IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent of:	Seung Hee Han, et al.	
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Title:	Method and Apparatus for Generating and Transmitting Code Sequence in a Wireless Communication System	

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PETITION FOR *INTER PARTES* REVIEW OF UNITED STATES PATENT NO. 7,746,916 PURSUANT TO 35 U.S.C. §§ 311–319, 37 C.F.R. § 42

prime number that is smaller than the desired length" (i.e., K = $N_{FFT/IFFT}$, the "*second length,*" when N_{b1} = 1 and the initial ranging "uses all sub-bands." Ex. 1007, 5:20-25 and 11:1-15). *See,* Ex. 1007, 8:59-9:1. *See* Wells Declaration, ¶ 125.

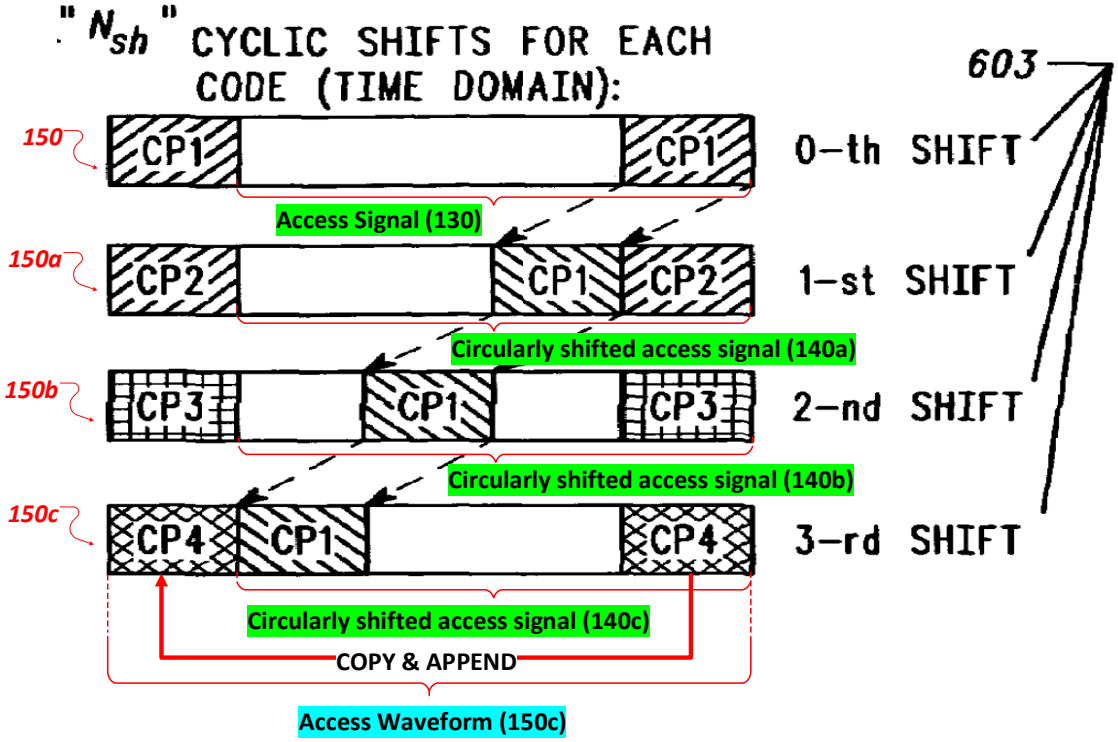
Zhuang327 discloses "***wherein the cyclic extension of the code sequence having the first length is performed such that a part of the code sequence having the first length, having a length corresponding to a difference between the first length and the second length, is added to either a start or an end of the code sequence having the first length***," as recited in claim 1. Claim 7 of Zhuang327 makes clear that the cyclic extension is performed such that a part of the code sequence having the first length ("(K-N_G) terms from the beginning of each GCL sequence") is added to an end of the code sequence having the first length: "wherein when N_G is smaller than K, the corresponding set of sequences of length K is generated by copying (K-N_G) terms from the beginning of each GCL sequence and *appending them to the end*." Ex. 1007, claim 7 at 15:66-16:2. *See also* Petitioner-FIG. 2 and Wells Declaration, ¶ 126.

Zhuang327 discloses "***wherein the circular shift is performed to the code sequence having the second length such that either a rear portion of the code sequence having the second length moves to a start of the code sequence having the second length, or a front portion of the code sequence having the second***

length moves to an end of the code sequence having the second length," as recited in claim 1. For example, Zhuang327 discloses the circular shift is performed to the time-domain access signal 130 having the second length $N_{FFT/IFFT}$: "for each ranging code, N_{sh} *cyclic time shifts 603 of the time-domain ranging signal* (phase rotation in frequency domain) can be used to further increase the number of ranging opportunities. Ex. 1007, 6:30-45. *See* Wells Declaration, ¶¶ 127-128.

More specifically, FIG. 6 (reproduced and annotated below) of Zhuang327 shows three examples of cyclically-shifted access signals 140a, 140b, and 140c of the original time-domain access signal 130. To be sure, Zhuang327 discloses that a cyclic prefix (CP) can be added to the access signal 130 or to cyclically-shifted access signals 140a, 140b, and 140c to form access waveforms. Ex. 1007, 5:29-36. The resulting ranging/access waveforms are denoted as 150, 150a, 150b, and 150c in FIG. 6: the access waveform 150 results from adding CP1 from the original, non-circularly-shifted access signal 130; and the access waveforms 150a, 150b, and 150c result from adding CP2, CP3 and CP4 to the circularly-shifted access signals 140a, 140b, and 140c, respectively.[8]

[8] Notably, the CP1, CP2, CP3 and CP4 shown in FIG. 6 are cyclic *prefixes* applied to time-domain circularly-shifted access signals 140 to form access waveforms



Excerpt of FIG. 6 of Zhuang327 - with annotations by Petitioner

The three circularly-shifted access signals 140a, 140b, and 140c result from circularly shifting a rear portion (CP1) of the original access signal 130 "in time domain by some multiples of L." Ex. 1007, 6:30-45. The embodiment referred to as "3rd shift" shows that the circular shift is performed to the code sequence having

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150, and are distinguished from the cyclic *postfixes* used to cyclically extend GCL sequences 110 to form access/ranging sequences 120. *See* Petitioner-FIG. 2.

the second length (i.e., non-circularly-shifted access signal 130, the "original (or 0^{th} shift) sequence," Ex. 1007, 6:38) such that the rear portion of the code sequence having the second length (i.e., CP1 of the original access signal 130) moves to a start of the code sequence having the second length (i.e., a start of the original access signal 130). "Lastly, a CP [i.e., CP4] is added to form the final ranging waveform [150c]." Ex. 1007, 5:33-34. *See* Wells Declaration, ¶¶ 129-133.

2. **Zhuang327 anticipates claim 2**

Zhuang327 discloses "***the part of the code sequence having the first length comprises at least a cyclic prefix or a cyclic postfix***," as recited in claim 2. Based on antecedent, "the part of the code sequence having the first length" refers to "a part of the code sequence having the first length, having a length corresponding to a difference between the first length and the second length" as recited in claim 1. In other words, "the part of the code sequence having the first length" is the padding portion added to the sequence. *See* Wells Declaration, ¶ 134. Zhuang327 discloses such a padding portion comprises at least a cyclic postfix as Zhuang327 makes clear that "$(K\text{-}N_G)$ terms from the beginning of each GCL sequence" (denoted as 130 in Petitioner-FIG. 1) is appended to the end of the sequence of length N_G as a cyclic postfix. Ex. 1007, 5:66-16:2. *See* Wells Declaration, ¶ 135.