



US 20230411837A1

(19) **United States**

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

(10) **Pub. No.:** US 2023/0411837 A1

(43) **Pub. Date:** Dec. 21, 2023

(54) **ANTENNA STRUCTURE**

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

(72) Inventors: **Tzu-Min WU**, Hsinchu (TW);
Kuang-Yuan KU, Hsinchu (TW);
Kuo-Jen LAI, Hsinchu (TW)

(21) Appl. No.: **18/328,938**

(22) Filed: **Jun. 5, 2023**

(30) **Foreign Application Priority Data**

Jun. 16, 2022 (TW) 111122401
May 19, 2023 (TW) 112118693

Publication Classification

(51) **Int. Cl.**
H01Q 1/36 (2006.01)
H01Q 1/48 (2006.01)
H01Q 5/328 (2006.01)

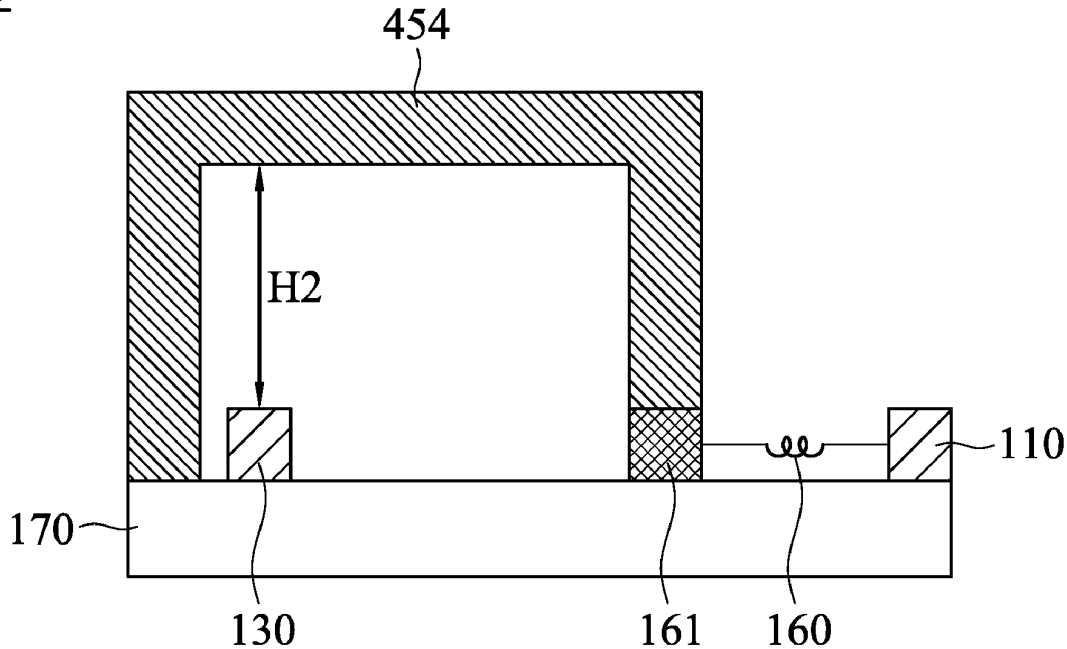
(52) **U.S. Cl.**

CPC **H01Q 1/36** (2013.01); **H01Q 1/48**
(2013.01); **H01Q 5/328** (2015.01)

(57) **ABSTRACT**

An antenna structure includes a ground element, a feeding radiation element, a first radiation element, a second radiation element, a first coupling branch, an inductive element, and a dielectric substrate. The feeding radiation element has a feeding point. The first radiation element is coupled to the feeding radiation element. The second radiation element is coupled to the feeding radiation element. The second radiation element and the first radiation element substantially extend in opposite directions. The first coupling branch is coupled through the inductive element to a first grounding point on the ground element. The first coupling branch includes an elevated portion extending across the first radiation element. The ground element, the feeding radiation element, the first radiation element, the second radiation element, the inductive element, and the first coupling branch are disposed on the same surface of the dielectric substrate.

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(19) **United States**

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

(10) **Pub. No.: US 2023/0411845 A1**

(43) **Pub. Date: Dec. 21, 2023**

(54) **MOBILE DEVICE WITH HIGH RADIATION EFFICIENCY**

(52) **U.S. Cl.**
CPC **H01Q 5/307** (2015.01); **H01Q 9/42** (2013.01); **H01Q 1/22** (2013.01)

(71) Applicant: **Acer Incorporated**, New Taipei City (TW)

(57) **ABSTRACT**

(72) Inventors: **Kun-Sheng CHANG**, New Taipei City (TW); **Ching-Chi LIN**, New Taipei City (TW); **Chuan-Chun WANG**, New Taipei City (TW)

A mobile device with high radiation efficiency includes a ground element, a first radiation element, a second radiation element, a third radiation element, a fourth radiation element, a dielectric substrate, a speaker body, and a cable. The first radiation element and the fourth radiation element are coupled to the ground element. The second radiation element and the third radiation element are coupled to a feeding point. An antenna structure is formed by the first radiation element, the second radiation element, the third radiation element, and the fourth radiation element. The speaker body has a first vertical projection on the dielectric substrate, and the first vertical projection at least partially overlaps the third radiation element. The cable is coupled to the speaker body. The cable has a second vertical projection on the dielectric substrate, and the second vertical projection does not overlap the antenna structure at all.

(21) Appl. No.: **17/818,776**

(22) Filed: **Aug. 10, 2022**

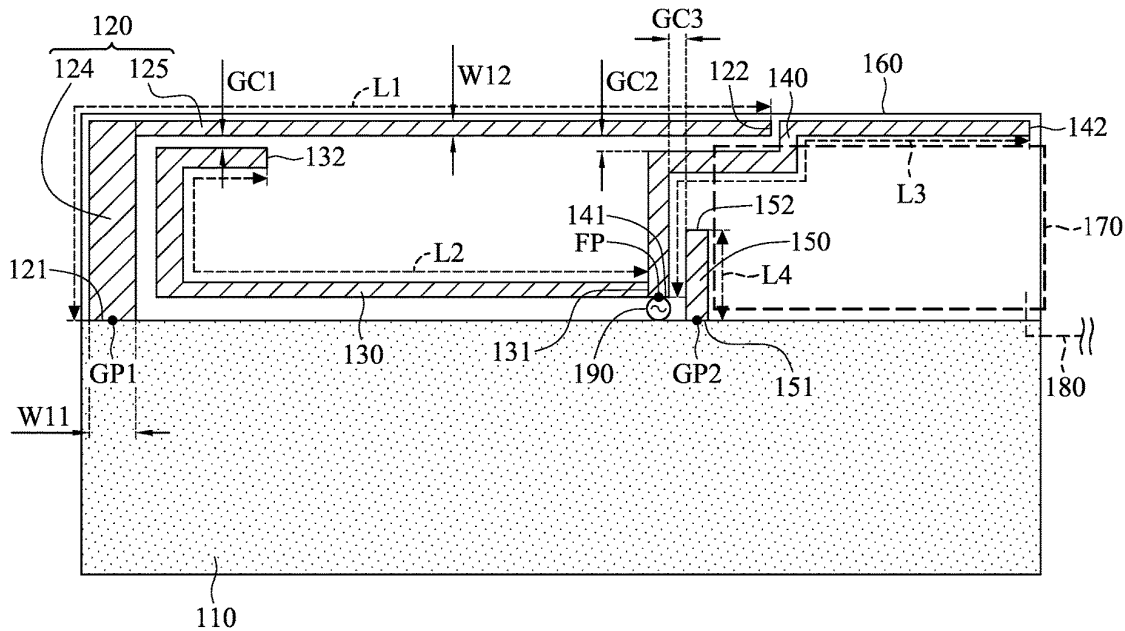
(30) **Foreign Application Priority Data**

Jun. 20, 2022 (TW) 111122782

Publication Classification

(51) **Int. Cl.**
H01Q 5/307 (2006.01)
H01Q 9/42 (2006.01)
H01Q 1/22 (2006.01)

100





US 20230411848A1

(19) **United States**

(12) **Patent Application Publication**
YOSHIKAWA

(10) **Pub. No.: US 2023/0411848 A1**

(43) **Pub. Date: Dec. 21, 2023**

(54) **ANTENNA, WIRELESS COMMUNICATION
MODULE, AND WIRELESS
COMMUNICATION DEVICE**

(52) **U.S. Cl.**
CPC **H01Q 5/35** (2015.01); **H01Q 9/047**
(2013.01)

(71) Applicant: **KYOCERA CORPORATION,**
Kyoto-shi, Kyoto (JP)

(57) **ABSTRACT**

(72) Inventor: **Hikomichi YOSHIKAWA,**
Yokohama-shi, Kanagawa (JP)

(21) Appl. No.: **18/040,153**

(22) PCT Filed: **Jul. 26, 2021**

(86) PCT No.: **PCT/JP2021/027602**

§ 371 (c)(1),
(2) Date: **Jul. 10, 2023**

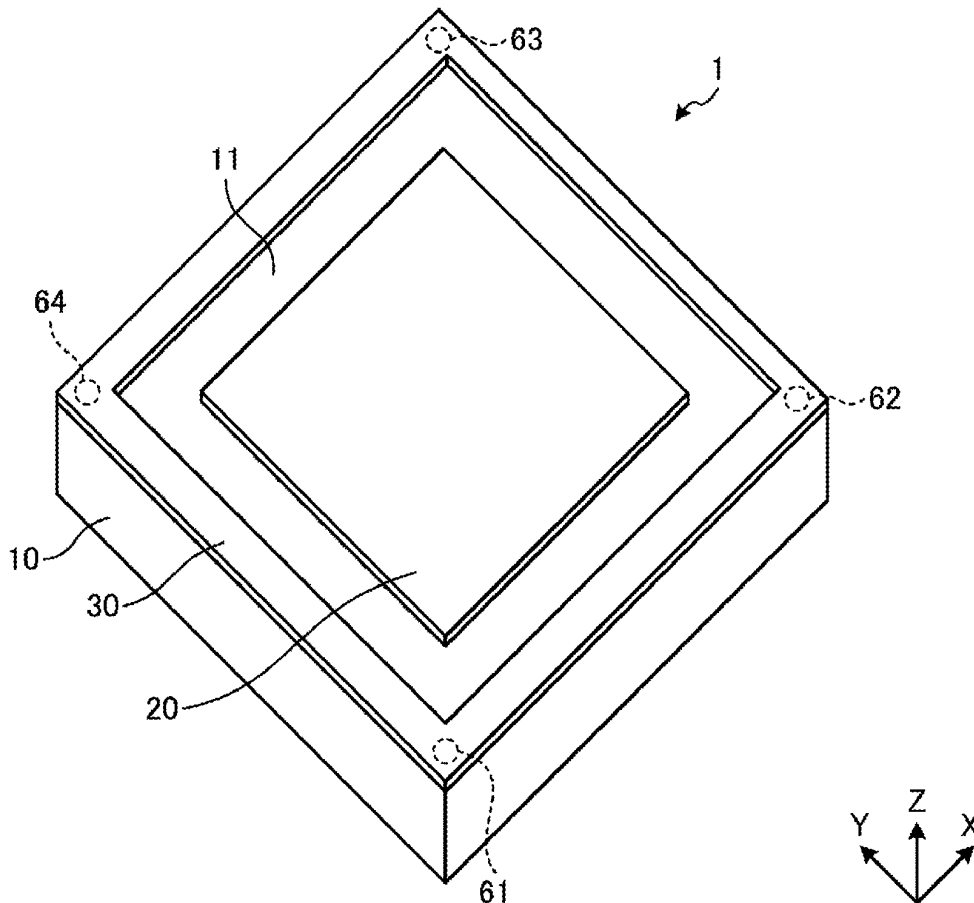
(30) **Foreign Application Priority Data**

Aug. 3, 2020 (JP) 2020-131661

Publication Classification

(51) **Int. Cl.**
H01Q 5/35 (2006.01)
H01Q 9/04 (2006.01)

An antenna includes a base, a patch conductor, a peripheral conductor surrounding the patch conductor, a first predetermined number of coupling conductors capacitively connecting the patch conductor and the peripheral conductor, the first predetermined number being at least three, and a first power feed line connected to the patch conductor. Among the first predetermined number of coupling conductors, any two form a first coupling pair composing a part of a first coupling group aligned in a first direction along a first plane, and any two form a second coupling pair composing a part of a second coupling group arranged in a second direction intersecting the first direction along the first plane. The antenna is configured to resonate in a first frequency band along a first electrical current path, and is configured to resonate in a second frequency band along a second electrical current path.





US 20230420826A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2023/0420826 A1**
KIM et al. (43) **Pub. Date: Dec. 28, 2023**

(54) **ANTENNA AND ELECTRONIC DEVICE
COMPRISING SAME**

Publication Classification

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

(51) **Int. Cl.**
H01Q 1/24 (2006.01)
H01Q 21/08 (2006.01)
H01Q 9/04 (2006.01)

(72) Inventors: **Youngjung KIM**, Suwon-si (KR);
Jonghyuck LEE, Suwon-si (KR);
Youngjun KIM, Suwon-si (KR);
Jongsuk KIM, Suwon-si (KR);
Kyungbin KIM, Suwon-si (KR);
Kwangseo KIM, Suwon-si (KR);
Donghwan KIM, Suwon-si (KR)

(52) **U.S. Cl.**
CPC *H01Q 1/243* (2013.01); *H01Q 21/08*
(2013.01); *H01Q 9/0407* (2013.01)

(57) **ABSTRACT**

An electronic device according to various embodiments may comprise: a housing; an antenna structure comprising a substrate, which comprises a first substrate surface facing a first direction and a second substrate surface facing a second direction opposite from the first substrate surface, and at least one antenna element disposed on the substrate so as to form a beam pattern in the first direction; a first support part disposed so as to at least partially correspond to the second substrate surface; a conductive bracket comprising at least one conductive extension part disposed higher than the second substrate surface with respect to the first support part; and a wireless communication circuit configured to transmit and/or receive a wireless signal in a designated frequency band by means of the at least one antenna element.

(21) Appl. No.: **18/244,039**

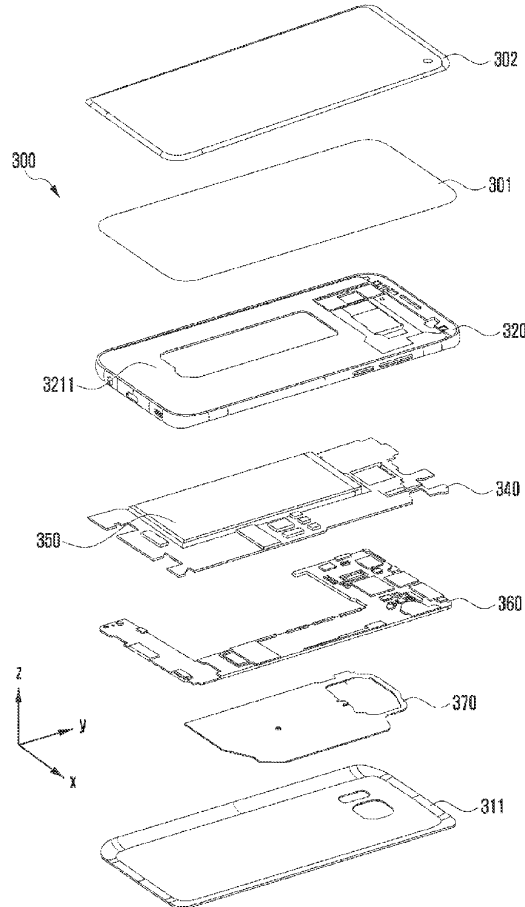
(22) Filed: **Sep. 8, 2023**

Related U.S. Application Data

(63) Continuation of application No. PCT/KR2022/
002127, filed on Feb. 14, 2022.

(30) **Foreign Application Priority Data**

Mar. 9, 2021 (KR) 10-2021-0030897





US 20230420827A1

(19) **United States**

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

(10) **Pub. No.: US 2023/0420827 A1**

(43) **Pub. Date: Dec. 28, 2023**

(54) **TERMINAL ANTENNA SYSTEM AND ELECTRONIC DEVICE**

Publication Classification

(71) Applicant: **HONOR DEVICE CO., LTD.**,
Shenzhen, Guangdong (CN)

(51) **Int. Cl.**
H01Q 1/24 (2006.01)
H01Q 1/52 (2006.01)

(72) Inventors: **Shaobo LI**, Shenzhen (CN); **Yiwu HU**,
Shenzhen (CN)

(52) **U.S. Cl.**
CPC **H01Q 1/243** (2013.01); **H01Q 1/521**
(2013.01)

(21) Appl. No.: **18/266,959**

(57) **ABSTRACT**

(22) PCT Filed: **Sep. 7, 2022**

Embodiments of this application relate to the field of antenna technologies, and disclose a terminal antenna system and an electronic device, to effectively reduce mutual impact between adjacent antennas. A specific solution is as follows: The terminal antenna system includes: a first radiator and a second radiator, where a first end of the first radiator is coupled to a first end of the second radiator through a gap. A first feed point is provided at a second end, away from the second radiator, of the first radiator, and a first ground point is further provided on the first radiator. A second feed point is provided at a second end of the second radiator, and the second end of the second radiator is an end away from the first radiator.

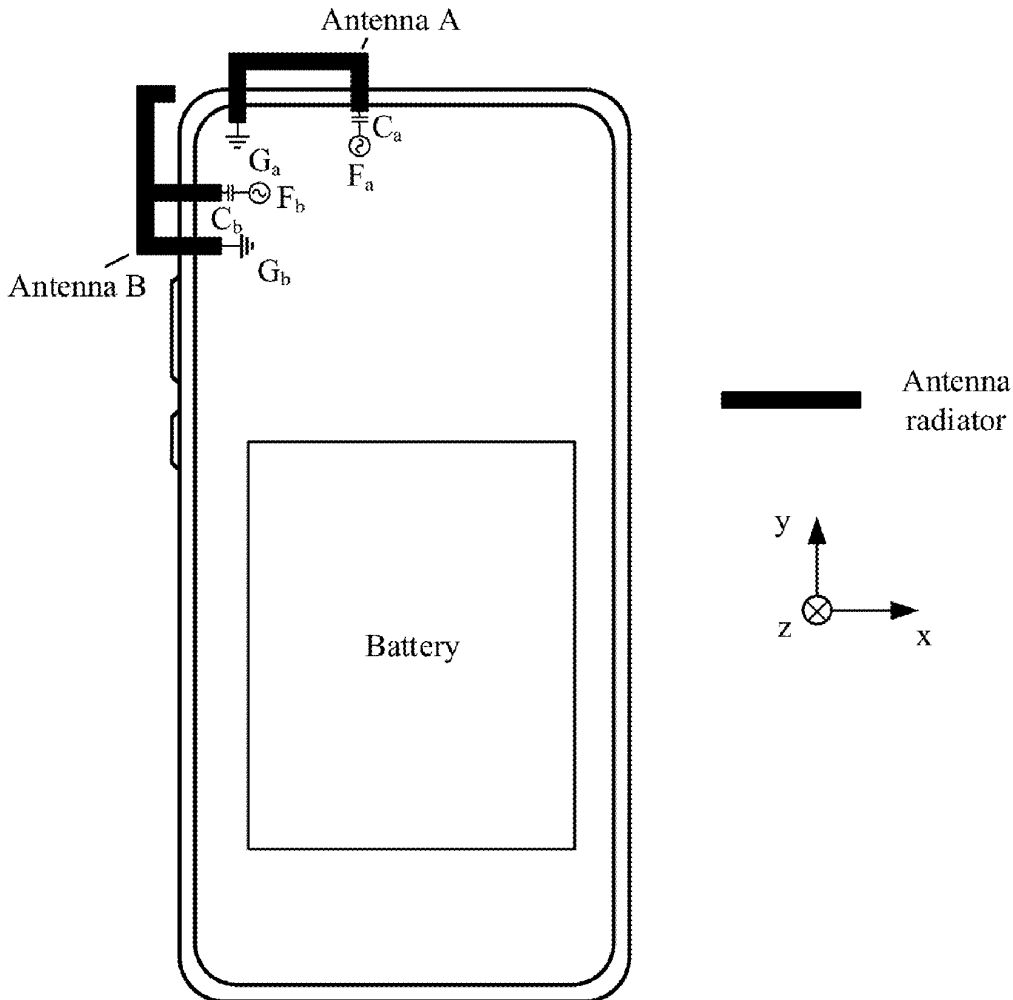
(86) PCT No.: **PCT/CN2022/117659**

§ 371 (c)(1),

(2) Date: **Jun. 13, 2023**

(30) **Foreign Application Priority Data**

Nov. 12, 2021 (CN) 202111340312.3





(19) **United States**

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

(10) **Pub. No.: US 2023/0420835 A1**

(43) **Pub. Date: Dec. 28, 2023**

(54) **INTEGRATED STRUCTURE OF DIFFERENTIAL DIELECTRIC RESONATOR ANTENNA AND INDEPENDENTLY CONTROLLABLE DUAL-BAND FILTER**

Publication Classification

(51) **Int. Cl.**
H01Q 1/50 (2006.01)
H01Q 9/04 (2006.01)
H01P 1/20 (2006.01)
(52) **U.S. Cl.**
CPC *H01Q 1/50* (2013.01); *H01P 1/20* (2013.01); *H01Q 9/0485* (2013.01)

(71) Applicant: **NANTONG UNIVERSITY**, Nantong, Jiangsu (CN)

(72) Inventors: **Hui Tang**, Nantong, Jiangsu (CN);
Cheng Shao, Nantong, Jiangsu (CN);
Jie Ge, Nantong, Jiangsu (CN);
Qingyuan Lu, Nantong, Jiangsu (CN);
Jianxin Chen, Nantong, Jiangsu (CN)

(57) **ABSTRACT**

Disclosed is an integrated structure of a differential dielectric resonator antenna and a separately controllable dual-band filter. The integrated structure includes a dielectric substrate, a rectangular dielectric resonator and a feed structure. Two functions, i.e., an antenna function and a filter function, which do not interfere with each other, are realized at the same time. Differential excitation is performed on a main mode of the rectangular dielectric resonator, so as to design a differential dielectric resonator antenna. A separately controllable first passband of the filter is integrated and realized on a virtual ground of the differential dielectric resonator antenna, and then a separately controllable second passband of the filter is realized by using a reflection ground. The antenna and the filter share the same module, but maintain good isolation, such that the number and volume of microwave devices in a radio frequency system can be reduced.

(73) Assignee: **NANTONG UNIVERSITY**, Nantong, Jiangsu (CN)

(21) Appl. No.: **18/035,931**

(22) PCT Filed: **Nov. 30, 2021**

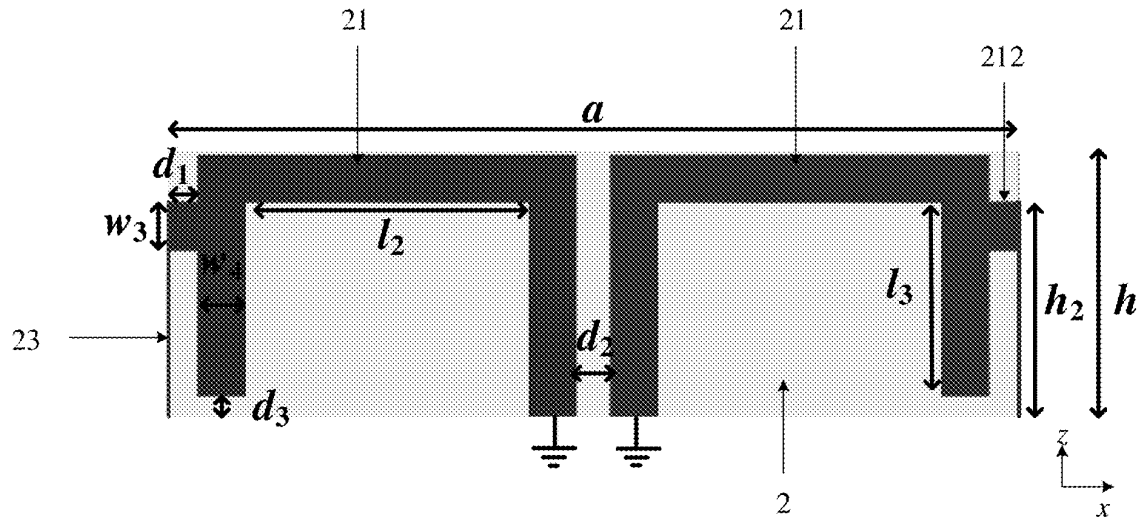
(86) PCT No.: **PCT/CN2021/134307**

§ 371 (c)(1),

(2) Date: **May 9, 2023**

(30) **Foreign Application Priority Data**

Dec. 29, 2020 (CN) 202011591320.0





US 20230422409A1

(19) **United States**

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

(10) **Pub. No.: US 2023/0422409 A1**

(43) **Pub. Date: Dec. 28, 2023**

(54) **CIRCUIT BOARD FOR ANTENNA,
ANTENNA PACKAGE INCLUDING THE
SAME AND IMAGE DISPLAY DEVICE
INCLUDING THE SAME**

Publication Classification

(51) **Int. Cl.**
H05K 3/46 (2006.01)
H05K 1/02 (2006.01)
H01Q 1/22 (2006.01)

(71) Applicant: **DONGWOO FINE-CHEM CO.,
LTD.**, Jeollabuk-do (KR)

(52) **U.S. Cl.**
CPC *H05K 3/4605* (2013.01); *H05K 1/0242*
(2013.01); *H05K 2201/10098* (2013.01); *H05K*
2201/093 (2013.01); *H05K 2201/10128*
(2013.01); *H01Q 1/2291* (2013.01)

(72) Inventors: **Dae Kyu KIM**, Gyeonggi-do (KR);
Byung Soo BANG, Gyeonggi-do (KR);
Gi Taek OH, Gyeonggi-do (KR)

(21) Appl. No.: **18/209,551**

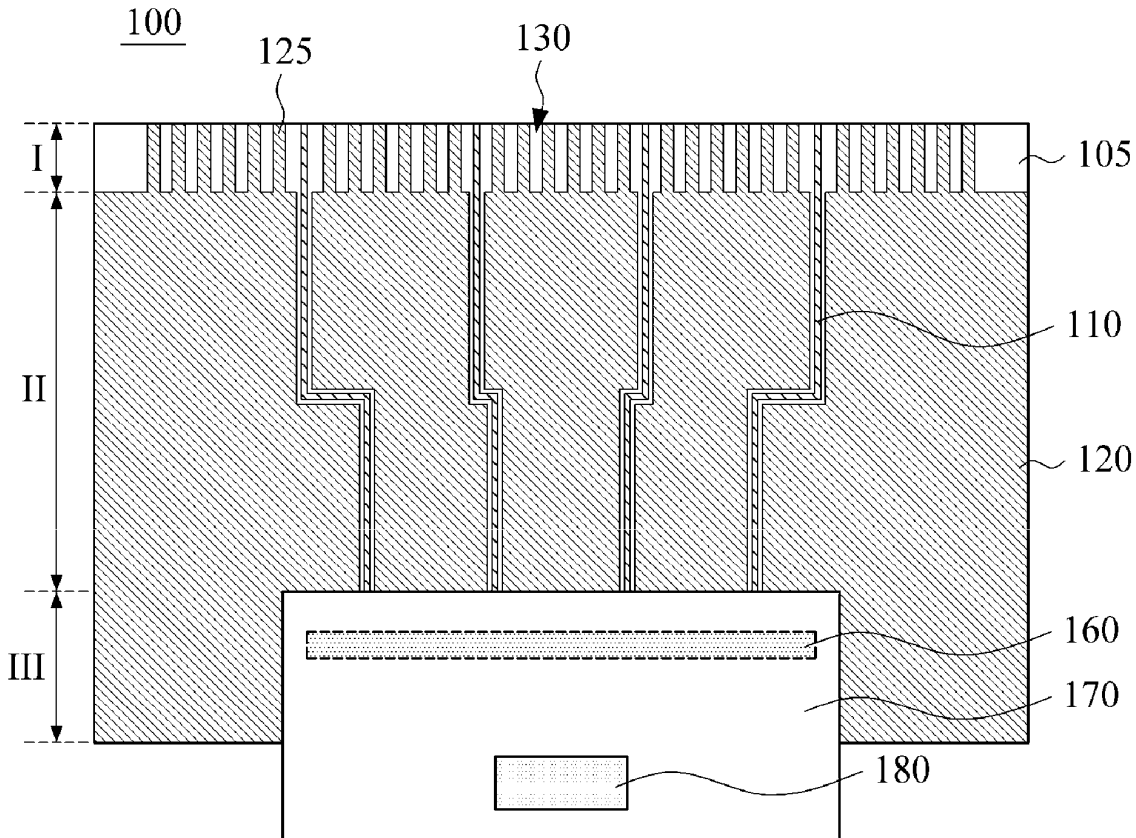
(57) **ABSTRACT**

(22) Filed: **Jun. 14, 2023**

A circuit board for an antenna may include a core layer, a signal wiring disposed on a surface of the core layer, and a co-planar ground disposed around the signal wiring on the surface of the core layer. The co-planar ground may include line patterns adjacent to a front end portion of the signal wiring.

(30) **Foreign Application Priority Data**

Jun. 22, 2022 (KR) 10-2022-0076118





US 20240006747A1

(19) **United States**

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

(10) **Pub. No.: US 2024/0006747 A1**

(43) **Pub. Date: Jan. 4, 2024**

(54) **PLANAR BROAD-BAND TRANSMITTER**

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

(71) Applicant: **Garrity Power Services LLC,**
Rockwall, TX (US)

CPC **H01Q 1/36** (2013.01); **H01Q 9/0407**
(2013.01); **H01Q 1/48** (2013.01)

(72) Inventors: **Antony Brinlee,** Plano, TX (US); **Paul**
Garrity, Rockwall, TX (US)

(57) **ABSTRACT**

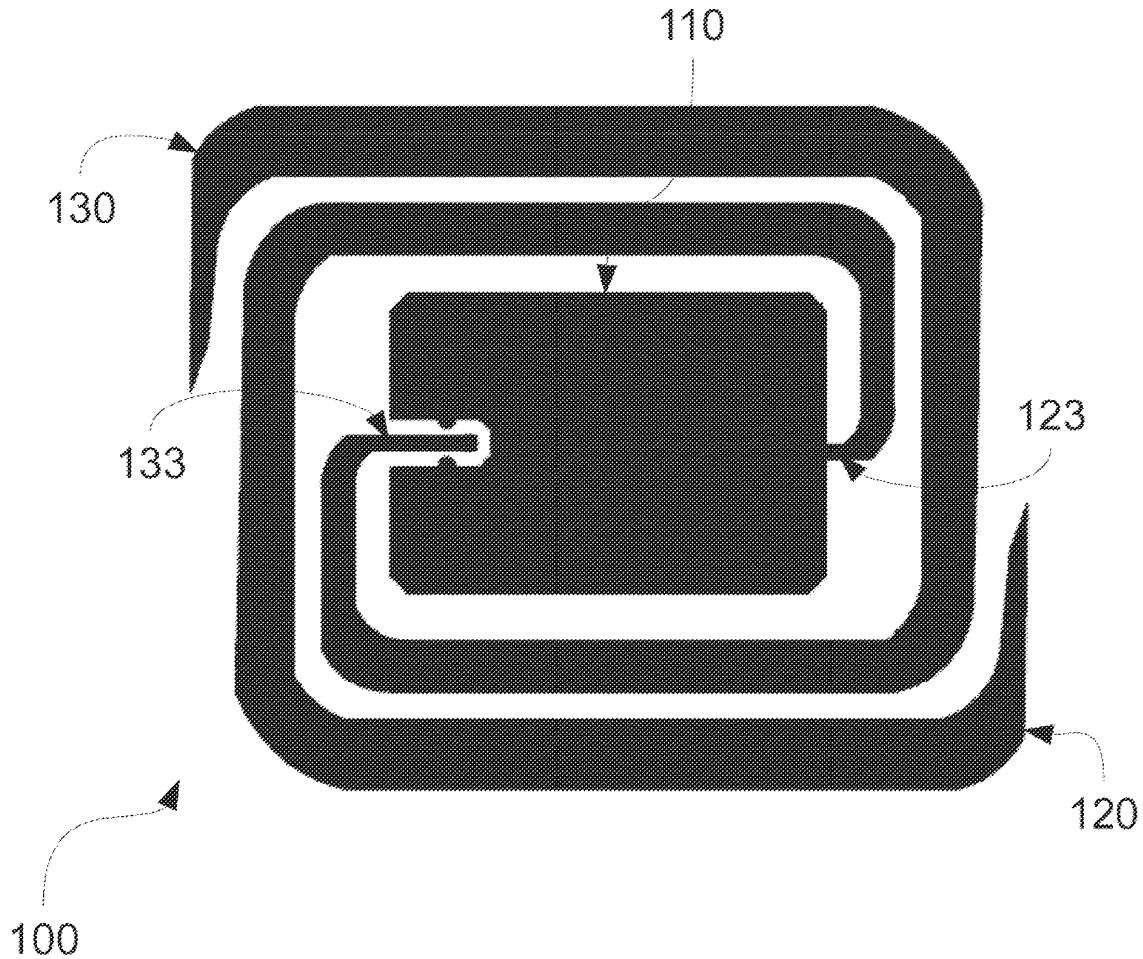
(21) Appl. No.: **17/856,174**

(22) Filed: **Jul. 1, 2022**

A transmitter comprising a planar antenna including a ground plane and first and second spiral radiating elements wrapping around the ground plane, and a driving circuit. Proximal ends of the spiral radiating elements terminate near points located along a perimeter of the ground plane. Exactly one of the first and second spiral radiating elements are electrically isolated from the ground plane. The first and second spiral radiating elements are wound in the same direction for approximately a single turn and increase in thickness for approximately three-fourths of the turn. The driving circuit drives one of the first and second spiral radiating elements.

Publication Classification

(51) **Int. Cl.**
H01Q 1/36 (2006.01)
H01Q 9/04 (2006.01)
H01Q 1/48 (2006.01)





US 20240006768A1

(19) **United States**

(12) **Patent Application Publication**
YU

(10) **Pub. No.: US 2024/0006768 A1**

(43) **Pub. Date: Jan. 4, 2024**

(54) **ANTENNA STRUCTURE FOR MOBILE TERMINAL**

Publication Classification

(71) Applicant: **JRD COMMUNICATION (SHENZHEN) LTD.**, Shenzhen, Guangdong (CN)

(51) **Int. Cl.**
H01Q 5/50 (2006.01)
H01Q 5/335 (2006.01)
H01Q 1/24 (2006.01)

(72) Inventor: **Longjie YU**, Shenzhen, Guangdong (CN)

(52) **U.S. Cl.**
CPC *H01Q 5/50* (2015.01); *H01Q 5/335* (2015.01); *H01Q 1/241* (2013.01)

(73) Assignee: **JRD COMMUNICATION (SHENZHEN) LTD.**, Shenzhen, Guangdong (CN)

(57) **ABSTRACT**

(21) Appl. No.: **18/255,371**

Embodiments of the present invention provide an antenna structure for a mobile terminal. The antenna structure comprises a first antenna to a sixth antenna, a matching circuit, and a feed point; a spacer region is provided between the first antenna and the second antenna; a fourth antenna is disposed on one side of the spacer region, the fifth and fourth antennas are disposed opposite to each other, and the third antenna and the feed point are disposed on the side edge of the fifth antenna; the fifth, sixth and third antennas are electrically connected, and the matching circuit is connected to the fifth antenna, the sixth antenna, the third antenna, and the feed point.

(22) PCT Filed: **Dec. 16, 2020**

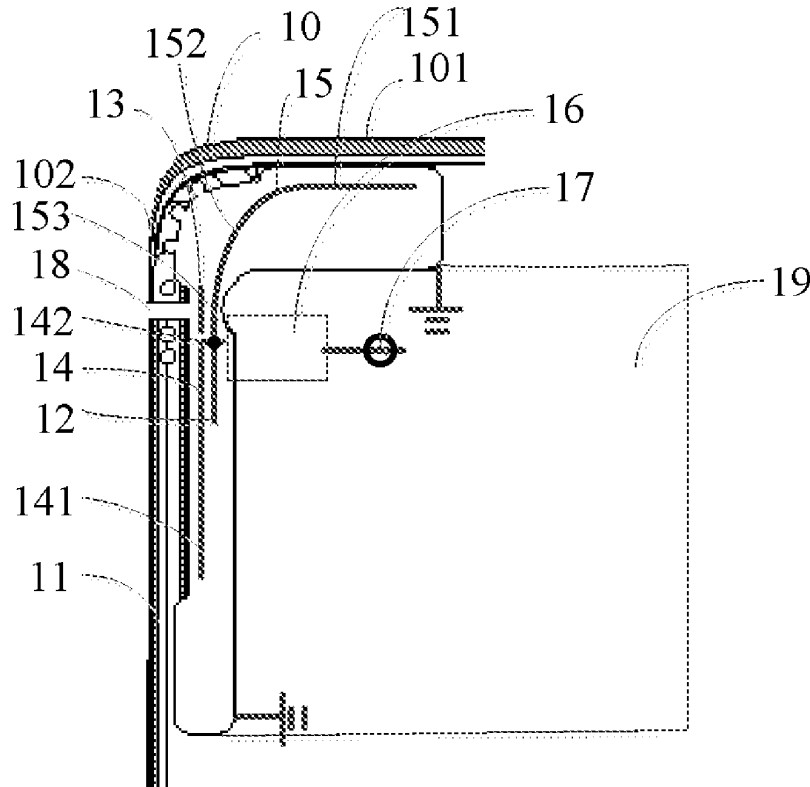
(86) PCT No.: **PCT/CN2020/136715**

§ 371 (c)(1),

(2) Date: **Jun. 1, 2023**

(30) **Foreign Application Priority Data**

Dec. 2, 2020 (CN) 202011403272.8



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102 } 14 { 141
142 } 15 { 151
152
153 }



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(19) **United States**

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

(10) **Pub. No.: US 2024/0006769 A1**

(43) **Pub. Date: Jan. 4, 2024**

(54) **ELECTRONIC DEVICE**

Publication Classification

(71) Applicant: **PEGATRON CORPORATION**, Taipei City (TW)

(51) **Int. Cl.**
H01Q 9/04 (2006.01)
H01Q 1/12 (2006.01)

(72) Inventors: **Chien-Yi Wu**, Taipei City (TW);
Chih-Wei Liao, Taipei City (TW);
Chao-Hsu Wu, Taipei City (TW); **Hau Yuen Tan**, Taipei City (TW);
Shih-Keng Huang, Taipei City (TW);
Cheng-Hsiung Wu, Taipei City (TW);
Chia-Hung Chen, Taipei City (TW);
Sheng-Chin Hsu, Taipei City (TW);
Hao-Hsiang Yang, Taipei City (TW)

(52) **U.S. Cl.**
CPC **H01Q 9/0407** (2013.01); **H01Q 1/12** (2013.01)

(73) Assignee: **PEGATRON CORPORATION**, Taipei City (TW)

(57) **ABSTRACT**

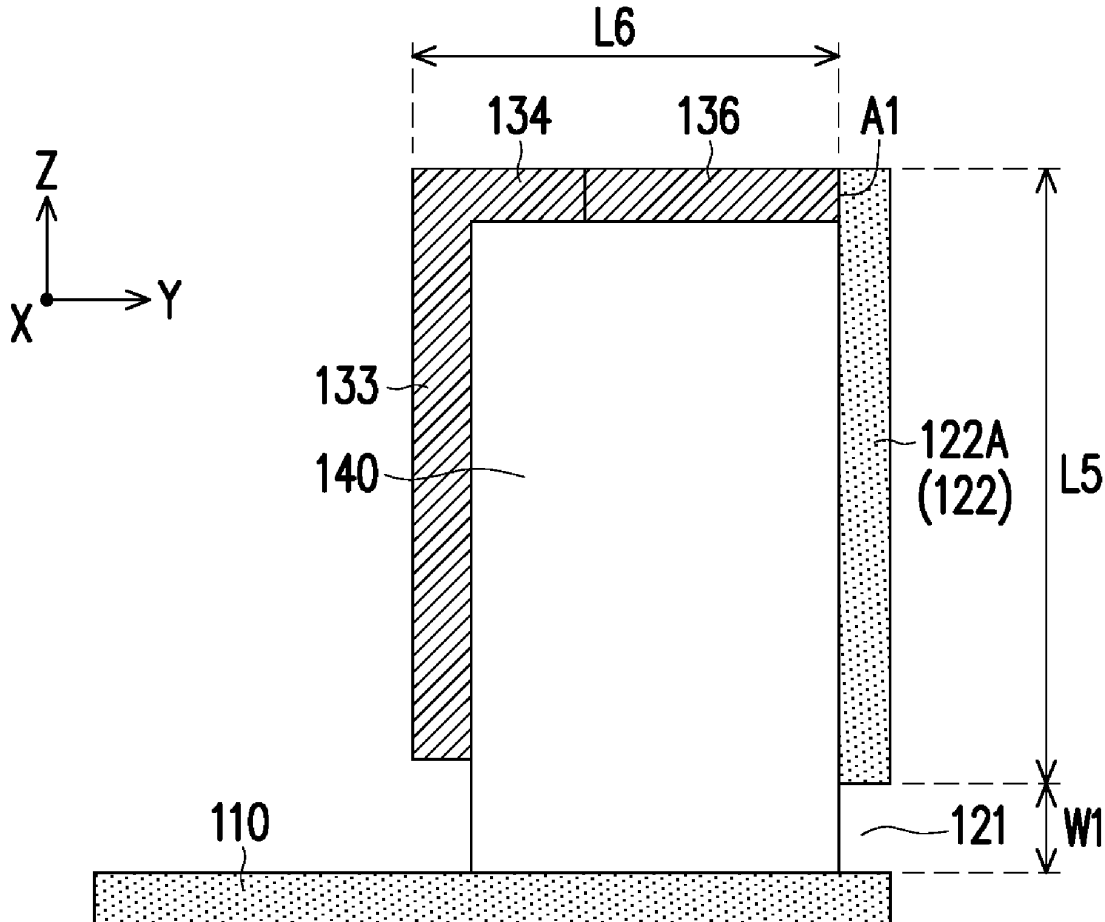
An electronic device including a metal bottom plate, a metal frame and at least one radiator is provided. The metal bottom plate includes at least one ground terminal. The metal frame includes at least one slot, at least one disconnecting part, at least one first connecting part and at least one second connecting part. The disconnecting part includes a first part and a second part. Each radiator includes a first terminal and a second terminal. The second terminal is connected to a junction between the first part and the second part. The first terminal, the second terminal, the first part, the first connecting part and the ground terminal form a first antenna path radiating at a first frequency band. The first terminal, the second terminal, the second part, the second connecting part and the ground terminal form a second antenna path radiating at a second frequency band.

(21) Appl. No.: **18/317,862**

(22) Filed: **May 15, 2023**

(30) **Foreign Application Priority Data**

Jul. 4, 2022 (TW) 111124879





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(19) **United States**

(12) **Patent Application Publication**
LI

(10) **Pub. No.: US 2024/0014541 A1**

(43) **Pub. Date: Jan. 11, 2024**

(54) **ELECTRONIC DEVICE**

Publication Classification

(71) Applicant: **Honor Device Co., Ltd.**, Shenzhen, Guangdong (CN)

(51) **Int. Cl.**
H01Q 1/22 (2006.01)
H01Q 1/27 (2006.01)
H01Q 1/38 (2006.01)
H01Q 1/00 (2006.01)

(72) Inventor: **Yuanpeng LI**, Shenzhen (CN)

(52) **U.S. Cl.**
CPC **H01Q 1/2216** (2013.01); **H01Q 1/273** (2013.01); **H01Q 1/38** (2013.01); **H01Q 1/002** (2013.01)

(73) Assignee: **Honor Device Co., Ltd.**, Shenzhen, Guangdong (CN)

(21) Appl. No.: **18/029,489**

(57) **ABSTRACT**

(22) PCT Filed: **Feb. 9, 2022**

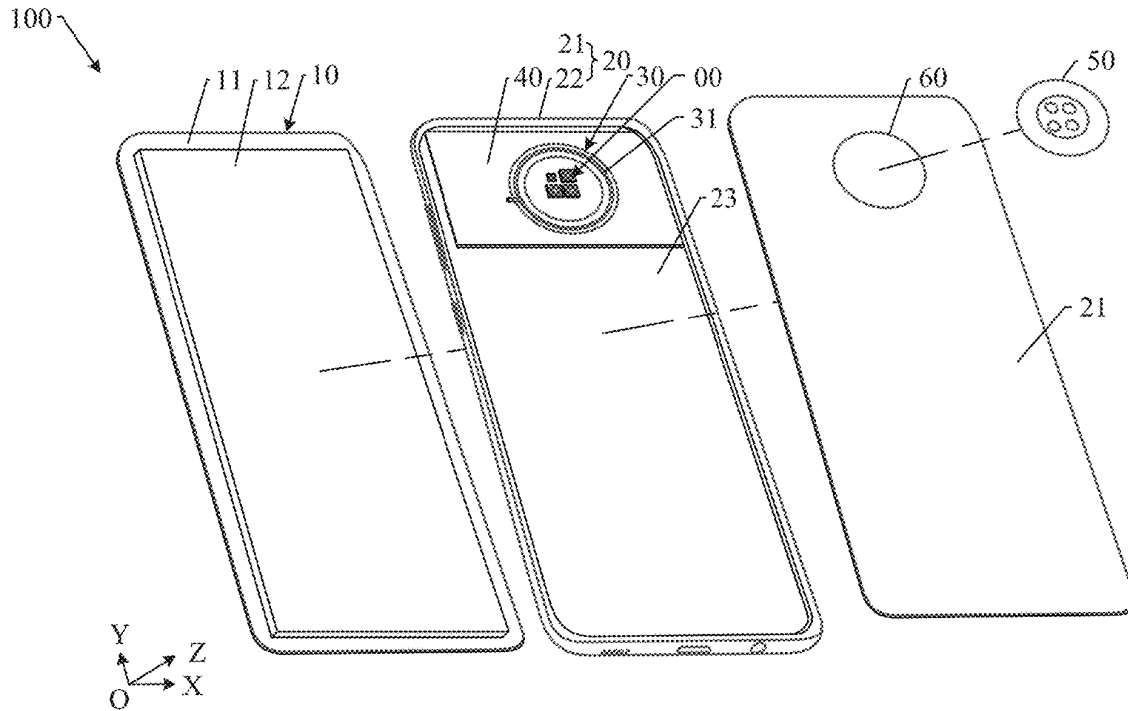
An electronic device is provided. The electronic device comprises an NFC antenna and a metal member. The NFC antenna includes an NFC coil, and the metal member is located on the side of a plane in which the NFC coil is located. The NFC coil includes a first part and a second part that are arranged along a circumferential direction of the NFC coil, the first part is located outside an orthographic projection that is of the metal member and that is on the plane in which the NFC coil is located, and the second part passes through the orthographic projection that is of the metal member and that is on the plane in which the NFC coil is located.

(86) PCT No.: **PCT/CN2022/075717**

§ 371 (c)(1),
(2) Date: **Mar. 30, 2023**

(30) **Foreign Application Priority Data**

Apr. 19, 2021 (CN) 202110420862.X





US 20240014543A1

(19) **United States**

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

(10) **Pub. No.: US 2024/0014543 A1**

(43) **Pub. Date: Jan. 11, 2024**

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

Publication Classification

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

(51) **Int. Cl.**
H01Q 1/22 (2006.01)
H05K 7/14 (2006.01)
G06F 1/16 (2006.01)

(72) Inventors: **Kwangbok PARK**, Suwon-si (KR);
Jaeho LEE, Suwon-si (KR); **Yonghun JI**,
Suwon-si (KR)

(52) **U.S. Cl.**
CPC **H01Q 1/2266** (2013.01); **H05K 7/1427**
(2013.01); **G06F 1/1662** (2013.01)

(21) Appl. No.: **18/347,824**

(57) **ABSTRACT**

(22) Filed: **Jul. 6, 2023**

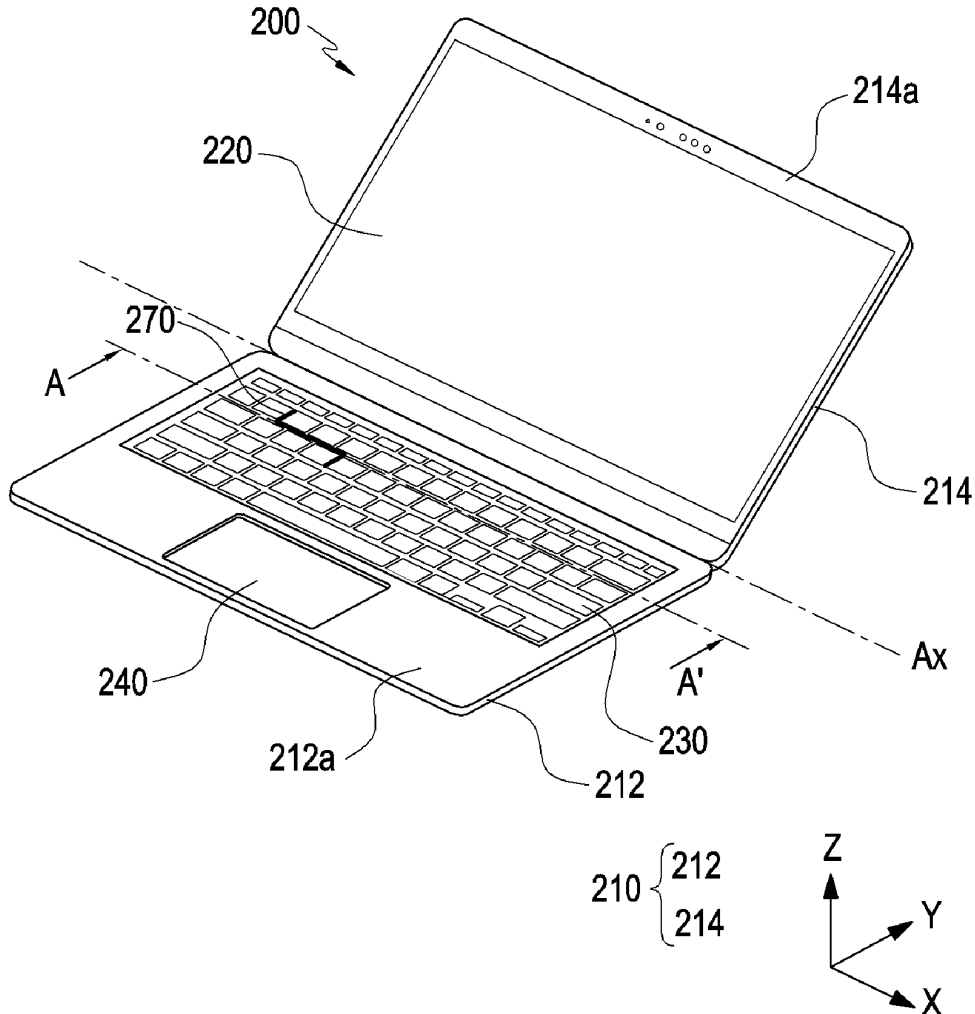
Related U.S. Application Data

(63) Continuation of application No. PCT/KR2023/
009524, filed on Jul. 5, 2023.

According to an embodiment of the disclosure, an electronic device may comprise: a housing including a conductive portion, a plurality of non-conductive portions, and a plurality of openings, a plurality of keyboard key caps exposed through the plurality of openings of the housing, an antenna, and a circuit board disposed inside the housing and electrically connected to the antenna. At least one of the plurality of openings may be defined by the conductive portion, the plurality of the non-conductive portions, and the antenna.

Foreign Application Priority Data

Jul. 7, 2022 (KR) 10-2022-0083550
Aug. 12, 2022 (KR) 10-2022-0101511





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(19) **United States**

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

(10) **Pub. No.: US 2024/0014555 A1**

(43) **Pub. Date: Jan. 11, 2024**

(54) **ANTENNA STRUCTURE AND ELECTRONIC DEVICE**

H01Q 9/04 (2006.01)

H01Q 5/307 (2006.01)

(71) Applicant: **WISTRON NEWEB CORPORATION, HSINCHU (TW)**

(52) **U.S. Cl.**
CPC *H01Q 5/10* (2015.01); *H01Q 1/48* (2013.01); *H01Q 1/2266* (2013.01); *H01Q 9/045* (2013.01); *H01Q 5/307* (2015.01)

(72) Inventors: **SHIH-CHIANG WEI, Hsinchu (TW); YUNG-CHIEH YU, Hsinchu (TW); HSIEH-CHIH LIN, Hsinchu (TW)**

(57) **ABSTRACT**

An antenna structure and an electronic device are provided. The electronic device includes a housing and the antenna structure disposed therein. The antenna structure includes a grounding element, a feeding radiation element, a feeding element and a first grounding radiation element. The feeding radiation element includes a first radiating portion, a second radiating portion and a third radiating portion. The first radiating portion and the second radiating portion jointly surround the first grounding radiation element. The first radiating portion is spaced apart from and coupled with the first grounding radiation element to generate a first operating frequency band. The second radiating portion is spaced apart from and coupled with the first grounding radiation element to generate a second operating frequency band. The first operating frequency band is lower than the second operating frequency band.

(21) Appl. No.: **18/152,833**

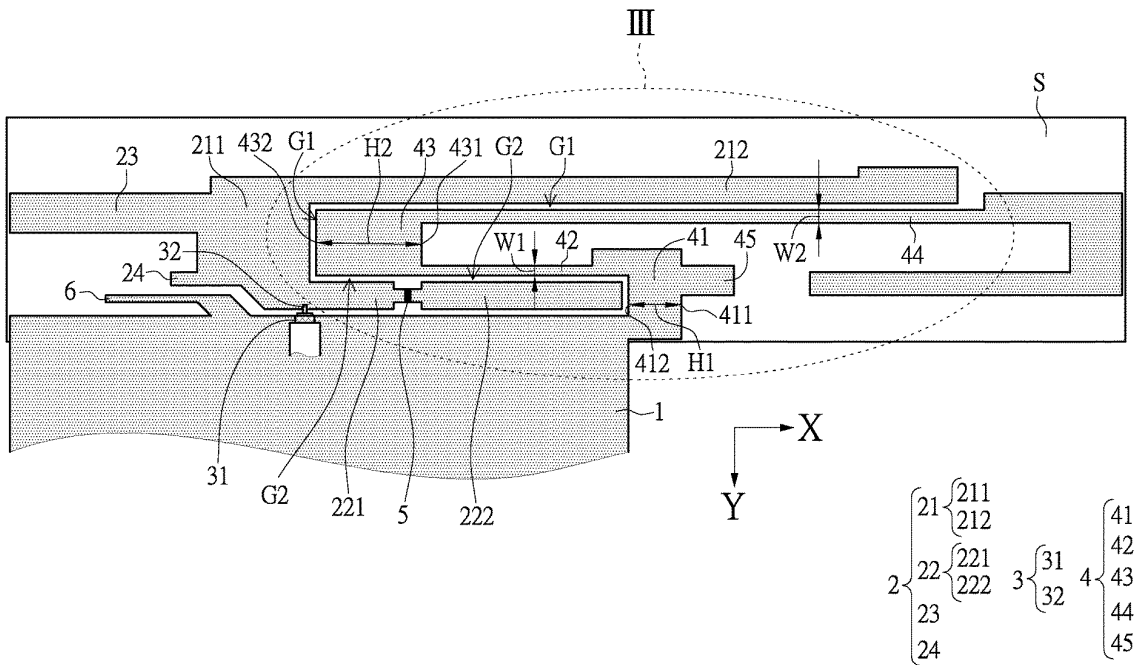
(22) Filed: **Jan. 11, 2023**

(30) **Foreign Application Priority Data**

Jul. 6, 2022 (TW) 111125249

Publication Classification

(51) **Int. Cl.**
H01Q 5/10 (2006.01)
H01Q 1/48 (2006.01)
H01Q 1/22 (2006.01)





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(19) **United States**

(12) **Patent Application Publication**
WU

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(54) **ANTENNA ASSEMBLY AND ELECTRONIC DEVICE**

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H01Q 1/24 (2006.01)

(71) Applicant: **GUANGDONG OPPO MOBILE TELECOMMUNICATIONS CORP., LTD.**, Dongguan (CN)

(52) **U.S. Cl.**
CPC *H01Q 5/10* (2015.01); *H01Q 1/48* (2013.01); *H01Q 5/328* (2015.01); *H01Q 1/243* (2013.01)

(72) Inventor: **Xiaopu WU**, Dongguan (CN)

(57) **ABSTRACT**

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An antenna assembly and an electronic device are provided in the disclosure. The antenna assembly includes a radiator, a signal source, and a tuning circuit. The radiator includes a first sub-radiator and a second sub-radiator. The first sub-radiator and the second sub-radiator define a coupling gap therebetween. The first sub-radiator is configured to be coupled to the second sub-radiator through the coupling gap. The first sub-radiator has a first grounding end, a first coupling end, and a feeding point disposed between the first grounding end and the first coupling end. The first grounding end is grounded. The second sub-radiator has a second grounding end, a second coupling end, and a tuning point disposed between the second grounding end and the second coupling end. The first coupling end is spaced apart from the second coupling end by the coupling gap, and the second grounding end is grounded.

(22) Filed: **Sep. 20, 2023**

Related U.S. Application Data

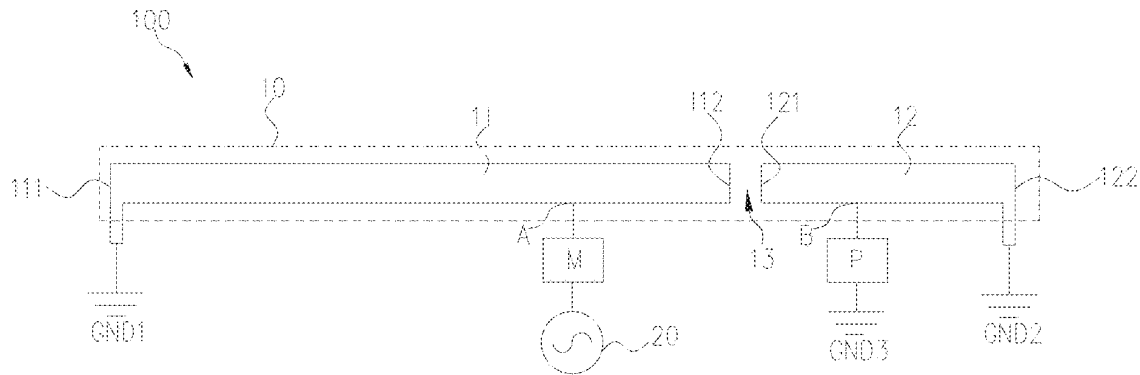
(63) Continuation of application No. PCT/CN2022/077301, filed on Feb. 22, 2022.

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(54) **ANTENNA STRUCTURE**

Publication Classification

(71) Applicant: **Wistron NeWeb Corporation**, Hsinchu (TW)

(51) **Int. Cl.**
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H01Q 21/28 (2006.01)

(72) Inventors: **Kuo Jen LAI**, Hsinchu (TW);
Chin-Lien HUANG, Hsinchu (TW)

(52) **U.S. Cl.**
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(21) Appl. No.: **18/061,010**

(57) **ABSTRACT**

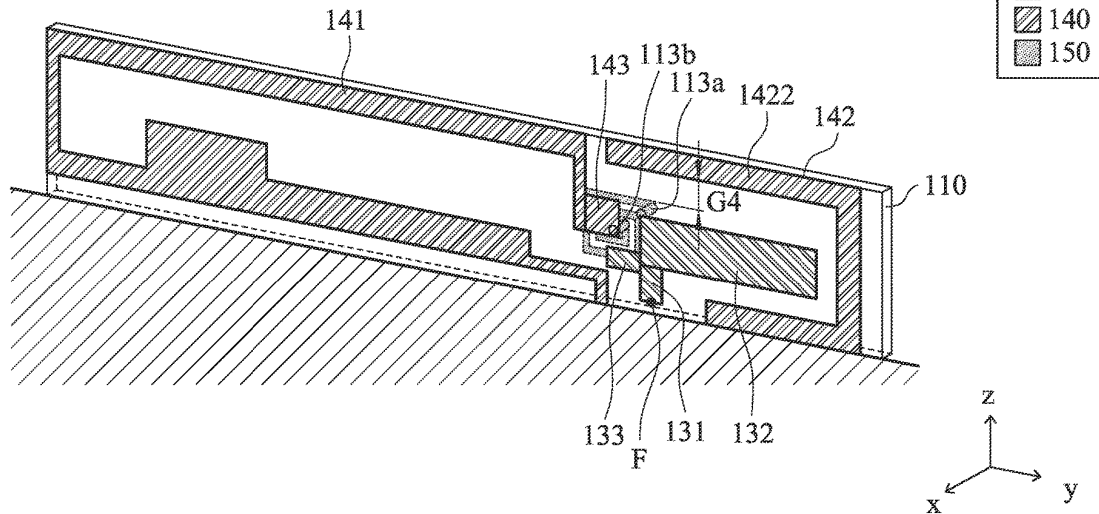
(22) Filed: **Dec. 2, 2022**

The antenna structure includes a substrate, a feeding unit, an antenna unit, and an inductive element. The ground layer is disposed on the substrate. The feeding unit is disposed on the substrate. The antenna unit is disposed on the substrate and connected to the ground layer. The feeding unit and the antenna unit are indirectly connected. One end of the inductive element is electrically connected to the feeding unit, and another end of the inductive element is electrically connected to the antenna unit.

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(54) **ANTENNA STRUCTURE AND COMMUNICATION DEVICE**

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

CPC **H01Q 9/045** (2013.01); **H01Q 1/48** (2013.01); **H01Q 21/00** (2013.01)

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

(57)

ABSTRACT

(72) Inventors: **Kuo-Jen LAI**, Hsinchu (TW);
Kuang-Yuan KU, Hsinchu (TW);
Chun-Jui PAN, Hsinchu (TW)

An antenna structure includes a dielectric substrate, a conductive frame, a first radiation element, and a second radiation element. The dielectric substrate has a first surface and a second surface which are opposite to each other. The conductive frame is disposed on the first surface of the dielectric substrate. The conductive frame has a slot region. The first radiation element is disposed on the second surface of the dielectric substrate, and is coupled to a feeding point. The second radiation element is disposed on the first surface of the dielectric substrate, and is coupled to the conductive frame. The second radiation element is adjacent to the first radiation element. The first radiation element is partially adjacent to the second radiation element on one side. The first radiation element and the second radiation element are substantially positioned inside the slot region of the conductive frame.

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