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**General:** Patents with claims involving terms of degree must provide objective boundaries for those of skill in the art.

*Guangdong Alison Hi-Tech Co. v. Int'l Trade Comm'n and Aspen Aerogels Inc.*

United States Court of Appeals for the Federal Circuit

No. 2018-2042

Decided: August 27, 2019

## **I. Background**

Domestic manufacturer Aspen Aerogels, Inc. (Aspen) owns U.S. Patent No. 7,078,359 ('359 patent), which is directed to an improvement in aerogel composite products. Aspen filed a complaint with the U.S. International Trade Commission (Commission) in 2016 alleging that foreign manufacturer Guangdong Alison Hi-Tech Co. (Alison) had violated section 337 of the Tariff Act of 1930, 19 U.S.C. § 1337, by importing composite aerogel insulation materials that infringe several of its patents, including the '359 patent.

In September 2017, an administrative law judge (ALJ) held that Alison had violated section 337 based at least in part on her determination that claims 1, 7, and 9 of the '359 patent were valid and were infringed by Alison's importation of the accused products. Independent claim 1 of the '359 patent recites, "[a] composite article to serve as a flexible, durable, light-weight insulation product, said article comprising a *lofty* fibrous *batting* sheet and a continuous aerogel through said *batting*." (Emphasis added.) In holding that Alison had violated section 337, the ALJ rejected Alison's indefiniteness argument and adopted the '359 patent's express definition of "lofty . . . batting" as "[a] fibrous material that shows the properties of bulk and some resilience (with or without full bulk recovery)." '359 patent, col. 7, lines 45-47 and 49.

In February 2018, the Commission affirmed the ALJ's determination and entered a limited exclusion order barring Alison from importing their infringing composite aerogel insulation materials. Alison appealed the Commission's final determination that certain claims of the '359 patent were not indefinite based on their use of the term "lofty ... batting."

## **II. Issue**

- 1) Did the Commission err in determining that certain claims of the '359 patent were not indefinite based on their use of the term "lofty ... batting?"

## **III. Discussion**

No. The court determined that the phrase "lofty ... batting," as used in the claims of the '359 patent, was not indefinite in view of the specification. Under 35 U.S.C. § 112,

a patent's specification must conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention. Further, 35 U.S.C. § 112 requires that "a patent's claims, viewed in light of the specification and prosecution history, inform those skilled in the art about the scope of the invention with reasonable certainty." *Nautilus, Inc. v. Biosig Instruments, Inc.*, 572 U.S. 898, 910. However, "a patentee need not define his invention with mathematical precision in order to comply with the definiteness requirement." *Sonix Tech. Co. v. Publ'ns Int'l, Ltd.*, 844 F.3d 1370, 1377 (Fed. Cir. 2017). Instead, "[t]he degree of precision necessary for adequate claims is a function of the nature of the subject matter." *Biosig Instruments, Inc. v. Nautilus, Inc.*, 783 F.3d 1374, 1382 (Fed. Cir. 2015). As such, patents with claims involving terms of degree "must provide objective boundaries for those of skill in the art" in the context of the invention. *One-E-Way*, 859 F.3d at 1068 (quoting *Interval Licensing LLC v. AOL, Inc.*, 766 F.3d 1364, 1371 (Fed. Cir. 2014)). The court indicated that intrinsic evidence, such as the claims, figures, written description, or prosecution history of a patent, can provide the necessary objective boundaries.

Alison argued that the challenged claims were invalid because "lofty ... batting" is an indefinite term of degree without a precise boundary. The court agreed that "lofty ... batting" is a term of degree, but indicated that Alison sought a level of "mathematical precision" beyond what the law requires, as the law only requires that a patent provide objective boundaries for terms of degree. *Sonix*, 844 F.3d at 1377. To determine whether the '359 patent provided objective boundaries for the term "lofty ... batting," the court looked to the written description for: (1) express definitions for the phrase "lofty ... batting;" (2) details regarding the functional characteristics of a "lofty ... batting;" and (3) examples and metrics that further informed the meaning of "lofty ... batting."

First, the court found that the written description of the '359 patent provides the following express definitions for the phrase "lofty ... batting" and its components. The specification of the '359 patent discloses that a "batting" is commonly understood to be "a fibrous material commonly used for lining quilts or for stuffing or packaging or as a blanket of thermal insulation." '359 patent col. 7, lines 21-23. Further, a "lofty batting" is expressly defined as "a fibrous material that shows the properties of *bulk* and *some resilience* (with or without full bulk recovery)." *Id.* at col. 7, lines. 1-3 (Emphasis added.) The specification explains that "bulk" refers to the air or openness created by the web of fibers in a lofty batting. *Id.* at col. 7, lines 48-50 and col. 8, lines 8-13. The specification further explains that a batting is "sufficiently resilient" if it "can be compressed to remove the air (bulk) yet spring back to substantially its original size and shape." *Id.* at col. 7, lines 40-50. Additionally, the specification discloses that a batting is also "lofty" if it "contains sufficiently few individual filaments (or fibers) [such] that it does not significantly alter the thermal properties of the reinforced composite as compared to a non-reinforced aerogel body of the same material." *Id.* at col. 7, lines 28-32.

Second, the court found that the written description of the '359 patent details the functional characteristics of a "lofty ... batting." Indeed, the court found that the written description explains that using a lofty batting as reinforcement in an aerogel composite "minimizes the volume of unsupported aerogel while avoiding substantial degradation of

the thermal performance of the aerogel.” *Id.* at col. 7, lines 4-7. Further, because “highly aligned (straight) fibers” in the x-y horizontal plane can make the resulting composite stiff, the ’359 patent explains that it is better to have the reinforcing fibers run along all three axes. *Id.* at col. 8, lines 13-16. But because heat is typically transferred via fibers running along the z-axis, a suitably lofty batting must have “a high enough quantity of fibers oriented along the z-axis to maintain loft, yet not so great a quantity that the insulating properties of the resulting composite are compromised by these fibers.” *Id.* at col. 8, lines 16-23. These functional characteristics distinguish the lofty batting from the “fibrous mat” of the prior art (i.e., a “densely woven or thickly tangled mass” that has minimal open space, a higher density, and lacks the resilience of a lofty batting). *Id.* at col. 7, line 60 - col. 8, line 5.

Lastly, the court found that the written description of the ’359 patent includes many examples and metrics that further inform the meaning of “lofty . . . batting.” The specification identifies specific examples of commercial products that can qualify as a lofty batting, including “Primaloft” (*id.* at col. 7, lines 15-20), “Holofil” (*id.* at col. 7, lines 50-56), “Thinsulate Lite Loft” (*id.* at col. 11, lines 30-32), and “Quartzel” (*id.* at col. 12, lines 6-9). It includes a list of nearly twenty “particularly suitable” fibrous materials for forming lofty batting, including commercial products like “Nomex,” “Kevlar,” “Spectra,” and “Kynol.” *Id.* at col. 9, lines 25-40. The specification also provides metrics for the fineness of fibers (*id.* at col. 7, lines 23-25), the cross-sectional area of the fibers (*id.* at col. 7, lines 32-36), the thermal conductivity of the batting (*id.* at col. 7, lines 36-39), the compressibility and resilience of the batting (*id.* at col. 7, lines 42-59), and the density of the batting (*id.* at col. 7, line 64 - col. 8, line 1). Moreover, the specification includes a detailed discussion of seven examples of aerogel composites manufactured in accordance with the claimed invention, along with corresponding test results. *See id.* at col. 11, line 21 - col. 14, line 34.

The court concluded that the above-referenced evidence in the written description was sufficient to dispose of the indefiniteness issue, and emphasized that the written description is key to determining whether a term of degree is indefinite. However, the court indicated that prosecution history and extrinsic evidence such as technical dictionary definitions and expert testimony may provide further support for objective boundaries.

#### **IV. Conclusion**

The court affirmed the Commission’s final determination on the indefiniteness ground, holding that claims 1, 7, and 9 were not indefinite because the ’359 patent informs a person of ordinary skill in the art about the scope of “lofty ... batting” with reasonable certainty by providing objective boundaries for the claim term “lofty ... batting.”