



US 20230231643A1

(19) **United States**

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

(10) **Pub. No.: US 2023/0231643 A1**

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

(54) **OPTICAL SIGNAL TRANSMITTING
DEVICE, OPTICAL SIGNAL RECEIVING
DEVICE, AND OPTICAL SIGNAL
TRANSMISSION SYSTEM**

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

(72) Inventors: **Yue Wen**, Shenzhen (CN); **Wendou
Zhang**, Shenzhen (CN)

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

(21) Appl. No.: **18/189,212**

(22) Filed: **Mar. 24, 2023**

Related U.S. Application Data

(63) Continuation of application No. PCT/CN2021/
115252, filed on Aug. 30, 2021.

(30) **Foreign Application Priority Data**

Sep. 25, 2020 (CN) 202011027437.6

Publication Classification

(51) **Int. Cl.**
H04J 14/04 (2006.01)
H04B 10/50 (2006.01)
H04J 14/02 (2006.01)
(52) **U.S. Cl.**
CPC **H04J 14/04** (2013.01); **H04B 10/503**
(2013.01); **H04J 14/02** (2013.01)

(57) **ABSTRACT**

An optical signal transmitting device comprises an optical transmitter and a mode converter. The optical transmitter transmits a multi-path transmitted initial optical signal to the mode converter, wherein the initial optical signal comprises a first optical signal and a second optical signal both having a first wavelength, and a third optical signal having a second wavelength different from first wavelength. The mode converter is configured to perform phase conversion on the incident initial optical signal to obtain and reflect a first target optical signal, which is single-path transmitted and comprises the third optical signal, the first optical signal transmitted in a first mode, and the second optical signal transmitted in a second mode different from the first mode.

Two-dimensional
optical fiber array

