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The Director

of the United States Patent and Trademark Office has received an application for a patent for a new and useful invention. The title and description of the invention are enclosed. The requirements of law have been complied with, and it has been determined that a patent on the invention shall be granted under the law.

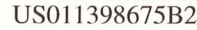
Therefore, this United States

Patent

grants to the person(s) having title to this patent the right to exclude others from making, using, offering for sale, or selling the invention throughout the United States of America or importing the invention into the United States of America, and if the invention is a process, of the right to exclude others from using, offering for sale or selling throughout the United States of America, products made by that process, for the term set forth in 35 U.S.C. 154(a)(2) or (c)(1), subject to the payment of maintenance fees as provided by 35 U.S.C. 41(b). See the Maintenance Fee Notice on the inside of the cover.

Katherine Kelly Vidal

DIRECTOR OF THE UNITED STATES PATENT AND TRADEMARK OFFICE



(10) **Patent No.:** US 11,398,675 B2
(45) **Date of Patent:** Jul. 26, 2022

- (56)
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- Primary Examiner — Tho G Phan

- (74) *Attorney, Agent, or Firm* — Ipsilon USA, LLP

- (57) **ABSTRACT**

- (2) Date: **Mar. 9, 2020**

- The present invention relates to a feed-motion antenna device. Provided is an antenna for receiving data from low Earth orbit satellites, the antenna comprising a fixedly mounted antenna reflector, a moveable feed, a feed positioner configured to move the feed in the focal plane of the antenna reflector, the feed positioned having a primary rotation axis and an auxiliary rotation axis, and a control device configured to send control signals to the feed positioner. The primary rotation axis of the feed positioner passes through the center of the antenna reflector and the primary rotation axis is perpendicular to the focal plane of the antenna reflector; the auxiliary rotation axis of the feed positioner is parallel to the primary rotation axis. The feed positioner comprises an equal-arm structure comprising a first arm and a second arm, and each arm is arranged in a plane perpendicular to the primary and auxiliary rotation axes. The first arm is connected at one its end to the primary rotation axis and adapted to be rotated around the primary rotation axis, the feed is connected to an end of the second arm, and the first arm and the second arm are connected to each other at the auxiliary rotation axis and are adapted to be rotated with respect to each other. The diameter of the

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- (65) **Prior Publication Data**

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- H01Q* 3/18 (2006.01)

- CPC
- H01Q*
- 3/18 (2013.01)

- (58) **Field of Classification Search**
CPC H01Q 15/14; H01Q 1/12; H01Q 3/12;
H01Q 3/14; H01Q 3/18; H01Q 19/10
See application file for complete search history.

