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Aoki

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(54) **COMMUNICATIONS APPARATUS,
CONTROL METHOD, AND STORAGE
MEDIUM**

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(58) **Field of Classification Search**

None

See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

8,576,762 B2 * 11/2013 Thomas H04W 52/0216
370/311

8,964,631 B2 2/2015 Aoki
(Continued)

FOREIGN PATENT DOCUMENTS

EP 2981146 A1 2/2016
JP 2002-305717 A 10/2002

(Continued)

OTHER PUBLICATIONS

Lai et al., "Efficient and scalable IEEE 802.11 Ad-Hoc-Mode
Timing Synchronization Function", Proceedings of the 17th Inter-
national Conference on Advanced Information Networking and
Applications (AINA '03), pp. 1-6, 2003.

(Continued)

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(57) **ABSTRACT**

A communications apparatus is provided that determines a
timing of starting a period when a communications group, to
which other communications apparatuses belong, can per-
form communications, based on a beacon signal that was
received in a predetermined period; transmits a signal that
requests obtaining of information to the other communica-
tions apparatuses, according to the determined timing; and
obtains information from each of the other communications
apparatuses. The communications apparatus transmits the
signal according to the timing determined based on a beacon
from an apparatus belonging to a first communications
group to other communications apparatuses that belong to
the first communications group, and the signal according to
the timing determined based on a beacon from an apparatus
belonging to a second communications group to other com-

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