



US 20260142361A1

(19) **United States**

(12) **Patent Application Publication**
Hu

(10) **Pub. No.: US 2026/0142361 A1**

(43) **Pub. Date: May 21, 2026**

(54) **ELECTRONIC DEVICE**

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

(72) Inventor: **Wenlong Hu**, Shenzhen (CN)

(21) Appl. No.: **19/448,599**

(22) Filed: **Jan. 14, 2026**

Related U.S. Application Data

(63) Continuation of application No. PCT/CN2024/
075496, filed on Feb. 2, 2024.

(30) **Foreign Application Priority Data**

Sep. 7, 2023 (CN) 202311146409.X

Publication Classification

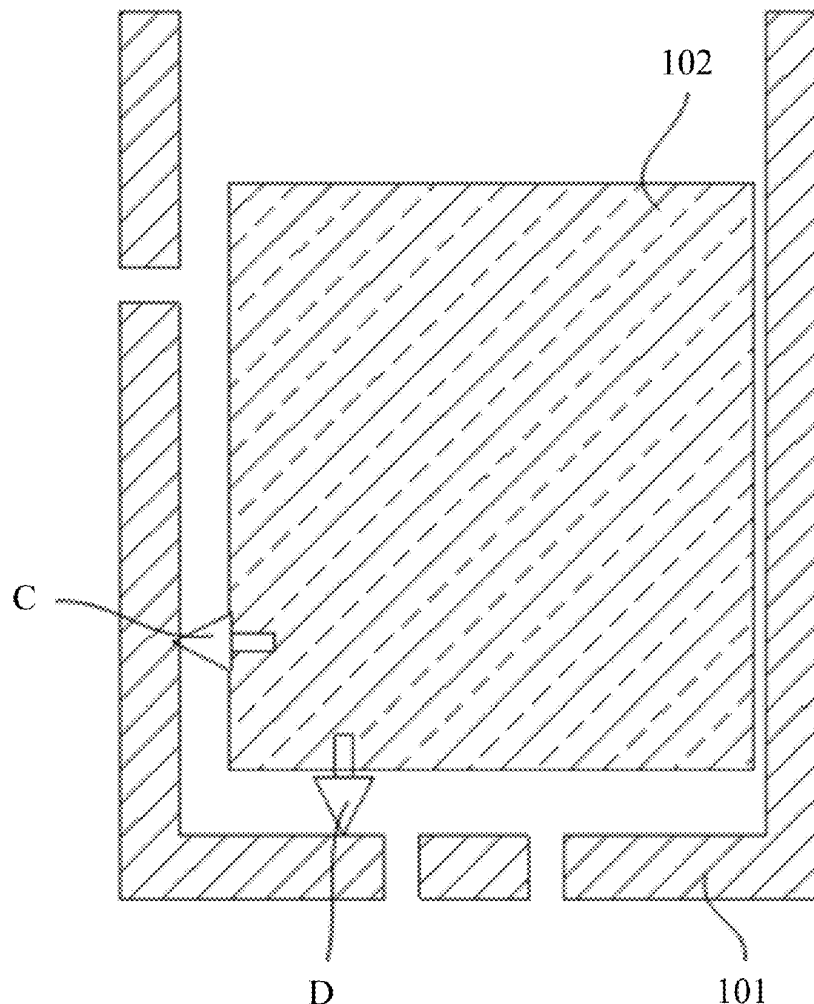
(51) **Int. Cl.**
H01Q 1/22 (2006.01)

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

CPC **H01Q 1/22** (2013.01)

(57) **ABSTRACT**

This application discloses an electronic device. The electronic device includes a metal frame antenna component, a metal component, and a tuning component. A spacing exists between the metal component and the metal frame antenna component. The tuning component includes an equivalent device region and a plurality of welding regions. The plurality of welding regions are separately located on two ends of the equivalent device region. The welding region on one end of the equivalent device region is welded to the metal frame antenna component, and the welding region on the other end of the equivalent device region is welded to the metal component. In this application, the tuning component can be directly welded to the metal frame antenna component and the metal component through the welding regions. This has a simple connection structure, occupies small space, and facilitates a compact design of the electronic device.

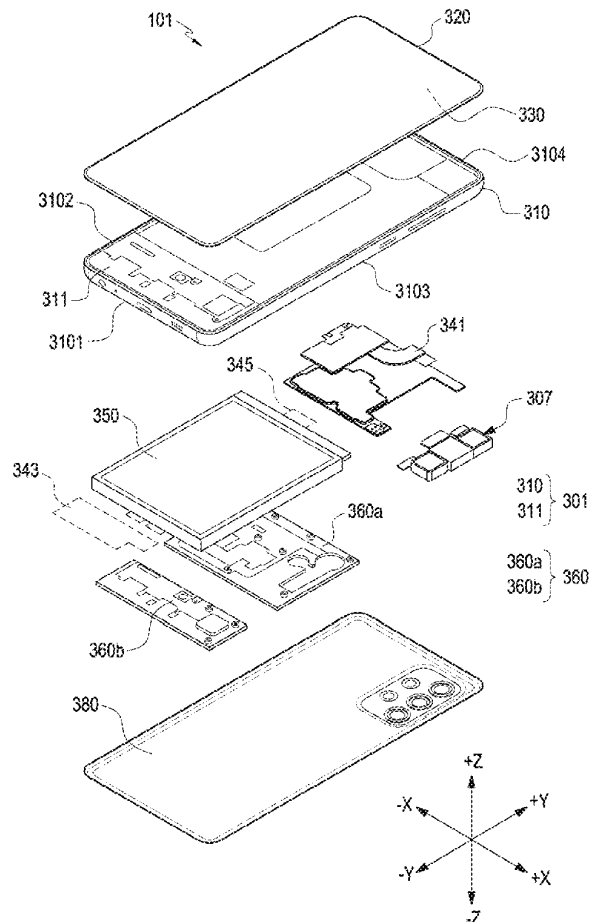




US 20260142362A1

(19) **United States**(12) **Patent Application Publication**
HWANG et al.(10) **Pub. No.: US 2026/0142362 A1**(43) **Pub. Date: May 21, 2026**(54) **ANTENNA STRUCTURE AND ELECTRONIC
DEVICE COMPRISING SAME****Publication Classification**(71) Applicant: **SAMSUNG ELECTRONICS CO.,
LTD.**, Suwon-si (KR)(51) **Int. Cl.**
H01Q 1/22 (2006.01)
H01Q 1/52 (2006.01)
H01Q 21/06 (2006.01)(72) Inventors: **Jihye HWANG**, Suwon-si (KR);
Hyeonuk KANG, Suwon-si (KR);
Soojung KIM, Suwon-si (KR); **Yunjae
HAN**, Suwon-si (KR); **Kyungjae LEE**,
Suwon-si (KR)(52) **U.S. Cl.**
CPC **H01Q 1/22** (2013.01); **H01Q 1/526**
(2013.01); **H01Q 21/065** (2013.01)(57) **ABSTRACT**

According to an embodiment of the present disclosure, an electronic device may comprise a housing, a circuit board, an antenna module, or a conductive support member. The housing may include a ground area. The antenna module may be disposed in the housing. The antenna module may be electrically connected to the circuit board. The antenna module may include a substrate or an antenna array. The antenna array may be disposed on the substrate. The conductive support member may support the antenna module. The conductive support member may include a bracket or a contact portion. The bracket may surround at least a part of the substrate. The contact portion may protrude from the bracket. The contact portion may be electrically connected to the ground area. Various other embodiments may also be possible.

(21) Appl. No.: **19/452,822**(22) Filed: **Jan. 19, 2026****Related U.S. Application Data**(63) Continuation of application No. PCT/KR2024/
007690, filed on Jun. 5, 2024.(30) **Foreign Application Priority Data**Jul. 19, 2023 (KR) 10-2023-0094068
Sep. 13, 2023 (KR) 10-2023-0121873



US 20260142363A1

(19) **United States**

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

(10) **Pub. No.: US 2026/0142363 A1**

(43) **Pub. Date: May 21, 2026**

(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)
G06F 1/16 (2006.01)
H05K 7/14 (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); **G06F 1/1662**
(2013.01); **H05K 7/1427** (2013.01)

(21) Appl. No.: **19/451,245**

(22) Filed: **Jan. 16, 2026**

(57) **ABSTRACT**

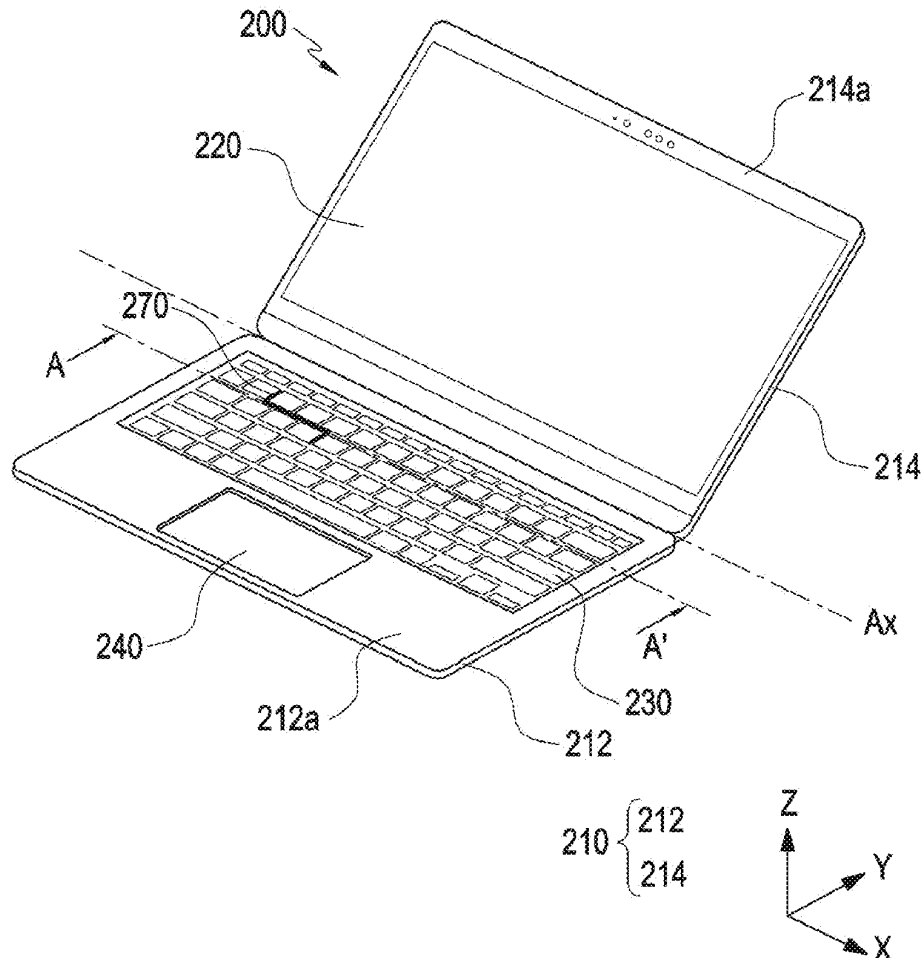
Related U.S. Application Data

(63) Continuation of application No. 18/347,824, filed on
Jul. 6, 2023, now Pat. No. 12,555,891, which is a
continuation of application No. PCT/KR2023/
009524, filed on Jul. 5, 2023.

Foreign Application Priority Data

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

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.





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(19) **United States**

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

(10) **Pub. No.: US 2026/0142365 A1**

(43) **Pub. Date: May 21, 2026**

(54) **ELECTRONIC DEVICE COMPRISING
ANTENNA**

Publication Classification

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

(51) **Int. Cl.**
H01Q 1/24 (2006.01)
H01Q 21/28 (2006.01)

(72) Inventors: **Seyeon LEE**, Suwon-si (KR); **Haeyeon
KIM**, Suwon-si (KR); **Jinkyung KIM**,
Suwon-si (KR); **Jongoh LIM**, Suwon-si
(KR); **Kyueun JUNG**, Suwon-si (KR)

(52) **U.S. Cl.**
CPC **H01Q 1/243** (2013.01); **H01Q 21/28**
(2013.01)

(21) Appl. No.: **19/451,886**

(57) **ABSTRACT**

(22) Filed: **Jan. 16, 2026**

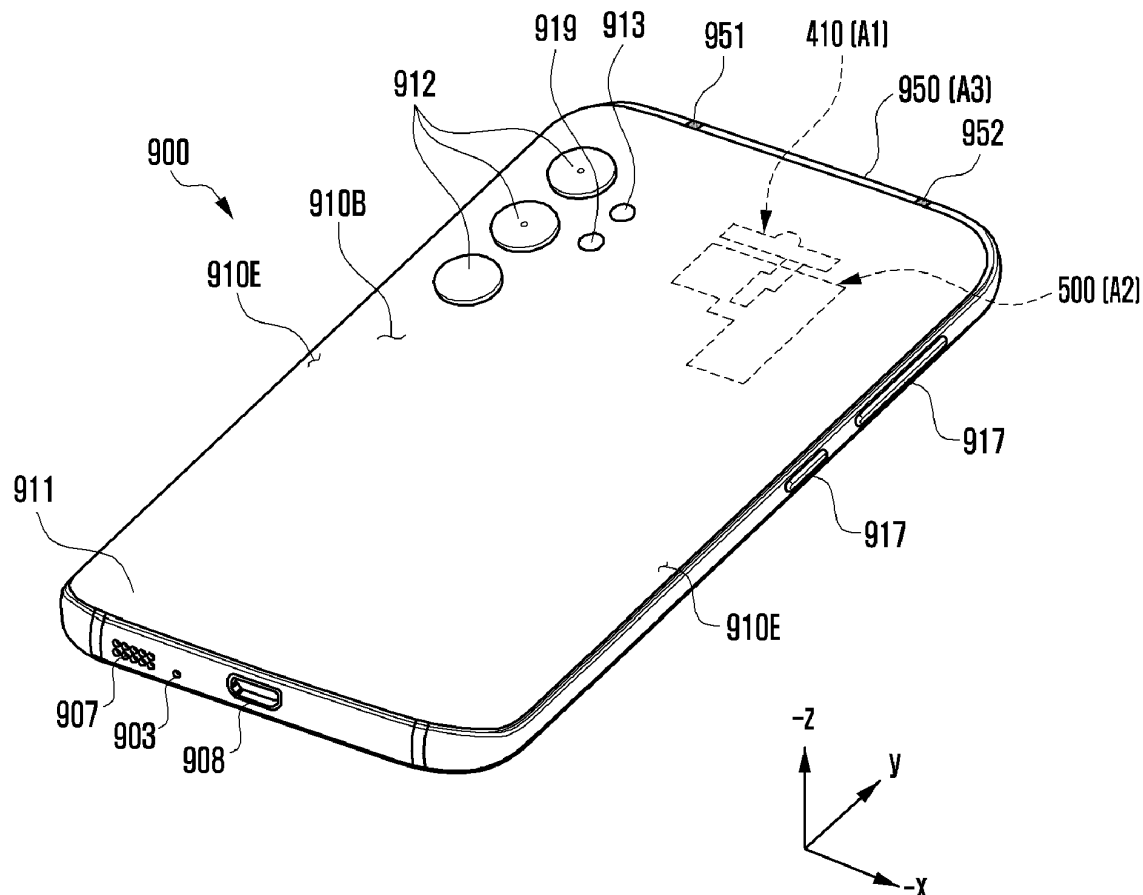
An electronic device comprises a housing and a dielectric structure disposed in an inner space of the housing and including a first surface and a second surface opposite to the first surface. A first antenna structure is disposed in the dielectric structure. A second antenna structure is arranged at the first surface to be spaced apart from a part of the first antenna structure and includes a conductive layer. A wireless communication circuit transmits or receives a signal in at least one frequency band through the first antenna structure and/or the second antenna structure. The first antenna structure comprises a first conductive pattern at the first surface to be spaced apart from the second antenna structure, and a second conductive pattern electrically connected to the first conductive pattern and arranged at the second surface to at least partially overlap the conductive layer when the first surface is seen from above.

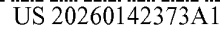
Related U.S. Application Data

(63) Continuation of application No. PCT/KR2024/
010159, filed on Jul. 16, 2024.

(30) **Foreign Application Priority Data**

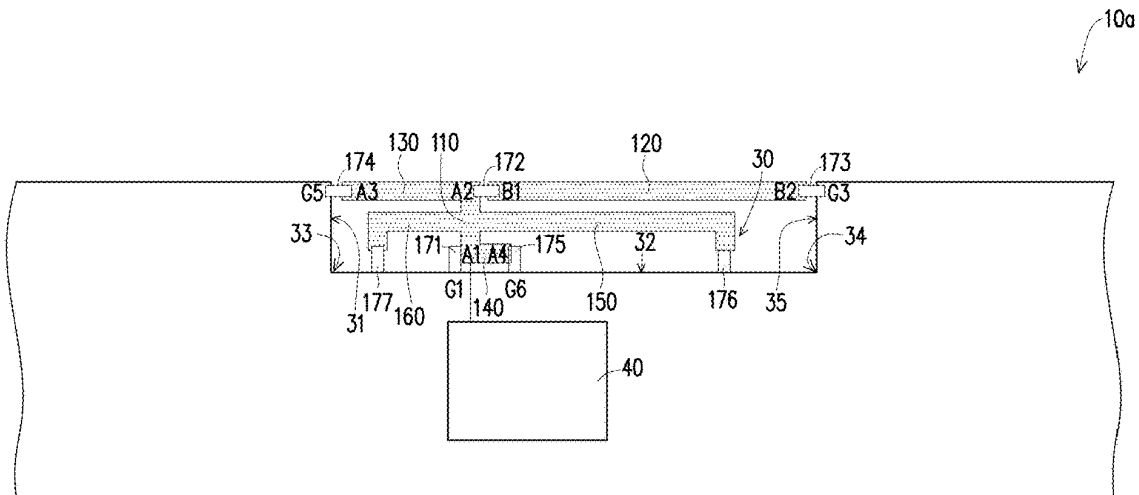
Jul. 19, 2023 (KR) 10-2023-0093744
Oct. 17, 2023 (KR) 10-2023-0138283





(43) **Pub. Date:** **May 21, 2026**

Nov. 21, 2024 (TW) 113144907





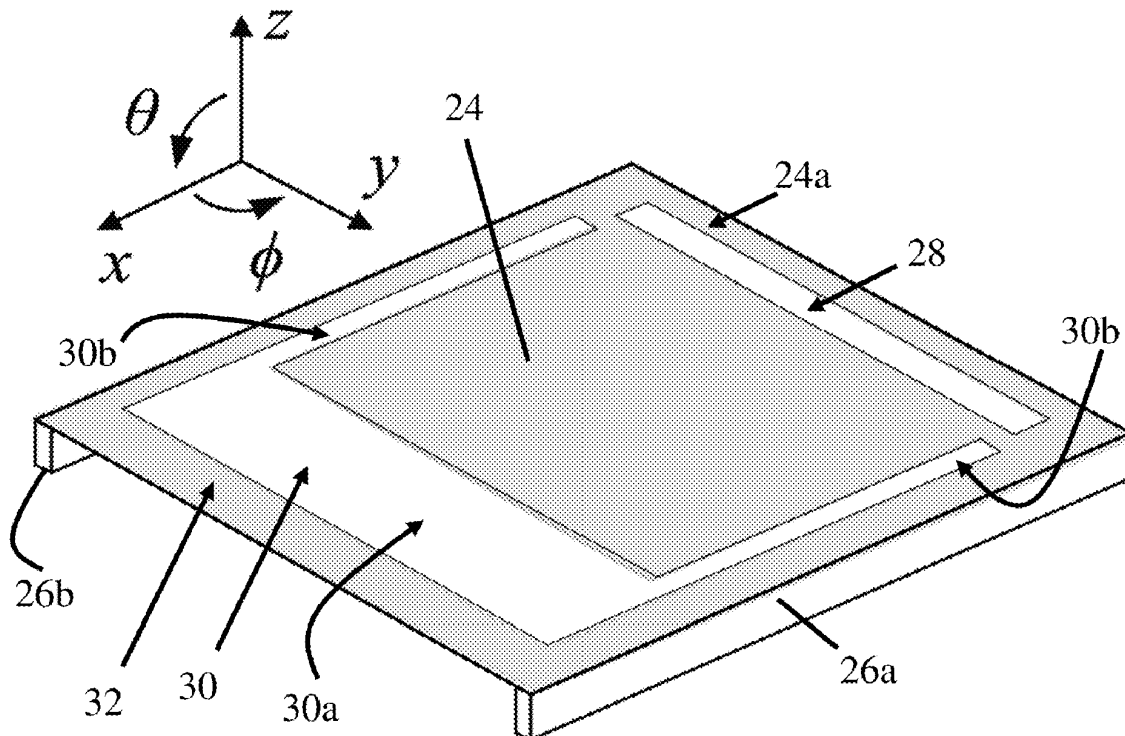
US 20260142377A1

(19) **United States**(12) **Patent Application Publication**
LEUNG et al.(10) **Pub. No.: US 2026/0142377 A1**(43) **Pub. Date: May 21, 2026**(54) **COMPACT RADIATION PATTERN
DECOUPLING DESIGN OF
TWO-DIMENSIONAL MIMO MICROSTRIP
ANTENNAS****Publication Classification**(51) **Int. Cl.**
H01Q 9/04

(2006.01)

(52) **U.S. Cl.**CPC **H01Q 9/0421** (2013.01)(71) Applicant: **City University of Hong Kong,**
Kowloon (HK)(72) Inventors: **Kwok Wa LEUNG**, Kowloon Tong
(HK); **Guang Yao LIU**, Kowloon Tong
(HK); **Nan YANG**, Guangzhou (CN)(73) Assignee: **City University of Hong Kong,**
Kowloon (HK)(21) Appl. No.: **18/953,944**(22) Filed: **Nov. 20, 2024**(57) **ABSTRACT**

A microstrip antenna which includes a substrate, a microstrip patch configured on a first side of the substrate, a ground configured on a second side of the substrate which is opposite to the first side, and a first shorting wall extending from a side of the microstrip patch toward the ground. The first shorting wall substantially overlaps with the substrate on a direction that is perpendicular to the microstrip patch. The first shorting wall is located at a first non-radiating edge of the microstrip antenna. Dummy elements are no longer needed in this design, which makes it compact.





US 20260149164A1

(19) **United States**(12) **Patent Application Publication**
LI et al.(10) **Pub. No.: US 2026/0149164 A1**(43) **Pub. Date: May 28, 2026**(54) **ANTENNA ASSEMBLY AND ELECTRONIC
DEVICE**(71) Applicant: **GUANGDONG OPPO MOBILE
TELECOMMUNICATIONS CORP.,
LTD.**, Dongguan (CN)(72) Inventors: **Zongshang LI**, Dongguan (CN);
Huanhong LIU, Dongguan (CN)(21) Appl. No.: **19/402,311**(22) Filed: **Nov. 26, 2025**(30) **Foreign Application Priority Data**

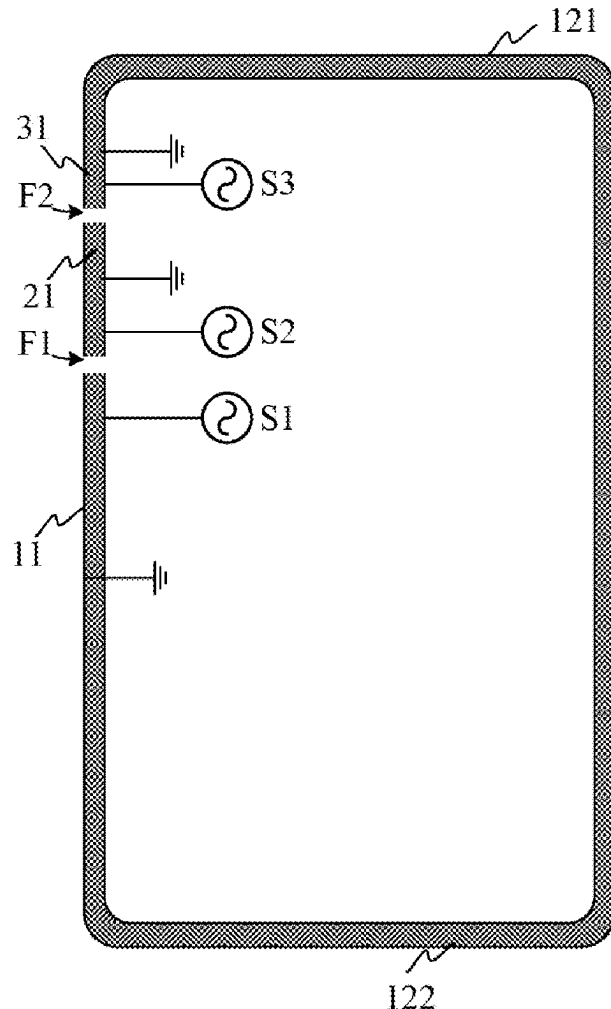
Nov. 26, 2024 (CN) 202411711243.6

Publication Classification(51) **Int. Cl.**
H01Q 1/22 (2006.01)
H01Q 5/30 (2015.01)
H01Q 5/378 (2015.01)
H01Q 21/28 (2006.01)(52) **U.S. Cl.**CPC **H01Q 1/22** (2013.01); **H01Q 5/30**
(2015.01); **H01Q 5/378** (2015.01); **H01Q**
21/28 (2013.01)

(57)

ABSTRACT

Provided are an antenna assembly and an electronic device. The antenna assembly includes a first antenna, a second antenna, and a third antenna. Each of the first, second and third antennas includes a radiator and a feed source. The radiators of the first and second antennas are coupled through a first gap therebetween, and the radiators of the second and third antennas are coupled through a second gap therebetween. The radiator of the first antenna is excited to support first and second frequency bands. The radiator of the second antenna is excited to support third and fourth frequency bands, and the radiators of the first and second antennas may be excited to jointly support the third and fourth frequency bands. The radiator of the third antenna and part of the radiator of the second antenna are excited to support the second frequency band and a WiFi 5G frequency band.





US 20260149169A1

(19) **United States**(12) **Patent Application Publication**
MATSUE et al.(10) **Pub. No.: US 2026/0149169 A1**(43) **Pub. Date: May 28, 2026**(54) **ELECTRONIC TIMEPIECE AND
ELECTRONIC DEVICE**(71) Applicant: **CASIO COMPUTER CO., LTD.**,
Tokyo (JP)(72) Inventors: **Takeshi MATSUE**, Tokyo (JP);
Nobuharu ASO, Tokyo (JP); **Kazu
HASEGAWA**, Tokyo (JP)(73) Assignee: **CASIO COMPUTER CO., LTD.**,
Tokyo (JP)(21) Appl. No.: **19/377,072**(22) Filed: **Nov. 3, 2025**(30) **Foreign Application Priority Data**

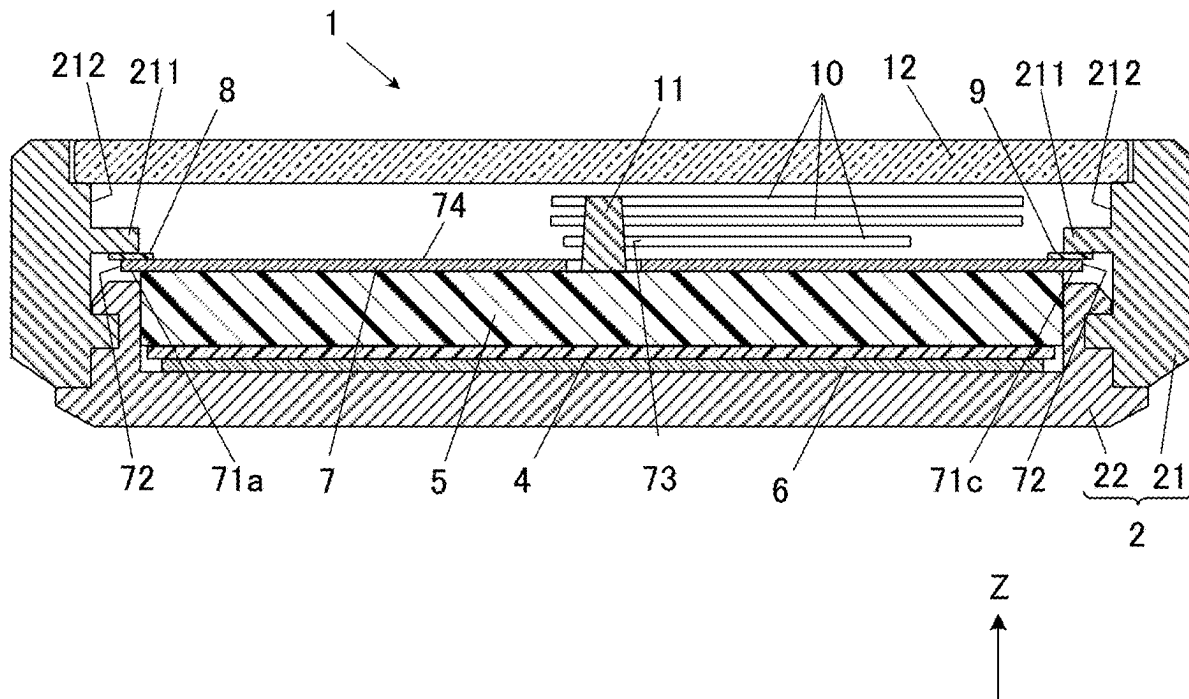
Nov. 22, 2024 (JP) 2024-203591

Publication Classification(51) **Int. Cl.****H01Q 1/27** (2006.01)**G04G 17/04** (2006.01)(52) **U.S. Cl.**CPC **H01Q 1/273** (2013.01); **G04G 17/04**
(2013.01)

(57)

ABSTRACT

An electronic timepiece includes, a substrate; an antenna provided on the substrate; a metal plate-shaped member; and a case that includes a metal sidewall facing an end face of the plate-shaped member and that stores the substrate and the plate-shaped member. The plate-shaped member is electrically connected to the side wall of the case. A gap is provided between a portion of the plate-shaped member and the side wall.





US 20260149184A1

(19) **United States**

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

(10) **Pub. No.: US 2026/0149184 A1**

(43) **Pub. Date: May 28, 2026**

(54) **PRINTED HIGH-ISOLATION MULTI-FEED ANTENNA**

Publication Classification

(71) Applicant: **Intel Corporation**, Santa Clara, CA (US)

(51) **Int. Cl.**

H01Q 13/10 (2006.01)

H01Q 5/40 (2015.01)

H01Q 9/30 (2006.01)

(72) Inventors: **Seong-Youp John SUH**, Portland, OR (US); **Tae Young YANG**, Portland, OR (US); **Oren Ezra AVRAHAM**, Givat Shmuel (IL); **Ofir DEGANI**, Haifa (IL); **Bryce D. HORINE**, Portland, OR (US); **Harry SKINNER**, Beaverton, OR (US); **Walid EL HAJJ**, Antibes (FR); **Serge DAO**, Vallauris (FR); **Jayprakash THAKUR**, Bangalore (IN); **Richard PERRY**, Portland, OR (US); **Ronen KRONFELD**, Shoham (IL)

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

CPC **H01Q 13/10** (2013.01); **H01Q 5/40** (2015.01); **H01Q 9/30** (2013.01)

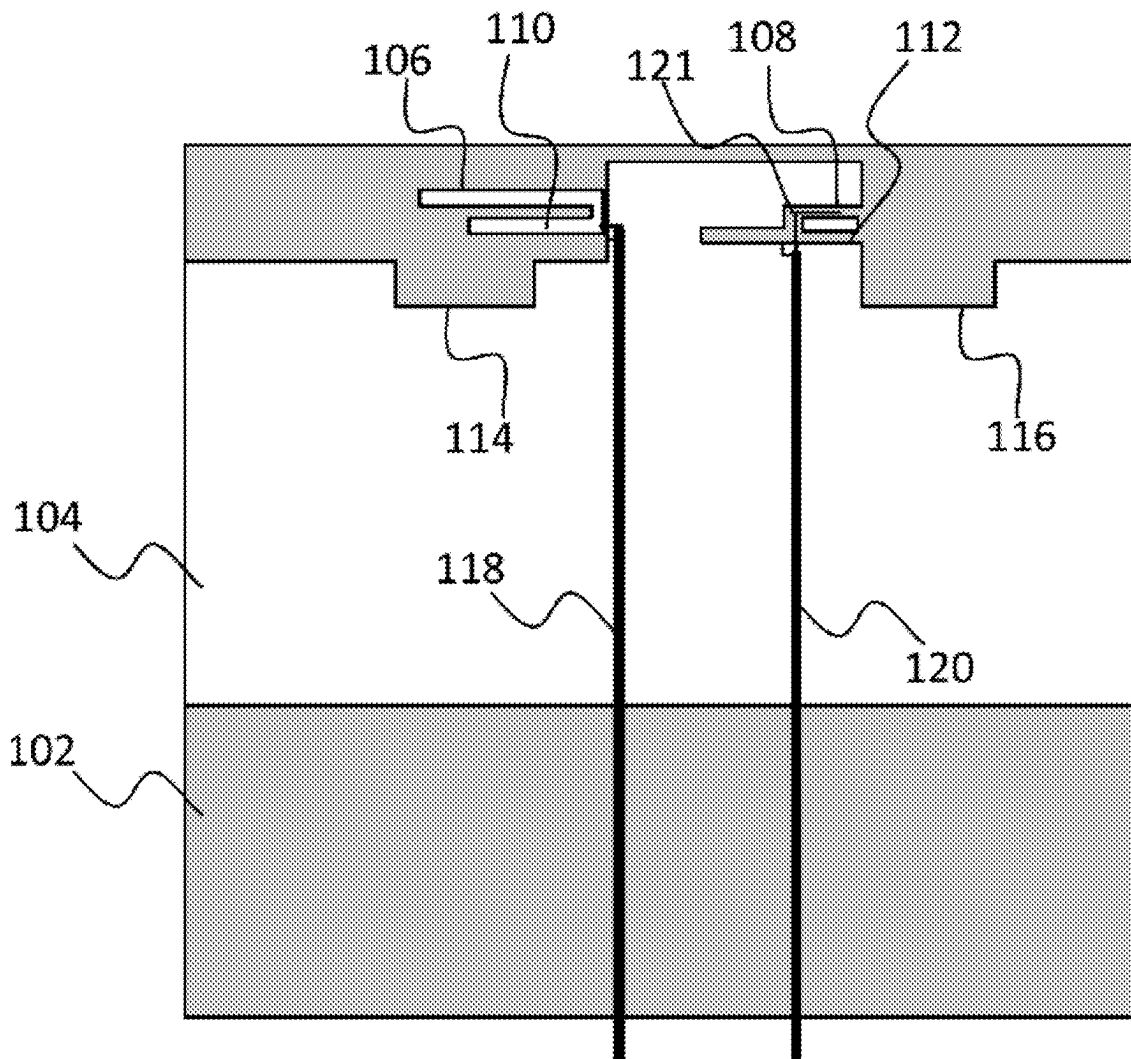
(21) Appl. No.: **18/956,041**

(22) Filed: **Nov. 22, 2024**

(57)

ABSTRACT

A multi-feed antenna device includes a monopole antenna, having an antenna portion; a first antenna extension of a first length, extending from the antenna portion; a second antenna extension of a second length, less than the first length, extending from the antenna portion; a slot antenna, including a first slot of third length; a second slot of a fourth length, greater than the third length; a first antenna feed, coupled to the monopole antenna; a second antenna feed, coupled to the slot antenna; and a ground plane, common to both the monopole antenna and the slot antenna.





US 20260163227A1

(19) **United States**

(12) **Patent Application Publication**

Liao et al.

(10) **Pub. No.: US 2026/0163227 A1**

(43) **Pub. Date: Jun. 11, 2026**

(54) **ELECTRONIC DEVICE**

(71) Applicant: **PEGATRON CORPORATION,**
TAIPEI CITY (TW)

(72) Inventors: **Chih-Wei Liao**, Taipei City (TW);
Hao-Hsiang Yang, Taipei City (TW);
Chao-Hsu Wu, Taipei City (TW);
Shih-Keng Huang, Taipei City (TW);
Sheng-Chin Hsu, Taipei City (TW)

(73) Assignee: **PEGATRON CORPORATION,**
TAIPEI CITY (TW)

(21) Appl. No.: **19/329,471**

(22) Filed: **Sep. 15, 2025**

(30) **Foreign Application Priority Data**

Dec. 11, 2024 (TW) 113148268

Publication Classification

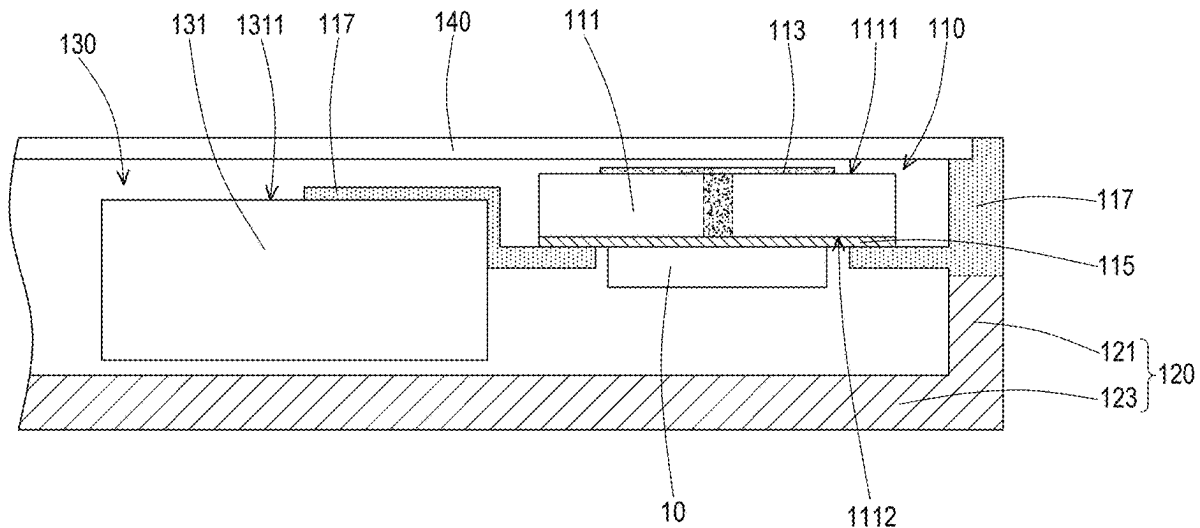
(51) **Int. Cl.**
H01Q 1/22 (2006.01)
H01Q 1/48 (2006.01)
H01Q 9/04 (2006.01)

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

CPC **H01Q 1/2266** (2013.01); **H01Q 1/48**
(2013.01); **H01Q 9/0407** (2013.01)

(57) **ABSTRACT**

An electronic device includes an antenna module and a metal casing. The antenna module is disposed in the metal casing, is adapted to resonate at a frequency band, and includes an insulating base plate, two patch antennas, a grounding surface, and two grounding extension segments. The insulating base plate includes a first surface and a second surface opposite to each other. The patch antennas are disposed on the first surface, arranged side by side, and spaced apart along a first direction. Each patch antenna includes a central axis, a feeding end, and a center point. The feeding end is located on the central axis and deviates from the center point. A distance between the center points of the patch antennas is less than or equal to 0.5 times a wavelength of the frequency band. The grounding extension segments are connected to the grounding surface disposed on the second surface.





(19) **United States**
(12) **Patent Application Publication** (10) **Pub. No.: US 2026/0163250 A1**
Pan et al. (43) **Pub. Date: Jun. 11, 2026**

(54) **ANTENNA ELEMENT, ANTENNA, AND COMMUNICATION DEVICE**

Publication Classification

(71) Applicant: **HUAWEI TECHNOLOGIES CO., LTD.**, Shenzhen (CN)

(51) **Int. Cl.**
H01Q 15/24 (2006.01)
H01Q 1/24 (2006.01)
H01Q 9/44 (2006.01)
(52) **U.S. Cl.**
CPC *H01Q 15/24* (2013.01); *H01Q 1/246* (2013.01); *H01Q 9/44* (2013.01)

(72) Inventors: **Lijun Pan**, Dongguan (CN); **Wenhui Deng**, Dongguan (CN); **Weihong Xiao**, Dongguan (CN); **Xiaogang Xue**, Dongguan (CN); **Jianrong Li**, Shenzhen (CN)

(73) Assignee: **HUAWEI TECHNOLOGIES CO., LTD.**, Shenzhen (CN)

(21) Appl. No.: **19/465,319**

(22) Filed: **Jan. 30, 2026**

Related U.S. Application Data

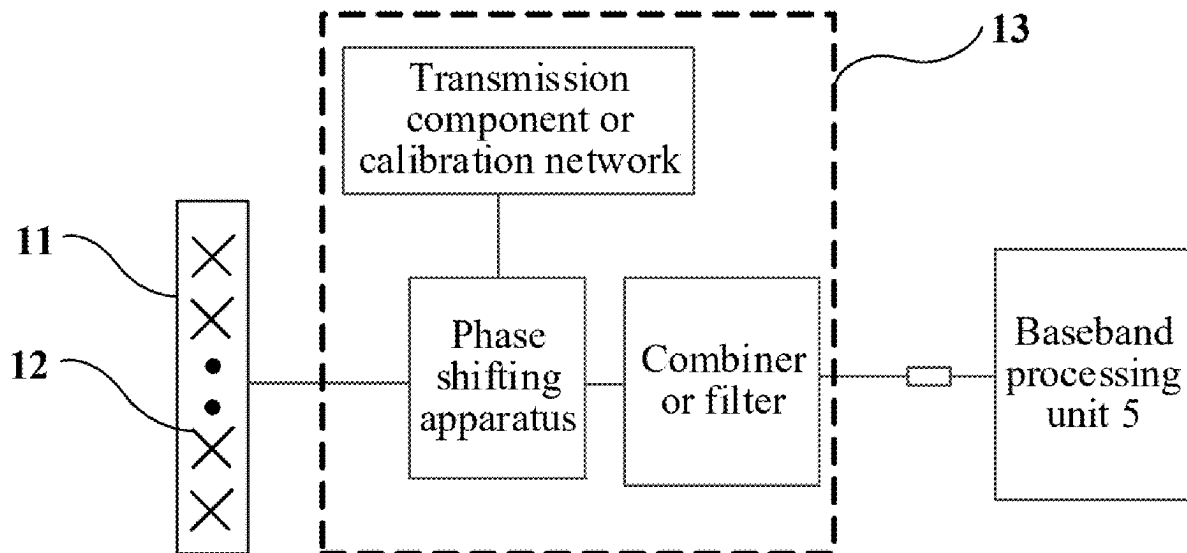
(63) Continuation of application No. PCT/CN2024/108585, filed on Jul. 30, 2024.

Foreign Application Priority Data

Jul. 31, 2023 (CN) 202310961619.8

(57) **ABSTRACT**

Embodiments of this application provide an antenna element which includes four radiators and four feed structures. The feed structure is connected to the radiator, and is configured to feed the radiator. The radiator includes a first transmission line, a first radiation arm, a second radiation arm, and a second transmission line that are sequentially connected, where the first transmission line and the second transmission line are respectively connected to the feed structures. The four radiators are respectively a first radiator, a second radiator, a third radiator, and a fourth radiator, where the first radiator and the second radiator radiate signals in a first polarization direction, and the third radiator and the fourth radiator radiate signals in a second polarization direction, to form a dual-polarized antenna element. The feed structure is a one-to-two feed structure, and two radiators are connected in parallel and connected to a same feed structure.





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(19) **United States**

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

(10) **Pub. No.: US 2026/0163251 A1**

(43) **Pub. Date: Jun. 11, 2026**

(54) **ANTENNA ELEMENT, ANTENNA, AND COMMUNICATION DEVICE**

Publication Classification

(71) Applicant: **HUAWEI TECHNOLOGIES CO., LTD.**, Shenzhen (CN)

(72) Inventors: **Zijing Du**, Xi'an (CN); **Jun Shu**, Dongguan (CN); **Dingjiu Daojian**, Dongguan (CN); **Jie Yao**, Dongguan (CN); **Jionsai Zhou**, Shenzhen (CN)

(73) Assignee: **HUAWEI TECHNOLOGIES CO., LTD.**, Shenzhen (CN)

(21) Appl. No.: **19/463,798**

(22) Filed: **Jan. 29, 2026**

Related U.S. Application Data

(63) Continuation of application No. PCT/CN2024/106156, filed on Jul. 18, 2024.

Foreign Application Priority Data

Jul. 31, 2023 (CN) 202310947784.8

(51) **Int. Cl.**

H01Q 19/10 (2006.01)

H01Q 1/24 (2006.01)

H01Q 5/30 (2015.01)

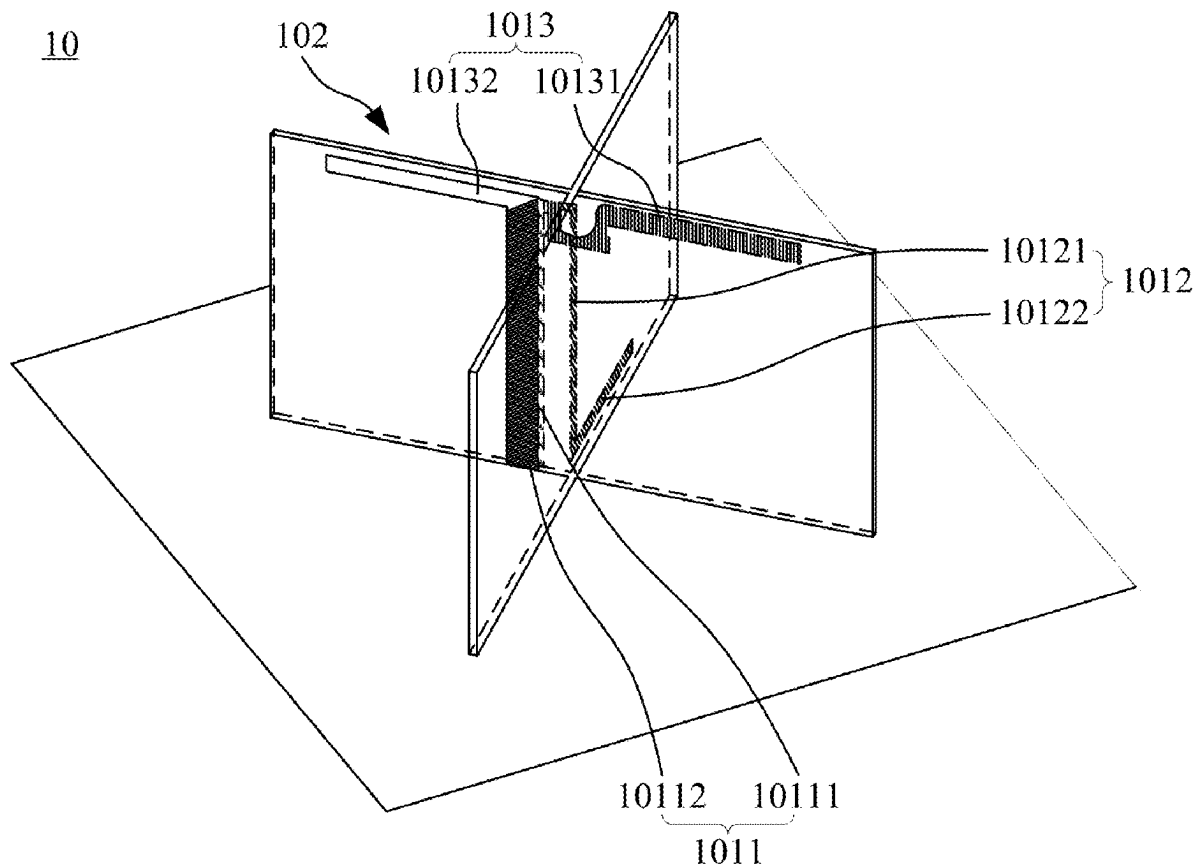
(52) **U.S. Cl.**

CPC **H01Q 19/10** (2013.01); **H01Q 1/246** (2013.01); **H01Q 5/30** (2015.01)

(57)

ABSTRACT

An antenna element, an antenna, and a communication device are provided. The antenna element includes a radiation arm, a feed line, and a decoupling stub, wherein the radiation arm is connected to the feed line. The decoupling stub includes a first stub and a second stub, the first stub is parallel to the feed line, and an end of the first stub is connected to the feed line. The second stub is located on a first side of the first stub away from the radiation arm, the second stub is connected to the first stub, the second stub extends from the first stub to a second side away from the feed line, and the second stub is perpendicular to the feed line.





US 20260163253A1

(19) **United States**

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

(10) **Pub. No.: US 2026/0163253 A1**

(43) **Pub. Date: Jun. 11, 2026**

(54) **ANTENNA AND ELECTRONIC DEVICE**

H01Q 9/04 (2006.01)

H01Q 15/00 (2006.01)

(71) Applicant: **Huawei Technologies Co., Ltd.**,
Shenzhen (CN)

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

CPC **H01Q 21/28** (2013.01); **H01Q 5/35**
(2015.01); **H01Q 9/0407** (2013.01); **H01Q**
15/0086 (2013.01)

(72) Inventors: **Meng Xue**, Xi'an (CN); **Zhengyuan**
Hu, Xi'an (CN); **Chengcheng Nie**,
Xi'an (CN); **Qian Zhang**, Xi'an (CN)

(21) Appl. No.: **19/425,345**

(22) Filed: **Dec. 18, 2025**

Related U.S. Application Data

(63) Continuation of application No. PCT/CN2024/
096100, filed on May 29, 2024.

(30) **Foreign Application Priority Data**

Aug. 24, 2023 (CN) 202311076486.2

Publication Classification

(51) **Int. Cl.**

H01Q 21/28 (2006.01)

H01Q 5/35 (2015.01)

(57)

ABSTRACT

In accordance with an embodiment an antenna that includes a conductive plate and at least three antenna structures. The conductive plate includes two plate parts disposed at a first included angle that is less than 180°. Each antenna structure is located on a side of the conductive plate away from the first included angle. Each antenna structure includes a first radiation part and a second radiation part, each radiation part is electrically connected to a plate part, and there is a gap between the two radiation parts. Two of the at least three antenna structures are arranged in a first direction, and two of the at least three antenna structures are arranged in a second direction. The first direction and the second direction are set at a specified included angle. The second radiation parts of the at least three antenna structures are located on a same side of a second plate part.

