



US 20240178777A1

(19) **United States**(12) **Patent Application Publication**  
**YANG et al.**(10) **Pub. No.: US 2024/0178777 A1**(43) **Pub. Date: May 30, 2024**(54) **METHOD FOR PRE-POSITIONING ROTOR  
OF OUTDOOR FAN IN HIGH-SPEED  
COUNTER-ROTATION STATE BEFORE  
OPERATION**(52) **U.S. Cl.**CPC ..... **H02P 21/34** (2016.02); **H02P 21/18**  
(2016.02); **H02K 2213/03** (2013.01); **H02P**  
**2207/05** (2013.01)(71) Applicant: **Zhongshan Broad-Ocean Motor Co.,  
Ltd., Zhongshan (CN)**

(57)

**ABSTRACT**(72) Inventors: **Fei YANG**, Zhongshan (CN); **Min  
WANG**, Zhongshan (CN); **Song LUO**,  
Zhongshan (CN); **Chao LI**, Zhongshan  
(CN)

A method for pre-positioning a rotor of an outdoor fan in a counter-rotation state before operation includes: 1) during a counter-operation state, sending, by a microprocessor, a signal to the inverter circuit to turn off all upper electronic switching tubes and turn on all lower electronic switching tubes; 2) measuring a phase current of each phase coil winding in the stator assembly; 3) calculating a back electromotive force of each phase coil winding in the stator; 4) calculating a position angle of the rotor assembly; 5) checking if the phase current of each phase coil winding is all smaller than a preset threshold current; if not, return to 1); if yes, proceed to 6); and 6) calculating a resistance torque to stop the rotor assembly based on the position angle of the rotor assembly, and then stopping the rotor assembly to achieve pre-positioning of the rotor before starting.

(21) Appl. No.: **18/221,869**(22) Filed: **Jul. 13, 2023**(30) **Foreign Application Priority Data**

Nov. 24, 2022 (CN) ..... 202211478597.1

**Publication Classification**(51) **Int. Cl.****H02P 21/34** (2006.01)**H02P 21/18** (2006.01)