

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

VIKING DRILL & TOOL, INC.,
Petitioner,

v.

HONGJIA WANG,
Patent Owner.

IPR2023-00474
Patent 11,007,583 B2

Before WILLIAM V. SAINDON, JAMES J. MAYBERRY, and
CYNTHIA L. MURPHY, *Administrative Patent Judges*.

SAINDON, *Administrative Patent Judge*.

JUDGMENT
Final Written Decision
Determining All Challenged Claims Unpatentable
35 U.S.C. § 318(a)

Granting-in-Part Petitioner's Motion to Exclude
37 C.F.R. § 42.64(c)

I. INTRODUCTION

A. Background and Summary

Viking Drill & Tool, Inc. (“Petitioner”) filed a Petition (Paper 1, “Pet.”) requesting *inter partes* review of claims 1, 2, 5, 7, 8, 12–15, 18, 19, and 22 of U.S. Patent No. 11,007,583 (Ex. 1001, “the ’583 patent”)¹. Counsel for the listed inventor of the ’583 patent, Hongjia Wang (“Patent Owner”), filed a Preliminary Response. Paper 11² (“Prelim. Resp.”). We instituted an *inter partes* review on July 10, 2024. Paper 15 (“Dec. on Inst.”).

During the *inter partes* review, Patent Owner filed a Response (Paper 30, “Resp.”), Petitioner filed a Reply (Paper 44),³ and Patent Owner filed a Sur-reply (Paper 65) and an addendum thereto (Paper 75, “Sur-reply Add’m”). An oral hearing was held, the transcript of which is made of record. Paper 87 (“Tr.”); Paper 88 (confidential portion of the hearing).

Petitioner filed a motion to strike (Paper 39) certain exhibits filed with the Response, to which Patent Owner filed an opposition (Paper 42). We granted the motion to strike. Paper 43.⁴ We also issued an order sanctioning Patent Owner’s counsel for, among other things, attempting to make substantive changes under the guise of addressing clerical errors. Paper 49.

¹ The ’583 patent comprises the originally-issued U.S. Patent No. 11,007,583 B2 as well as U.S. Pat. No. 11,007,583 C1, an *ex parte* reexamination certificate confirming the patentability of original claims 1–14 and adding claims 15–22. Ex. 1001, pp. 16–17.

² Paper 11 is a Corrected Preliminary Response, correcting some informalities in the originally submitted Preliminary Response (Paper 9).

³ A redacted, publicly-available copy of the Reply can be found in Paper 45.

⁴ We struck Exhibits 2050, 2053, and 2054, as well as paragraphs 52–107 of Exhibit 2034.

Petitioner also filed a motion to exclude (Paper 61, “Mot. Excl.”), to which Patent Owner filed an opposition (Paper 68, “Opp. Mot. Excl.”) and Petitioner filed a reply (Paper 85, “Reply Mot. Excl.”)⁵. For the reasons explained below, we grant-in-part Petitioner’s motion to exclude.

We have authority to enter this final written decision under 35 U.S.C. § 318(a). The standard for review is set forth in 35 U.S.C. § 316(e), which provides that “the petitioner shall have the burden of proving a proposition of unpatentability by a preponderance of the evidence.” For the reasons provided below, we determine that Petitioner has met this burden of establishing unpatentability of all challenged claims.

B. Real Parties in Interest

Patent Owner identifies Hongjia Wang as real party in interest. *See* Paper 7, 1 (Patent Owner’s Mandatory Notice). Petitioner identifies Viking Drill & Tool, Inc., a/k/a Consolidated Toledo Drill, as real party in interest. Pet. 5.

C. Related Matters

The ’583 patent has been asserted against Petitioner in *Tsteigen, Inc. d/b/a/ Tec-Spiral; Hongjia Wang v. Viking Drill & Tool, Inc. d/b/a Consolidated Toledo Drill*, No. 21-cv-002759 (D. Minn.). *See* Paper 7, 1; Pet. 5. The ’583 patent is also the subject of IPR2023-00473, filed by Petitioner and decided concurrently with this Decision.

⁵ A redacted, publicly-available copy of this reply can be found in Paper 86.

D. Prior Art and Asserted Grounds

Petitioner’s grounds rely on the following prior art references:

Name	Reference	Exhibit No.
Bannister	US 2,193,186, iss. Mar. 12, 1940	1006
Welty	US 2,276,532, iss. Mar. 17, 1942	1008
Korb	US 4,582,458, iss. Apr. 15, 1986	1012
Gentry	US 8,029,215 B2, iss. Oct. 4, 2011	1010
Durfee	US 10,058,929 B2, iss. Aug. 28, 2018	1011
Zhou	CN 203356678 U, iss. Dec. 25, 2013	1007

Petitioner asserts that claims 1, 2, 5, 7, 8, 12–15, 18, 19, and 22 would have been unpatentable on the following grounds:

Claim(s) Challenged	35 U.S.C. §	Reference(s)/Basis
1, 2, 5, 8, 13–15, 19	102	Zhou
1, 2, 5, 7, 8, 12–15, 18, 19, 22	103	Zhou, Bannister, Gentry, Durfee
1, 2, 7, 19, 22	103	Welty, Bannister, Durfee, Korb
5, 8, 12–15, 18	103	Welty, Bannister, Durfee, Korb, Zhou

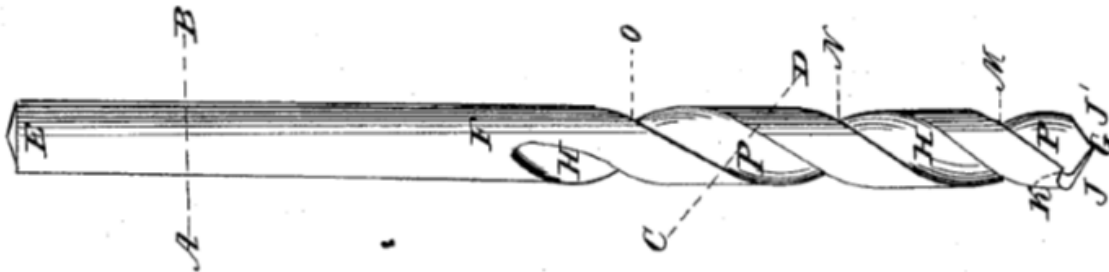
E. Technical Background and Overview of the ’583 Patent

The ’583 patent is directed to a drill bit. Before turning to the features of the ’583 patent, we provide a brief overview of the field of drill bits. Although drill bits are fairly well known, describing them requires familiarity with several terms of art as well as some geometry. The following serves as a reference for technical and geometric terms used throughout this Decision.

1. Drill Bit Types

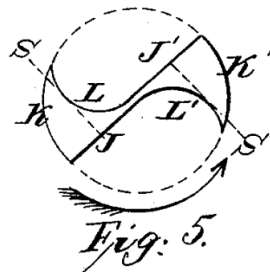
There are many types of drill bits, with two types relevant to this proceeding being a *twist drill bit* and a *step drill bit*. According to a textbook definition, twist drill bits are “rotary end-cutting tools having one

or more cutting lips and one or more helical or straight flutes for the passage of chips and the admission of a cutting fluid.” Ex. 1017, 21.⁶ Below is an image of a typical twist drill bit, from U.S. Patent 38,119 (Ex. 1016):



Ex. 1016, Fig. 1. The above figure depicts several features common to twist drill bits. The drill bit is a generally cylindrical rod; on the left side is a smooth shank (E–F) and on the right side are the helical flutes (H, P), with the cutting edges forming a tip (G) on the far right end. Ex. 1016. We will refer to the imaginary line that runs down the rotational center of the drill bit as the *rotational axis*, and a given position along this axis as an *axial position*. We will typically refer to positions measured along this axis as *forward* when they are closer to the tip and *backward* as a position is further from the tip. We will refer to drawings that depict the rotational axis as coplanar to the page (e.g., Ex. 1016, Fig. 1) as a *longitudinal view*.

Figure 5 of Exhibit 1016, reproduced below, shows an image of the drill bit from Figure 1, but looking down the rotational axis:



⁶ We use Petitioner’s added pagination for Exhibit 1017.

Ex. 1016, Fig. 5. This figure illustrates cutting edges J, J' at the tip of the drill bit, with an arrow demarcating that the cutting surfaces rotate counterclockwise in this view. The rotational axis is coming out of the page, such that we are looking down the rotational axis, from the tip. We will refer to this view as an *axial view* (with a presumption that the view is of the tip unless otherwise specified). We will typically refer to positions closer to the rotational axis as *inward* and positions further from the rotational axis as *outward*.

The textbook in Exhibit 1017 further explains that a step drill bit is a type of twist drill bit, having along its length portions of different radiuses. Ex. 1017, 25. An example is shown in Figure 9-17 of Exhibit 1017, a portion of which is reproduced below:

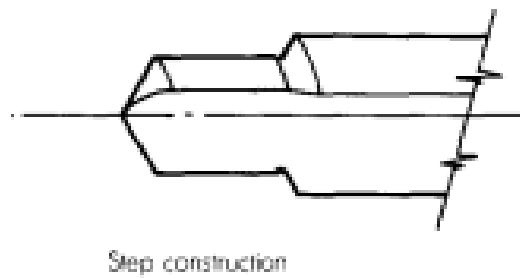


Figure 9-17 shows longitudinal view of a step drill having two different radiuses along its length. Ex. 1017, 45. Each step is separated by an angular cutting edge; Figure 9-17 shows two such steps. The different radiuses allow a step drill bit to cut to close tolerances, because the smaller steps act as a pilot for the larger steps, tending to center the bit. *Id.* at 25. We will refer to the distance of a given surface from the rotational axis to be a *radial position*, with its distance from the surface equal to the radius of a circle having an origin on the rotational axis.

Some step drill bits are specifically designed for cutting holes in materials such as sheet-metal panels, wherein different diameters are provided so that a single bit can be used to cut different-size holes (i.e., instead of having to swap in progressively larger fixed-size drill bits to make a large hole). *See, e.g.*, Ex. 1010, 1:16–23. Figure 1 of Exhibit 1010 depicts such a step drill:

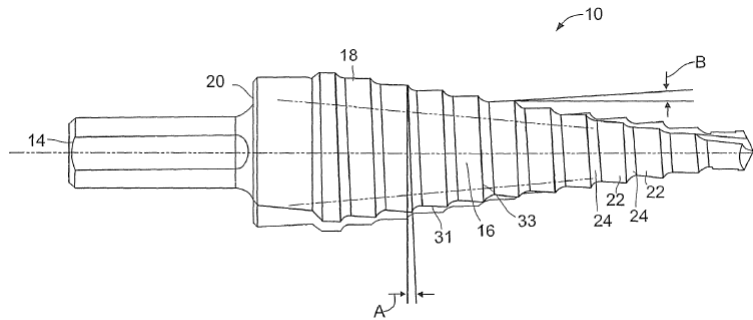


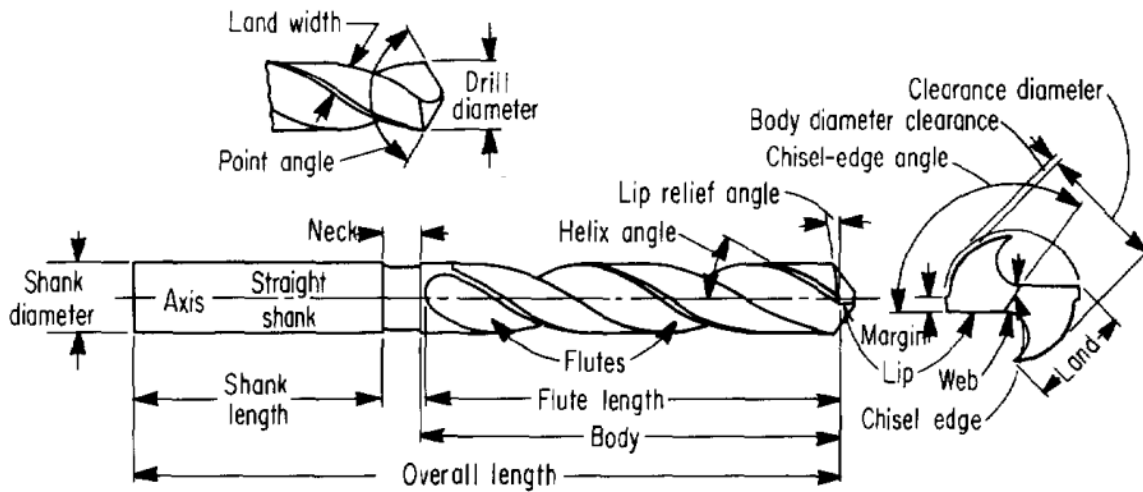
FIG. 1

Figure 1 of Exhibit 1010 depicts a longitudinal view of a step drill bit.

These are just two types of drill bits; many more exist for different cutting tasks. *See, e.g.*, Ex. 1017, 23–25 (discussing different types of twist drill bits), 55 (flat and half-round drills), 58 (spade drills), 70–71 (trepanning drills).

2. Drill Bit Features

Drill bits are rotary end-cutting tools having one or more cutting lips, one or more flutes for the passage of chips and cutting fluid, and a shank that is driven by a device that imparts the rotational force. Ex. 1017, 21–22. The cutting lips are rotated and remove the material from the work piece, which breaks off into chips that are carried away by the flute. *Id.* Figure 9-15, reproduced in part below, depicts these and other features:



Ex. 1017, 22 (modified to remove non-relevant examples and for size); *see also id.* at 21–22 (providing a definition of the labeled parts in Figure 9-15). A drill designer will vary relative sizes and orientations of these components to suit the needs of the cutting task. *See id.* at 47–52. Because the drill point forms the main cutting surface, attention is focused here. For example, a hole of a certain diameter is created by making the cutting lips extend out to that diameter. *See id.* at 21. The axial view of the drill bit in Figure 9-15 shows that the lips, as one moves along the circumference, are separated by the lands and the flute, the lands being the structural portion of the bit behind, or trailing, the lip during rotation. *Id.* As shown, there are two lips, two lands, and two flutes, with the flutes being what separates each lip/land pair. The lips are shown as symmetrical, i.e., they are spaced approximately 180° from one another. *See also, e.g.,* Ex. 1011, 9:45–47 (“symmetrical step drill bits provide two cutting edges spaced 180 degrees from one another”). Symmetry of the cutting lips ensures that the opposed cutting lips drill bit enter the work at the same position, preventing wobble. *Accord* Resp. 1 (arguing that *non-symmetric* cutting lips “produces a wobble”). We note that the land trails, or follows, the cutting lip as the drill bit is rotated—that

is, in the axial view of Figure 9-15, the bit would spin counterclockwise. *See also, e.g.*, Ex. 1011, 8:5–8 (“a leading edge is an edge that is toward the front of the rotating step drill bit 1 and a trailing edge is an edge toward the rear of the rotating step drill bit 1”). We also note that the cutting lips may also be referred to as cutting edges. *See, e.g.*, Ex. 1010, 1:37–40 (“Each of the cutting surfaces 22 is generally cylindrically-shaped and has a lip or cutting edge 31.”).

a) Radial Relief

The lands are often recessed from the lips after some distance, or margin, so that they do not rub against the hole. Ex. 1017, 21; *see also id.* at 22, Fig. 9-15 (depicting this arrangement of the lip, margin, and lands); *but see* Ex. 1011, 9:59 *et seq.* (deliberately providing a rubbing surface in order to stabilize the bit). This is labeled in Figure 9-15 as “body-diameter clearance.” Ex. 1017, 22. The radius of a circle defined by the lands is smaller than the radius of a circle defined by the cutting lip, which is also known in the art as *radial relief*. Ex. 1010, 2:13–16 (“Thus, the radial relief C is provided by the difference in the radius of the cutting surface proximate the cutting edge 31 and the radius of the cutting surface proximate trailing edge 32.”); Ex. 1011, 10:4–11 (“With a positive radial relief the radius of each step section 10, 11 can be gradually reduced from the cutting edge 18a, 20a toward the trailing edge of the step section to provide a space S between the peripheral surface 21 of the step sections and the side wall of the hole being cut”); Ex. 1004 ¶ 51 (“relief in a radial direction measured in the plane of rotation”). Radial relief helps the drill bit resist binding on the sides of the hole in the workpiece. Ex. 1010, 2:16–18 (“radial relief C eases the

rotation of the step drill bit 10 within the workpiece”). Figure 3 of Exhibit 1011 is reproduced below:

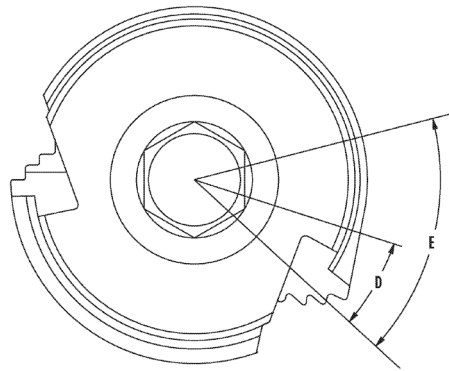


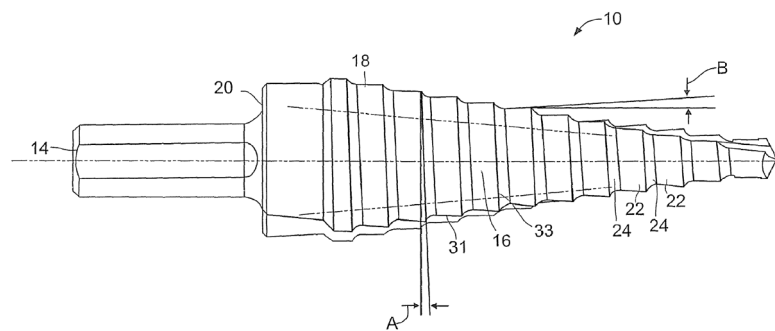
FIG. 3

Ex. 1011, Fig. 3. Figure 3 is an axial end view of a step drill bit, looking up its axis from the shank. *Id.* at 1:51–52. The cutting edge can be seen in the 4 o’clock position, wherein the cutting edge is located radially outward along a distance D compared to the ends of the edge, providing radial relief. *Id.* at 11:54–59. In sum, *radial relief* is where the radius of some portion of the non-cutting surface is smaller than the radius of the cutting surface. *Accord* Ex. 1004 ¶¶ 51–52.

b) Axial Relief

The cutting lips at the tip of the drill bit are angled relative to the rotational axis of the drill bit, forming a cone-shaped point. Ex. 1017, 21. The angle is not necessarily constant, however, and may trail off. *Id.* at 21, 50. That is, the location of the interface between the cutting lip and the workpiece along the axis of the drill bit moves distally. This is depicted in Figure 9-15 as a “lip relief angle,” and is also known as axial relief. *Id.* at 21, 22. Axial relief provides clearance between the cutting surface and the workpiece, and it is known in the art to vary the amount of relief based on the application. *Id.* at 50 (“With inadequate lip relief, a drill will not cut

freely; excessive relief will shorten the drill life.” . . . “Higher relief angles generally provide best results with light feeds and low-strength, nonferrous materials.” . . . “[R]educed relief angles provide cutting edges with additional support to withstand the higher cutting loads”); Ex. 1010, 1:52–63; Ex. 1011, 12:1–2 (“extending the axial relief for a relatively long distance provides a faster cutting bit”); Ex. 1004 ¶ 50. Figure 1 in Exhibit 1010 is reproduced below:



Ex. 1010, Fig. 1. Axial relief (A) of a step drill bit is marked on the cutting surface. The leading edge of the cutting surface is located axially forward of a trailing edge of the cutting surface. In sum, *axial relief* is where a portion of the cutting surface is axially forward from a trailing portion of the cutting surface. *Accord* Ex. 1004 ¶¶ 47–50.

3. Geometry Useful in Describing Drill Bits

This Decision discusses different shapes such as a spiral, cone, and cylinder. Envisioning and describing these three-dimensional objects by themselves is relatively simple. Both cones and cylinders have a radius r and a height h , with the walls of the cone converging at an apex (or, perhaps, the walls of the cylinder being a cone with parallel walls, i.e., converging at infinity). A three-dimensional spiral is a curve that turns around an axis as it

moves down that axis. As relevant to this Decision, the spiral can be wrapped on the surface of a cone or a cylinder. When wrapped around a cone, the spiral moves radially away from the rotational axis as it spins down, whereas when wrapped around a cylinder the spiral stays at a constant radius as it spins down the rotational axis. The amount a spiral turns per unit of distance down the rotational axis can be defined by an angle relative to the rotational axis, called the helix angle. *See, e.g.*, Ex. 1017, 21 (defining helix angle); Ex. 1001, 2:25–26 (“helix angle ω_0 is an angle of the spiral lines and an axis”); Ex. 1011, 1:34–36 (“[i]n . . . conventional step drill bits, the flute has a constant angular helical pattern about the longitudinal [(rotational)] axis of the . . . bit”); Ex. 1012, 2:41–44 (“The flutes may be cut helically about the drill or longitudinally at a fixed angle to the drill axis from about 0 to 15 degrees.”). When looking down the rotational axis, i.e., in the radial view, an object moving along a spiral path appears to spin around the rotational axis.

We next turn to how to describe the position of various locations on a cone, cylinder, or a spiral wrapped around either. As introduced earlier in this section, we will refer to the position of a location along the rotational axis as an axial location, generally relative to one of the endpoints of the shape. We will refer to the position of a location outward from the rotational axis as a radial location, generally described by the radius of a circle originating at the axis and passing through the location. Next, for a given axial location and radial location, we are left with a circle of possible locations, requiring us to define where along that circle we are describing. This we will call the angular position, relative to a chosen zero point. Relative to that zero position, a location can then be described a certain

number of degrees ($0-360^\circ$) or radians ($0-2\pi$) from the zero position. These three coordinates (axial, radial, angular) allow us to precisely define any location on a cone or cylinder (or a combination thereof).

We wish to make one further point on geometry. Imagine a simplified, transparent drill bit consisting of a cone and a cylinder portion, having drawn on it a spiral path proceeding down the exterior surfaces of this bit from the tip to the shaft at a constant helical angle relative to the rotational axis. Imagine an ant walking along the spiral path. If one views the ant's path while looking down the rotational axis of the bit (i.e., the radial view), the ant would be observed to walk in circles, like the Earth orbiting the Sun. When on the conical portion, the ant would steadily increase its radial distance from the axis, whereas when on the cylindrical portion the ant would remain at a constant radius. When viewing the ant in the longitudinal view, the ant's path appears sinusoidal; like if it were walking up and down hills. Interestingly, given that the helix angle is constant as it moves down the rotational axis, from the perspective of the ant, *it is walking in a straight line*. That is, the curve defining the spiral is a straight line on this topography on which it lies. It only appears sinusoidal in a longitudinal view or circular in an axial view because those views are two-dimensional. This is similar to the effect of mapping on a two-dimensional piece of paper the path of an airplane flying in a straight line over a three-dimensional sphere (Earth)—the line appears curved on a two-dimensional flat plane even though it is straight on a three-dimensional sphere. Thus, while reviewing the figures of the '583 patent and the prior art, we encourage the reader to keep in mind the distortive limitations of two-dimensional representations of three-dimensional objects.

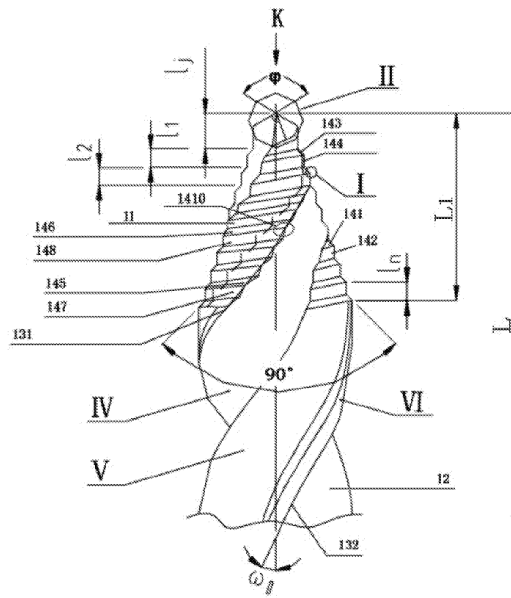
4. The '583 Patent

The abstract of the '583 patent characterizes the disclosed invention as follows:

The present invention provides a twist drill. A cone portion is provided at a front end of the operating portion, and an exterior surface of the operating portion is provided with a spiral flute for shunting cutting chips. The exterior surface of the cone portion is provided with a plurality of composite cutting blade groups which are sequentially enlarged in diameter from the front end to the rear end of the cone portion. The cone portion is provided with a top blade on the tip. In use, the top blade is used for positioning, and the cutting process is carried out by the top blade and the composite cutting blade groups.

Ex. 1001, code (57).

The '583 patent describes a twist drill bit having a cone portion at the tip of the bit that is configured like step drill bit. Figure 3, reproduced below, is illustrative:



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FIG. 3

Ex. 1001, Fig. 3. Figure 3 of the '583 patent depicts a cone portion (L1) at the end of a cylindrical portion of a twist drill bit. The cone portion is formed by a series of first and second step surfaces (141, 142) defining a conical surface and a cylindrical surface, respectively. Ex. 1001, 5:9–29. A cutting edge (1410) is located where those surfaces intersect a spiral flute (IV). *Id.*

F. Challenged Claims

Claims 1, 2, 5, 7, 8, 12–15, 18, 19, and 22 are challenged. Claims 1 and 8 are independent. Claim 1 is reproduced below.

1. A twist drill, comprising:

an operation portion comprising a cone portion and a cylinder portion axially fixed to the cone portion;

a shank portion axially fixed to the cylinder portion opposite the cone portion;

a spiral flute formed on an exterior surface of the operating portion extending from a front end of the cone portion and at least partway up the cylinder portion, the spiral flute having a sidewall;

a plurality of composite cutting blade groups formed sequentially and spirally on a cone portion exterior from a front end of the cone portion to a rear end of the cone portion, each of the plurality of composite cutting blade groups comprising:

a conical first step surface;

a cylindrical second step surface adjacent to the conical first step surface,

a major cutting edge defined by the intersection of the conical first step surface and the sidewall of the spiral flute;

a minor cutting edge defined by the intersection of the cylindrical second step and the and the [sic] sidewall of the spiral flute; and

a cutting tip defined by the intersection of the major cutting edge, the minor cutting edge, and the sidewall of the spiral flute; and

a top blade provided on the front end of the cone portion;

wherein a diameter of each of the plurality of composite cutting blade groups increases sequentially from the front end of the cone portion to the rear end of the cone portion; and each of the plurality of composite cutting blade groups is configured to crush cutting chips into finer chips and the spiral flute is configured to shunt the finer chips; and

wherein at least one cylindrical second step surface is immediately adjacent to a conical first step surface of a next composite cutting blade group; and the diameter of the last composite cutting blade group located at the rear end of the cone portion immediately adjacent to the cylinder portion is equal to the cylinder portion diameter.

Ex. 1001, 10:2–43.

Claim 8 differs from claim 1 by further reciting “the minor cutting edge being configured to smooth the machined surface of the workpiece to improve surface quality” and “the top blade comprises a chisel edge, two auxiliary cutting edges and two straight major cutting edges, the auxiliary cutting edge is respectively intersected with the straight major cutting edge and the chisel edge.” *Id.* at 11:18–20, 11:25–28.

II. PATENTABILITY ANALYSIS

A. Burdens of Proof

“In an IPR, the petitioner has the burden from the onset to show with particularity why the patent it challenges is unpatentable.” *Harmonic Inc. v.*

Avid Tech., Inc., 815 F.3d 1356, 1363 (Fed. Cir. 2016) (citing 35 U.S.C. § 312(a)(3) (requiring *inter partes* review petitions to identify “with particularity . . . the evidence that supports the grounds for the challenge to each claim”)); *Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015) (discussing the burden of proof in *inter partes* review).

Although the burden of proof for showing unpatentability remains on a petitioner, the patent owner may have a burden of production. For example, a patent owner has the burden for showing it is entitled to priority. *Dynamic Drinkware*, 800 F.3d at 1379 (discussing *Tech. Licensing Corp. v. Videotek, Inc.*, 545 F.3d 1316, 1326–27 (Fed. Cir. 2008)); *see also In re Magnum Oil Tools Int’l, Ltd.*, 829 F.3d 1364, 1376 (Fed. Cir. 2016) (“[A] patentee bears the burden of establishing that its claimed invention is entitled to an earlier priority date than an asserted prior art reference.”).

B. Level of Ordinary Skill in the Art

Petitioner asserts the following level of ordinary skill in the art:

A [person of ordinary skill in the art (POSA)] with respect to the ’583 patent would have been an individual educated in mechanical engineering with a bachelor’s degree and at least one or two years of experience in the development of drill bits, or an associate’s degree and at least five years of experience in the development of drill bits. A POSA would typically work in a team with machinists and would be aware of developments in the field of machine tools, particularly drill bits, for example by attending trade shows, and by reading patents and trade journals.

Pet. 25 (citing Ex. 1004 ¶ 14).

Patent Owner does not appear to challenge this proposed level of skill or offer its own. We adopt Petitioner’s definition for purposes of this Decision, which appears consistent with the ’583 patent and prior art.

C. Claim Construction

We apply the claim construction standard set forth in *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312–13 (Fed. Cir. 2005) (en banc). 37 C.F.R. § 42.100(b). That is, “the words of a claim ‘are generally given their ordinary and customary meaning.’” *Phillips*, 415 F.3d at 1312. “[T]he ordinary and customary meaning of a claim term is the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention.” *Id.* at 1313. In addition, we must also “consider the patent’s prosecution history.” *Id.* at 1317.

1. Terms Construed in IPR2023-00473

The following constructions were made in IPR2023-00473, a case decided concurrently with this one. For context, we include our constructions, but direct the reader to our Decision in IPR2023-00473 for further details.

Claims 1 and 8 state that the “composite cutting blade groups” are “formed sequentially and spirally on a cone portion exterior” of the twist drill. The parties agreed to construe the cutting blade groups being “formed spirally” as meaning that the cutting blade groups are slanted with respect to the rotational axis, i.e., are not perpendicular to the rotational axis. The parties have agreed that being “formed spirally” is met by axial relief. Pet. 23; Tr. 77:9–12. We adopted this construction.

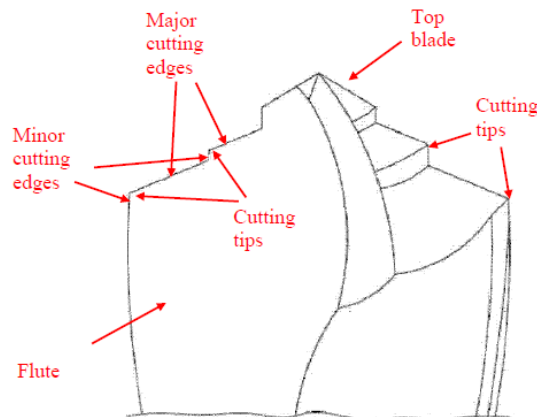
Independent claims 1 and 8 both recite that “each of the plurality of composite cutting blade groups is configured to crush cutting chips into finer chips.” We construed the “finer chips” limitation as reciting a natural consequence of having a plurality of cutting surfaces, relative to having one large cutting surface.

2. Construction of Remaining Terms

We determine that no further terms require construction. *Realtime Data, LLC v. Iancu*, 912 F.3d 1368, 1375 (Fed. Cir. 2019) (“The Board is required to construe ‘only those terms . . . that are in controversy, and only to the extent necessary to resolve the controversy.’”) (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999)).

D. Asserted Anticipation by Zhou (Claims 1, 2, 5, 8, 13–15, 19)

Petitioner asserts that claims 1, 2, 5, 8, 13–15, and 19 are anticipated by Zhou, and identifies how Zhou discloses the limitations of the claims. Pet. 36–52. Petitioner provides a marked-up version of Figure 3 of Zhou to help illustrate, reproduced below:



Pet. 42. Figure 3 depicts a twist drill with the conical section at the end. The conical section is labeled with a top blade and several cutting tips identified as having major and minor cutting edges; one of the spiral flutes is shown as a flat surface defining the cutting edges.

Patent Owner’s arguments focus on the limitations of independent claims 1 and 8 requiring a “major cutting edge” and a “minor cutting edge,” which are defined by the intersection of the major/minor step surface and the sidewall of the spiral flute. Resp. 9–14; Sur-reply 3–5. Patent Owner argues

that, because the cutting edges are formed by an intersection with a *spiral* flute, they “must necessarily be curved when the claim limitations are met.” Resp. 11; Sur-reply 4–5. Petitioner replies that Patent Owner’s arguments are unsupported. Reply 2–5.

We agree with Petitioner that Patent Owner’s arguments are not rooted in the claim language. We do not find that spiral flutes, which in part define the cutting edges, necessitate curved cutting edges. The spiral flute itself is not a line but rather is made of a three-dimensional space cut from and wrapped around the drill bit. Ex. 1044 ¶ 9 (“the flute can have various cross sectional shapes based on how it is manufactured”). Imagine the following. Choose an arbitrary axial location along a drill bit and remove a thin slice (perpendicular to the rotational axis). It would be a generally disc-like shape, with cutouts where the flutes are. Each flute would appear in this slice to be some sort of shape—a “U,” “C,” “V,” “J,” or the like. It is this profile shape (a negative shape, or cut-out) that is extruded down the drill bit to form the flute. *See, e.g.*, Ex. 1016 ¶ 6 (noting that the “shape of the groove is retained throughout its whole length”); Ex. 1044 ¶ 9 (stating that the flute “can be cut into the drill using a grinding wheel having a semicircular cut pattern or that of another shape”).⁷

⁷ Returning to our hypothetical ant walking down a drill bit, imagine that instead of walking along a spiral path, the ant is walking along the bottom of a spiral flute. The walls of that flute would appear to be the walls of a canyon from the perspective of the ant. The canyon would have a more-or-less constant shape as the ant walked along the canyon from beginning to end (in a straight line). The shape of the floor and walls of that canyon could take on a number of different shapes, including straight lines (like a “V,” “U,” or a tilted “J”).

The claims of the '583 patent do not limit the shape of the spiral flutes. Yes, they spiral, but what is the profile of the flute that is spiraling? Like the original Morse twist drill bit (Ex. 1016), the flutes could have a straight line in their profile. Ex. 1016, Fig. 4 (showing the spiral flute is a “J”-shape in cross-section), ¶ 3 (describing the “groove [(flute)], when seen in cross-section, [] will produce the straight cutting edge”); Ex. 1044 ¶ 9 (a flute can have “any desired shape, including straight line segments”). The straight line in the profile allows a straight line at the cutting tip, of which there are many examples in the prior art before us. Ex. 1016 ¶¶ 3, 6; Ex. 1006, Figs. 1–2; Ex. 1007, Fig. 2; Ex. 1009, Fig. 2; Ex. 1001, Fig. 1B–1C (noting especially how the cross-section of the flute in 1C below the cutting blades is made from a straight, radially-extending portion).⁸ Thus, if one forms the claimed cutting blade groups along a wall that extends radially-straight-out from the flute, then there will be no difference in angular position between the edges, thus no need to curve between them. In sum, Patent Owner’s arguments presume features not required by the claims.

Patent Owner cites to Petitioner’s expert, testifying in another proceeding, that “having the cutting tips formed spirally on the cone portion

⁸ A technical note. The flute’s profile shape as we describe it is perpendicular to the *helix* angle and thus will have a slightly different shape if considered in a slice of the drill bit taken perpendicular to the rotational axis. *Compare* Ex. 1016, Fig. 5 (radial view of drill bit tip showing a J-shaped flute profile) *with id.* Fig. 4 (flute profile taken perpendicular to the helix angle, as marked C-D in Figure 1, also J-shaped but the curved part is slightly different). But a straight edge of a profile that runs along a radius line would carry through to the tip. *Id.* ¶ 6 (explaining that the straight cutting part of the J-shape retains that shape as the tip is sharpened, i.e., the straight part is also straight in the axial view).

is an inherent result of maintaining the spiral shape of the flute sidewalls all the way to the tip of the drill.” Resp. 11 (citing Ex. 2105 ¶ 253). The “cutting tips formed spirally” limitation is found in dependent claims 18 and 22, however, which are not part of this ground. Multiple cutting tips can be set on the same angular position according to claims 1 and 8, for the reasons just expressed, but dependent claims 18 and 22 specifically require the cutting tips to spiral (in this context, requiring their angular positions to be different, as will be at issue in the next ground). Thus, Petitioner’s expert’s testimony here is not directed to the limitations at issue in this ground.

Patent Owner also provides drawings of the Matco Hyper-Step drill bit to illustrate its point (Resp. 14), but we note that that drill bit shows features substantially different from what is claimed, e.g., a large number of cutting teeth extending a long way down the drill bit and having a very sharp helical angle. *See also* Ex. 1001, Fig. 3 (a similar shape to the Matco bit, with a large number of cutting teeth extending a significant distance down the bit and having a helical angle of 45° (half of the 90° illustrated)); Ex. 1017, 52 (describing a standard helix angle as on the order of 25–33°). Thus, these arguments are not persuasive.

We have reviewed Petitioner’s element-by-element analysis for the claims challenged under this ground. Pet. 36–52. We have reviewed Patent Owner’s arguments against, discussed them above, and found them unpersuasive. Resp. 9–14; Sur-reply 3–5. In an *inter partes* review, arguments not made or insufficiently developed are forfeit. Paper 16, 9 (“any arguments not raised in the response may be deemed waived”); *DeSilva v. DiLeonardi*, 181 F.3d 865, 866–67 (7th Cir. 1999) (“A brief must make all arguments accessible to the judges, rather than ask them to play

archaeologist with the record.”); *Ernst Haas Studio, Inc. v. Palm Press, Inc.*, 164 F.3d 110, 111–12 (2d Cir. 1999) (“Appellant’s Brief is at best an invitation to the court to scour the record, research any legal theory that comes to mind, and serve generally as an advocate for appellant. We decline the invitation.”). We adopt Petitioner’s element-by-element analysis in its Petition as our own, and find that Petitioner has established by a preponderance of the evidence that claims 1, 2, 5, 8, 13–15, 19 are anticipated by Zhou.

E. Asserted Obviousness in View of Zhou, Bannister, Gentry, and Durfee (Claims 1, 2, 5, 7, 8, 12–15, 18, 19, and 22)

Petitioner offers an alternative, obviousness ground for many of the claims we found anticipated by Zhou, arguing that to the extent certain features (such as axial relief) are not disclosed in Zhou, it would have been obvious to include them. Pet. 52–65 (addressing claims 1, 2, 5, 13–15, and 19).

Patent Owner repeats its argument regarding the major and minor cutting edges being formed by the surface of the sidewall of the loot. Resp. 16, 17; Sur-reply 3–5. That argument is unpersuasive for the same reasons we expressed in our analysis of the Zhou anticipation ground above. Patent Owner raises a new issue, however, that Petitioner has not established a reason to combine references. Resp. 17–24; Sur-reply 8–9.

1. Reason to Combine Analysis

Some of Patent Owner’s arguments appear to address the combination of Zhou and one or more references in general (e.g., as would be applicable to the independent claims), whereas the majority of Patent Owner’s

arguments appear directed specifically toward Petitioner’s proposed combination with respect to claims 18 and 22.

a) Petitioner’s Proposed Modifications

(1) Independent Claims 1 and 8

Petitioner’s proposed modification to Zhou is a backup position to its anticipation ground. The proposed modification is that, to the extent Zhou’s cutting surfaces do not exhibit axial relief, it would be obvious to do so. Pet. 56–57. We find that it was old and well-known to provide axial relief. Ex. 1004 ¶ 178; Ex. 1006, p.2, 1:75–2:4; Ex. 1010, 1:52–63; Ex. 1017, 21 (equating “lip relief” to axial relief). It prevents rubbing, among other benefits. Ex. 1017, 50; Ex. 1004 ¶ 178. As we mentioned above, we find that Zhou already describes axial relief. Ex. 1007 ¶¶ 8–9 (translating “axial relief” as “back angle”); Ex. 1004 ¶ 134. Thus, to the extent Zhou does not explicitly teach axial relief, we find that a person of ordinary skill in the art at the time of the invention had a reason to include this known feature in order to achieve its known benefits of preventing rubbing.

(2) Dependent Claim 13

Dependent claim 13 requires that the minor cutting edge of the top blade is longer than the minor cutting edges of the cutting blade groups. Petitioner has explained why it believes that Zhou already discloses this limitation. Pet. 49–50. As a backup position, Petitioner asserts that it would have been obvious to modify Zhou to include this feature. *Id.* at 63–65. Petitioner asserts that Korb shows this feature and that a person of ordinary skill in the art would have known that the longer top blade provided the advantage of creating a deeper pilot hole to act as a better guide in the workpiece, e.g., as shown in Korb. *Id.*; Ex. 1012, Fig. 7; Ex. 1004 ¶ 195

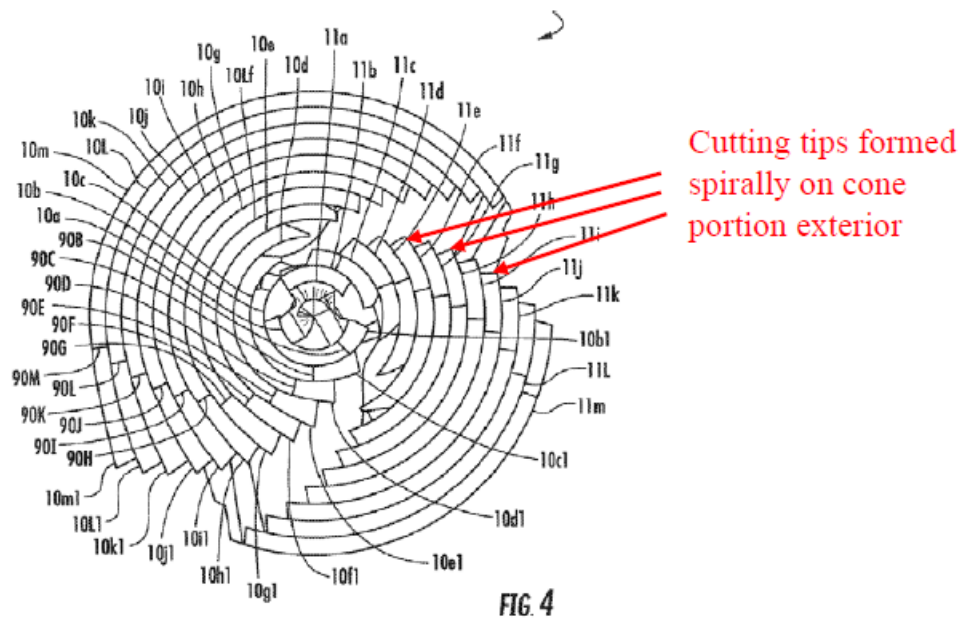
(providing a persuasive technical explanation for why Korb’s tip design provides these known benefits). Thus, to the extent Zhou does not explicitly teach a longer top blade, we find that a person of ordinary skill in the art at the time of the invention had a reason to include this known feature in order to achieve its known benefits of providing a better guide.

(3) Dependent Claims 7 and 12

Dependent claims 7 and 12 recite that the major cutting edge length of the top blade is greater than each of the major cutting edges of the plurality of composite cutting blade groups. Petitioner asserts that Zhou does not expressly teach this configuration, but that “this is a matter of routine engineering choice.” Pet. 65–66. Petitioner points out that Zhou teaches that the tip has a larger diameter than the steps, and that it “would be consistent with these parameters of Zhou to have a straight major cutting edge length of the top blade be greater than each of the major cutting edges of the cutting blade groups.” *Id.* at 65. Petitioner also points to Gentry and Durfee, which depict this configuration. *Id.* at 65–66 (citing Ex. 1010, Fig. 2; Ex. 1011, Fig. 4; Ex. 1004 ¶¶ 197–199). Petitioner’s expert provides a persuasive technical explanation of why the claimed configuration is consistent with Zhou’s teachings of the relative proportions of the drill bit step diameters, and also explains that the longer top blade major cutting edge extends the life of the bit. Ex. 1004 ¶¶ 197–198. Thus, we find that a person of ordinary skill in the art at the time of the invention had a reason to include the known feature of a wider top blade in order to achieve its known benefits of providing a longer blade life.

(4) *Dependent Claims 18 and 22*

Dependent claims 18 and 22 each recite “wherein the cutting tips of the plurality of composite cutting blade groups are formed spirally on a cone portion exterior.” Petitioner asserts that Zhou discloses cutting tips “formed along a straight line by the flute edge.” Pet. 67. Petitioner then asserts that “it was well-known that cutting tips could be formed spirally on a cone portion exterior.” *Id.* Petitioner backs up its assertion by citing Gentry and Durfee, which, according to Petitioner “show step drills with cutting tips that are formed spirally on the cone portion exterior.” *Id.* (citing Ex. 1011, Fig. 4, 3:57–6:32); Ex. 1004 ¶ 201. Petitioner provides a marked-up version of Figure 4 of Durfee, which we reproduce below:



Pet. 67 (providing a marked-up copy of Ex. 1011, Fig. 4). Figure 4 of Durfee is an axial view of the tip of a step drill bit. Figure 4 depicts step sections 10 and 11. The intersection between the steps sections and two flutes create cutting edges arranged in a spiral pattern (not labeled in the figure but label added by Petitioner).

Petitioner asserts that a person of ordinary skill in the art would have known that a spiral flute helps to lift swarf away from the cutting surface. Pet. 67 (citing Ex. 1004 ¶¶ 201–202). The testimony of Petitioner’s expert states that a person of ordinary skill in the art would have known that “the spiral shape of the flute side walls was desirable since it helps to lift chips, or swarf, away from the cutting surface and evacuate it from the hole being cut.” Ex. 1004 ¶ 202. This makes intuitive sense, as a wall perpendicular to the surface would push accumulated chips along, whereas the wedge shape of the spiral will lift them away from the cutting surface. According to Petitioner, a person of ordinary skill in the art would have been motivated to modify Zhou’s flute to arrange the cutting edges such that they, as a whole, have a spiral shape in order to achieve these chip-lifting benefits. Thus, we find that a person of ordinary skill in the art at the time of the invention had a reason to include the known feature of cutting tips that spiraled around the cone portion, in order to achieve the benefit of providing better chip removal.

(5) Zhou, Bannister, Gentry, Korb, and Durfee are Analogous Art

We find that Zhou, Bannister, Gentry, Korb, and Durfee are analogous art. They are in the field of metal cutting tools and each offer solutions relevant to the problems of metal cutting tools and specifically drill bits. Ex. 1001, 1:16–17 (describing the technical field as “metal cutting and metal cutting tools”), 1:29–31, 1:38–40 (describing problems in the field relating to positioning, speed, efficiency, and cutting forces); Ex. 1006, 1, 1:1–11 (describing the invention as being more effective at a number of drilling tasks such as power and positioning); Ex. 1007 ¶ 14 (describing the invention as improving drilling efficiency and durability by reducing axial

resistance and torque); Ex. 1010, 2:50–56 (describing the invention as being a more effective way to manufacture “a spiral drill bit”); Ex. 1011, 1:13–15, 1:32–39 (describing the invention as “related to drill bits” and specifically the shape of their flutes); Ex. 1012, 1:6–7, 51–55 (stating that “[t]his invention relates to drill bits of step construction for drilling holes of different diameters” that “minimize the problems of axial wobble and drill chatter” and “have improved concentricity”).

We reject Patent Owner’s arguments that step drills are not relevant to the claimed invention. *See, e.g.*, Resp. 24. Patent Owner offers no persuasive reason to believe that a person of ordinary skill in the art would not be familiar with step drills, nor that problems faced by designers making step drills are not pertinent to problems faced by designers making twist drills. *Compare id.* (“It was not at all obvious to combine step-like features . . . to the exterior of the cone portion of a twist drill”) *with* Ex. 1006, p.1, 2:34–35 (“I grind the drill so that the point presents a series of drilling units.”), p.2, 2:51 (describing the drilling units as “stepped cutting edges”). Indeed, the wall Patent Owner tries to raise between twist drills and step drills is illusory. Ex. 1017, 25 (listing “step drills” as one of the types of twist drills, and further noting that “[s]tep drills can frequently be made by grinding down and stepping conventional drills”); Ex. 1006, p.1, 2:34–35 (forming steps on a twist drill). A person of ordinary skill in the art would consider them part of the same field of cutting tools. Ex. 1017, 25; *see also* Ex. 1011 (discussing both twist drills and step drills); Ex. 1001, 1:16–17 (defining the field of endeavor as “metal cutting tools”). Several prior art references have combined features of twist drills and step drills. Ex. 1006, Fig. 1; Ex. 1007, Fig. 1; Ex. 1009, Fig. 3; Ex. 1014, Fig. 1. Patent Owner

appears to be making distinctions based on the specific items being cut (e.g., sheet metal), but none of that has to do with the limitations of the claims. Accordingly, we are not persuaded by this line of reasoning. Instead, we find that Zhou, Bannister, Gentry, Korb, and Durfee are analogous art.

b) The Proposed Modifications do not Change Zhou's Principle of Operation

Patent Owner argues that Petitioner's proposed modifications would be a "major redesign" and require a change in, or otherwise defeat, Zhou's principle of operation. Resp. 19–21. Patent Owner does not explicitly define what it means by Zhou's principle of operation. Patent Owner's arguments appear to be focused on the proposed modification to make Zhou's cutting tips formed spirally, which is relevant only to the portion of Petitioner's ground addressing dependent claims 18 and 22. *Id.* at 19.

We find no reason to believe that Petitioner's proposed modification would not still result in a working drill bit. Patent Owner argues that, in order to make the modification proposed by Petitioner, various curves would need to be added to Zhou's drill bit, which would create points of weakness. *Id.* at 20–21. However, we find this to be a strawman argument that Patent Owner has created. Petitioner is proposing to modify Zhou's cutting tips so that they spiral around in the manner shown in Durfee and Gentry. Pet. 67. We are given no reason to believe that Durfee and Gentry's cutting tips are weak, or would be weak when applied to Zhou. We think that it is no stretch to assume that a person of ordinary skill in the art would understand that drill bits would be made from a material effective for use as a drill bit, and we are given no evidence that Durfee or Gentry are inoperable. *See Ex.* 1007 ¶ 1 (stating the drill bits "can be manufactured from high-speed steel or

a hard alloy”); Ex. 1017, 22 (discussing materials suitable for drill bits). The combination is to shape Zhou’s drill bit tip to be like that shown in Durfee or Gentry, and from a technical standpoint we find this to be within the level of ordinary skill. Ex. 1044 ¶ 15 (Petitioner’s expert characterizing the modification as “a very minor modification” that involves “a matter of routine engineering design choice”); Ex. 1017, 25 (a textbook explaining that “[s]tep drills can frequently be made by grinding down and stepping conventional drills”). Accordingly, we are not persuaded that the proposed combination would change Zhou’s principle of operation or otherwise pose a technical impediment.

c) The Proposed Modifications do not Add Redundant Features

Patent Owner argues that the features that Petitioner attempts to add are “inherent to Zhou’s drill bit” and are “redundant thereto.” Resp. 22–23. These arguments appear to be focused only on Petitioner’s ground addressing dependent claims 18 and 22. Specifically, Patent Owner points out that Zhou discusses:

the most notable distinguishing features of the present utility model are the main cutting edge segmentation and the asymmetrical edge heights, which are intended to achieve a further reduction in the drilling axial resistance and torque, so that swarf is separated and expelled more smoothly

Ex. 1007 ¶ 14. However, the specific features that Zhou explains that provide this swarf separation is not the edge itself but rather swarf separation grooves on the edges. *Id.* ¶ 11. These grooves are ground into edges 1 and 4, and are labeled items 6 and 7 in Figure 1. *Id.* ¶ 24; *see also* Ex. 1017, 58 (discussing similar “chip splitter” or “chipbreaker grooves”), 59 (Fig. 9-42, illustrating the chip splitters). The proposed combination is not to improve

swarf separation using grooves, but rather the spiral flute geometry. Pet. 67–68. Accordingly, we do not find that Petitioner’s proposed modification to improve swarf separation is the same solution provided by Zhou.

More importantly, we do not find that improving a device that already claims to be improved is “redundant.” A redundant feature could be thought of as one that adds no value beyond what already exists. An improvement, as its name implies, improves on an existing thing and therefore is not what already exists. We do not see any persuasive evidence or argument from Patent Owner that the proposed modification would not actually improve Zhou’s drill bit as proposed. *See generally* Resp. 21–23; Sur-reply 8–9. Instead, Patent Owner focuses on language in Zhou which claims it is an improvement over the prior art or provides certain features such as swarf removal, and appears to suggest that no one is allowed to improve on these features or change them to make Zhou better. *See, e.g.*, Resp. 22 (citing Ex. 1007 ¶ 14). Obviousness is judged from the perspective of the person of ordinary skill in the art, not the beliefs of the inventor of Zhou. 35 U.S.C. § 103. A person of ordinary skill in the art is familiar with all of the art, not just Zhou, and thus is not limited to doggedly following every word of a reference without consideration of what else they know. *KSR Int’l Co. v. Teleflex, Inc.*, 550 U.S. 398, 421 (2007) (“A person of ordinary skill is also a person of ordinary creativity, not an automaton.”); *Custom Accessories, Inc. v. Jeffrey-Allan Indus., Inc.*, 807 F.2d 955, 962 (Fed. Cir. 1986) (“The person of ordinary skill in the art is a hypothetical person who is presumed to know the relevant prior art.”). Even ordinarily skilled artisans have skill and are looking to improve the prior art. *KSR*, 550 U.S. at 421 (“a person of ordinary skill in the art has good reason to *pursue* the known options within

his or her technical grasp” (emphasis added)); *In re Sovish*, 769 F.2d 738, 743 (Fed. Cir. 1985) (a person of ordinary skill in the art is presumed to have skill). Petitioner has provided a specific reason why a spiral-tip configuration such as in Gentry or Durfee would improve the cutting capabilities of Zhou and has cited persuasive evidence in support of its position. We do not find these additions redundant but rather another approach to improve the chip removal characteristics of the drill bit, and both approaches use different means to achieve their ends.

d) Petitioner has offered a Reason with Rational Underpinnings to Modify Zhou

Patent Owner argues that there would be no reason to add step-like features from step drills to the twist drill in Zhou. Resp. 23–24; Sur-reply 5–8, 17–18. We believe we have sufficiently addressed this argument in our section on rationale and analogous art—step drills and twist drills are highly related. In addition, we agree with Petitioner that Zhou already adds step-like features from step drills; it has steps. Reply 6; Ex. 1006, Fig. 1 (edges forming a stepped shape); *see also* Ex. 1006, p.2, 2:49–56 (Bannister describing a similar configuration to Zhou as having “stepped cutting edges”).

Patent Owner also argues, specifically with respect to dependent claims 18 and 22, that there is no indication that swarf removal is a problem with Zhou’s drill bit. Resp. 23. There is no requirement that the prior art identify a specific issue with Zhou’s drill bit. *Intel Corp. v. Qualcomm Inc.*, 21 F.4th 784, 797 (Fed. Cir. 2021) (stating that “a rationale is not inherently suspect merely because it’s generic in the sense of having broad applicability or appeal” and that such “generic” improvements may support “a motivation

to combine prior art references *even absent any hint of suggestion* in the references themselves”). Instead, the question is whether there is a reason to modify Zhou to have the spiraling cutting tips described in Gentry and Durfee. Petitioner proposes that it would improve swarf separation, which is desirable, and provides evidence in the form of expert testimony that a person of ordinary skill in the art would recognize that such an improvement would be made. Pet. 67 (citing Ex. 1004 ¶¶ 201–202); Reply 7 (citing to same). Even if Zhou touts improved swarf removal, we credit the testimony of Petitioner’s expert that “[d]rills are competitive and commoditized products where innovators are always looking for improvements that can give even marginal advantages over the competition.” Ex. 1044 ¶ 17. Accordingly, we find that a person of ordinary skill in the art would have a reason to add the proposed modification to provide further advantages in swarf separation.

2. *Objective Indicia of Non-Obviousness*

Patent Owner asserts that objective indicia of non-obviousness overcome any prima facie obviousness case. Resp. 25–40; Sur-reply 14–25. Patent Owner first asserts that there is a nexus between the challenged claims and its alleged objective indicia. Resp. 26–29; Sur-reply 14–18. Patent Owner also alleges that its evidence shows copying (Resp. 30–35; Sur-reply 18–20), industry praise (Resp. 35–36; Sur-reply 20–21), commercial success (Resp. 36–39; Sur-reply 21–25), and satisfaction of a long-felt need (Resp. 39–40). Petitioner disputes these allegations. Reply 15–25.

a) Nexus

Patent Owner bears the burden of establishing nexus. *WMS Gaming Inc. v. Int'l Game Tech.*, 184 F.3d 1339, 1359 (Fed. Cir. 1999). A presumption of nexus is only appropriate if “the patentee shows that the asserted objective evidence is tied to a specific product and that product embodies the claimed features, and is coextensive with them.” *Fox Factory, Inc. v. SRAM, LLC*, 944 F.3d 1366, 1373 (Fed. Cir. 2019) (cleaned up). The coextensiveness requirement is not met simply by showing that “the patent claims broadly cover the product that is the subject of the evidence of secondary considerations.” *Id.* at 1377. Coextensiveness can be thought of as “the degree of correspondence between a product and a patent claim.” *Id.* at 1374. “[T]he existence of one or more unclaimed features, standing alone,” does not necessarily defeat coextensiveness. *Id.* Instead, “the concept of unclaimed features is best viewed as part of a spectrum.” *Teva Phrama. Int'l GmbH v. Eli Lilly and Co.*, 8 F.4th 1349, 1361 (Fed. Cir. 2021). “The presumption analysis requires the fact finder to consider the unclaimed features of the stated products to determine their level of significance and their impact on the correspondence between the claim and the products.” *Id.* (citing *Fox Factory*, 944 F.3d at 1375). The nexus analysis should focus on and consider the difference between the prior art and the claimed invention, and the extent to which the objective indicia speaks to these gaps. *Campbell Soup Co. v. Gamon Plus, Inc.*, 10 F.4th 1268, 1278 (Fed. Cir. 2021) (“[T]o establish a nexus, [the patent owner] needed to present evidence that the commercial success and praise of the [product] derived from those ‘unique characteristics.’”) (citing *Fox Factory*, 944 F.3d at 1373–74). Simply providing evidence tied to features already

present in the prior art does not satisfy the inquiry. *Id.* (“objective indicia must be linked to a [] patent claim’s unique characteristics”); *Fox Factory*, 944 F.3d at 1378 (stating that for patents claiming combinations of prior art features, a patentee must show that the secondary considerations evidence is “attributable to the claimed combination of [prior art features], as opposed to, for example, prior art features in isolation or unclaimed features”).

Patent Owner’s assertions regarding nexus are conclusory and extensively incorporate by reference other documents. *See generally* Resp. 26–29; Sur-reply 15–18. Patent Owner begins by citing to sixteen claim charts. Resp. 26 (citing Exs. 2074–2089). Patent Owner then alleges that the products it has licensed “are coextensive with the patented invention” because all of them are drill bits. *Id.* at 27. Patent Owner asserts that there are no unclaimed features, but in support of that allegation merely cites to its expert, who in turn says the same words without providing any support for his opinion. *Id.* at 27–28 (citing Ex. 2034 ¶ 150).

We acknowledge that the claims of the ’583 patent are directed to a drill bit and that Patent Owner’s evidence is directed to drill bits. However, nexus cannot be established by showing that “the patent claims broadly cover the product that is the subject of the evidence of secondary considerations.” *Fox Factory*, 944 F.3d at 1377. Indeed, Petitioner argues that Patent Owner has not shown the “formed spirally” limitation, which requires axial relief and is found in independent claims 1 and 8.⁹ Reply 22.

⁹ The issue of axial relief is central to our Decision in IPR2023-00473, decided concurrently with this Decision and addressing the same claims of the ’583 patent on different grounds. Although axial relief does not feature large in this Decision, it remains a requirement of the claims.

Patent Owner counters that their expert “confirmed that the products he provided claim charts for exhibit axial relief.” Sur-reply 14 (citing Ex. 2034 ¶¶ 125–148). But Patent Owner’s expert does not provide an explanation of how these charts demonstrate that these drill bits have axial relief. For example, Patent Owner’s expert points to Exhibits 2074, 2075, 2076, 2077, etc., each of which merely asserts that the drill bits shown “has a plurality of composite cutting blade groups . . . formed sequentially and spirally on a cone portion exterior.” *See* Ex. 2074, 2; Ex. 2075, 2; Ex. 2076, 2; Ex. 2077, 2. Patent Owner similarly provides a drawing in its brief apparently showing axial relief, but we do not credit this attorney argument. Sur-reply 15. In any event, the expert declaration and claim charts provide no analysis or explanation identifying axial relief, and merely consists of photos in which we are left to make our own conclusions. We determine that Patent Owner has not met its burden in showing that the licensed products exhibit the “formed spirally” limitation. Patent Owner continues that “[t]he ’583 patent’s novelty lies in its unique drill tip configuration, which combines the conical portion of a twist drill with a plurality of composite cutting blades of a step drill.” *Id.* at 17. These features are already present in Bannister and Zhou, as we have explained above. *See, e.g.*, Ex. 1006, p.1, 2:34–35 (“I grind the drill so that the point presents a series of drilling units.”).

Patent Owner advises us to view the photos and reach our own conclusion that the surfaces show axial relief, but we decline that invitation. Sur-reply 14 (arguing that “axial relief is readily apparent from a visual examination”). As is hopefully clear from our discussion on drill bit geometry, it is difficult to view a two-dimensional photo of a three-dimensional object and be certain of the actual shapes. We have reviewed

the photos in the claim charts, and many of the photographs are zoomed in or difficult to ascertain the orientation of the bit. We do not find that the drill bits in the claim charts exhibit axial relief via a *sua sponte* “visual examination” of photographs due to the uncertainty of establishing such a precise relationship in view of the distortive effects of photographs. In any event, it is Patent Owner’s burden to make that showing, and it is something that would have been easy to do (if it were present) using measurements and/or by providing a technical data package (akin to blueprints). Thus, we find that Patent Owner has not demonstrated that the licensed products are co-extensive with the claimed invention.¹⁰ *Accord Volvo Penta of the Americas, LLC v. Brunswick Corporation*, 81 F.4th 1202, 1210–11 (Fed. Cir. 2023) (holding that the Board correctly found conclusory arguments and declaration to be insufficient to establish a nexus). Nevertheless, we review the specific evidence offered for non-obviousness for completeness. Aspects of our analysis below helps further illustrate that Patent Owner has not established nexus.¹¹

b) Copying

Patent Owner argues that Petitioner has copied its claimed invention. Resp. 30–35; Sur-reply 18–20. Patent Owner does not sell any drill bits. Instead, Patent Owner has ownership interests in a manufacturer (Tec-

¹⁰ Patent Owner also argues that certain alleged infringing products have nexus to the claimed invention, but again Patent Owner’s analysis is conclusory and faulty for the same reasons. Resp. 26–27.

¹¹ We recognize that nexus can be established by a presumption of nexus for a coextensive product, as well as by demonstration of “unique characteristics” of a product. *Fox Factory*, 944 F.3d 1366, 1373–74 (Fed. Cir. 2019). Patent Owner’s arguments fail under any theory of nexus.

Spiral) and a supplier (Tsteigen) of drill bits. Ex. 2035 ¶¶ 2–4. These companies then sublicense to Astro (a distributor) who then further sublicenses to Matco (a distributor / retailer). *Id.* ¶ 5.¹² Astro calls its drill bit line “Easy-Boost” whereas Matco calls its product line “Hyper-Step.” *Id.* ¶¶ 8–9.

We are unmoved by Patent Owner’s arguments based on Petitioner’s drawings of drill bits that also contain the words “Hyper-Step.” Resp. 32 (discussing Exs. 2062, 2063). Petitioner points out that Exhibit 2063 was created more than a year after the introduction of their competing drill bit, for the specific purpose of pointing out the substantial differences between the two once litigation had begun. Reply 17 (citing Ex. 1045 ¶¶ 10–12); Ex. 1045 ¶ 10 (“Exhibit 2063 was created in response to the ‘cease and desist’ letter that [Petitioner] received from Patent Owner on or about June 4, 2021, for the specific purpose of illustrating that the products are not the same.”) (emphasis in original). The drawing in Exhibit 2062 was produced in August 2020, and shows a drill bit with the label “Hyper-Step.” Patent Owner claims that this is evidence that Petitioner called its *own* drill bit a Hyper-Step drill bit (Resp. 32), but we do not read the evidence this way. We are given little context as to Exhibit 2062, except that the drawing was done by Petitioner’s drafter and sent to its director of engineering in August of 2020. Ex. 2062, 1. The email does not say why. Petitioner asserts that it began selling its competing product in spring of 2020 (Ex. 1045 ¶ 7), so regardless of why it was made, the timing does not work out for Patent Owner’s theory that this somehow establishes copying. *See also* Ex. 1045

¹² Patent Owner does not list Tec-Spiral, Tsteigen, Astro, or Matco as real parties in interest. *See* Papers 7, 13 (Mandatory Notices).

¶ 9 (Petitioner’s director of engineering testifying that Petitioner “did not make any drawings or take any measurements of the Hyper-Step drills during our development work. We made no effort to replicate the exact design of the Hyper-Step drills.”).

Patent Owner provides a copy of what it alleges to be “an item:item cross-reference to the Matco [tools].” Resp. 32 (citing Ex. 2064). Even if we are to assume that this document shows that Petitioner wanted to know which of its products most closely aligned with which of Matco’s products, we fail to see how this shows copying. Business competitors would be presumed to keep track of competing products in their ordinary course of business; it would seem foolish for a company not to know what their competitors are doing.

Patent Owner also argues that there is evidence that the alleged copiers of the ’583 patent advertise the advantages of its design. Resp. 33–34 (citing Exs. 2025, 2026, 2027, 2048, 2058); *id.* at 34 (citing Ex. 2028). We have reviewed these advertisements, but they describe benefits of a step-tip drill bit in a manner similar to the way Bannister describes the advantages of his step-tip drill bit. For example, Exhibit 2027 states that the “[s]plit-point design that gives accurate starting and is selfcentering eliminating the need for the use of a center punch” and “reduces heat generation” (Ex. 2027, 1) while Bannister states that “the stepped cutting edges, forms a pilot for succeeding the larger drilling unit, so that holes drilled with my improved drill are perfectly round and straight” with “less heat generated,” and further noting that prior art drill bits required a punch. Ex. 1006, p.1, 1:5–11 (generates less heat; drills in one operation), 2:1–35 (design overcomes need for “punch mark” or using multiple drills), p.2,

2:45–54 (stepped cutting surfaces). We do not find in these advertisements an emphasis on axial relief or spiraling cutting tips, but rather a step-tip design like in Bannister or Zhou.¹³

Patent Owner lastly alleges that a German company has filed multiple requests for *ex parte* reexamination of the '583 patent and that they have refrained from entering the US marketplace in the meantime. Resp. 35. Patent Owner asserts that this is “a clear instance of commercial acquiescence.” *Id.* We find Patent Owner’s position to be conjecture. If anything, even if we accept as true that three reexaminations have been filed by one company, this is evidence that the company does not believe the patents to be valid and (depending on the timing, which Patent Owner does not provide) potentially a recognition that Patent Owner has initiated a lawsuit over the patent and the company is taking reasonable precautions before proceeding to market.

The remainder of Patent Owner’s arguments are based on out-of-court statements made by a third party that have been excluded as hearsay. *See generally* Resp. 30–32 (citing Exs. 2047, 2055, 2056, 2057, 2059, 2060).

c) Industry Praise

Patent Owner begins by asserting that Petitioner’s and a third party’s “internal documents (discussed in detail above) concerning their testing of drill bits and the reasons for deciding to copy the same are particularly telling here.” Resp. 35. However, Patent Owner does not cite to any particular evidence or provide any specific analysis, making it difficult for

¹³ We note these features because they are the features that Petitioner asserts would have been obvious to add to Zhou.

us to piece together its argument. *United States v. Dunkel*, 927 F.2d 955, 956 (7th Cir. 1991) (“A skeletal ‘argument’, really nothing more than an assertion, does not preserve a claim. . . . Especially not when the brief presents a passel of other arguments. . . . Judges are not like pigs, hunting for truffles buried in briefs.”).

Patent Owner turns to “positive reviews” which allegedly discuss features of the patented invention. Resp. 35–36. The first piece of evidence is a website screenshot allegedly showing reviews, presumably of people who have purchased drill bits. Ex. 2011. Stepping over the fact that these are anonymous reviews appearing on a public website,¹⁴ even if we were to assume that consumers liked the product, it is not clear to us that *consumers* are the relevant actors for *industry* praise.¹⁵ Consumers have a vested interest in liking expensive things that they have purchased. We are skeptical that consumers in this situation (anonymous online statements) represent industry praise. Patent Owner offers no analysis in support of its position.

¹⁴ We view anonymous reviews with heavy skepticism. We have not been presented with evidence that makes us comfortable with taking these at face value. Even if we assume that each review is offered by a unique individual who actually purchased and used the product, it is common knowledge that many companies compensate reviewers for positive reviews or combine reviews of similar products. *See, e.g.*, Tr. 50:4–5 (Patent Owner’s counsel responding to a question on this topic: “You don’t know whether my client or my client’s reseller is out there trying to put this in other people’s lips”); Ex. 2012, 2 (a video “review” website disclosing that they received tools for free or for compensation and that the “reviews” are provided by the manufacturer).

¹⁵ Consumer’s preference is directly handled in the commercial success category, however.

Patent Owner next alleges praise in “technical journals, including TechShop magazine.” Resp. 36 (citing Ex. 2012). However, Exhibit 2012 is merely a screen capture of a website. Even so, this is by no means a “technical journal[],” but rather a conduit for paid product placements. Ex. 2012, 2 (site disclaimer stating: “We are provided tools free of charge, however, we receive compensation for some videos we produce. Tool Showcase videos are not reviews and the descriptions and specifications of the products are provided by the manufacturer.”).

Patent Owner then alleges praise in reviews on “YouTube from industry insiders.” Resp. 36 (citing Exs. 2013–2018, 2049–2054). Exhibits 2013 and 2049 are the “Tool Showcase” that is the same entity as the alleged “technical journal[]” of Exhibit 2012. We find that it is also a paid product placement and does not credibly represent industry praise.

Exhibits 2015 and 2051 are offered as a YouTube video describing Matco Hyper-Step drill bits by a YouTube personality known as Flat Rate Master. In the video, Flat Rate Master alleges that another individual, known as Bam Bam, got his tool stuck in an engine block and was able to use a Matco Hyper-Step drill bit to get it out. Flat Rate Master alleges that Bam Bam found the drill bit to go “through it like butter.” For his part, however, Flat Rate Master characterized the drill bit as “simple.” Flat Rate Master made clear that his video was not sponsored by Matco.¹⁶

Exhibit 2052 is a video entitled “Matco Hyper-Step Drill Bits Have No Chill,” and depicts an unidentified individual randomly drilling holes in things. Ex. 2016; Ex. 2036 ¶¶ 46–47. No words are spoken.

¹⁶ This reinforces our earlier point that marketing promotions masquerading as reviews or opinions are commonplace in the industry.

Exhibits 2050, 2053, 2054 have previously been excluded. Paper 43.

Reviewing the evidence offered for industry praise, we find disjointed clips of dubious relevance and reliability, paired with the lack of any meaningful explanation from Patent Owner. When asked at oral hearing about what we should do with its evidence, Patent Owner acknowledged that: “you would be entitled to take those tertiary statements with a grain of salt. You don’t know whether my client or my client’s reseller is out there trying to put this in other people’s lips. I don’t have a problem with that at all.” Tr. 49:5–50:25. We place little-to-no persuasive value on Patent Owner’s offerings for industry praise.

d) Commercial Success

Patent Owner asserts that its products have been commercially successful, and that Petitioner’s competing products have also been commercially successful. Resp. 36–39. In an effort to correlate the success with the claimed features, Patent Owner asserts that “Astro and Matco both advertise the patented features (and performance deriving therefrom).” *Id.* at 38 (citing Exs. 2011, 2041–2046). We have reviewed these exhibits and are not persuaded that the commercial success can be attributed to the claimed invention. For example, the advertising materials tout that the Hyper-Step is innovative because “the multi-steps tip acts like a step drill, allowing for laser like holes through sheet metal and prevents walking on curved services.” Ex. 2041, 1. This sounds like Bannister: “the central grinding unit 13 and each succeeding grinding unit formed by the stepped cutting edges, forms a pilot for the succeeding larger drill unit, so that holes drilled with my improved drill are perfectly round and straight, and of uniform section.” Ex. 1006, p.2, 2:49–55; *see also id.* at p.1, 2:15–20 (identifying the

problem of drill walking which is solved by using a series of drilling units, i.e., presenting a small initial drilling surface). Thus, even if we were to credit the Hyper-Step as having commercial success because, e.g., it can charge a price premium (e.g., Sur-reply 24–25),¹⁷ the evidence that Patent Owner is offering suggests that the success is based on nothing more than features offered by Bannister, or unclaimed features.

e) Long-Felt Need

Patent Owner asserts that, historically, it has been necessary to use a pilot hole with a smaller diameter drill bit before drilling a larger hole, creating a two-step process. Resp. 39. Patent Owner asserts that no one had thought to combine a plurality of cutting blade groups on the conical portion of the twist drill. *Id.* at 40. However, we find these statements contravened by the prior art before us. The problem that Patent Owner identifies is almost verbatim recited as the problem identified in Bannister, a drill from 1938. Ex. 1006, p. 1, 1:55–2:11. Bannister offered a solution to the problem by creating a plurality of cutting blade groups on the conical portion of the twist drill. *Id.* at Fig. 1; p.1, 2:32–35 (“In accordance with my invention, I provide a drill in which the beforementioned difficulties are overcome. I grind the drill so that the point presents a series of drilling units.”); p.2, 2:49–56 (also referring to the drilling units as “stepped cutting edges”). Accordingly, the idea of providing steps on a twist drill bit has long been known. *See also* Ex. 1017, 25 (a textbook explaining that “[s]tep

¹⁷ We need not decide whether many of Patent Owner’s arguments here or elsewhere in its Sur-reply are improper new arguments because our finding that there is insufficient nexus means that the case does not turn on these potentially new arguments.

drills can frequently be made by grinding down and stepping conventional drills”). We find no compelling evidence of long-felt need for the claimed invention.

f) Conclusions for Objective Indicia

The following is a summary of our findings and conclusions from above regarding objective indicia of non-obviousness. Patent Owner has not established a nexus between the claimed invention and the licensed products it offers as evidence of non-obviousness. Instead, the evidence offered is linked to features regarding the stepped configuration itself, which is shown in the prior art and offers the advantages Patent Owner claims for itself. The evidence offered for copying merely shows competitors working to introduce or advertise a competing product. The evidence offered for industry praise is equivocal at best and does not come from the types of sources that would generally indicate that a person of ordinary skill in the art would have considered the claimed invention obvious. Much of the praise, as it were, simply repeats features that were known in the prior art such as Bannister. Patent Owner’s evidence for commercial success likewise appears to hinge upon features and benefits touted by Bannister. Similarly, Patent Owner’s evidence about long felt need ignores the fact that Bannister offers a solution to these same problems. In sum, the evidence offers little in the way to showing that the subject matter of the claims are non-obvious over other step-tip references like Zhou and Bannister.

3. Conclusion for the Zhou, Bannister, Gentry, and Durfee Ground

Zhou and Bannister disclose most of the claimed features and describe step-tip drill bits that address most of the problems that Patent Owner alleges are solved by its claimed invention. Ex. 1006, p.1, 1:5–11 (generates less

heat; drills in one operation), 2:1–35 (design overcomes need for “punch mark” or using multiple drills), p.2, 2:45–54 (stepped cutting surfaces); Ex. 1007 ¶ 14 (describing a stepped edge configuration to reduce axial resistance and torque and increase durability). To the extent Zhou does not describe axial relief, Petitioner asserts that Bannister’s stepped drill bit configuration provides this well-known feature. Pet. 56–57. For dependent claim 13, Petitioner asserts that, to the extent that Zhou’s drill bit tip is not longer than the remaining steps, Korb is an example that it is well-known in the art to provide an elongated tip at the end of the drill bit. *Id.* at 63–64. For dependent claims 7 and 12, Petitioner asserts that, to the extent that Zhou’s drill bit tip is not wider than the remaining steps, Gentry and Durfee both show that this configuration is an established design choice. *Id.* at 65–66. For dependent claims 18 and 22, Petitioner asserts that it would have been obvious to configure the cutting tips of a stepped drill in the manner shown in Gentry and Durfee, with an additional benefit of improved swarf removal due to the curved surface. *Id.* at 67–68. As we explained above, Petitioner has provided a reason to provide each of these proposed modifications. Patent Owner’s arguments against the reasons to combine have not been persuasive.

Patent Owner’s evidence of non-obviousness is directed to showing how the licensed products include beneficial features already known in the art, such as self-centering (no need for a pilot hole) and reduced heat generation (durability). To the extent Patent Owner believes that its success lies in providing a step-tip twist drill, Bannister and Zhou already do this. In sum, the allegedly unique features of the ’583 patent are features already present in Zhou and Bannister, not a point of novelty allegedly arising from

a combination of features not present in the prior art. *Fox Factory*, 944 F.3d at 1378 (stating that for patents claiming combinations of prior art features, a patentee must show that the secondary considerations evidence is “attributable to the claimed combination of [prior art features], as opposed to, for example, prior art features in isolation or unclaimed features”). Weighing the evidence of obviousness against the evidence of non-obviousness, we determine that Petitioner has shown by a preponderance of the evidence that the subject matter of claims 1, 2, 5, 7, 8, 12–15, 18, 19, and 22 would have been obvious in view of Zhou, Bannister, Gentry, and Durfee.

III. CONCLUSION

We find that Petitioner has established by a preponderance of the evidence that claims 1, 2, 5, 7, 8, 12–15, 18, 19, and 22 of the ’583 patent would have been obvious.¹⁸ Petitioner’s additional ground using Bannister, Durfee, Korb, and Zhou in addition to Welty (Ex. 1008) is cumulative in view of our determination in this proceeding and in IPR2023-00473, decided concurrently, also addressing these references (albeit in a different order).

¹⁸ Should Patent Owner wish to pursue amendment of the challenged claims in a reissue or reexamination proceeding subsequent to the issuance of this decision, we draw Patent Owner’s attention to the April 2019 *Notice Regarding Options for Amendments by Patent Owner Through Reissue or Reexamination During a Pending AIA Trial Proceeding*. See 84 Fed. Reg. 16,654 (Apr. 22, 2019). If Patent Owner chooses to file a reissue application or a request for reexamination of the challenged patent, we remind Patent Owner of its continuing obligation to notify the Board of any such related matters in updated mandatory notices. See 37 C.F.R. §§ 42.8(a)(3), (b)(2).

In summary:

Claim(s)	35 U.S.C. §	Reference(s)/ Basis	Claims Shown Unpatentable	Claims Not Shown Unpatentable
1, 2, 5, 8, 13–15, 19	102	Zhou	1, 2, 5, 8, 13–15, 19	
1, 2, 5, 7, 8, 12–15, 18, 19, 22	103	Zhou, Bannister, Gentry, Durfee	1, 2, 5, 7, 8, 12, 14, 15, 19	
1, 2, 7, 19, 22	103	Welty, Bannister, Durfee, Korb ¹⁹		
5, 8, 12–15, 18	103	Welty, Bannister, Durfee, Korb, Zhou ²⁰		
Overall Outcome			1, 2, 5, 7, 8, 12–15, 18, 19, 22	

IV. MOTION TO EXCLUDE

We decide Petitioner’s Motion to Exclude contemporaneously with our Final Written Decision.

A. Exhibit 2036 ¶¶ 37–55

Exhibit 2036 is the corrected declaration of David Fisher. Mr. Fisher is the president of Astro Pneumatic Tool Co., a distributor for tools sold by Tsteigen. Ex. 2036 ¶ 1. Tsteigen, in turn, is a company part owned by Patent Owner. Ex. 2035 ¶ 2. Petitioner asserts that Exhibit 2036 “contains statements made outside the course of this proceeding that Patent Owner

¹⁹ We do not reach this ground because we have determined that these claims are unpatentable in view of these references in a similar ground in this proceeding and in IPR2023-00473.

²⁰ See *supra* n.19.

relies upon for their truth, and [] is therefore hearsay.” Mot. Excl. 1. In particular, Petitioner asserts that paragraphs 37 through 55 of Exhibit 2036 are directed towards Patent Owner’s arguments for industry praise. *Id.* at 1–3. Petitioner asserts that these paragraphs contain out-of-court statements by third parties offered for their truth. *Id.*

Patent Owner argues that Petitioner’s hearsay argument is unfounded because Exhibit 2036 is testimony taken from this proceeding and are the statements of Mr. Fisher himself. Opp. Mot. Excl. 2. Patent Owner asserts that Petitioner is actually trying to attack the various exhibits cited by Mr. Fisher, but that Petitioner had missed its opportunity to object to this evidence directly. *Id.* at 2–3.

We do not exclude these portions of Mr. Fisher’s declaration. These paragraphs step through and provide Mr. Fisher’s commentary on a number of websites, videos, and other out-of-court statements made by third parties. If Petitioner wished to exclude the various out-of-court statements made by these third parties in the evidence cited by Mr. Fisher, then it needed to object to those exhibits and seek to exclude them. The exhibits were submitted prior to our Decision on Institution, and thus Petitioner had to have objected to them within 10 days of institution. 37 C.F.R. § 42.64(b)(1). Petitioner had not done so.

As to Petitioner’s larger point, that Mr. Fisher is a lay witness being offered as a conduit for hearsay (e.g., Reply Mot. Excl. 1–4), we note that even though Petitioner has missed its opportunity to exclude the hearsay, we are still able to weigh the persuasiveness of his testimony and the evidence cited therein.

B. Exhibit 2036 ¶¶ 33, 34, 36

We do not exclude paragraphs 33, 34, and 36 of Mr. Fisher’s declaration for similar reasons as paragraphs 37–55.

C. Exhibit 2034 ¶¶ 142–148; Exhibits 2094–2097

Exhibit 2034 is the declaration of Patent Owner’s expert, Dr. Endres. Paragraphs 52–107 have already been stricken. Paper 43. Paragraphs 142 through 148 include statements by Dr. Endres that he has reviewed and agrees with the claim charts shown in Exhibits 2094 through 2097, offered to show that third parties copied the claimed invention. Petitioner asserts that Dr. Endres lacks firsthand personal knowledge and cannot lay the proper foundation to establish that the drill bits depicted in the charts are those bits. Mot. Excl. 6. Petitioner asserts that Exhibits 2094 through 2097 are out-of-court statements authored by unknown persons being offered for their truth. *Id.*; *see also* Reply Mot. Excl. 6–7.

Patent Owner argues that Petitioner never objected to Exhibits 2094 through 2097 on hearsay grounds. Opp. Mot. Excl. 6–7. Patent Owner is correct. *See* Paper 35, 13 (objecting to these exhibits under FRE 401, 402, and 403). However, Petitioner objected to Exhibit 2034 under FRE 702, 703, and 37 CFR § 42.65. *Id.* at 2. Federal Rule of Evidence 703 states that an expert may base an opinion on facts or data that the expert has been aware of or personally observed. Rule 42.65 states that expert testimony must “disclose the underlying facts or data on which the opinion is based.” As near as we can tell, Dr. Endres had physical copies of the various drill bits to compare to the claim charts that were given to him. Ex. 2034 ¶ 142 (Dr. Endres testifying that “I also analyzed the Steel Vision Stepped Tip drill bit and the VIM HSSC29 drill bits and the ‘third-party copying’ patent

claims charts.”); Tr. 46:20–24 (admitting that the claim charts were prepared by counsel but that Dr. Endres was provided the drill bits themselves).²¹ Dr. Endres “agree[d]” with the claim charts based on his apparent possession of the drill bits shown in the claim charts. Ex. 2034 ¶¶ 142 (Dr. Endres stating he “analyzed the . . . drill bit”), 143 (Dr. Endres stating he “closely evaluated and agree[s] with” the claim charts). Accordingly, we will not exclude this testimony.

D. Exhibits 2047, 2055–2061

Petitioner asserts that Exhibits 2047, and 2055 through 2061 are based on out-of-court statements being offered by Patent Owner for the truth of the matter asserted. Mot. Excl. 7–8; Reply Mot. Excl. 7–11. These exhibits each include out-of-court statements by a third party regarding Matco drill bits. Matco sells drill bits under license from Astro, under license from Tsteigen, under license from Patent Owner. Ex. 2035 ¶¶ 3–5.

Patent Owner argues that Exhibit 2036 “is relevant to show that certain conversations took place—not for the truth of the assertions.” Opp. Mot. Excl. 9. As to the remaining exhibits, Patent Owner argues that they

²¹ In addition, Petitioner was in the position to obtain testimony from Dr. Endres as to whether he actually possessed physical copies, but Petitioner has not directed our attention to such evidence. *Cf.* Sur-reply Add’m 1 (Patent Owner asserting that Petitioner omitted testimony where it did question Dr. Endres about having personally examined drill bit samples, which he confirmed). We note that had Patent Owner did not object to Petitioner having filed excerpted transcripts, but we of the opinion that Petitioner should have produced the entire transcript. Although 37 C.F.R. § 42.53(f)(7) states that “the proponent of the testimony must arrange for providing a copy of the transcript” rather than providing a *complete* copy, we believe that the intent of the Rule is for a complete copy to be filed.

are “contemporaneous statements by [a third party] and [Petitioner] concerning their real time observations, impressions of, and reactions to [Patent Owner’s] patented drill bits.” *Id.* Patent Owner asserts that several statements in the exhibits are made by Petitioner “which are not hearsay.” *Id.* Patent Owner also asserts, without explanation, that “several hearsay exceptions apply.” *Id.* at 10.

1. Exhibit 2047

As to Exhibit 2047, Petitioner replies that Patent Owner is using the exhibit to show copying, not merely to show that certain conversations took place. Reply Mot. Excl. 8. We do not exclude Exhibit 2047, for the purpose of corroborating the fact that a third party and one of Patent Owner’s licensees engaged in discussions. *See* Ex. 2036 ¶¶ 25–26 (stating that negotiations took place and citing Ex. 2047 in support).

2. Exhibits 2055–2057, 2061

We exclude the emails of Exhibits 2055 through 2057 and 2061. They are directed towards the out-of-court statements of a third party. The statements are being used for the truth of the matter asserted; Patent Owner repeatedly uses the statements to argue that the third party (specifically, a salesperson employed by the third party) had a positive view of Matco or Astro drill bits. *See generally* Resp. 30–35; *see, e.g., id.* at 30 (asserting that the third-party salesman “have never seen anything like them”), 32 (asserting that the third-party described Astro’s drill bits as the “latest revolution” and having various positive attributes). The evidence is not offered merely for showing the third party’s awareness of the drill bits but rather their subjective opinion about them. We find that Exhibits 2055–2057 and 2061 are hearsay.

Further, we are not persuaded that any exceptions apply. Patent Owner never sought the third party's testimony in this proceeding. Patent Owner argues that Petitioner was involved in many of the conversations in some of the exhibits, but Patent Owner is not relying on the statements of Petitioner. *See, e.g.*, Reply Mot. Excl. 8–10 (highlighting how Patent Owner is using the documents to show a third party's beliefs); Resp. 30–31. Patent Owner also argues that these are present sense impressions or records of regularly conducted activities (Opp. Mot. Excl. 1), but does not provide any analysis of why these exceptions should apply. The emails do not strike us as present sense impressions but rather conversations during the course of business. In addition, although emails are common in the course of business, we do not understand this hearsay exception to be directed towards email conversations, but rather business records.

3. *Exhibit 2058*

Exhibit 2058 is a product catalog featuring cutting tools offered by a third party. Petitioner does not specifically explain why this document should be excluded. Patent Owner points out that it is a published document and should not be excluded. Opp. Mot. Excl. 10. We agree with Patent Owner, and do not exclude Exhibit 2058.

4. *Exhibit 2059*

Exhibit 2059 is a testing document produced by Astro. Ex. 2059 (noting the header). Petitioner argues that Patent Owner specifically cites to this document as evidence of beliefs held by a third party (different from Astro). Mot. Excl. 7. Patent Owner asserts that these are “observations of testing.” Opp. Mot. Excl. 10. We note that this document was produced by Astro, a party with ties to Patent Owner. Notwithstanding, Patent Owner

attempts to attribute the statements in this document to another third party (not Astro). We agree with Petitioner that Patent Owner is attempting to use these statements for the truth of the matter asserted. *See, e.g.*, Resp. 30–31 (alleging that the third party “was [] impressed with their performance” and citing to Exhibit 2059 as evidence of “initial testing documents”).

Accordingly, Patent Owner is not only attempting to use these documents for the truth of the matter asserted, but Patent Owner is attempting to attribute them to a party different from the party that made the statements. We do not find any exceptions to the hearsay rule to be applicable here. In addition, Exhibit 2059, as offered, is misleading and confusing. We exclude Exhibit 2059.

5. *Exhibit 2060*

Exhibit 2060 appears to contain a series of slides and notes, as would be used in a presentation. The document appears to be that of a third party. Patent Owner asserts that the content in this exhibit demonstrates the third party’s “strong desire to copy” the claimed invention. *See, e.g.*, Resp. 31, 39. Assuming they are what they are alleged to be, then these are out-of-court statements by a third party being used to prove the truth of the matter asserted—that an employee of the third party thought highly of Patent Owner’s licensed drill bits. We are not persuaded by Patent Owner’s passing arguments that these represent “real-time observations, impressions of, and reactions to” the claimed invention. *Opp. Mot. Excl.* 9–10. We exclude Exhibit 2060.

V. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that the record show that Petitioner has demonstrated by a preponderance of the evidence that claims 1, 2, 5, 7, 8, 12–15, 18, 19, and 22 of U.S. Patent No. 11,007,583 are unpatentable;

FURTHER ORDERED that Petitioner’s Motion to Exclude Exhibits 2094–2097, 2047, and 2058, as well as portions of Exhibit 2034 and 2036, is denied;

FURTHER ORDERED that Petitioner’s Motion to Exclude Exhibits 2055–2057 and 2059–2061 is granted; and

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

IPR2023-00474
Patent 11,007,583 B2

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