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QI et al.(10) **Pub. No.: US 2023/0232167 A1**(43) **Pub. Date: Jul. 20, 2023**(54) **SYSTEMS AND METHODS FOR
SUPPRESSING SOUND LEAKAGE**(71) Applicant: **SHENZHEN SHOKZ CO., LTD.**,
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Shenzhen (CN)(21) Appl. No.: **18/187,693**(22) Filed: **Mar. 22, 2023****Related U.S. Application Data**

(63) Continuation of application No. 17/807,154, filed on Jun. 16, 2022, now Pat. No. 11,632,637, which is a continuation of application No. 17/170,913, filed on Feb. 9, 2021, now Pat. No. 11,368,800, which is a continuation-in-part of application No. 17/074,762, filed on Oct. 20, 2020, now Pat. No. 11,197,106, which is a continuation-in-part of application No. 16/813,915, filed on Mar. 10, 2020, now Pat. No. 10,848,878, which is a continuation of application No. 16/419,049, filed on May 22, 2019, now Pat. No. 10,616,696, which is a continuation of application No. 16/180,020, filed on Nov. 5, 2018, now Pat. No. 10,334,372, which is a continuation of application No. 15/650,909, filed on Jul. 16, 2017, now Pat. No. 10,149,071, which is a continuation of application No. 15/109,831, filed on Jul. 6, 2016, now Pat. No.

9,729,978, filed as application No. PCT/CN2014/094065 on Dec. 17, 2014, said application No. 17/170,913 is a continuation-in-part of application No. 16/833,839, filed on Mar. 30, 2020, now Pat. No. 11,399,245, which is a continuation of application No. 15/752,452, filed on Feb. 13, 2018, now Pat. No. 10,609,496, filed as application No. PCT/CN2015/086907 on Aug. 13, 2015.

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(57)

ABSTRACT

A speaker comprises a housing, a transducer residing inside the housing, and at least one sound guiding hole located on the housing. The transducer generates vibrations. The vibrations produce a sound wave inside the housing and cause a leaked sound wave spreading outside the housing from a portion of the housing. The at least one sound guiding hole guides the sound wave inside the housing through the at least one sound guiding hole to an outside of the housing. The guided sound wave interferes with the leaked sound wave in a target region. The interference at a specific frequency relates to a distance between the at least one sound guiding hole and the portion of the housing.

