

# PATENT ABSTRACTS OF JAPAN

(11)Publication number : **2003-348885**

(43)Date of publication of application : **05.12.2003**

(51)Int.Cl. **H02P 6/18  
F24F 11/02  
H02P 21/00**

(21)Application number : **2002-149449**

(71)Applicant : **SANYO ELECTRIC CO LTD  
SANYO ELECTRIC AIR  
CONDITIONING CO LTD**

(22)Date of filing : **23.05.2002**

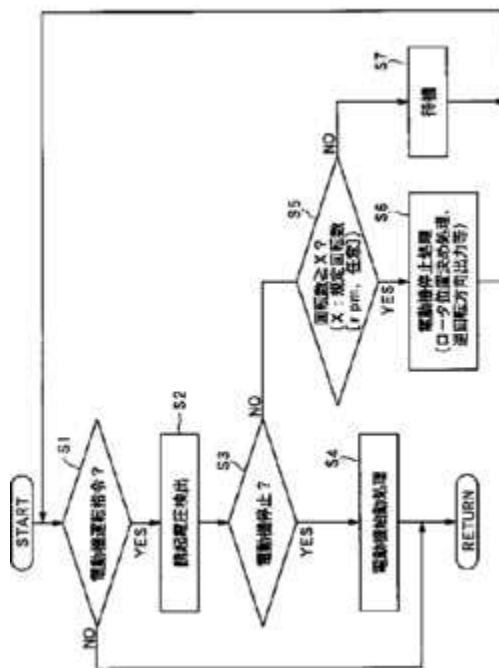
(72)Inventor : **HIBI HIDEJI  
YAMAGAMI YOSHINARI  
YOSHIDA HIROSHI**

**(54) METHOD AND APPARATUS FOR CONTROLLING PERMANENT MAGNET SYNCHRONOUS MOTOR**

(57)Abstract:

**PROBLEM TO BE SOLVED:** To obtain the operation state of a permanent magnet synchronous motor at starting, especially the operation state of a pair which is driven by the permanent magnet synchronous motor, with no sensor such as a Hall IC.

**SOLUTION:** An induced voltage at a brushless DC motor is detected (step S2). The operation state of brushless DC motors 30A and 30B is detected based on the detected induced voltage (steps S3 and S5).



IPR2015-00762 - EXHIBIT 1004  
Zhongshan Broad Ocean Motor Co., Ltd, Petitioner  
Nidec Motor Corporation, Patent Owner