US 20230232355A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2023/0232355 A1**

AWAD et al. (43) **Pub. Date: Jul. 20, 2023**

(54) **COMMUNICATIONS DEVICES, INFRASTRUCTURE EQUIPMENT AND METHODS**

(71) Applicant: **Sony Group Corporation**, Tokyo (JP)

(72) Inventors: **Yassin Aden AWAD**, Basingstoke (GB); **Vivek SHARMA**, Basingstoke (GB); **Yuxin WEI**, Basingstoke (GB); **Hideji WAKABAYASHI**, Basingstoke (GB)

(73) Assignee: **Sony Group Corporation**, Tokyo (JP)

(21) Appl. No.: **17/915,483**

(22) PCT Filed: **Mar. 5, 2021**

(86) PCT No.: **PCT/EP2021/055656**

§ 371 (c)(1),
(2) Date: **Sep. 29, 2022**

(30) **Foreign Application Priority Data**

Apr. 16, 2020 (EP) 20169971.7

Publication Classification

(51) **Int. Cl.**
H04W 56/00 (2006.01)
H04W 36/00 (2006.01)

(52) **U.S. Cl.**
CPC ... ***H04W 56/0045*** (2013.01); ***H04W 36/0072*** (2013.01)

(57) **ABSTRACT**

A communications device including circuitry configured to determine that the communications device is to perform a handover procedure from the first cell to a second cell, measure a difference between the start of a first radio frame received from the first cell and the start of a second radio frame received from the second cell, and to determine, during the handover procedure, in accordance with the measured difference, at least one of a value of a propagation delay of the second cell and a value of a timing advance of the second cell, the propagation delay of the second cell defining a time taken for a signal to travel one way between the communications device and the second cell, the timing advance of the second cell being defining a time taken for a signal to travel a round trip between the communications device and the second cell.