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United States Patent [19]

Ueno et al.

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[45] **Date of Patent:** **Jun. 13, 2000**

- [54] **MOBILE ROBOT STEERING METHOD AND CONTROL DEVICE**
- [75] Inventors: **Ichirou Ueno; Hironori Katou**, both of Saitama, Japan
- [73] Assignee: **Honda Giken Kogyo K.K.**, Tokyo, Japan
- [21] Appl. No.: **09/015,312**
- [22] Filed: **Jan. 29, 1998**
- [30] **Foreign Application Priority Data**
Jan. 29, 1997 [JP] Japan 9-029768
- [51] **Int. Cl.⁷** **G06F 165/00**
- [52] **U.S. Cl.** **701/23; 701/25; 701/26**
- [58] **Field of Search** **701/23, 25, 26**

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Assistant Examiner—Dalena Tran
Attorney, Agent, or Firm—Armstrong, Westerman, Hattori, McLeland & Naughton

[57] ABSTRACT

A robot is provided to run so that a trace of the robot efficiently covers a given area according to the detection of a boundary of the area. A spiral pattern running, wherein a radius of the spiral is gradually increased, is started at a desired location in the area and is paused upon the detection of a boundary wall by sensors. Then, a random pattern running, which includes turning to depart from the wall and running forward, is conducted. After the turning has been repeated a predetermined number of times through simulations, the spiral pattern running is resumed at a location spaced from the last turning spot by a predetermined distance or a predetermined length of running time.

[56] References Cited

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19 Claims, 13 Drawing Sheets

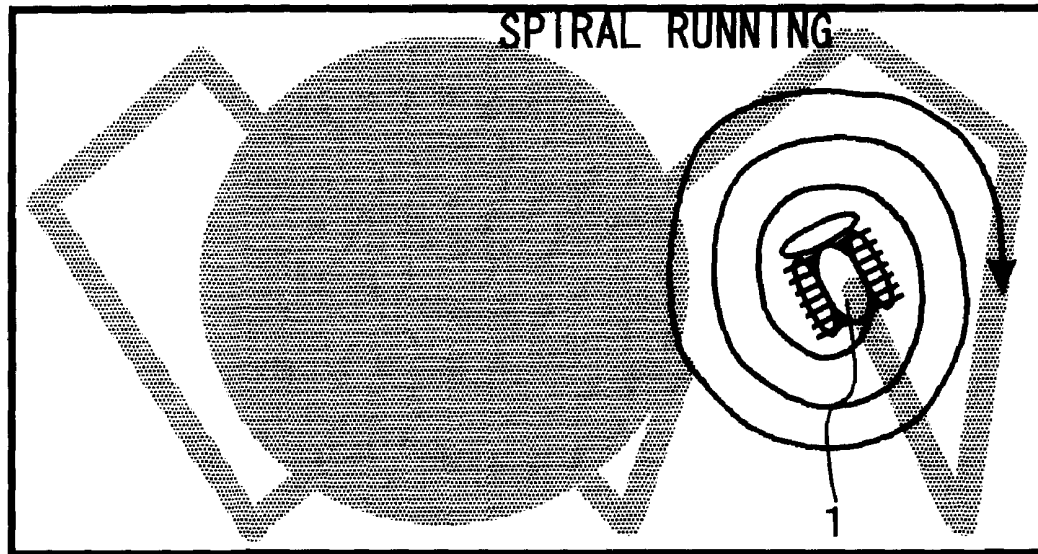


FIG. 1

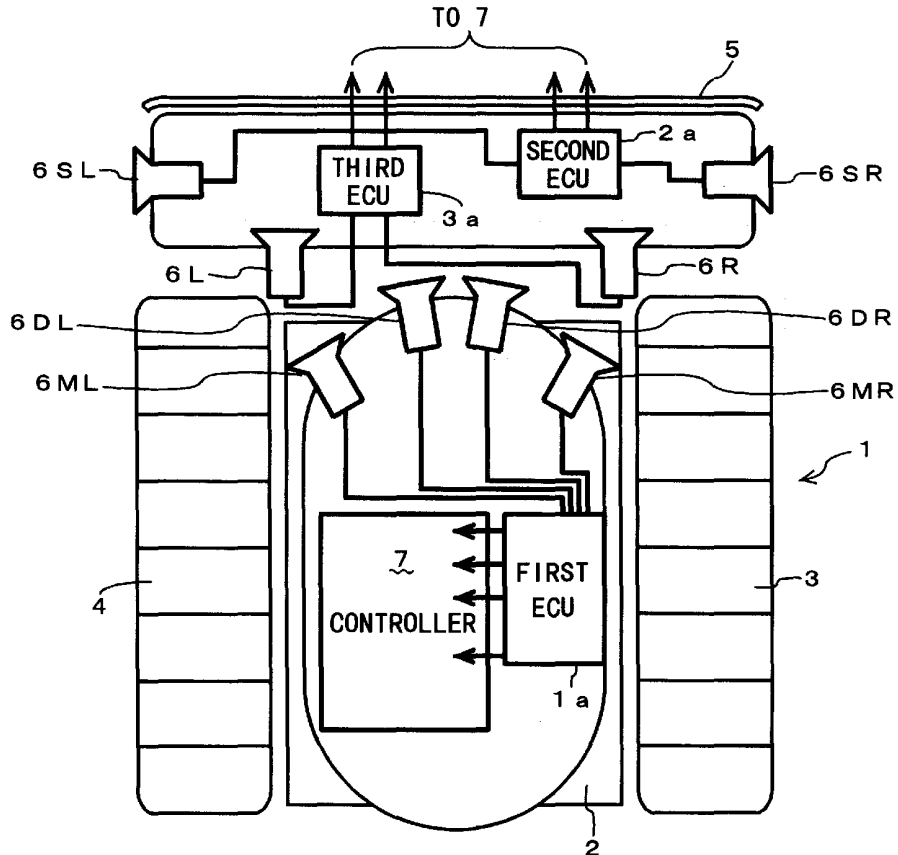


FIG. 2

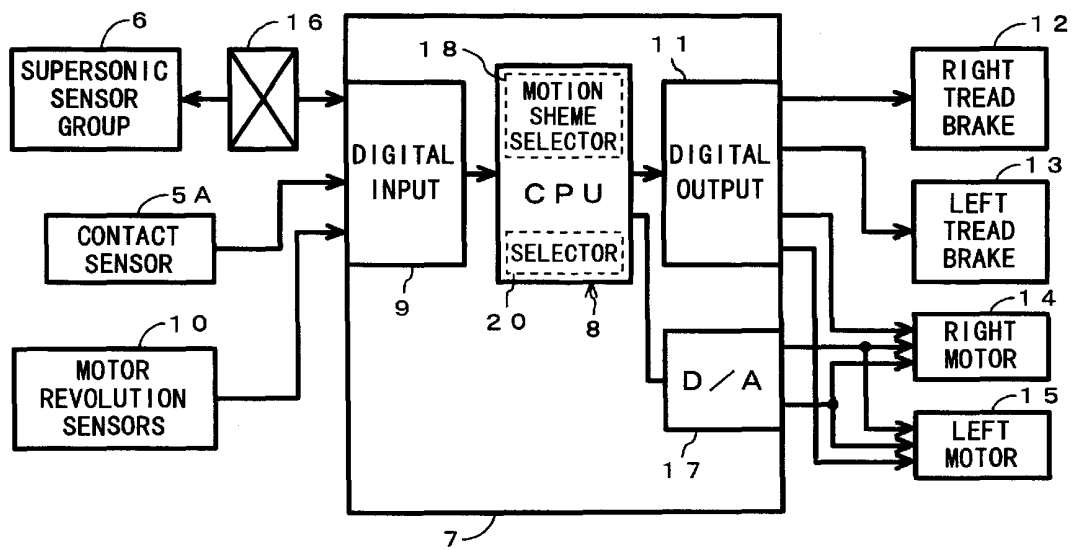


FIG. 3

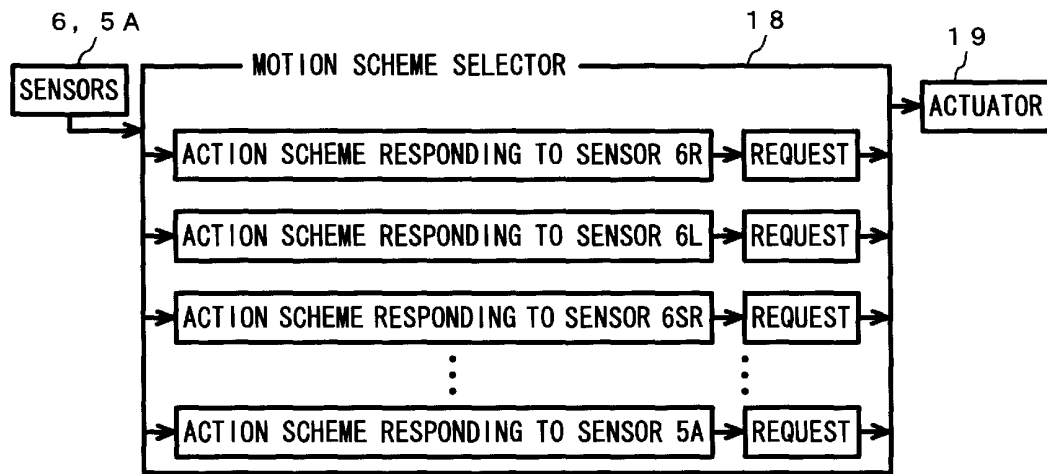


FIG. 4

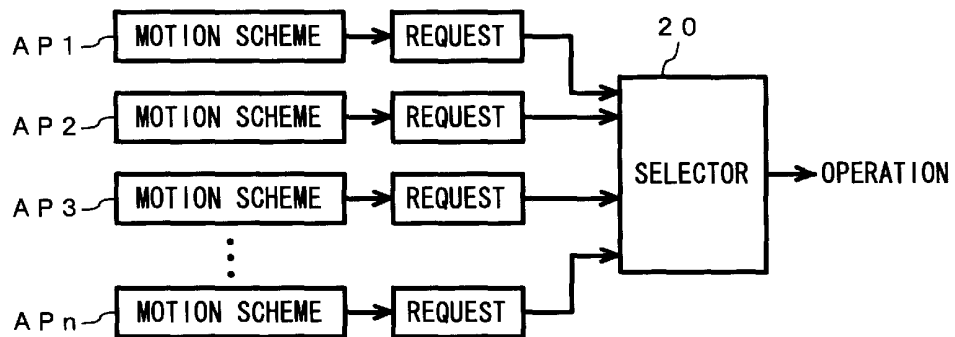


FIG. 5A

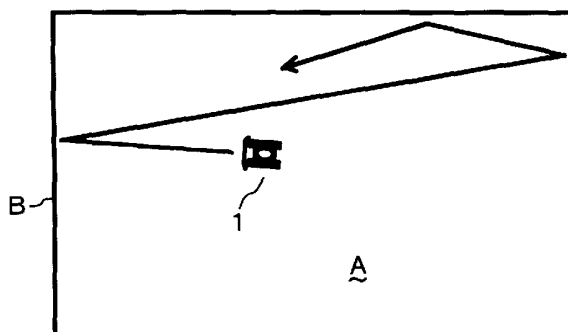


FIG. 5B

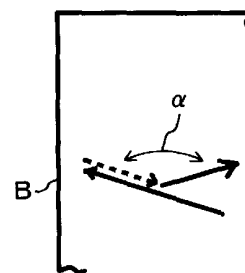


FIG. 6B

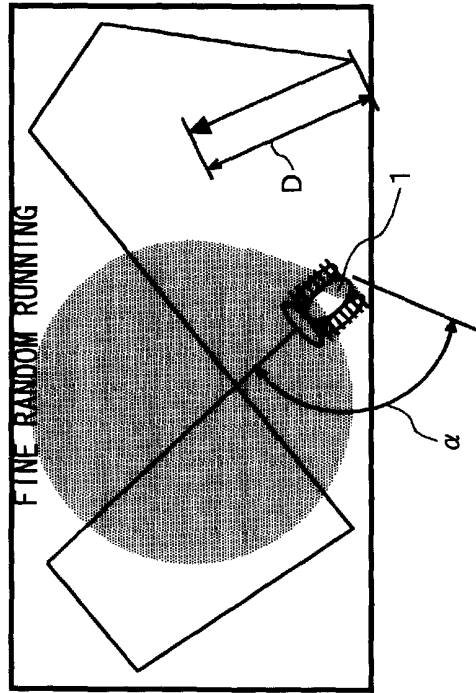


FIG. 6A

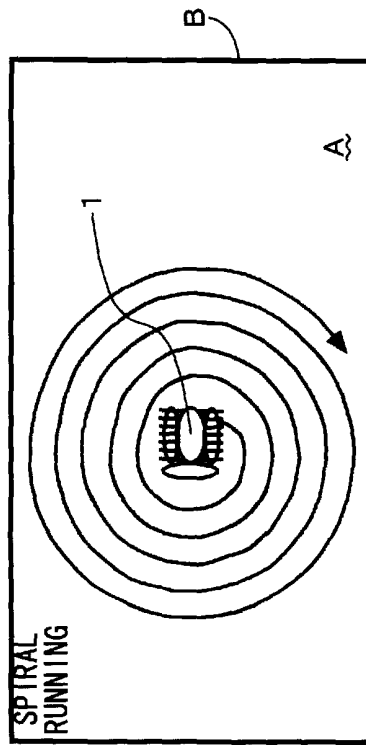


FIG. 6C

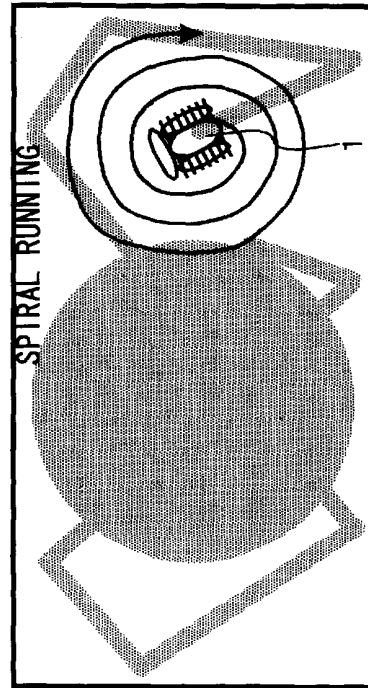


FIG. 7A

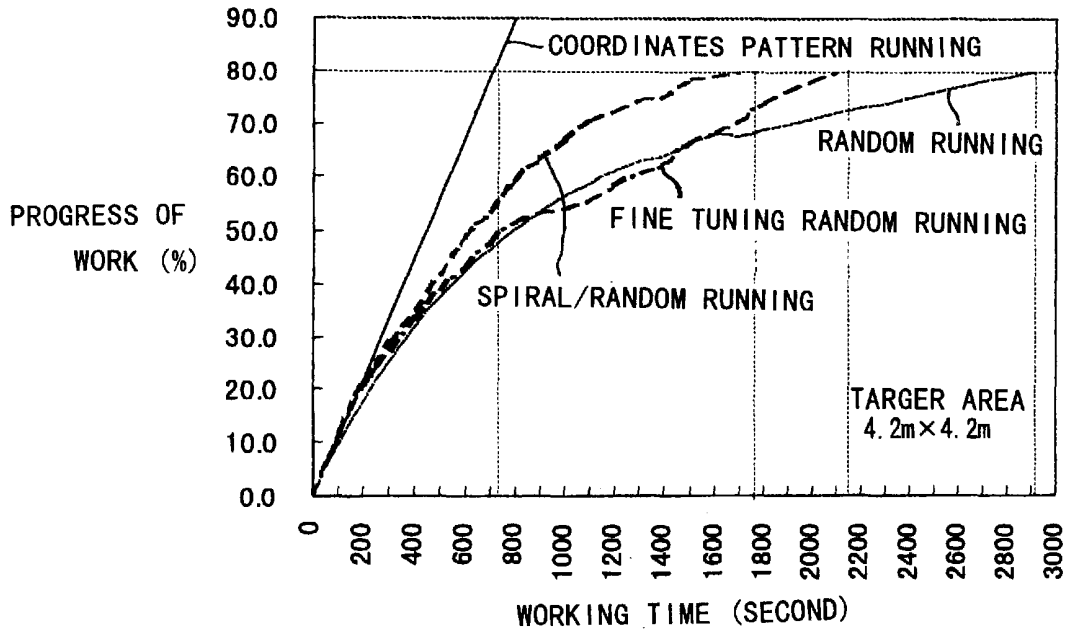
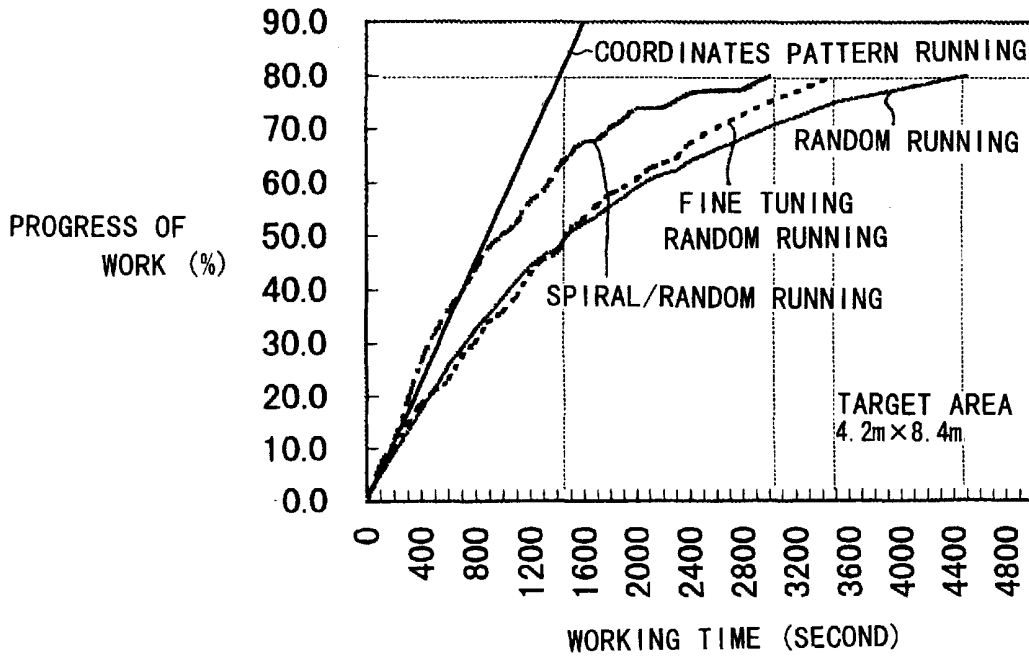


FIG. 7B



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