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

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(45) **Date of Patent: *Jun. 17, 2003**

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

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(*) 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.: **10/173,423**

(22) Filed: **Jun. 18, 2002**

(65) **Prior Publication Data**

US 2002/0165662 A1 Nov. 7, 2002

Related U.S. Application Data

(63) 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, 701/202, 211, 212, 213, 214; 340/988, 995; 342/357.01, 357.06, 357.08, 443, 147; 367/118

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(74) *Attorney, Agent, or Firm*—Mattingly, Stanger & Malur, P.C.

(57) **ABSTRACT**

A portable terminal with the function of walking navigation. The portable terminal displays information on its narrow screen so as to make it easy for the user (walker) to understand and realize an interface that enables the user to understand inputs of retrieving conditions intuitively, thereby saving the input labor.

Assume now that a user (walker) **10** is lost while walking towards a destination **11**. In such a case, the present invention enables necessary information to be compressed, for example, so as to display both direction and distance to the destination from a present place with an orientation and a length of an arrow on a small screen and further so as to match the orientation of the arrow with the direction of the destination in the actual space. If the user (walker) **10** specifies a compressed information item **12**, **13**, or **14** for inquiry, the present invention controls so that the arrow always points the direction of the destination corresponding to each of those compressed information items **12**, **13**, and **14**. The condition of retrieval can also be set by turning, for example, the tip of the portable terminal directly in the desired direction **12**, **13**, or **14**.

6 Claims, 10 Drawing Sheets

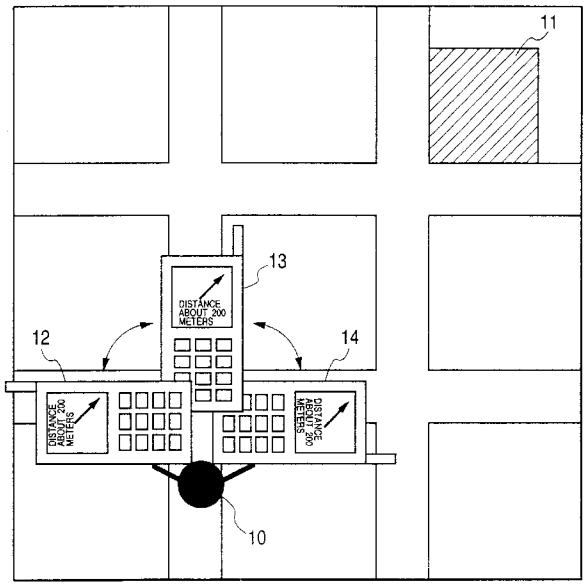

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FIG. 1

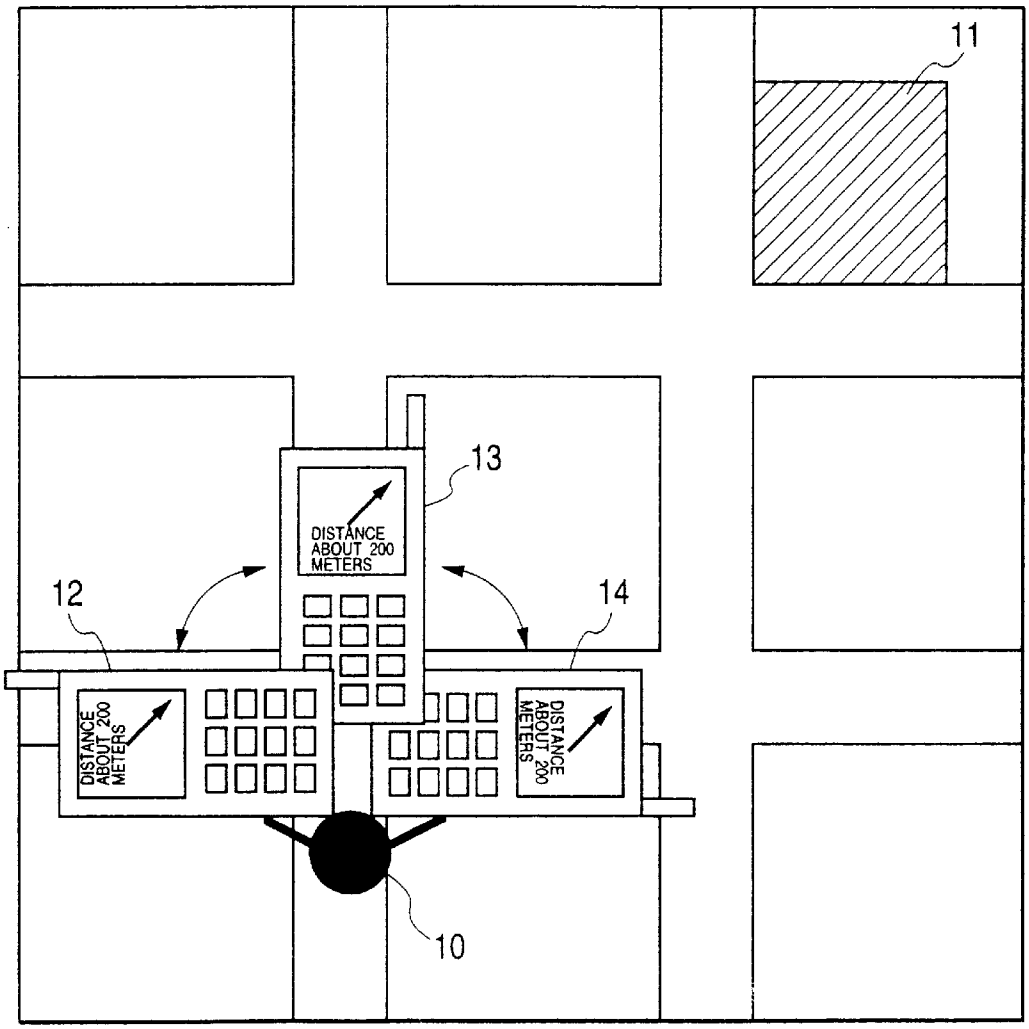

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FIG. 2

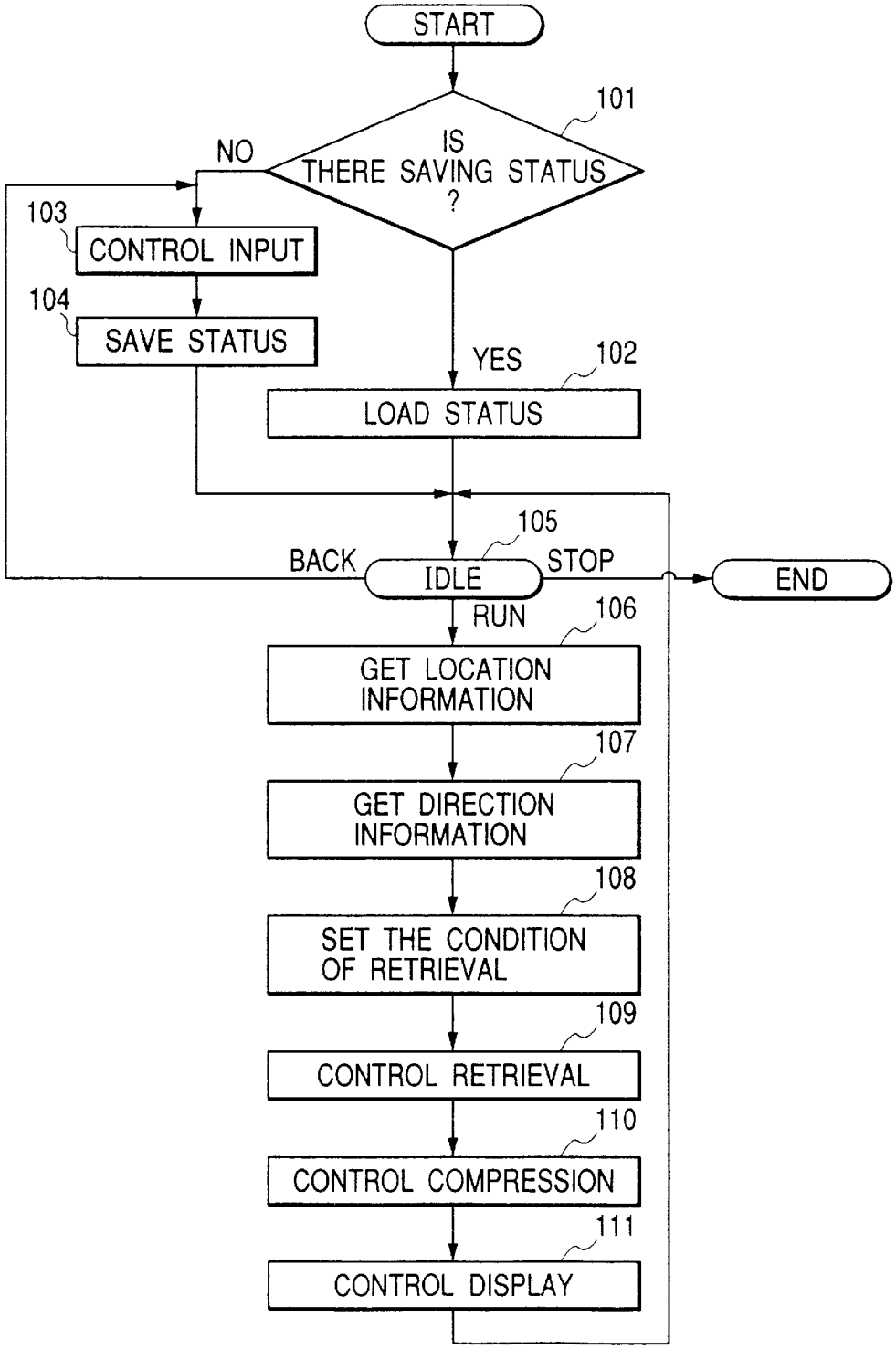

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FIG. 3(a)

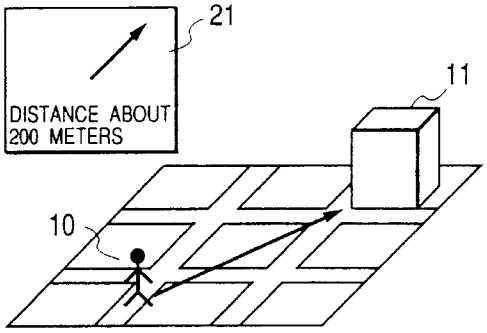

FIG. 3(b)

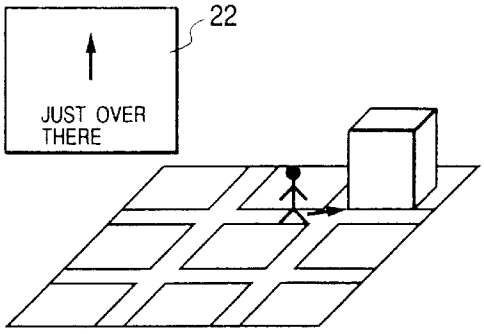

FIG. 3(c)

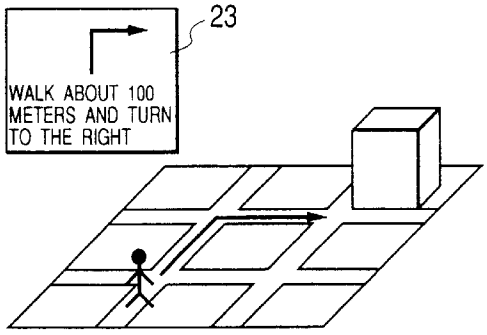

FIG. 3(d)

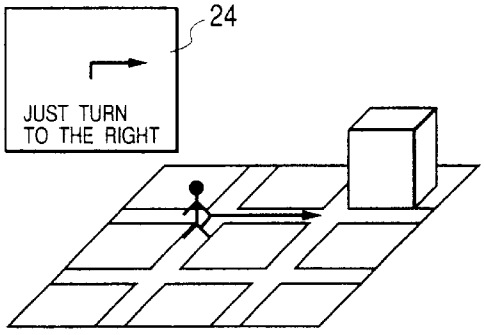

FIG. 3(e)

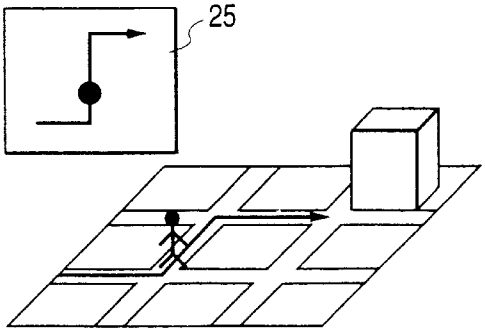

FIG. 3(f)

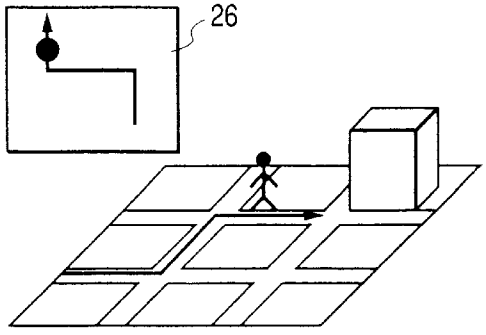

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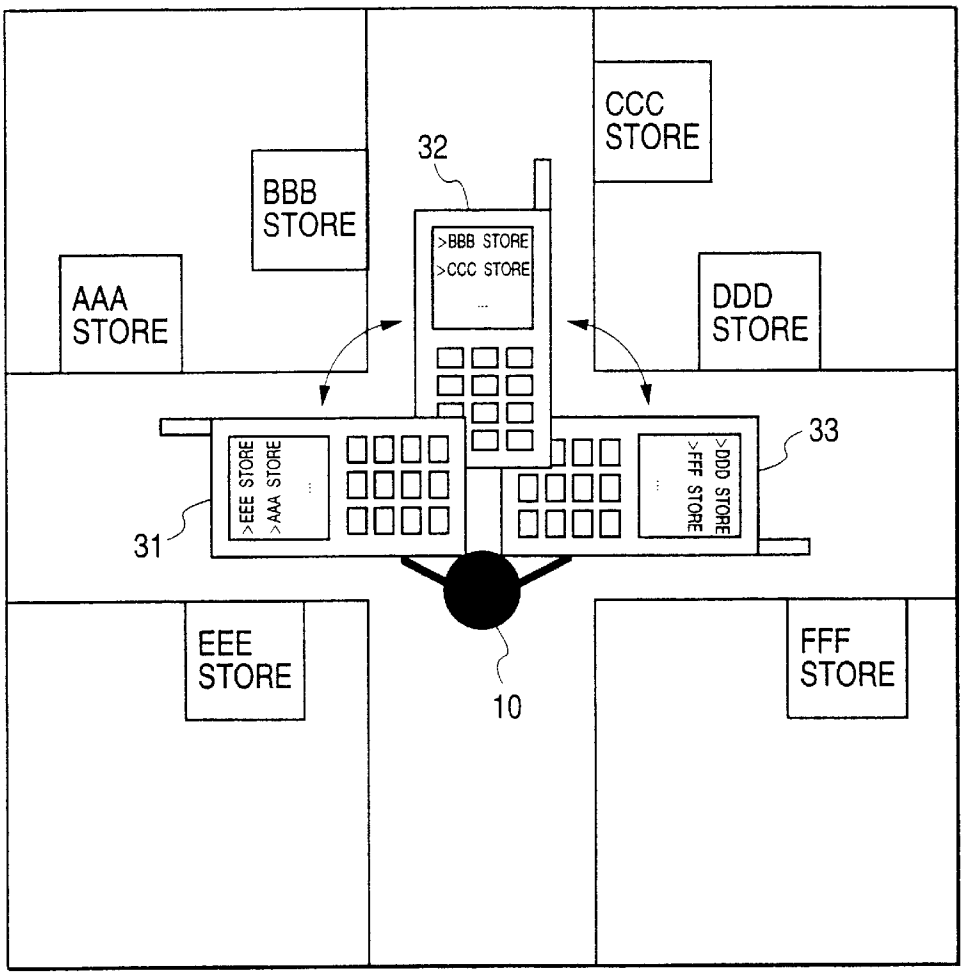
FIG. 4



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