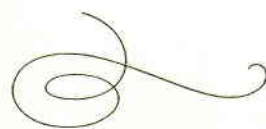
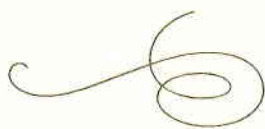


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The Director

of the United States Patent and Trademark Office has received an application for a patent for a new and useful invention. The title and description of the invention are enclosed. The requirements of law have been complied with, and it has been determined that a patent on the invention shall be granted under the law.

Therefore, this United States

Patent

grants to the person(s) having title to this patent the right to exclude others from making, using, offering for sale, or selling the invention throughout the United States of America or importing the invention into the United States of America, and if the invention is a process, of the right to exclude others from using, offering for sale or selling throughout the United States of America, products made by that process, for the term set forth in 35 U.S.C. 154(a)(2) or (c)(1), subject to the payment of maintenance fees as provided by 35 U.S.C. 41(b). See the Maintenance Fee Notice on the inside of the cover.

Ander Lane

DIRECTOR OF THE UNITED STATES PATENT AND TRADEMARK OFFICE



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(12) **United States Patent**
Sulc

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(45) **Date of Patent:** **Sep. 18, 2018**

(54) **SYSTEM FOR MESSAGE
ACKNOWLEDGEMENT AND DATA
COLLECTION IN WIRELESS MESH
NETWORKS**

H04W 8/26 (2013.01); *H04W 72/0446*
(2013.01); *H04W 84/18* (2013.01)

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **15/478,232**

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Related U.S. Application Data

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(30) **Foreign Application Priority Data**

Aug. 26, 2013 (CZ) 2013-651

(51) **Int. Cl.**

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H04W 24/08 (2009.01)
H04L 12/721 (2013.01)
H04W 56/00 (2009.01)
H04W 84/18 (2009.01)
H04W 72/04 (2009.01)
H04W 8/26 (2009.01)
H04W 4/06 (2009.01)

(52) **U.S. Cl.**

CPC **H04L 5/0055** (2013.01); **H04L 45/32** (2013.01); **H04W 24/08** (2013.01); **H04W 56/0015** (2013.01); **H04W 4/06** (2013.01);

(58) **Field of Classification Search**

None

See application file for complete search history.

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Alexander Franco

(57) **ABSTRACT**

A slave communication device includes a memory and a processor for operation within a wireless mesh network of communication devices including a control communication device. The memory stores a virtual routing identifier assigned to the slave communication device in response to increasing range from the control communication device. The processor, in response to receiving an initiation message from a control communication device, initiates data collection from said slave communication device synchronized relative to the start of the initiation message frame by, cumulatively setting bits in a first acknowledgement message in response to content of a second acknowledgement message received from another slave communication device. The first acknowledgement message being synchronized with start of the initiation message frame and the processor initiates communication of the first acknowledgement message to a destination in a time slot selected in response to the assigned virtual routing identifier.

14 Claims, 4 Drawing Sheets

