



US010280042B2

(12) **United States Patent**
Jung et al.

(10) **Patent No.:** **US 10,280,042 B2**
(45) **Date of Patent:** **May 7, 2019**

(54) **METHOD AND APPARATUS FOR STALL CONTROL OF ELEVATOR DOOR**

(71) Applicant: **Otis Elevator Company**, Farmington, CT (US)

(72) Inventors: **WoonCheol Jung**, Seoul (KR); **Hansoo Shim**, Uiwang-si (KR)

(73) Assignee: **OTIS ELEVATOR COMPANY**, Farmington, CT (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 88 days.

(21) Appl. No.: **15/478,482**

(22) Filed: **Apr. 4, 2017**

(65) **Prior Publication Data**

US 2018/0282128 A1 Oct. 4, 2018

(51) **Int. Cl.**

B66B 5/26 (2006.01)

B66B 13/14 (2006.01)

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

CPC **B66B 13/146** (2013.01)

(58) **Field of Classification Search**

CPC B66B 13/146

USPC 187/316

See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

4,299,308 A * 11/1981 Shung G05D 3/12
187/316

4,300,660 A * 11/1981 Schoenmann B66B 13/26
187/316

4,300,661 A * 11/1981 Hmelovsky G05D 3/12
187/316

4,300,662 A * 11/1981 Hmelovsky G05D 3/12
187/316

4,300,663 A * 11/1981 Hmelovsky B66B 13/14
187/316

4,305,480 A * 12/1981 Hmelovsky G05D 3/00
187/316

4,305,481 A * 12/1981 Hmelovsky G05B 19/416
187/316

4,308,935 A 1/1982 Deric
(Continued)

FOREIGN PATENT DOCUMENTS

CN 202594587 U 12/2012

CN 102205924 B 8/2013

(Continued)

OTHER PUBLICATIONS

EEM Elevator Control and Automation Systems, "Lift Door Controller / Smart Door—Automatic Door Control", available at : http://www.eem.com.tr/smart-door-automatic-door-control_8_en_u.html, accessed Feb. 13, 2017, 1 pg.

(Continued)

Primary Examiner — Jeffrey Donels

(74) *Attorney, Agent, or Firm* — Cantor Colburn LLP

(57) **ABSTRACT**

A method of updating a stall threshold level of an elevator door to control a door stall occurring during opening or closing of the elevator door includes determining an exceptional motion count of a door based on at least one of a speed and an acceleration of the door, determining whether the door is stalled, based on a determined exceptional motion count of the door and a preset stall threshold level of the door, and re-determining the stall threshold level of the door according to the determination of whether the door is stalled.

15 Claims, 6 Drawing Sheets

