IN THE UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF TEXAS
DALLAS DIVISION

FRACTUS, S.A.	§	
	§	
Plaintiff,	§	
v.	§	CIVIL ACTION NO.
	§	3:18-CV-2838-K
	§	
ZTE CORPORATION,	§	
ZTE (USA), INC., and	§	
ZTE (TX), INC.,	§	
	§	
Defendants.	§	

AMENDED *MARKMAN* ORDER

Before the Court is the parties' claim construction briefing. After consideration of the parties' claim construction briefing on the disputed phrases (Doc. Nos. 77, 82, and 85), all supporting material filed with these briefs, and the previous claim construction order issued in this case prior to this case being transferred to this Court, the Court construes the disputed claim phrases.

A. Background

This is a patent infringement case in which the Plaintiff, Fractus, S.A. ("Fractus"), alleges that the Defendants, ZTE Corporation, ZTE (USA), Inc., and ZTE (TX), Inc. (collectively "ZTE"), have infringed a number of patents owned by Fractus. The case originated in the Eastern District of Texas, Marshall Division and was assigned to the Honorable Rodney Gilstrap. The Defendants moved that Court to transfer venue to the Northern District of Texas, which Judge Gilstrap granted. Prior

to transferring the venue of this case to the Northern District of Texas, the parties filed claim construction briefing in which the parties presented a number of patent claim phrases that the parties assert require construction. Judge Gilstrap issued a Memorandum Opinion and Order (Doc. No. 93) in which Judge Gilstrap construed the disputed terms and phrases. The Court has reviewed the parties' claim construction briefing and Judge Gilstrap's claim construction order. While the Court is in agreement with most of Judge Gilstrap's constructions of the disputed phrases, the Court does not adopt the construction of "fractal type antenna." The Court, therefore, issues this Amended *Markman* Order and construes the disputed terms and phrases as follows.

B. Patents in Suit

There are seven patents in suit, which are U.S. Patent 7,394,432; U.S. Patent 7,397,431; U.S. Patent 8,941,541; U.S. Patent 8,976,069; U.S. Patent 9,054,421; U.S. Patent 9,240,632; and U.S. Patent 9,362,617. The inventions of the patents are all related to multiband antennas having, what the patents refer to as, multilevels. These antennas have multiple levels of structural detail incorporated into their design. The multiple levels of structural detail are created by the combination of smaller geometric shapes into an overall larger geometric shape. The various levels of detail are each associated with different frequency bands. In this manner, one antenna can be used with multiple frequency bands while being smaller than other multiband antennas known in the art.

C. The Disputed Phrases

The parties dispute the meanings of the following claim phrases:

1. "multilevel structure" and "structure for the multiband antenna,"

2. "antenna element having a multi-band behavior,"

3. "majority of the geometric elements,"

4. "level of structural detail" and "levels of detail,"

5. "geometric element" and "polygon,"

6. "set of closed figures bounded by the same number of sides, the sides comprising one or more straight lines, portions of circles and portions of ellipses,"

7. "number of sides,"

8. The "substantially within" terms, which are "said second [and third] portion[s] being located substantially within the first portion," "at least substantial parts of said second and third portions being part of the first portion," and "a [second/third] portion located substantially within the first portion."

9. "the second portion is a second level of structural detail within the first level of structural detail,"

10. "overall structure of the conductive radiating element" and "overall structure,"

11. "frequency band," and

12. "fractal type antenna"

D. Disputed Phrases for Which the Court Agrees with the Previous Constructions

The Court has fully reviewed the patents in suit, the parties' claim construction briefing, and Judge Gilstrap's construction of the disputed phrases. The Court agrees with the constructions of Judge Gilstrap for all disputed phrases, except for the phrase "fractal type antenna." For all other phrases, besides "fractal type antenna," the Court fully adopts the constructions of Judge Gilstrap and the reasoning described in his Memorandum Opinion and Order (Doc. No. 93) for those constructions. For clarity, the Court has included the adopted constructions of these disputed phrases in the Court's claim construction chart attached to this order.

E. "fractal type antenna"

The Court does not adopt Judge Gilstrap's construction of "fractal type antenna" and construes this disputed phrase as follows.

The parties dispute the meaning of "fractal type antenna," which occurs in claim 1 of the '421 patent. The Plaintiff proposes that this phrase be construed to mean "an antenna with a self-similar shape generated in an iterative manner." The Defendants propose that the phrase be construed to mean "an antenna possessing ideal fractal geometry." Judge Gilstrap construed "fractal type antenna" to mean "an antenna with a self-copying shape generated in an iterative manner on different scaling levels."

The dispute of this phrase is over the meaning of a "fractal" as it applies to antennas. Strictly speaking, a fractal is an abstract mathematical concept which defines

a shape that has an infinite number, self-similar shapes across different scaling levels. Regardless of the scale at which one views a fractal, the fractal presents the same shape or pattern. As a mathematical concept, the self-similarity at different scaling levels is infinite, so no matter how many times the scaling is increased, the same pattern or shape is repeated again and again.

The confusion with the construction of "fractal type antenna" stems from the practical limitations of application of this abstract mathematical concept. Because the abstract concept includes an infinite number of self-similar shapes at an infinite number of scaling levels, the creation of an actual physical fractal is impossible. While one may create a fractal-like object that displays a self-similar shape at multiple scaling levels, one cannot create a fractal object that displays a self-similar shape at all scaling levels. Eventually the level of detail required to do this becomes too small to practically manufacture. For this reason, there will ultimately be a level of scale for a fractal-like object at which the object no longer displays a self-similar shape. Therefore, in creating a fractal-like object, the best that can practically be created is an object having multiple fractal type iterations or, in other words, an object with multiple but a finite number of fractal iterations at multiple scaling levels.

A person of ordinary skill in the art would understand that a true fractal is a mathematical concept and would also understand the practical limitations on creating a real fractal type object. With this understanding, a person of ordinary skill in the art would understand that the claim's reference to a "fractal type antenna" is to an antenna

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