inventor must prove his conception by corroborating evidence, preferably

⁸ Another document relied on to show conception with respect to other limitations of the claims bears a type-written date of September 20, 2002. Ex. 2005. Yet, Patent Owner concedes that it (i.e., Exhibit 2005) was modified after September 20, 2002. *See* PO Resp. 12 (citing Ex. 2031). Patent Owner contends Exhibit 2005 was last modified on October 4, 2002, but does not present persuasive evidence to support the contention. *See* PO Resp. 12 (citing Ex. 2031). Regardless of when Exhibit 2005 was last modified, this example demonstrates that a date appearing on a document is not necessarily the date on which the document was created or last-modified.

by showing a contemporaneous disclosure.”). As explained by the Federal Circuit in *Mahurkar*, the requirement for corroborating evidence arose out of concern that inventors would be tempted to remember facts favorable to their case “by the lure of protecting their patent or defeating another’s patent.” 79 F.3d at 1577. Based on the record presented, it appears that the first time anyone other than Mr. Koerner saw this document was in 2009, during events that were precipitated by Mr. Frelich informing Mr. Koerner of Watabe’s existence. Ex. 2015 ¶¶ 9–10. Thus, corroboration evidence is required.

Independent corroboration may consist of testimony of a witness, other than the inventor, or it may consist of evidence of surrounding facts and circumstances, independent of information received from the inventor. *Reese v. Hurst*, 661 F.2d 1222, 1225 (CCPA 1981); *Medichem, S.A. v. Rolabo, S.L.*, 437 F.3d 1157, 1170 (Fed. Cir. 2006) (“The requirement of independent knowledge remains key to the corroboration inquiry.”). As Patent Owner recognizes, corroboration is determined under a “rule of reason” analysis. PO Resp. 4–5 (citing *Price*, 988 F.2d at 1195; *Berges v. Gottstein*, 618 F.2d 771, 776 (CCPA 1980)). “An evaluation of *all* pertinent evidence must be made so that a sound determination of the credibility of the inventor’s story may be reached.” *Price*, 988 F.2d at 1195. However, “[t]he rule of reason . . . does not dispense with the requirement for some evidence of independent corroboration.” *Coleman*, 754 F.2d at 360.

Although Patent Owner does not present any evidence corroborating that Exhibit 2006 predates the publication of Watabe, it does present evidence purporting to corroborate other facts regarding conception. In particular, Patent Owner offers evidence from Mr. Koerner’s widow, his sons, his patent attorney,

and a woman named Maria Shetler. The evidence, however, is insufficient on its face to show Mr. Koerner had, prior to October 8, 2002, “a definite and permanent idea of the complete and operative invention.” *Hybritech*, 802 F.2d at 1376. Further, some of the evidence offered by Patent Owner is not sufficiently reliable.

In her declaration, Mrs. Koerner testifies that Mr. Koerner told her, in the spring of 2002, that he “conceived of a solution to the problem of achieving stitch uniformity while free motion quilting by detecting fabric movement and automatically controlling the stitch rate.” Ex. 2002 ¶ 7. Regardless of whether this statement is being offered for the truth of the matter asserted by Mr. Koerner (i.e., that he conceived in spring of 2002), we do not give it weight in our conception analysis. Conception is a question of law based on underlying facts. *Price*, 988 F.2d at 1190; *Hybritech*, 802 F.2d at 1376. This statement, even if it were in the form testimony from Mr. Koerner himself, does not speak to any underlying facts. It is merely a legal conclusion that conception occurred.

Mrs. Koerner also testifies that, in the spring of 2002, Mr. Koerner demonstrated to her that he could use a mouse-like device to detect fabric motion. Ex. 2002 ¶ 7. This testimony relates to one aspect of the claimed inventions (e.g., the “detector means” of claim 1). It does not support a legal conclusion of conception of the complete and operative invention.

Mrs. Koerner further testifies that, several months later, her husband “demonstrated a model he built for detecting fabric movement to provide signals for controlling the stitching rate to our sons, Steve and Mike.” *Id.* at ¶ 9. We do not give weight to this testimony, because it lacks a foundation, as she does not testify to witnessing the demonstration.

Her sons are alive and could have offered testimony in support of the Patent Owner Response. They did not. The Patent Owner Response relies instead upon unsworn statements by Steve and Mike Koerner from 2009. Exs. 2034–2035. These statements are not reliable corroboration evidence. Mr. Freilich testifies that these statements were “signed by” the sons but not prepared by them. Ex. 2015 ¶ 14. Mr. Freilich testifies that the sons’ statements were prepared instead by Mr. Koerner with Mr. Freilich’s assistance, after Mr. Freilich telephoned the sons to “confirm their recollections.” *Id.* We do not find the sons’ statements, which were prepared by the inventor and his attorney, to be sufficiently independent from the inventor for purposes of corroboration. *See Reese*, 661 F.2d at 1225 (“evidence of corroboration must not depend solely on the inventor himself”); *Medichem*, 437 F.3d at 1170 (“The requirement of independent knowledge remains key to the corroboration inquiry.”).

Even if independent testimony of the September demonstration from someone with first-hand knowledge of it had been offered, such testimony could not support a legal conclusion of conception of the claimed inventions, which requires not only the detection of fabric movement but also control means or circuitry for actuation of a machine’s stitch head or needle in response to the detected movement. None of Mrs. Koerner’s declaration (Ex. 2002), the sons’ letters (Exs. 2034–2035), or even the sons’ declarations (Exs. 2047–2048), which were submitted not in support of Patent Owner’s Response but rather in response to Petitioner’s evidentiary objections to the son’s letters, purports to show controlling actuation of a machine’s stitch head or needle arm in response to the detection of fabric movement.

Patent Owner also submitted an April 7, 2009-dated letter from Maria Shetler. Ex. 2013, 2. The letter is an unsworn statement by Ms. Shetler that, pursuant to an inquiry from Mrs. Koerner, Ms. Shetler gave Mr. Koerner an old sewing machine in July 2002 for him to experiment with in developing his invention. *Id.* This evidence may tend to prove the underlying fact that Mr. Koerner intended to work on a sewing machine invention in July of 2002 (or soon thereafter), but Patent Owner has not proven underlying facts sufficient to establish that Mr. Koerner had “a definite and permanent idea of the complete and operative invention,” prior to October 8, 2002. *See, e.g., Hybritech*, 802 F.2d at 1376.

We have considered and evaluated all of the pertinent evidence Patent Owner has offered to establish conception prior to the publication of Watabe. We determine that Patent Owner has failed to establish conception of the inventions set forth in the instituted claims prior to the publication of Watabe. Therefore, Watabe is prior art under 35 U.S.C. § 102(a).

C. Anticipation by Watabe

We instituted trial on the ground of claims 1, 2, 5–7, 10, 12, 13, 17–21, 23–29, 31, 33, and 34 as anticipated by Watabe. Dec. 26.

1. Disclosure of Watabe

Watabe discloses a sewing machine that comprises:

distance measuring means for measuring, with each constant time interval, a distance by which a fabric is fed;
pitch width setting means for setting a stitch pitch width;
and needle speed changing means for setting a sewing needle operating speed for forming stitches

corresponding to the pitch width based on the distance measured by the distance measuring means and the pitch width set by the pitch width setting means.

Ex. 1004 ¶ 6. In short, Watabe discloses a sewing machine that utilizes a motion detector to synchronize automatically the delivery of stitch strokes to the detected movement of the fabric being stitched. Figure 1 of Watabe is reproduced below.

[FIG. 1]

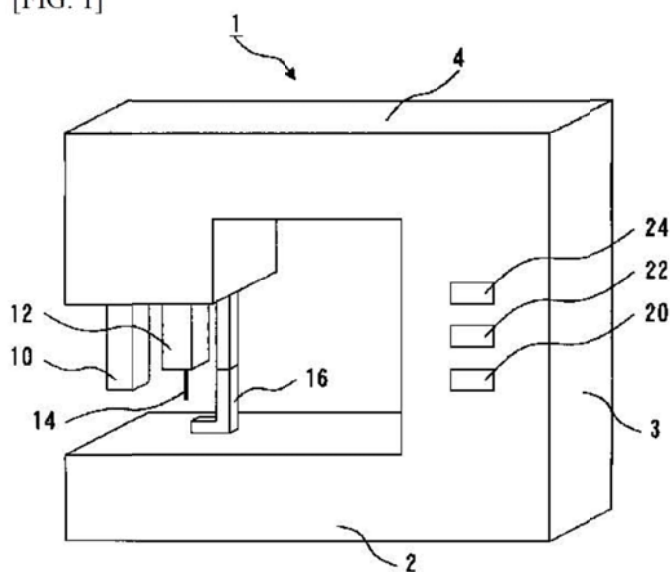


Figure 1 illustrates sewing machine 1 having bed portion 2, leg column portion 3, and arm portion 4. Ex. 1004 ¶ 10. The leg column portion is provided with switches 20, 22, and 24, for turning the sewing machine on, starting sewing, and setting a desired pitch width for the stitches. *Id.* at ¶ 11. The arm portion includes a “needle bar driving mechanism” having needle bar 12 supporting needle 14. *Id.* The arm portion also includes image sensor 10 that faces downward toward bed portion 2. *Id.*

Although not illustrated in Figure 1, the Watabe sewing machine also includes a motor for driving the stitch head and a circuit for controlling the motor.

Ex. 1004 ¶ 11. One revolution of the motor causes one revolution of the vertically reciprocating needle bar. *Id.* Thus, the speed of the motor is directly proportional to the speed of the needle bar driving mechanism. The Watabe sewing machine has a built-in microcomputer for controlling the motor based on the user-inputted pitch width and on the quantity of fabric movement detected by the image sensor. *Id.* at ¶¶ 7, 12.

When the Watabe sewing machine is turned on via switch 20, the microcomputer begins operating. Ex. 1004 ¶ 13. Thereafter, the microcomputer waits until sewing switch 22 is turned on. *Id.* at ¶ 14. Once that happens, the pitch width can be set via switch 24. *Id.* The microcomputer then actuates the motor, which causes the needle bar to start reciprocating continuously. *Id.* at ¶ 15. Initially, the motor revolves at a predetermined speed (e.g., 1 Hz) that is set in advance. *Id.*

Subsequently, the motor's speed is modified continuously in proportion to the speed of the fabric across the bed portion. As the fabric is moved across the bed portion, the amount of movement per interval of time is detected by the image sensor. Ex. 1004 ¶ 21. Using that information (and the pitch width), the microcomputer calculates a corresponding speed at which the motor should revolve. *Id.* The microcomputer then outputs to the circuit a control signal for changing the current speed of the motor to the newly calculated speed. *Id.* at ¶ 22. As a consequence, the Watabe sewing machine forms stitches in the fabric having the desired pitch width without the user having to change manually the speed of the needle (e.g., through pedals) as the speed of the fabric being moved across the bed portion changes. *Id.* at ¶ 26.

2. *Comparison of Watabe to the Independent Claims*

Claim 1 is exemplary of the independent claims (claims 1, 10, 21, 23, 28, and 31). It requires “a stitch head mounted at a fixed location and actuatable to insert a stitch through a stack of two or more planar layers located beneath said stitch head.” In the Institution Decision, we found this feature met in Watabe by its needle bar driving mechanism having needle bar 12 supporting needle 14 extending down from the arm portion 4. Dec. 16 (citing Ex. 1004 ¶ 11; Fig. 1). Patent Owner argues that the record lacks evidence that Watabe’s needle is *capable*⁹ of “stitching through two or more planar layers,” as recited by claim 1. PO Resp. 24.

We are not persuaded by Patent Owner’s argument. Watabe discloses and illustrates a sewing machine (Ex. 1004, Fig. 1), and specifically discusses the mechanics of the needle during sewing. *Id.* at ¶ 11. A sewing machine needle inherently is capable of stitching through two layers, so as to sew them together.

Further, none of the claims limits the thickness or hardness of the layers (or fabric) to be stitched. Thus, if a sewing machine is capable of inserting a stitch into a single layer of a fabric material (which is beyond dispute), it necessarily is capable of inserting a stitch into two layers of that same material, if each layer is half as thick as the single layer.

⁹ As set forth in the Institution Decision, claims 23–27 require actual insertion of a stitch head through multiple fabric layers, whereas claims 1, 2, and 5–7 require a stitch head that merely is capable of doing so. Dec. 20.

Claim 1 also requires “a substantially horizontally oriented bed for supporting said stack of planar layers for manually guided movement across said bed beneath said stitch head.” This feature is met in Watabe by its “bed portion 2 that has a flat table portion.” Ex. 1004 ¶ 10; Fig. 1.

Claim 1 also requires “detector means for detecting movement of a surface of said stack oriented parallel to said bed and proximate to said stitch head for producing signals representing the magnitude of stack surface movement.”¹⁰ This feature is met in Watabe by its “distance measuring means for measuring, with each constant time interval, a distance by which a fabric is fed.” Ex. 1004 ¶ 6; *see also id.* at ¶ 7 (“the distance measuring means may be structured from an image sensor and a microcomputer”).

Lastly, claim 1 requires “control circuit means responsive to said signals indicating stack surface movement exceeding a certain threshold for actuating said stitch head to insert a stitch through said stack.”¹¹ This feature is met in Watabe, which states that the sewing machine includes a “needle speed changing means for

¹⁰ We have construed this limitation, pursuant to 35 U.S.C. § 112, sixth paragraph, as encompassing the detectors illustrated in Figures 8 and 12 and described in columns 5, 6, 9, and 10 of the ’446 patent and equivalents. *See* Dec. 7. We noted, in particular, that Figures 8 and 12 illustrate optical motion detectors, although the text of the ’446 patent is broader in that it states that a motion detector “can take many different forms, including both noncontacting devices (e.g., optical detector) and contacting devices (e.g., track ball).” *Id.* (quoting Ex. 1001, 5:43–45).

¹¹ We have construed this limitation, pursuant to 35 U.S.C. § 112, sixth paragraph, as encompassing the circuitry illustrated in Figures 9 and 13, any circuitry capable of carrying out the algorithms illustrated in Figures 10, 11, and 14, the circuitry described at columns 7 and 10, and equivalents. *See* Dec. 7–9.

setting a sewing needle operating speed for forming stitches corresponding to the pitch width based on the distance measured by the distance measuring means and the pitch width set by the pitch width setting means.” Ex. 1004 ¶ 6; *see also id.* at ¶¶ 21-22.

Petitioner has shown by a preponderance of the evidence that Watabe anticipates independent claim 1. Independent claims 10, 21, 23, 28, and 31 are not materially different than claim 1 for purposes of comparison with Watabe. Petitioner also has shown by a preponderance of the evidence that Watabe anticipates claims 10, 21, 23, 28, and 31. *See* Pet. 37, 38, 41–47.

3. Comparison of Watabe to Dependent Claims

Dependent claims 2, 5–7, 12, 13, 17–20, 24–27, 29, 33, and 34 were included in the ground for review as anticipated by Watabe. Dec. 26. Petitioner has demonstrated by a preponderance of the evidence that Watabe discloses all additional features required by these claims. *See* Pet. 34–36, 38–40, 43–45, 47. As Patent Owner does not argue that Watabe fails to disclose any of these additional features, *see generally* PO Resp., we address in detail only a subset of the dependent claims.

Claim 2 depends from claim 1 and requires that the control circuit means additionally “includes means for applying power to said stitch head to cause said needle to traverse one cycle from said full up position to said full down position to said full up position.” This feature is met by Watabe’s “needle speed changing means,” which can control the speed of a rotating sewing machine motor, which

motion is converted “into reciprocating motion in the vertical direction, so that the sewing needle operates in the vertical direction.” Ex. 1004 ¶ 8; *see also id.* at ¶ 11.

Claim 5 depends from claim 1 and requires that the “bed defines a flat substantially horizontal surface for supporting said stack of planar layers” and that the “stitch head includes a needle mounted for movement substantially perpendicular to said bed surface between a full up position and a full down position whereat it pierces said planar layers supported on said bed surface.” These features are met by Watabe, which discloses “bed portion 2 that has a flat table portion” that is oriented perpendicularly to the needle 14, which reciprocates in a vertical direction, and, therefore, perpendicular to the table portion. Ex. 1004 ¶¶ 10-11.

Claim 12 depends from claim 10 and requires that the “detector operates to detect movement of said fabric layer surface without physically contacting said fabric layer.” This feature is met by Watabe’s “image sensor 10,” which operates through images and not physical contact. Ex. 1004 ¶ 11. Watabe describes it as “facing downward” but not as contacting anything. *Id.* Watabe depicts it being a significant distance above the table portion and, thus, not in a position to contact the fabric supported thereon. Ex. 1004, Fig. 1.

Claim 13 depends from claim 10 and requires “a window oriented to collect energy from said fabric layer surface oriented parallel to said plate; and signal processing means responsive to energy collected by said window for producing signals representing the magnitude of movement of said fabric layer across said plate.” These features are met by Watabe. Neither party proposed a construction for “window,” and the ’446 patent describes it only by function, stating that is “to

collect reflected energy from target area coincident with the stack [fabric] surface.” Ex. 1001, 2:41–44. We previously determined that an optical sensor, such as image sensor 10 of Watabe, must include a “window” because it necessarily detects light energy. *See* Dec. 11. Also, Patent Owner does not dispute that Watabe’s image sensor inherently includes a window. *See generally* PO Resp. Watabe discloses that its image sensor detects varying amounts of movement per constant time interval and, through control signals, Watabe’s needle speed changing means correspondingly changes the speed of the reciprocating needle. Ex. 1004 ¶¶ 6, 21, and 22.

Petitioner has demonstrated by a preponderance of the evidence that Watabe anticipates dependent claims 2, 5–7, 12, 13, 17–20, 24–27, 29, 33, and 34.

D. Obviousness over Watabe and Reed

We instituted review of claims 1, 2, 5–7, and 23–27 as being unpatentable as obvious over Watabe and Reed. Dec. 26.

Watabe refers to stitching of “fabric” without reference to the number of layers of fabric. Reed expressly teaches the stitching of multiple layers of fabric. Ex. 1009, Abstract (describing “quilting layered fabrics by a sewing machine”). Petitioner asserts that, to the extent claims 1, 2, 5–7, and 23–27 require multiple layers of fabric,¹² Watabe in view of Reed render them unpatentable. Pet. 31.

¹² Independent claim 23 (claims 24–27 being dependent thereon) requires actually “actuating said stitch head . . . to insert a stitch through said stack of fabric layers,” whereas apparatus claim 1 (claims 2 and 5–7 being dependent thereon) recites a stitch head that is merely “actuatable to insert a stitch through a stack of two or

In asserting unpatentability over Watabe and Reed, Petitioner does not propose modifying the Watabe sewing machine in view of Reed. Rather, Petitioner relies on Reed for providing an express teaching to the person of ordinary skill in the art that the Watabe prior art-sewing machine can be used to stitch together multiple layers of fabric such as in quilting. Pet. 31.

Patent Owner argues against Petitioner's obviousness ground by asserting that Reed and Watabe "are not combinable" because "Reed is an older reference that teaches the use of a movable sewing machine and hand controls for stitching in 'free-hand quilting.'" PO Resp. 25. Patent Owner further states that "the Board's Decision recognizes that there is no effort to demonstrate that Reed's sewing machine is interchangeable with Watabe's sewing machine, and there is nothing in Watabe or Reed to suggest that they could be combinable." *Id.* at 26. Patent Owner's arguments are not responsive to Petitioner's application of Watabe and Reed to the claims. Petitioner does not argue for physically combining the Watabe and Reed prior art-machines or modifying either of them in view of the other. Petitioner relies on Reed for providing an express teaching to the person of ordinary skill in the art that the Watabe prior art-sewing machine can be used to stitch together multiple layers of fabric. Pet. 31. Petitioner's reasoning is persuasive, and it has demonstrated, by a preponderance of the evidence, that claims 1, 2, 5-7, and 23-27 would have been obvious over Watabe and Reed.

more planar layers located beneath said stitch head." *See* Dec. 20 (quoting Ex. 1001, claims 23 and 1). Thus, a teaching of actually penetrating multiple layers is not required to meet claims 1, 2, and 5-7.

III. PETITIONER'S MOTION TO EXCLUDE

Petitioner moved to exclude some of the evidence relied upon by Patent Owner to support its arguments for prior invention. Paper 20. Resolution of Petitioner's motion is unnecessary to this final written Decision because, even considering the challenged evidence, Patent Owner's arguments for prior invention are not persuasive. Accordingly, we dismiss Petitioner's Motion to Exclude as moot.

IV. ORDER

Accordingly, it is

ORDERED that claims 1, 2, 5–7, 10, 12, 13, 17–21, 23–29, 31, 33, and 34 of U.S. Patent No. 6,883,446 B2 are held unpatentable;

FURTHER ORDERED that Petitioner's Motion to Exclude is dismissed;
and

FURTHER ORDERED that, because this Decision is final, a party to the proceeding seeking judicial review of the Decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

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