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(19) **United States**(12) **Patent Application Publication**  
**NAKAMURA**(10) **Pub. No.: US 2023/0232095 A1**(43) **Pub. Date: Jul. 20, 2023**(54) **VIBRATION APPARATUS, IMAGE PICKUP  
APPARATUS, CONTROL METHOD OF  
VIBRATION APPARATUS, AND STORAGE  
MEDIUM***H04N 23/67* (2006.01)*H04N 23/68* (2006.01)*H04N 23/63* (2006.01)*G03B 13/18* (2006.01)(71) Applicant: **CANON KABUSHIKI KAISHA,**  
Tokyo (JP)(52) **U.S. Cl.**CPC ..... *H04N 23/64* (2023.01); *H04N 23/667*(2023.01); *H04N 23/672* (2023.01); *H04N**23/681I* (2023.01); *H04N 23/635* (2023.01);*H04N 23/634* (2023.01); *H04N 23/6812*(2023.01); *G03B 13/18* (2013.01)(72) Inventor: **Hiroshi NAKAMURA,** Tokyo (JP)(21) Appl. No.: **18/152,254**(22) Filed: **Jan. 10, 2023**

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**ABSTRACT**(30) **Foreign Application Priority Data**

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A vibration apparatus includes a vibrating unit, and a control unit configured to control vibration of the vibrating unit. The control unit changes a vibration pattern of the vibrating unit by controlling the vibrating unit so as to change at least one of a vibration amplitude, a vibration frequency, and a vibration time according to at least one of a detection result of an offset amount from an in-focus position and a detection result of a predetermined object image in a mode that continuously performs autofocus processing.

