

Major Patents

■ Patents registered in 2020

Registration Number	Title	Inventor(s)
Europe - 02458223	AXIAL-FLOW FAN WITH DOUBLE IMPELLERS	Honami Osawa, Katsumichi Ishihara, Toshiyuki Nakamura, Takashi Kaise, Yoshihiko Aizawa, Seiji Nishimura
Europe - 02173022	BRUSHLESS MOTOR STATOR	Izumi Onozawa, Masashi Miyazawa
Europe - 02355309	ELECTRIC FAN	Naruhiko Kudo, Tomoaki Ikeda, Haruhisa Maruyama
Europe - 02685625	MOTOR CONTROLLER	Takahisa Toda
Europe - 02814167	FAN MOTOR CONTROL UNIT	Yo Muramatsu, Takahisa Toda, Kenta Nishimaki
Europe - 02811627	FAN MOTOR, INLINE TYPE FAN MOTOR AND ASSEMBLY METHOD OF THE SAME	Katsumichi Ishihara, Masashi Nomura, Tomoko Hayashi
China - ZL201410443400.X	THREE-PHASE ELECTROMAGNETIC MOTOR	Toshihito Miyashita, Manabu Horiuchi
Korea - 102073801	STATOR, METHOD FOR MANUFACTURING STATOR, AND MOTOR	Toshihito Miyashita, Masashi Suzuki, Manabu Horiuchi, Masaki Musha
U.S. - 10666108	STATOR, METHOD FOR MANUFACTURING STATOR, AND MOTOR	Toshihito Miyashita, Masashi Suzuki, Manabu Horiuchi, Masaki Musha
Taiwan - I687028	MOTOR STRUCTURE	Toshihito Miyashita, Manabu Horiuchi
Europe - 02996230	STEPPER MOTOR	Yasushi Yoda, Koji Nakatake, Masaaki Ohashi
Hong Kong - HK1216945	STEPPER MOTOR	Yasushi Yoda, Koji Nakatake, Masaaki Ohashi
Taiwan - I682610	STEPPER MOTOR	Yasushi Yoda, Koji Nakatake, Masaaki Ohashi
China - ZL201510772342.X	MOTOR CONTROL APPARATUS	Yuji Ide, Masahisa Koyama, Shintaro Koichi
Taiwan - I691159	MOTOR CONTROL APPARATUS	Yuji Ide, Masahisa Koyama, Shintaro Koichi
China - ZL201511023274.3	FAN CASING AND FAN APPARATUS	Naoya Inada, Honami Osawa
Taiwan - I712357	FAN CASING AND FAN APPARATUS	Naoya Inada, Honami Osawa
Taiwan - I688325	MOTOR CONTROL DEVICE	Yuji Ide, Takao Oshimori, Hiroaki Koike
China - ZL201610079626.5	MOTOR CONTROL APPARATUS	Yuji Ide, Michio Kitahara, Toshio Hiraide
Taiwan - I703809	MOTOR CONTROL APPARATUS	Yuji Ide, Michio Kitahara, Toshio Hiraide
Taiwan - I696808	MEASUREMENT DEVICE	Katsumichi Ishihara, Takahisa Toda, Yo Muramatsu
Taiwan - I683196	MOTOR CONTROL APPARATUS	Yuji Ide, Michio Kitahara, Toshio Hiraide
China - ZL201610087797.2	MOTOR CONTROL DEVICE	Yuji Ide, Daigo Kuraishi, Akihiko Takahashi, Toshio Hiraide
Taiwan - I705657	MOTOR CONTROL DEVICE	Yuji Ide, Daigo Kuraishi, Akihiko Takahashi, Toshio Hiraide
Taiwan - I703270	IMPELLER AND FAN DEVICE	Jiro Watanabe, Masashi Miyazawa, Akira Nakayama
U.S. - 10781819	IMPELLER AND FAN DEVICE	Jiro Watanabe, Masashi Miyazawa, Akira Nakayama
China - ZL201610232262.X	BIDIRECTIONAL AXIAL FAN DEVICE	Satoshi Fujimaki, Toshiya Nishizawa, Takashi Kawashima
Taiwan - I699484	BIDIRECTIONAL AXIAL FAN DEVICE	Satoshi Fujimaki, Toshiya Nishizawa, Takashi Kawashima
China - ZL201610329511.7	SENSOR FOR MOTOR	Takayoshi Seki
China - ZL201610649891.2	LINEAR MOTOR	Yasushi Misawa, Hiroyuki Sato, Akihiko Takahashi, Satoshi Sugita

Registration Number	Title	Inventor(s)
Korea - 102178178	LINEAR MOTOR	Yasushi Misawa, Hiroyuki Sato, Akihiko Takahashi, Satoshi Sugita
China - ZL201610649582.5	AXIAL BLOWER AND SERIES-TYPE AXIAL BLOWER	Toshiyuki Nakamura, Shuji Miyazawa
Europe - 03133292	AXIAL BLOWER AND SERIES-TYPE AXIAL BLOWER	Toshiyuki Nakamura, Shuji Miyazawa
Taiwan - I702340	AXIAL BLOWER AND SERIES-TYPE AXIAL BLOWER	Toshiyuki Nakamura, Shuji Miyazawa
Japan - 06745661	MOTOR CONTROL APPARATUS	Yuji Ide, Michio Kitahara, Toshio Hiraide
Japan - 06653542	MOTOR CONTROL APPARATUS	Yuji Ide, Michio Kitahara, Toshio Hiraide
China - ZL201610676324.6	MEASUREMENT DEVICE	Masahiro Koike, Tomoaki Ikeda, Takahisa Toda, Yo Muramatsu, Katsumichi Ishihara, Hikaru Urushimoto
China - ZL201611177833.0	MOTOR	Manabu Horiuchi, Toshihito Miyashita
Korea - 102192221	MOTOR	Manabu Horiuchi, Toshihito Miyashita
U.S. - 10848019	MOTOR	Manabu Horiuchi, Mai Shimizu, Jun Kitajima
Japan - 06764670	POWER CONVERTER	Kazuya Nishizawa, Takuya Ozawa
Japan - 06680648	MOTOR CONTROL APPARATUS	Yuji Ide, Toshio Hiraide, Keigo Kikuchi
Japan - 06734752	AUTOMATIC ENCODER DETERMINING DEVICE	Ryuichi Yanagisawa, Masao Mizuguchi
China - ZL201710785510.8	REVERSIBLE FLOW FAN	Yoshihisa Yamazaki
Europe - 03301305	REVERSIBLE FLOW FAN	Yoshihisa Yamazaki
U.S. - 10662973	REVERSIBLE FLOW FAN	Yoshihisa Yamazaki
Europe - 03301306	BLAST FAN	Yoshihisa Yamazaki, Satoshi Fujimaki, Takashi Kawashima, Soma Araki
Japan - 06802022	BLAST FAN	Yoshihisa Yamazaki, Satoshi Fujimaki, Takashi Kawashima, Soma Araki
U.S. - 10837345	BLAST FAN	Yoshihisa Yamazaki, Satoshi Fujimaki, Takashi Kawashima, Soma Araki
U.S. - 10712041	COOLING FAN AUTOMATIC CONTROL SYSTEM AND COOLING FAN AUTOMATIC CONTROL DEVICE	Naoki Murakami, Masashi Murakami
Japan - 06766024	ORDER MANAGEMENT SYSTEM, ORDER MANAGEMENT APPARATUS AND ORDER MANAGEMENT PROGRAM	Shigejiro Miyata, Keigo Kikuchi
Japan - 06676133	ARMATURE MOLDED STRUCTURE	Manabu Horiuchi, Hiroki Sagara, Jun Kitajima, Mai Shimizu, Takashi Matsushita
Japan - 06694500	BOBBIN STRUCTURE OF ARMATURE	Manabu Horiuchi, Hiroki Sagara, Jun Kitajima, Mai Shimizu, Takashi Matsushita
Japan - 06764921	ARMATURE STRUCTURE OF THREE-PHASE MOTOR	Manabu Horiuchi, Hiroki Sagara, Mai Shimizu, Jun Kitajima
Japan - 06643519	MOTOR CONTROL APPARATUS AND INSULATION RESISTANCE	Yuji Ide, Keigo Kikuchi, Toshio Hiraide, Masakazu Sakai

Technical Papers Published Outside the Company in General Technical Journals

January to December 2020

Title of Paper	Authors	Name of Journal	Issued in	Publisher
Feature: Products and Technology Development of Member Companies and the Results of 2020	SANYO DENKI CO., LTD.	Denki (Electrical Appliances)	2020.2	The Japan Electrical Manufacturers' Association (JEMA)
Specialty Technologies for Efficiently Producing Servo Systems Products	Shusaku Magotake, Kazuhiro Makiuchi	Monthly JETI	2020.3	Nippon Syuppan Seisaku Center Inc.
Development of the SANUPS W73A Grid-connected Isolated Type	Makoto Ishida, Hirofumi Nishizawa, Tetsuya Fujimaki, Katsutoshi Tanahashi	Monthly JETI	2020.4	Nippon Syuppan Seisaku Center Inc.
Development of SANMOTION R 3E Model Servo Amplifiers with Built-in Positioning Function	Naohiro Ito, Hiroyuki Kosuge, Kenichi Fujisawa, Keisuke Ishizaki, Naoki Kubo, Hideaki Nishizawa	Monthly JETI	2020.12	Nippon Syuppan Seisaku Center Inc.

Technical Papers Published Outside the Company

January to December 2020

Title of Paper	Authors	Name of Journal	Issued in	Publisher
Robust Estimation Method for Stator Temperature Based on Voltage Disturbance Observer Autotuning Resistance for SPMSM	Yuji Ide, Daigo Kuraishi, Akihiko Takahashi (Joint-author: Nagaoka University of Technology)	IEEJ Journal of Industry Applications	2020.7	IEEJ