US 20240244978A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2024/0244978 A1**

OKABE et al. (43) **Pub. Date: Jul. 18, 2024**

(54) **POLYMER PIEZOELECTRIC FILM ELEMENT, POWER STORAGE DEVICE USING SAME, AND LOAD DETECTION DEVICE**

(71) Applicant: **Mitsui Chemicals, Inc.**, Chou-ku, Tokyo (JP)

(72) Inventors: **Jun OKABE**, Yonezawa-shi, Yamagata (JP); **Tadahiro SUNAGA**, Yamato-shi, Kanagawa (JP); **Shizuo TOKITO**, Yonezawa-shi, Yamagata (JP)

(73) Assignee: **Mitsui Chemicals, Inc.**, Chuo-ku, Tokyo (JP)

(21) Appl. No.: **18/553,905**

(22) PCT Filed: **Apr. 18, 2022**

(86) PCT No.: **PCT/JP2022/018032**

§ 371 (c)(1),
(2) Date: **Oct. 4, 2023**

(30) **Foreign Application Priority Data**

Apr. 28, 2021 (JP) 2021-076711

Publication Classification

(51) **Int. Cl.**

H10N 30/857	(2006.01)
C08J 5/12	(2006.01)
C08J 5/18	(2006.01)
G01L 1/16	(2006.01)
H02N 2/18	(2006.01)
H10N 30/87	(2006.01)

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

CPC ***H10N 30/857*** (2023.02); ***C08J 5/128*** (2013.01); ***C08J 5/18*** (2013.01); ***G01L 1/16*** (2013.01); ***H02N 2/181*** (2013.01); ***H02N 2/186*** (2013.01); ***H10N 30/87*** (2023.02); *C08J 2327/16* (2013.01); *C08J 2367/04* (2013.01)

(57) **ABSTRACT**

Provided is a polymer piezoelectric film element which generates electricity at a high sensitivity upon vibrations across a broad frequency band, including those caused by the motion of humans or animals or faint contact stress, and those caused by automobiles and so on, which can be made into a thin film and at a high yield, and which can be used as a stably driving power supply device, a tactile sensor, or a vital sensor. The present invention pertains to: a polymer piezoelectric film element characterized in that an electrode sheet is formed on both surfaces of a polymer piezoelectric film, and by having a structure which has bumps and dips or a wave-shaped structure which has peaks and valleys in an axis perpendicular to said surfaces; and a power storage device, a sensor, or a vital sensor.