

**United States Court of Appeals
for the Federal Circuit**

FS.COM INC.,
Appellant

v.

INTERNATIONAL TRADE COMMISSION,
Appellee

CORNING OPTICAL COMMUNICATIONS LLC,
Intervenor

2022-1228

Appeal from the United States International Trade
Commission in Investigation No. 337-TA-1194.

Decided: April 20, 2023

DARLENE GHAVIMI, K&L Gates LLP, Austin, TX, argued for appellant. Also represented by GEORGE C. SUMMERFIELD, JR., Chicago, IL.

CATHY CHEN, Office of the General Counsel, United States International Trade Commission, Washington, DC, argued for appellee. Also represented by WAYNE W. HERRINGTON.

GREGORY G. RAPAWY, Kellogg, Hansen, Todd, Figel & Frederick, PLLC, Washington, DC, argued for intervenor.

Also represented by HANNAH CARLIN, DONALD CHANSLOR GALLENSTEIN, ANDREW GOLDSMITH, EVAN TODD LEO, JOHN THORNE.

NICHOLAS R. GRENNAN, Suiter Swantz PC LLO, Omaha, NE, for amicus curiae Diversified Material Specialists, Inc.

Before MOORE, *Chief Judge*, PROST and HUGHES, *Circuit Judges*.

MOORE, *Chief Judge*.

FS.com Inc. (FS) appeals from an International Trade Commission final decision determining FS violated 19 U.S.C. § 1337 (Section 337). We affirm.

BACKGROUND

Corning Optical Communications LLC (Corning) filed a complaint with the Commission alleging FS was violating § 337 by importing high-density fiber optic equipment that infringed U.S. Patent Nos. 9,020,320; 10,444,456; 10,120,153; and 8,712,206. Those patents generally relate to fiber optic technology commonly used in data centers. The '320, '456, and '153 patents disclose fiber optic apparatuses including a chassis that houses fiber optic equipment (e.g., modules, trays, and adapters) to support fiber optic connections. '320 patent at 4:58–5:44. For example, claim 1 of the '320 patent recites:

1. A fiber optic apparatus, comprising:
a chassis; and
a fiber optic connection equipment provided in the chassis;
the fiber optic connection equipment configured to support *a fiber optic connection density of at least ninety-eight (98) fiber optic connections per U space*,

based on using at least one simplex fiber optic component or at least one duplex fiber optic component.

The '206 patent is directed to fiber optic modules. '206 patent at 1:52–57. For example, claim 14 of the '206 patent recites:

14. A fiber optic module, comprising:

a main body defining an internal chamber disposed between a front side and a rear side;

a plurality of optical fibers disposed in the internal chamber;

a front opening disposed along a longitudinal axis in the front side;

a first plurality of fiber optic components optically connected to the plurality of optical fibers, the first plurality of fiber optic components disposed through the front opening providing a fiber optic connection density of at least one fiber optic connection per 7.0 millimeters (mm) of width of the front opening; and

at least one second fiber optic component optically connected to at least one of the plurality of optical fibers to provide optical connection between the at least one second fiber optic component and at least one of the first plurality of fiber optic components.

After investigating Corning's complaint, the ALJ issued an initial determination finding FS' importation of high-density fiber optic equipment violated § 337. The ALJ found FS induced infringement of claims 1 and 3 of the '320 patent; claims 11, 12, 14–16, 19, and 21 of the '456 patent;

and claims 9, 16, 23, and 26 of the '153 patent.¹ The ALJ further found FS' accused modules directly infringed claims 22 and 23, which depend from claim 14, of the '206 patent. In reaching this finding, the ALJ adopted the Office of Unfair Import Investigations' construction of "a front opening" as recited in the claims. Finally, the ALJ rejected FS' various invalidity challenges, including its argument that certain claims of the '320 and '456 patents were not enabled.

FS petitioned for Commission review. The Commission decided to review the initial determination in part, including the ALJ's construction of "a front opening" in the '206 patent. It adopted Corning's proposed construction and affirmed the ALJ's resulting infringement finding. It declined to review the ALJ's enablement determination and adopted the ALJ's analysis. The Commission ultimately affirmed the ALJ's determination that FS violated § 337 and issued a general exclusion order prohibiting the importation of infringing high-density fiber optic equipment and components thereof and a cease-and-desist order directed to FS.

FS appeals the Commission's determination that the claims of the '320 and '456 patents are enabled and its claim construction of "a front opening" in the '206 patent. We have jurisdiction under 28 U.S.C. § 1295(a)(6).

DISCUSSION

I. Enablement

FS challenges the Commission's determination that claims 1 and 3 of the '320 patent and claims 11, 12, 15, 16, and 21 of the '456 patent are enabled. These claims recite

¹ FS did not dispute the importation requirement was satisfied with respect to its accused products. *See* 19 U.S.C. § 1337(a)(1)(B)(i).

“a fiber optic connection density of at least ninety-eight (98) fiber optic connections per U space” or “a fiber optic connection of at least one hundred forty-four (144) fiber optic connections per U space.” *See, e.g.*, ’320 patent at 19:56–57 (claim 1); 19:65–67 (claim 3). FS argues these open-ended density ranges are not enabled because the specification only enables up to 144 fiber optic connections per U space.²

A patent’s specification must describe the invention and “the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains . . . to make and use the same.” 35 U.S.C. § 112(a). To enable, “the specification of a patent must teach those skilled in the art how to make and use the full scope of the claimed invention without undue experimentation.” *MagSil Corp. v. Hitachi Glob. Storage Techs., Inc.*, 687 F.3d 1377, 1380 (Fed. Cir. 2012) (internal quotation marks omitted). Enablement is a question of law based on underlying factual findings. *Pac. Biosciences of Cal., Inc. v. Oxford Nanopore Techs., Inc.*, 996 F.3d 1342, 1350 (Fed. Cir. 2021). We review the Commission’s legal conclusions de novo and any underlying findings of fact for substantial evidence. *Ajinomoto Co. v. Int’l Trade Comm’n*, 597 F.3d 1267, 1272 (Fed. Cir. 2010).

In determining enablement, the Commission applied the two-part standard set forth in *Anderson Corp. v. Fiber Composites, LLC*, 474 F.3d 1361 (Fed. Cir. 2007):

[O]pen-ended claims are not inherently improper;
as for all claims their appropriateness depends on

² The ALJ construed “U space” to have its “plain and ordinary meaning, an example of which is a rack unit, which is a standardized measurement of 1.75 inches (44.45mm) in height within a standardized 19-inch rack or 23-inch rack.” J.A. 152–56; *see also* ’320 patent at 5:1–5.

the particular facts of the invention, the disclosure, and the prior art. They may be supported if there is an inherent, albeit not precisely known, upper limit and the specification enables one of skill in the art to approach that limit.

Id. at 1376–77 (quoting *Scripps Clinic & Rsch. Found. v. Genentech, Inc.*, 927 F.2d 1565, 1572 (Fed. Cir. 1991)). Although this language from *Andersen* is infrequently applied, the parties agree this legal test governs their dispute. Applying this standard, the Commission determined the challenged claims were enabled because skilled artisans would understand the claims have an inherent upper limit and that the specification enables skilled artisans to approach that limit. The question of whether a skilled artisan would understand there is an upper limit is a question of law based on underlying factual findings.

FS argues the Commission erred in concluding the claims have an inherent upper limit. FS faults the Commission for simply stating that “some inherent limit exists” without identifying the exact upper limit—i.e., without determining the scope of the claimed ranges. Read as a whole, however, we understand the Commission’s opinion as determining there is an inherent upper limit of about 144 connections per U space. *See* Appellant’s Opening Br. at 51 (“The only potential finding by the Commission of an inherent upper limit to the open-ended claims is approximately 144 connections per 1U space.”). That determination was based on the Commission’s finding that skilled artisans would have understood, as of the ’320 and ’456 patent’s shared priority date (August 2008), that densities substantially above 144 connections per U space were technologically infeasible.

The Commission’s finding is supported by substantial evidence. The shared written description of the ’320 and ’456 patents and the expert testimony credited by the Commission show that a skilled artisan would understand the

maximum fiber optic connection density technologically feasible as of August 2008 was about 144 connections per U space. The written description discloses the maximum density achievable using the LC-type simplex and duplex adapters available as of August 2008 was 144 connections per U space. *See* '320 patent at 14:5–24; 15:29–47; cols. 19–20 (table showing the “Max Fibers per 1 RU” using “Duplexed LC” adapters is 144 connections). Corning’s expert Dr. Prucnal testified that, despite market pressure, no commercial product has achieved a greater density than 144 connections using the LC-type simplex and duplex adapters.³ J.A. 95,848–49; *see also* J.A. 134,192 at 181:1–8. He also testified that a skilled artisan may achieve a density slightly above 144 connections by adding another adapter. J.A. 151,974–75. In light of this evidence, the Commission properly held the open-ended claims have an inherent upper limit of about 144 connections per U space. In other words, the Commission properly construed the claim limitations to cover only connection densities up to about 144 connections per U space and to exclude higher densities. FS does not dispute that the claims are enabled if they do not encompass densities above about 144 connections per U space. *See* Appellant’s Opening Br. at 51–52.

³ FS also argues the Commission improperly excluded evidence that MDC-type duplex adapters developed in 2019 have made it possible for skilled artisans to achieve densities up to 432 connections per U space. FS contends this evidence shows no upper limit exists. If admitted, this evidence would confirm our determination of claim scope. Such evidence can be permitted to prove the state of the art at the relevant time—2008. The evidence demonstrates that as of August 2008, a skilled artisan was unable to achieve densities above approximately 144 connections. The MDC-type adapters that allowed skilled artisans to achieve higher densities were not developed until 2019.

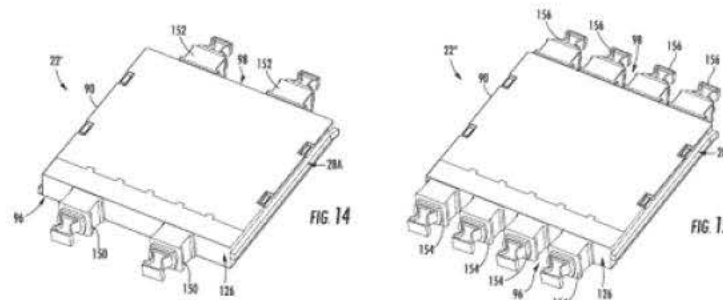
We therefore affirm the Commission's enablement determination.

II. "A Front Opening"

The Commission construed "a front opening" in claim 14 of the '206 patent as "an opening located in the front side of a fiber optic module, *e.g.*, the opening depicted in Figure 13 of the '206 patent as having dimensions H_1 and W_1 ." The Commission concluded this term encompasses one or more openings. FS argues the proper construction of "a front opening" is limited to a single front opening and therefore its modules, which contain multiple openings separated by material or dividers, do not infringe claims 22 and 23. We do not agree.

"We review claim construction *de novo* and review any subsidiary factual findings based on extrinsic evidence for substantial evidence." *Kyocera Senco Indus. Tools Inc. v. Int'l Trade Comm'n*, 22 F.4th 1369, 1378 (Fed. Cir. 2022). Generally, the terms "a" or "an" in a patent claim mean "one or more," unless the patentee evinces a clear intent to limit "a" or "an" to "one." *01 Communique Lab'y, Inc. v. LogMeIn, Inc.*, 687 F.3d 1292, 1297 (Fed. Cir. 2012).

The claim language and written description do not demonstrate a clear intent to depart from this general rule. FS argues the recitation of "front openings" in unasserted claim 63 evinces the patentee's clear intent to limit "a front opening" in claim 14 to a single opening. That the patentee limited claim 63 to multiple openings does not show an intent to limit claim 14 to one opening. Indeed, the written description discloses embodiments with one or more front openings. Figures 14 and 15 of the '206 patent, shown below, depict the same module as in Figure 13 with front opening 126. '206 patent at 11:54–59, 12:54–58.



These figures show front opening 126 further subdivided into multiple openings with structural material separating the adapters. We see no reason to depart from the general rule that “a front opening” encompasses one or more openings.

CONCLUSION

We have considered the parties’ remaining arguments and find them unpersuasive. For the reasons given above, we affirm the Commission’s decision.

AFFIRMED