

(19) United States

(12) Patent Application Publication (10) Pub. No.: US 2022/0377944 A1 RAJPUT et al.

Nov. 24, 2022 (43) **Pub. Date:**

(54) COOLING SYSTEM, AIR REMOVAL ATTACHMENT, AIR REMOVAL METHOD, AND STORAGE MEDIUM

(71) Applicant: NEC Corporation, Minato-ku, Tokyo

(72) Inventors: Nirmal Singh RAJPUT, Tokyo (JP); Masaki CHIBA, Tokyo (JP); Mahiro HACHIYA, Tokyo (JP); Takafumi NATSUMEDA, Tokyo (JP); Yoshinori MIYAMOTO, Tokyo (JP); Minoru YOSHIKAWA, Tokyo (JP)

(73) Assignee: **NEC Corporation**, Minato-ku, Tokyo

(21) Appl. No.: 17/764,293

(22) PCT Filed: Oct. 2, 2019

(86) PCT No.: PCT/JP2019/039729

§ 371 (c)(1),

(2) Date: Mar. 28, 2022

Publication Classification

(51) Int. Cl. H05K 7/20 (2006.01)F28D 15/06 (2006.01)F28D 15/02 (2006.01)

(52) U.S. Cl. CPC H05K 7/20827 (2013.01); H05K 7/20381 (2013.01); F28D 15/06 (2013.01); F28D 15/0266 (2013.01)

(57)ABSTRACT

The present invention provides an attachment for a server rack cooling system having at least one heat exchange condenser, the attachment includes: a pipe extension configured to connect to a portion of the server rack cooling system at which air and refrigerant are able to be transferred into the attachment from the at least one heat exchange condenser; a valve on the pipe extension configured to allow exhaust to the outside through the pipe extension at an open position and to block exhaust to the outside at a closed position; and an sensor disposed at a position inside of the pipe extension between the at least one heat exchange condenser and the valve and configured to provide a detection signal determined by a presence of fluid at the position of the sensor; wherein, the valve is opened and closed based on the detection signal from the sensor.

