



US 20170244154A1

(19) **United States**

(12) **Patent Application Publication**
CHOU et al.

(10) **Pub. No.: US 2017/0244154 A1**

(43) **Pub. Date: Aug. 24, 2017**

(54) **ANTENNA STRUCTURE AND WIRELESS
COMMUNICATION DEVICE USING SAME**

H01Q 1/36 (2006.01)

H01Q 13/10 (2006.01)

(71) Applicant: **Chiun Mai Communication Systems,
Inc.**, New Taipei (TW)

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

CPC **H01Q 1/243** (2013.01); **H01Q 13/106**
(2013.01); **H01Q 1/48** (2013.01); **H01Q 1/36**
(2013.01)

(72) Inventors: **MING-YU CHOU**, New Taipei (TW);
YU-KAI TSENG, New Taipei (TW);
KUO-LUN HUANG, New Taipei (TW)

(57)

ABSTRACT

(21) Appl. No.: **15/399,749**

(22) Filed: **Jan. 6, 2017**

(30) **Foreign Application Priority Data**

Feb. 19, 2016 (CN) 201610093269.8
May 19, 2016 (CN) 201610339153.8

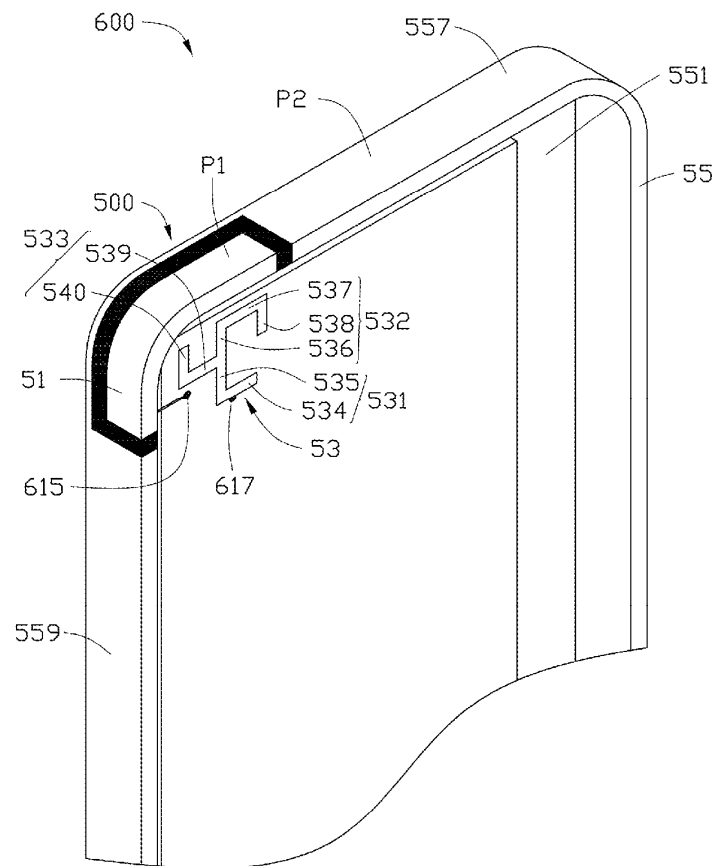
Publication Classification

(51) **Int. Cl.**

H01Q 1/24 (2006.01)

H01Q 1/48 (2006.01)

An antenna structure includes a metallic frame and a stub antenna. The metallic frame defines a slot and two gaps. The two gaps are positioned at two ends of the slot and are substantially perpendicular to the slot. The metallic frame is divided into a first portion and a second portion by the slot and the two gaps. A portion of the metallic frame surrounded by the slot and the two gaps forms the first portion. The first portion serves as a radiator of the antenna structure and is grounded through the second portion. The stub antenna is positioned at an interior of the metallic frame and is spaced from the radiator.





US 20170244163A1

(19) **United States**

(12) **Patent Application Publication**
YOO et al.

(10) **Pub. No.: US 2017/0244163 A1**

(43) **Pub. Date: Aug. 24, 2017**

(54) **ANTENNA STRUCTURE AND ELECTRONIC
DEVICE INCLUDING THE SAME**

H01Q 1/38 (2006.01)

H01Q 9/04 (2006.01)

(71) Applicant: **SAMSUNG ELECTRONICS CO.,
LTD.**, Suwon-si (KR)

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

CPC *H01Q 1/521* (2013.01); *H01Q 9/0442*
(2013.01); *H01Q 21/06* (2013.01); *H01Q 1/38*
(2013.01)

(72) Inventors: **Chae Up YOO**, Seoul (KR); **Ho Jung
NAM**, Goyang-si (KR); **Min Cheol
SEO**, Seoul (KR); **Sung Koo PARK**,
Suwon-si (KR); **Jung Ho PARK**,
Hwaseong-si (KR)

(57)

ABSTRACT

An electronic device includes a carrier having a surface, a first antenna radiator configured to transmit and/or receive a signal of a specific frequency band, a second antenna radiator configured to transmit and/or receive a signal of the specific frequency band, a communication circuit electrically connected to the first antenna radiator and the second antenna radiator, and a processor configured to control the communication circuit. The first antenna radiator includes a first conductive pattern disposed at a portion of the surface of the carrier. The second antenna radiator includes a second conductive pattern disposed at another portion of the surface of the carrier. The first antenna radiator includes a first open stub extending from one point of the first conductive pattern and configured to provide a transmission coefficient between the first antenna radiator and the second antenna radiator that is lower than a specific value at the specific frequency band.

(21) Appl. No.: **15/435,715**

(22) Filed: **Feb. 17, 2017**

(30) **Foreign Application Priority Data**

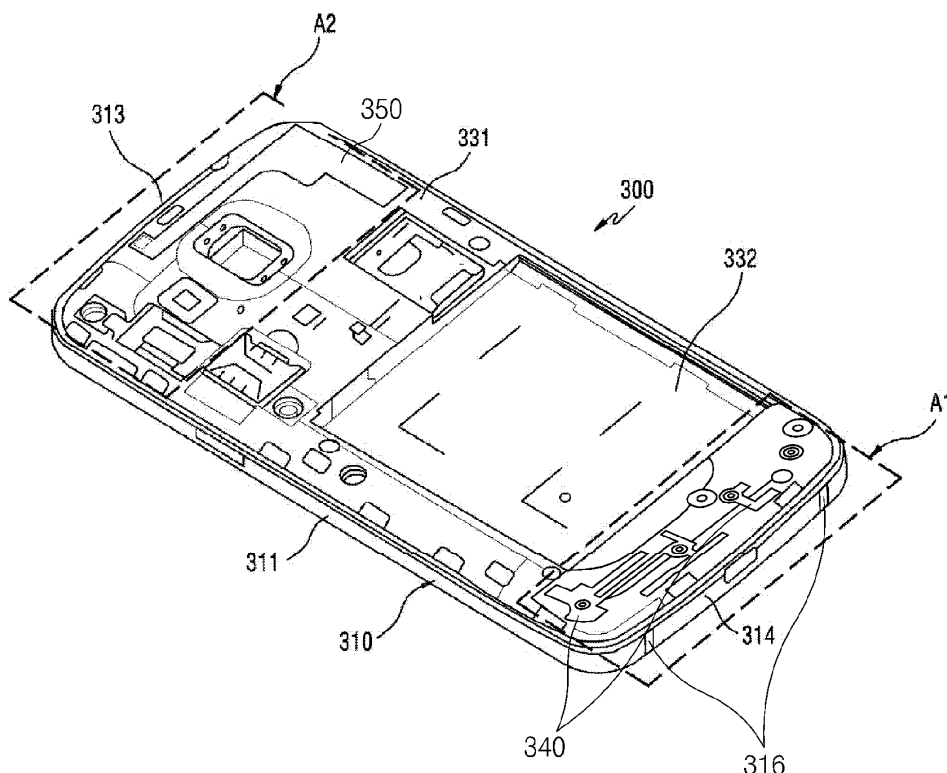
Feb. 19, 2016 (KR) 10-2016-0020035

Publication Classification

(51) **Int. Cl.**

H01Q 1/52 (2006.01)

H01Q 21/06 (2006.01)





US 20170264003A1

(19) **United States**

(12) **Patent Application Publication**
JUNG et al.

(10) **Pub. No.: US 2017/0264003 A1**

(43) **Pub. Date: Sep. 14, 2017**

(54) **ELECTRONIC DEVICE COMPRISING ANTENNA**

(71) Applicant: **Samsung Electronics Co., Ltd.**,
Suwon-si (KR)

(72) Inventors: **Sang Min JUNG**, Anyang-si (KR);
Min Ho SOH, Suwon-si (KR); **Hyun KIM**, Seoul (KR); **Gwang Un OH**,
Suwon-si (KR)

(21) Appl. No.: **15/374,213**

(22) Filed: **Dec. 9, 2016**

(30) **Foreign Application Priority Data**

Mar. 10, 2016 (KR) 10-2016-0029145

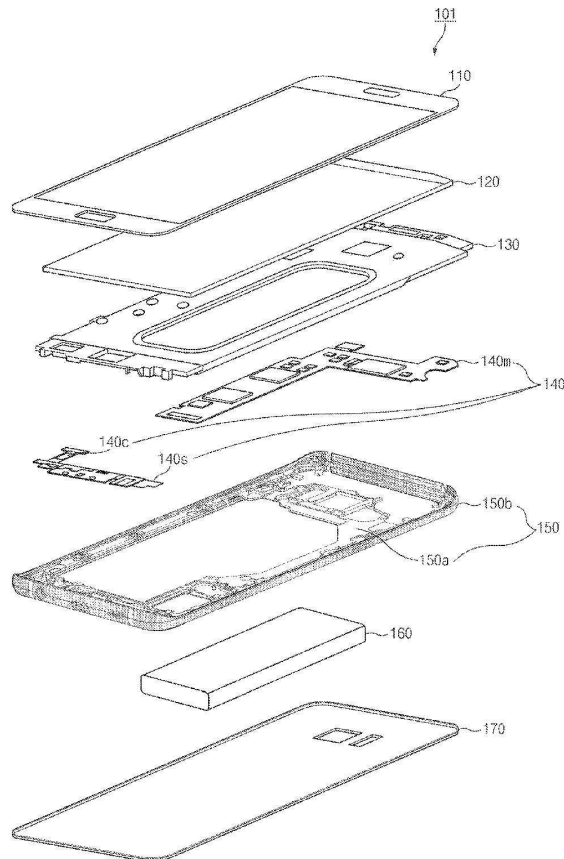
Publication Classification

(51) **Int. Cl.**
H01Q 1/24 (2006.01)
H01Q 21/00 (2006.01)
H01Q 1/48 (2006.01)

(52) **U.S. Cl.**
CPC **H01Q 1/243** (2013.01); **H01Q 1/48**
(2013.01); **H01Q 21/00** (2013.01)

(57) **ABSTRACT**

An electronic device is provided. The electronic device includes an antenna radiator, a first feeding terminal configured to supply a first frequency band signal to the antenna radiator, a second feeding terminal configured to supply a second frequency band signal to the antenna radiator, and a plurality of grounds electrically connected with the antenna radiator. The first feeding terminal is connected with the antenna radiator and at least one of the plurality of grounds through a passive circuit including a plurality of electrical paths.





US 20170271747A1

(19) **United States**

(12) **Patent Application Publication**
TSENG et al.

(10) **Pub. No.: US 2017/0271747 A1**

(43) **Pub. Date: Sep. 21, 2017**

(54) **ANTENNA**

(71) Applicant: **Wistron NeWeb Corp.**, Hsinchu (TW)

(72) Inventors: **Shih-Hsien TSENG**, Hsinchu (TW);
Chih-Ming WANG, Hsinchu (TW)

(21) Appl. No.: **15/262,531**

(22) Filed: **Sep. 12, 2016**

(30) **Foreign Application Priority Data**

Mar. 18, 2016 (TW) 105108418

Publication Classification

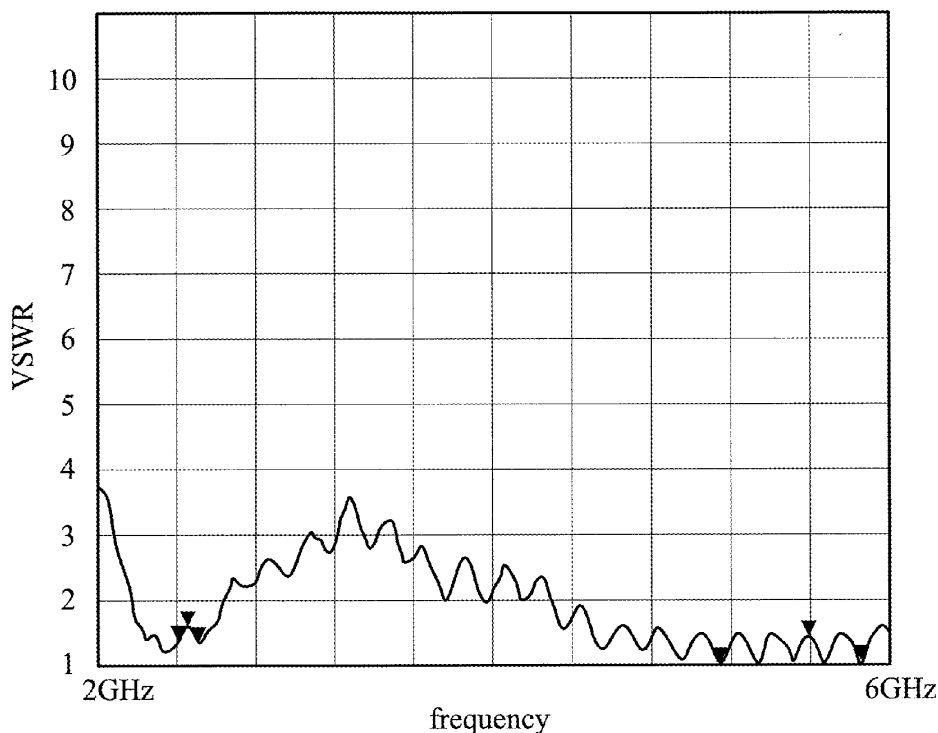
(51) **Int. Cl.**
H01Q 1/24 (2006.01)
H01Q 13/08 (2006.01)

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

CPC **H01Q 1/243** (2013.01); **H01Q 13/085**
(2013.01)

(57) **ABSTRACT**

An antenna is provided adapted to be formed on a metal housing of an electronic device. The antenna includes a first slot, a second slot, a substrate, a feed conductor and a signal source. The first slot and the second slot are formed on the metal housing. The first slot and the second slot are aligned along an axis. The substrate is disposed on the metal housing. The feed conductor is disposed on the substrate and corresponding to the first slot. The feed conductor includes a first section and a second section, the first section is extended in a first direction, the first slot is extended in the first direction toward the second slot, the second section extends in a second direction, and the second slot extends in the second direction toward the first slot. The signal source is electrically connected to the feed conductor.





US 20170271749A1

(19) **United States**

(12) **Patent Application Publication**
WANG et al.

(10) **Pub. No.: US 2017/0271749 A1**

(43) **Pub. Date: Sep. 21, 2017**

(54) **DIVERSITY ANTENNA AND MOBILE
TERMINAL**

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

CPC **H01Q 1/243** (2013.01); **H01Q 1/48**
(2013.01); **H01Q 5/50** (2015.01)

(71) Applicant: **Beijing Xiaomi Mobile Software Co.,
Ltd., Beijing (CN)**

(72) Inventors: **Linchuan WANG, Beijing (CN);
Zonglin XUE, Beijing (CN); Xiaofeng
XIONG, Beijing (CN)**

(57)

ABSTRACT

(21) Appl. No.: **15/347,790**

(22) Filed: **Nov. 10, 2016**

(30) **Foreign Application Priority Data**

Mar. 16, 2016 (CN) 201610151249.1

Publication Classification

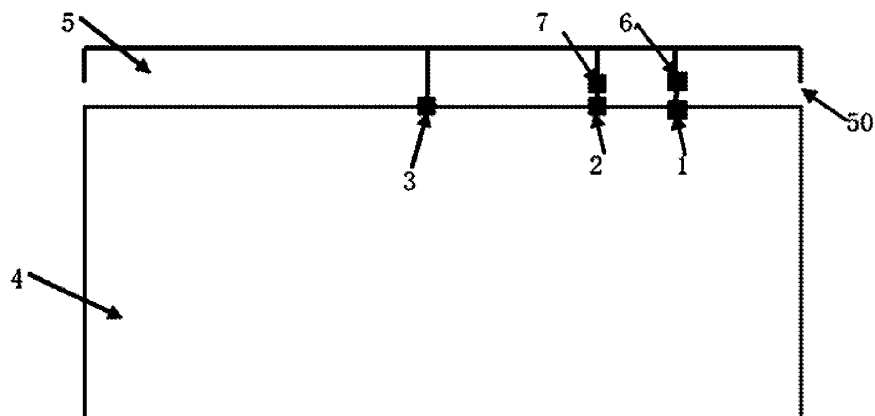
(51) **Int. Cl.**

H01Q 1/24 (2006.01)

H01Q 5/50 (2006.01)

H01Q 1/48 (2006.01)

A diversity antenna applied in a mobile terminal and a mobile terminal are provided. The mobile terminal includes a metal housing and the metal housing includes a housing body and a receiving region located over the housing body, and the receiving region is a frame structure in which a side is provided with a slit. The diversity antenna includes a feed point, a first ground point and a second ground point, and the feed point, the first ground point and the second ground point are all arranged on the housing body, and a distance between the feed point and the slit is 3 mm to 15 mm. The diversity antenna further includes a capacitive element connected to the frame structure and arranged in series with the feed point, and a switch arranged in series with the first ground point.





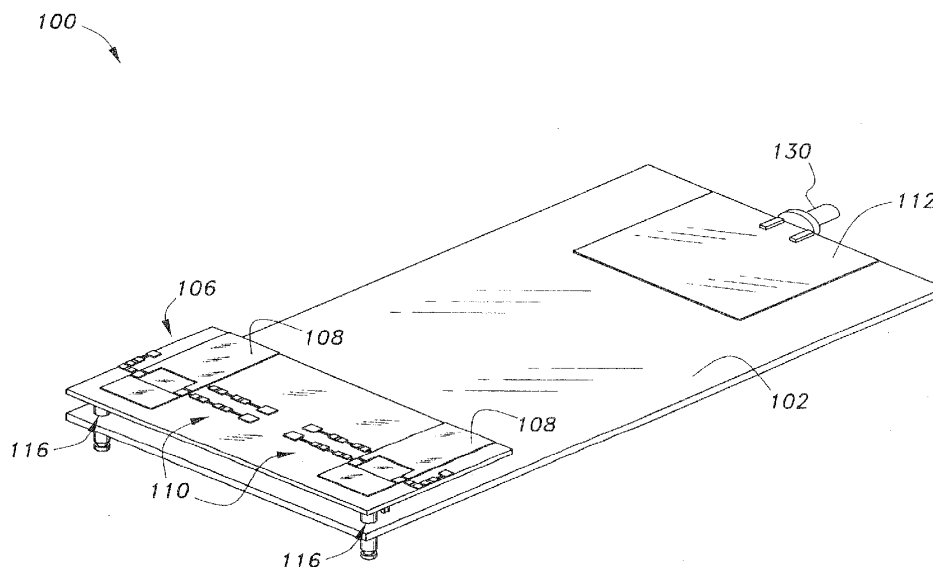
US 20170271751A1

(19) **United States**(12) **Patent Application Publication**
SHARAWI et al.(10) **Pub. No.: US 2017/0271751 A1**(43) **Pub. Date: Sep. 21, 2017**(54) **COGNITIVE RADIO ANTENNA ASSEMBLY**(71) Applicant: **KING FAHD UNIVERSITY OF
PETROLEUM AND MINERALS,**
Dhahran (SA)(72) Inventors: **MOHAMMAD S. SHARAWI,**
DHAHRAN (SA); **RIFAQAT**
HUSSAIN, DHAHRAN (SA)(21) Appl. No.: **15/614,511**(22) Filed: **Jun. 5, 2017****Related U.S. Application Data**(63) Continuation-in-part of application No. 14/641,253,
filed on Mar. 6, 2015.**Publication Classification**(51) **Int. Cl.**
H01Q 1/24 (2006.01)
H01Q 9/42 (2006.01)
H01Q 21/28 (2006.01)**H01Q 1/38** (2006.01)**H01Q 5/321** (2006.01)(52) **U.S. Cl.**CPC **H01Q 1/243** (2013.01); **H01Q 1/38**
(2013.01); **H01Q 5/321** (2015.01); **H01Q**
21/28 (2013.01); **H01Q 9/42** (2013.01)

(57)

ABSTRACT

The cognitive radio antenna assembly includes two boards, a main board that has an ultra-wideband antenna (UWB) and also serves as a ground plane for the reconfigurable antenna, and an elevated MIMO board having two planar inverted-F antennas (PIFAs) that are reconfigurable to selectively operate on different frequency bands. Each PIFA has a radiating patch having a slot bridged by PIN diodes and DC blocking capacitors on opposite sides of the slot. The resonant frequency of each PIFA is controlled by which diodes are switched on and off. The PIFA antennas are shorted to the ground plane the (UWB antenna) on the main board by shorting walls. The PIFA antennas are capable of resonating from the 700 MHz band through 3000 MHz, while the UWB senses the spectrum over the entire bandwidth. The antenna assembly is compact, being suitable for cellular phone and wireless applications in 4G wireless standards.





US 20170271765A1

(19) **United States**(12) **Patent Application Publication**
AN et al.(10) **Pub. No.: US 2017/0271765 A1**(43) **Pub. Date: Sep. 21, 2017**(54) **METAL BODY ANTENNA HAVING LOOP
TYPE RADIATION ELEMENTS**(52) **U.S. Cl.**CPC **H01Q 7/00** (2013.01); **H01Q 1/48**
(2013.01); **H01Q 5/30** (2015.01)(71) Applicant: **ACE TECHNOLOGIES
CORPORATION**, Incheon (KR)

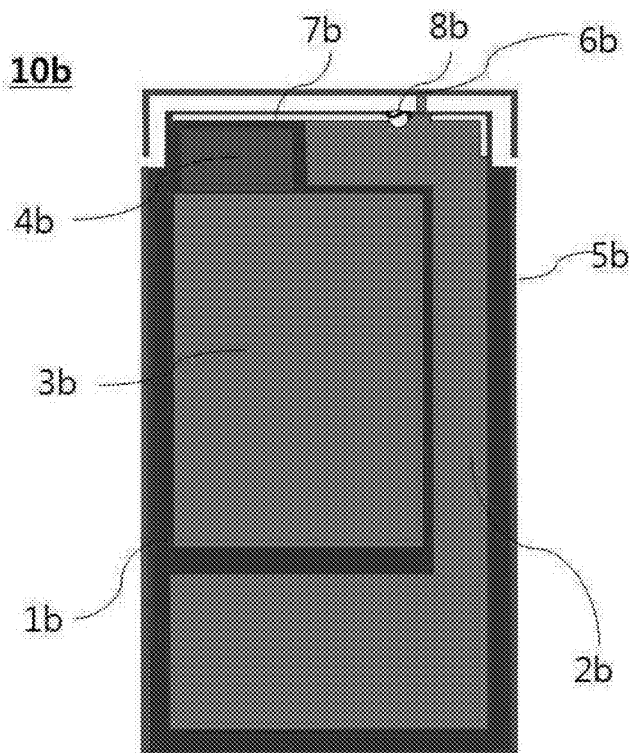
(57)

ABSTRACT(72) Inventors: **Sung Nam AN**, Seoul (KR); **Won Whi
JIN**, Bucheon-si (KR); **Jun Hee KIM**,
Incheon (KR)

A metal body antenna using a housing unit and a battery cover as an antenna. The metal body antenna includes a radiation element supplied with a signal from a feeding power port, a ground coupled to the radiation element by loop coupling to generate an induction current, a frame bezel unit separated from the ground by a dielectric and a gap, and a connection line configured to connect the ground and the frame bezel unit and formed over the dielectric so that an electric current induced into the ground flows into the frame bezel unit, wherein an antenna having an electrical length of a half wavelength operates in a wideband. Accordingly, a bezel unit is effectively used, and a wideband and multi-band antenna structure having a radiation loss satisfies all of the Penta Band (i.e., GSM850, EGSM, DCS, PCS, and W2100), that is, bands chiefly used in mobile phones.

(21) Appl. No.: **15/455,242**(22) Filed: **Mar. 10, 2017**(30) **Foreign Application Priority Data**

Mar. 18, 2016 (KR) 10-2016-0032567

Publication Classification(51) **Int. Cl.****H01Q 7/00** (2006.01)**H01Q 5/30** (2006.01)**H01Q 1/48** (2006.01)



US 20170272557A1

(19) **United States**

(12) **Patent Application Publication**
XUE et al.

(10) **Pub. No.: US 2017/0272557 A1**

(43) **Pub. Date: Sep. 21, 2017**

(54) **ANTENNA AND MOBILE TERMINAL
INCLUDING THE SAME**

(71) Applicant: **Beijing Xiaomi Mobile Software Co.,
Ltd., Beijing (CN)**

(72) Inventors: **Zonglin XUE, Beijing (CN); Linchuan
WANG, Beijing (CN); Xiaofeng
XIONG, Beijing (CN)**

(73) Assignee: **Beijing Xiaomi Mobile Software Co.,
Ltd., Beijing (CN)**

(21) Appl. No.: **15/411,705**

(22) Filed: **Jan. 20, 2017**

(30) **Foreign Application Priority Data**

Mar. 16, 2016 (CN) 201610151308.5

Publication Classification

(51) **Int. Cl.**
H04M 1/02 (2006.01)
H04M 1/725 (2006.01)
(52) **U.S. Cl.**
CPC **H04M 1/026** (2013.01); **H04M 1/725**
(2013.01)

(57) **ABSTRACT**

An antenna and a mobile terminal are provided. The antenna may include a radiation unit and at least one parasitic unit. The radiation unit includes a first radiation sub-unit and a second radiation sub-unit. A first terminal of the first radiation sub-unit is connected to a bottom edge of a rear cover of the mobile terminal. A second terminal of the first radiation sub-unit is provided with a feed point, a first terminal of the second radiation sub-unit is connected to the bottom edge. A second terminal of the second radiation sub-unit is provided with a ground point. A distance from the feed point to the ground point is greater than zero and less than a preset value. The at least one parasitic unit is coupleable with the radiation unit via the feed point.

