

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

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(54) **PORTABLE TERMINAL WITH THE FUNCTION OF WALKING NAVIGATION**

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(73) Assignee: **Hitachi, Ltd., Tokyo (JP)**

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

This patent is subject to a terminal disclaimer.

(21) Appl. No.: **10/428,755**

(22) Filed: **May 5, 2003**

(65) **Prior Publication Data**

US 2003/0195695 A1 Oct. 16, 2003

Related U.S. Application Data

(63) Continuation of application No. 10/173,423, filed on Jun. 18, 2002, now Pat. No. 6,580,999, which is a continuation of application No. 09/613,634, filed on Jul. 11, 2000, now Pat. No. 6,430,498.

(30) **Foreign Application Priority Data**

Jul. 12, 1999 (JP) 11-197010

(51) Int. Cl.⁷ **G01C 21/00**

(52) U.S. Cl. **701/200; 701/201; 342/357.01; 342/357.08**

(58) **Field of Search** **701/200, 201, 701/211, 212, 213; 340/988, 995; 342/357.01, 357.06, 357.08**

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(57) **ABSTRACT**

A portable terminal has a function of walking navigation. The direction of a destination is displayed by an indicating arrow that always points in the direction of the destination. In the navigation processing, the user enters data to select a menu and/or set retrieving conditions on the setup screen. At first, the user gets the location information of the portable terminal, represented by a latitude/longitude or coordinates and an altitude, for example. Then, the user gets the direction information of the portable terminal, which is the direction of the tip of the portable terminal as determined by a compass, a gyro, or a clinometer. The location information and the direction information are set as terminal information for the retrieving conditions. The system controls retrieving of the database and retrieves the information corresponding to the selected menu, such as route guidance.

20 Claims, 10 Drawing Sheets

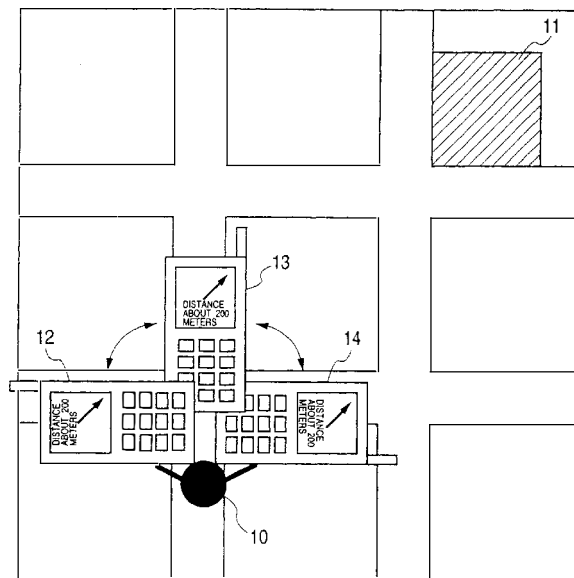


FIG. 1

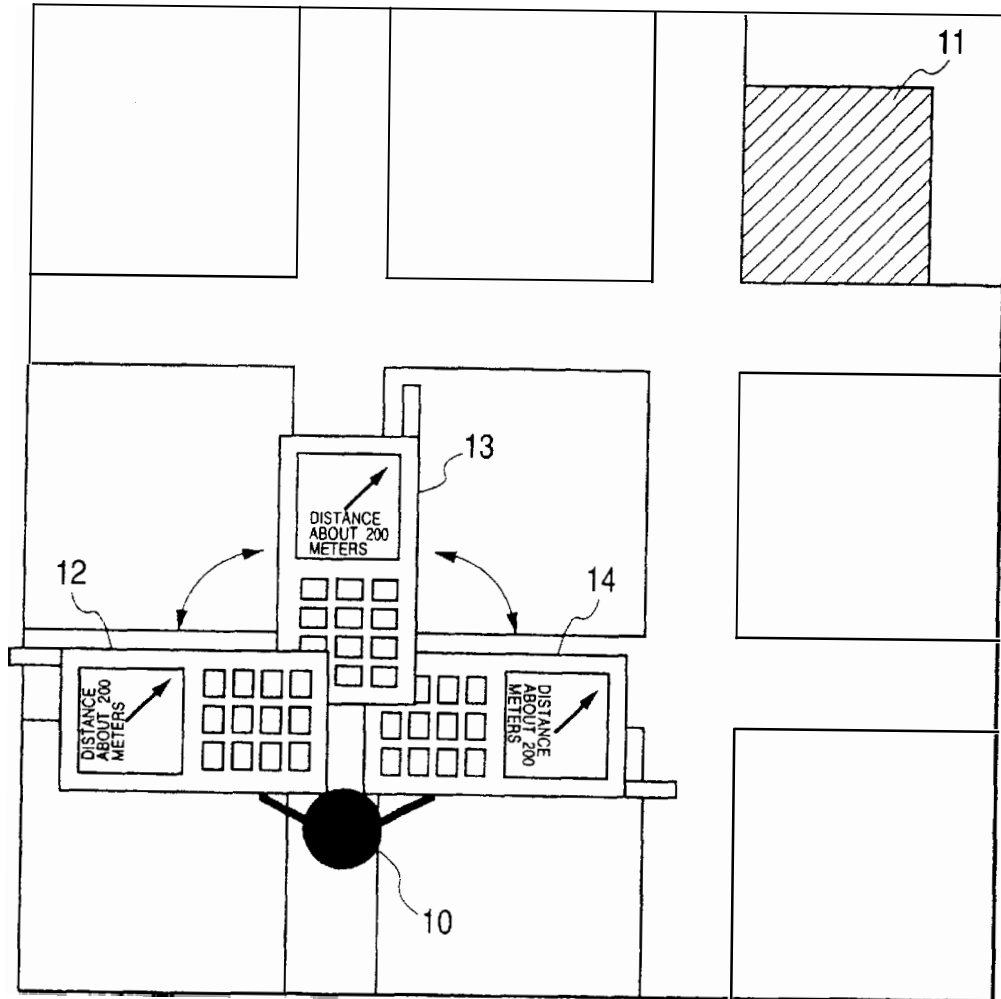


FIG. 2

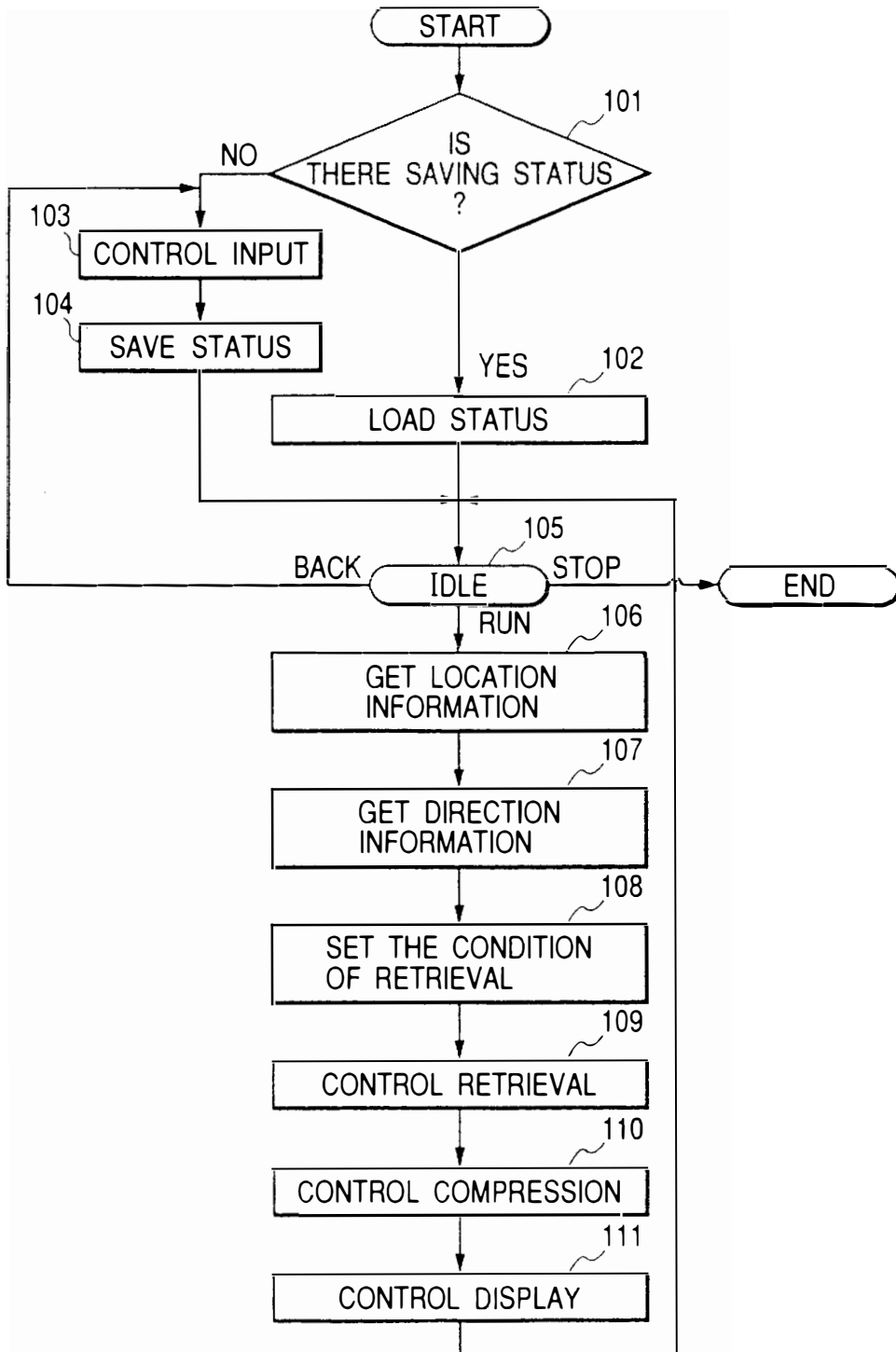


FIG. 3(a)

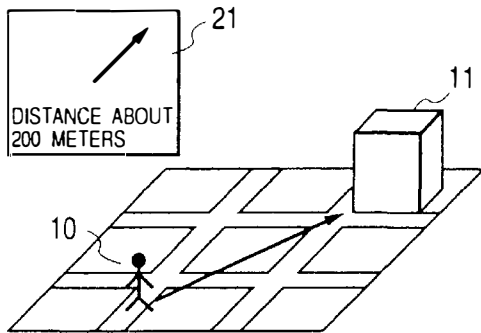


FIG. 3(b)

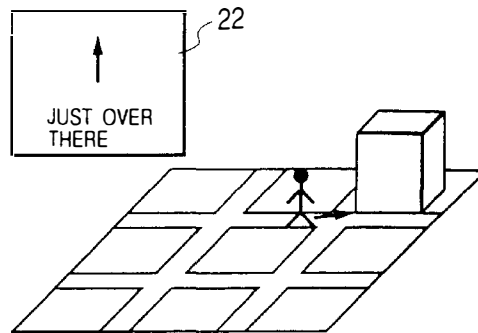


FIG. 3(c)

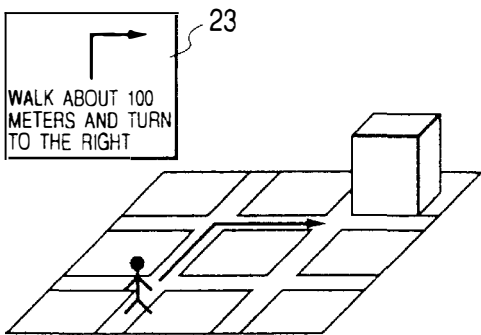


FIG. 3(d)

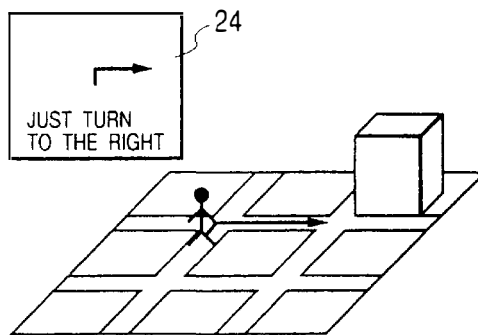


FIG. 3(e)

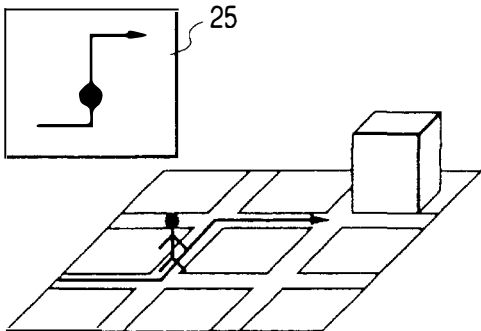


FIG. 3(f)

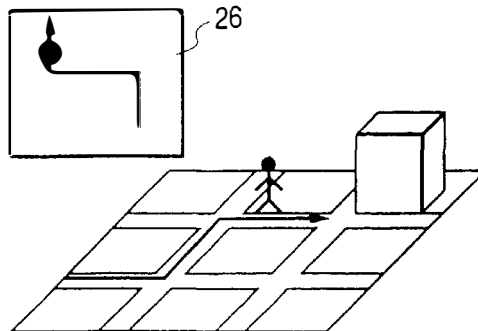
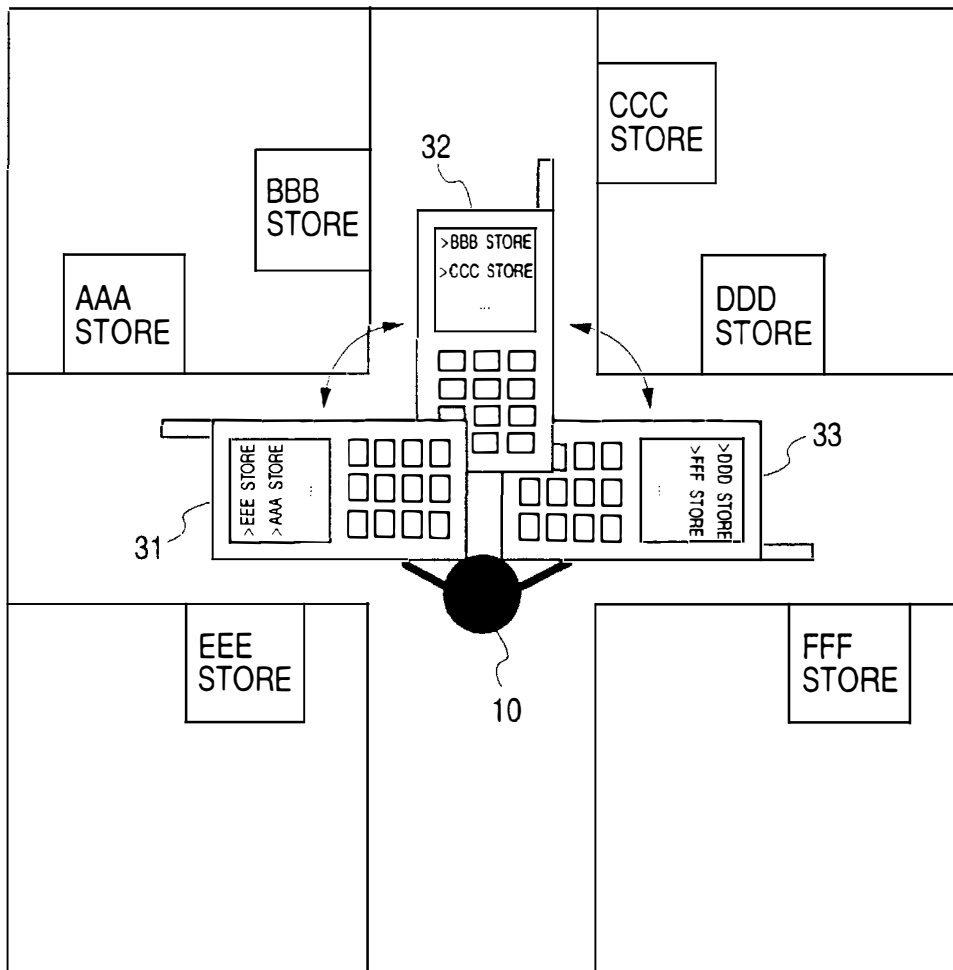


FIG. 4



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