

# (19) United States

## (12) Patent Application Publication (10) Pub. No.: US 2024/0213011 A1 ZHANG et al.

Jun. 27, 2024 (43) **Pub. Date:** 

### (54) ION SOURCE APPARATUS AND MASS **SPECTROMETER**

(71) Applicant: SHIMADZU CORPORATION,

Kyoto-shi (JP)

Inventors: Xiaoqiang ZHANG, Shanghai (CN);

Zhi Geng, Shanghai (CN); Wenjian

Sun, Shanghai (CN)

(73) Assignee: SHIMADZU CORPORATION,

Kyoto-shi (JP)

- (21)Appl. No.: 18/508,669
- (22)Filed: Nov. 14, 2023
- (30)Foreign Application Priority Data

Dec. 23, 2022 (CN) ...... 202211666688.8

### **Publication Classification**

(51) Int. Cl.

H01J 49/06 (2006.01)H01J 49/24 (2006.01)

U.S. Cl.

CPC ..... H01J 49/063 (2013.01); H01J 49/24

(2013.01)

#### (57)**ABSTRACT**

The technical solution of the present disclosure provides an ion source apparatus and a mass spectrometer. According to the ion source apparatus, the axial ion guide assembly includes the plurality of multipole segments extending axially, the transmission path of axial ions is straight, and the ion transmission efficiency is substantially unaffected when the axial ion source is used alone. Further, since the ion outlet of the lateral ion guide assembly faces a gap between two adjacent segmented multipoles, the lateral ion guide assembly does not affect axial field, thereby integrating the multiple ion sources while ensuring the ion transmission efficiency and ion constraining of the axial ion source.

