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Astely et al.

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(54) **PUCCH RESOURCE ALLOCATION FOR CARRIER AGGREGATION IN LTE-ADVANCED**

(71) Applicant: **Telefonaktiebolaget LM Ericsson (publ)**, Stockholm (SE)

(72) Inventors: **David Astely**, Bromma (SE); **Robert Baldemair**, Solna (SE); **Dirk Gerstenberger**, Stockholm (SE); **Daniel Larsson**, Stockholm (SE); **Lars Lindbom**, Karlstad (SE); **Stefan Parkvall**, Bromma (SE)

(73) Assignee: **TELEFONAKTIEBOLAGET LM ERICSSON (PUBL)**, Stockholm (SE)

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

This patent is subject to a terminal disclaimer.

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(Continued)

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H04M 1/00 (2006.01)
H04L 5/00 (2006.01)
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(52) **U.S. Cl.**
CPC ***H04L 5/0053*** (2013.01); ***H04L 5/001*** (2013.01); ***H04L 5/0094*** (2013.01); ***H04W 28/26*** (2013.01);
(Continued)

(58) **Field of Classification Search**
CPC .. H04B 1/3833; H04M 1/0247; H04M 1/0237
(Continued)

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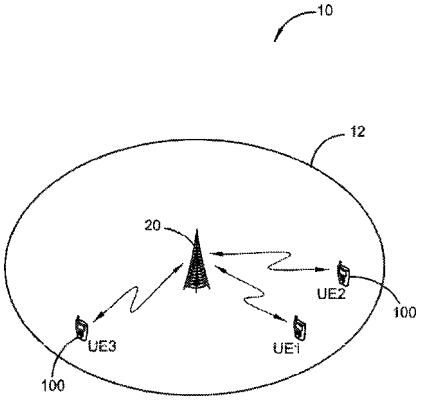
Primary Examiner — Md Talukder
(74) *Attorney, Agent, or Firm* — Coats & Bennett, PLLC

(57) **ABSTRACT**

Systems and methods of signaling uplink control information in a mobile communication network using carrier aggregation are provided. In one exemplary embodiment, a method may include scheduling downlink transmissions to a first user terminal on a single downlink component carrier (CC) associated with a primary cell and scheduling downlink transmissions to a second user terminal on multiple downlink CCs or on a downlink CC associated with a non-primary cell. Further, the method may include receiving, on a first set of radio resources, control information associated with the downlink transmissions to the first user terminal. In addition, the method may include receiving, on
(Continued)



a second set of radio resources, control information associated with the downlink transmissions to the second user terminal.

41 Claims, 12 Drawing Sheets

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H04W 8/24	(2009.01)
H04W 48/16	(2009.01)
H04W 88/02	(2009.01)
H04W 88/08	(2009.01)

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(58) **Field of Classification Search**
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See application file for complete search history.

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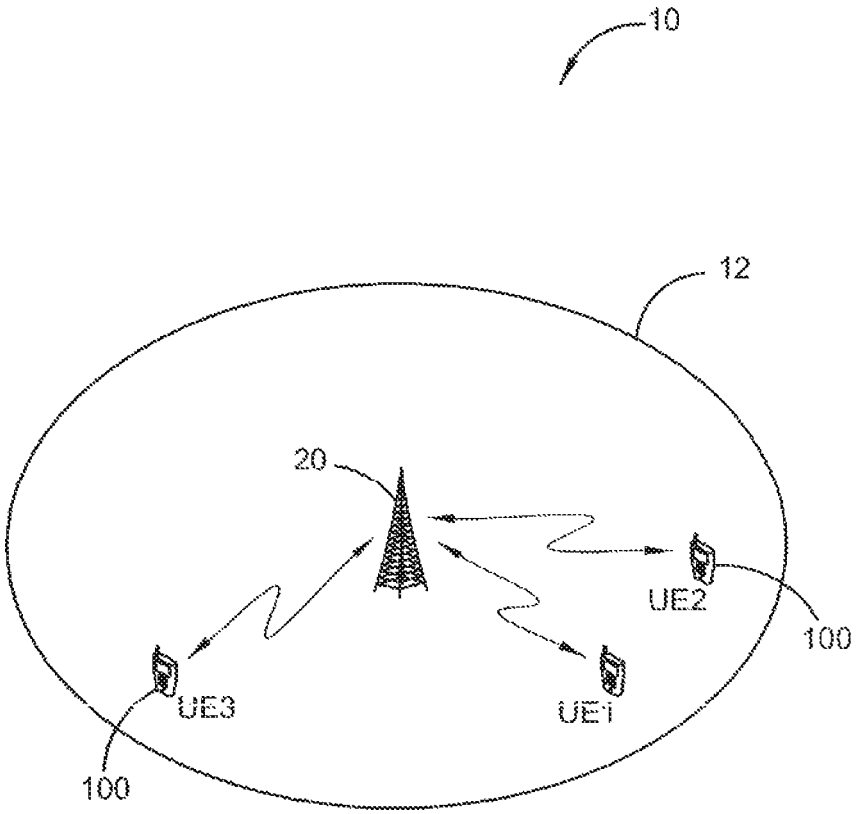

FIG. 1

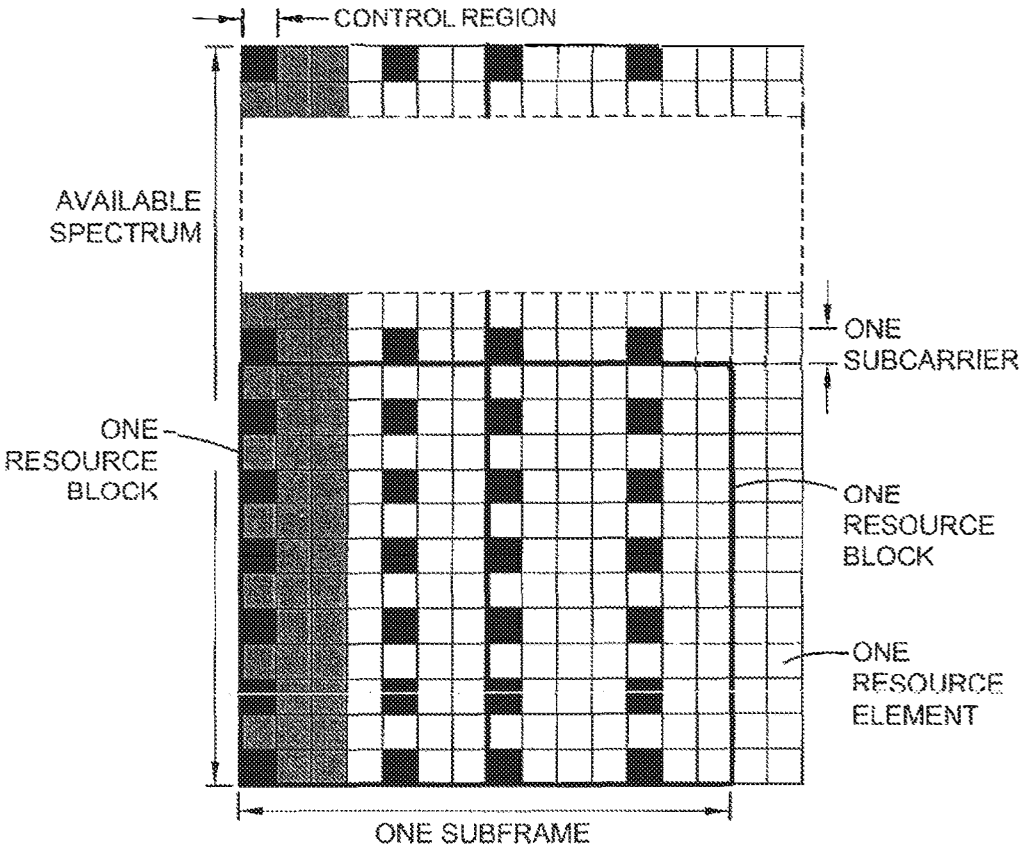

FIG. 2

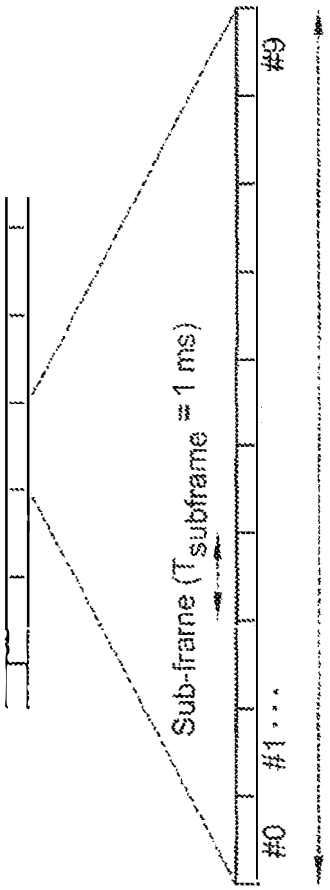

FIG. 3

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