

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

VIKING DRILL & TOOL, INC.
Petitioner

v.

HONGJIA WANG
Patent Owner

IPR2023-00473
IPR2023-00474
U.S. Patent No. 11,007,583
Issued: May 18, 2021

DECLARATION OF TAYLOR FULK IN SUPPORT OF PETITIONER'S
REPLY IN *INTER PARTES* REVIEW OF U.S. PATENT NO. 11,007,583

I, Taylor Fulk, being duly sworn, declare as follows:

1. I am currently the Director of Engineering for Petitioner, Viking Drill & Tool, Inc. ("Viking"). I have worked for Viking since approximately 2001.
2. Viking is an employee-owned manufacturer of cutting tools located in Saint Paul, Minnesota. Viking was founded in 1952, and for many years has been one of the largest manufacturers of cutting tools in the United States, with

hundreds of different types of cutting tools in its catalog. Viking sells tools under the Viking name, as well as under the name Norsemen. Exhibit 1023 is an example of a Viking catalog from 2014.

3. The cutting tool business is highly competitive. Most products in our catalog have existed in some form for decades. However, cutting tool companies (including Viking) are regularly coming up with modifications or variations of cutting tools in an effort to improve some aspect of their functionality or to serve a particular market or application. When that happens, it is common in the industry for competitors to quickly develop and introduce their own competing version of the modified tool design.

4. That is what happened with Viking's stepped tip twist drill product. [REDACTED]

[REDACTED]

[REDACTED] At the time, we did not consider the product to be particularly unique. The drill was nothing more than a step drill cut into the tip of a twist drill. Step drills were well-known at the time – Viking has manufactured and sold step drills for many years (examples are shown on pages 96 and 127 of the Viking Catalog of Exhibit 1023). In terms of their cutting operation, the Hyper-Step drills cut in the same way and according to the same principles as existing step drills.

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[REDACTED]

7. The first sales of Viking’s competing products (which we eventually named “Vortex-Point”) took place in the spring of 2020.

8. I have reviewed redacted versions of Patent Owner Hongjia Wang’s Response to Viking IPR petitions and, in particular, the sections dealing with alleged secondary considerations evidence relating to obviousness.

9. In that Response, Patent Owner accuses Viking of copying the Hyper-Step products. That is wrong. We were certainly aware of the Hyper-Step products and were provided a set of the drills sold by Matco at the time we did our development work. However, we relied on our own experience and expertise (including our existing knowledge and experience manufacturing step drills) to design our products. We 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 – we believed that with our experience our product would be better than the Hyper-Step product (which in fact turned out to be true).

10. To support its allegation of copying, Patent Owner relies on Exhibit 2063, which is a drawing and photographs comparing Viking’s Vortex and Matco’s Hyper-Step drills. To be clear, this document was not created during the development of Viking’s Vortex drill bits. This is shown by the fact that the drawing in Exhibit 2063 is dated June 9, 2021, whereas, as mentioned above, commercial sales of the Vortex drill bit began more than a year earlier, in the spring of 2020. Instead, Exhibit 2063 was created in response to the “cease and desist” letter that Viking received from Patent Owner on or about June 4, 2021, for the specific purpose of illustrating that the products are not the same.

11. Patent Owner claims that Exhibit 2063 shows that Viking “copied the measurements of the Hyper-Step drill bits down to a microscopic level of detail.” That is false. In fact, the document shows exactly the opposite – that there are substantial, important differences between the two products. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED].

There are other differences between the products illustrated in the drawing, including the overall length of the tool, the length of the flute, and the diameters

and lengths of each of the individual steps. The differences in dimensions shown in the drawings on the first page of Exhibit 2063 are substantial and show that we did not copy the Hyper-Step product.

12. The photographs included in Exhibit 2063 show further important differences between the Vortex and Hyper-Step drills. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

13. Still other differences exist. For some sizes, the Vortex drills have a different number of steps than the comparably sized Hyper-Step drill. Our 7/64 drill has a step, which the Hyper-Step drill does not. Moreover, Viking individually designs various reliefs for each of its drills and, while I do not know exactly what reliefs are present in the Hyper-Step drills, they are almost certainly different. Again, these differences will have a meaningful effect on the performance of the tool.

14. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

15. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

16. To further put the sales of stepped tip twist drills into context, the annual sales of all twist drills in the United States is conservatively estimated to be over \$300 million dollars per year, and worldwide is estimated to be over \$4 billion

dollars per year. [REDACTED]

[REDACTED]

17. Patent Owner asserts that stepped-tip twist drills solved a long felt need for a drill with improved cutting speed with a variety of alleged advantages, including reducing the tendency of twist drills to walk, eliminating the need for pilot holes, ease and precision of cutting and durability. I disagree.

18. Regarding the tendency of twist drills to walk, any such problem was solved many years ago by the split tip. The secondary cutting edges provided by a split tip greatly reduce the tendency of a drill bit to walk, regardless of the drill bit size. As shown in Viking's 2014 catalog, split tips on drills were common prior to the '583 patent, and were touted as having the advantage of providing "fast penetration and accurate starting without a center punch." *E.g.*, Ex.2023, pp. 2-7. Thus, the '583 patent did not solve this problem.

19. The same is true with eliminating the need for pilot holes. There was no unmet need in that area, since split tips already provided the ability to precisely and accurately start the drill hole, such that there was no need for a pilot hole.

20. In addition, drill makers traditionally discourage the drilling of pilot holes because it causes unnecessary damage to the cutting edges of the drills.

21. Regarding the tendency to slip, any such problem was also solved many years ago by modifying the shank. One such shank variation that was well

known in the prior art is the three-flatted shank, which greatly reduces slippage by increasing the ability of the chuck to firmly grip the shank of the drill bit. The stepped tip does not contribute to reduced slippage.

22. The Vortex drills do not substantially increase the precision of drilling compared to standard twist drills. If a precision hole is needed, a reamer is generally used instead of a twist drill.

23. Regarding alleged increased durability, any actual difference in durability will be heavily dependent on how the drill is used. Moreover, as discussed below, stepped tips cannot practically be re-sharpened. Therefore, if one takes into account the ability to re-sharpened, stepped-tip twist drills actually have a shorter life, since standard-tip twist drills can be re-sharpened.

24. Regarding faster cutting with reduced torque relative to standard-tipped drill bits, this is not a new or unknown phenomenon in the drilling art – step drills are well recognized for providing these same advantages. This is because, as previously mentioned, stepped-tip drills operate under the same principles as step drills.

25. Step drills are not, as Patent Owner claims, only used for drilling holes in thin work pieces. All of Vikings stepped tip drills will drill through any thickness of material provided there is enough length of tools to accommodate material thickness. Step drills are frequently used with thicker workpieces.

26. Moreover, stepped-tip twist drills such as Viking's Vortex drills also have disadvantages. One, they are more challenging and expensive to manufacture. [REDACTED]

[REDACTED]
[REDACTED]
[REDACTED] Two, they are very difficult, if not impossible, to re-sharpen. Especially with higher-end twist drills with standard tips, customers will frequently re-sharpen them as a way to extend their life and avoid having to purchase a new drill. That is not done with step-tipped drills because of the tip geometry.

27. Like nearly all of its drilling tools, Viking's Vortex drills have various reliefs in order to improve cutting and reduce rubbing during cutting. The Vortex drills have three different types of relief: axial relief, radial relief and back taper relief. As a result of the reliefs (particularly radial relief and back taper relief), the steps on the Vortex drills are not strictly cylindrical. Nonetheless, I understand that, in asserting that the Vortex drills infringe the '583 patent, Patent Owner has asserted that the Vortex drills have "cylindrical second step surfaces" as claimed, even though they are not perfectly cylindrical.

I declare under penalty of perjury that the foregoing is true and correct.

1-11-24
Date

Taylor Fulk
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