(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
1 July 2004 (01.07.2004)

PCT

(10) International Publication Number
WO 2004/055686 A2

(51) International Patent Classification[7]: G06F 15/02

(21) International Application Number:
PCT/IB2003/005653

(22) International Filing Date: 3 December 2003 (03.12.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/433,748 16 December 2002 (16.12.2002) US

(71) Applicant *(for all designated States except US)*: **KONINKLIJKE PHILIPS ELECTRONICS N.V.** [NL/NL]; Groenewoudseweg 1, NL-5621 BA Eindhoven (NL).

(72) Inventor; and

(75) Inventor/Applicant *(for US only)*: **GIANNOPOULOS, Demetri** [US/US]; P.O. Box 3001, Briarcliff Manor, NY 10510-8001 (US).

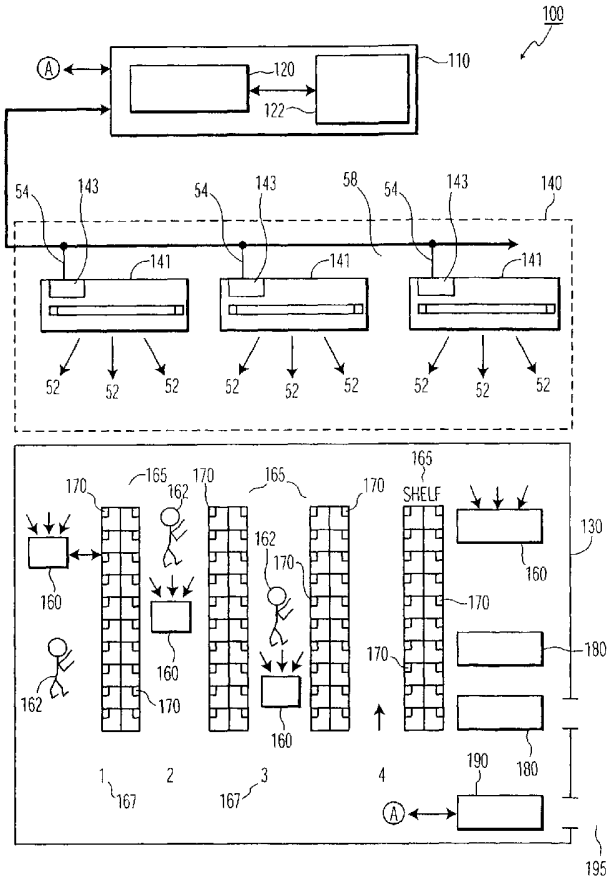
(74) Common Representative: **KONINKLIJKE PHILIPS ELECTRONICS N.V.**; c/o Keegan, Frank, P.O. Box 3001, Briarcliff Manor, NY 10510-8001 (US).

(81) Designated States *(national)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States *(regional)*: ARIPO patent (BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

[Continued on next page]

(54) Title: ELECTRONIC SHOPPING INFORMATION SYSTEM



(57) Abstract: An electronic shopping information system (100) assists shoppers (162) in a shopping venue (130). The electronic shopping system (100) may give shoppers (162) directions to desired products, tell shoppers (162) about sale items as they pass through the store aisles (167), and provide electronic coupons based on a preference profile. The shopping information system (100) includes portable electronic handsets (160), called electronic shopping cards (ESC) (160), carried by shoppers (162). The ESC (160), a microprocessor (201) controlled unit with an optical transceiver (203), requests and receives pricing directly from electronic price tags (170). In addition, the optical transceiver (203) can receive data from a central computer via artificial light sources throughout the shopping venue (130). The ESC's (160) may also keep a running total of items in a shopper's shopping cart and optically transmit the total to a check-out device (180) which obviates the need to bar-scan the items.

WO 2004/055686 A2

Declaration under Rule 4.17:

— *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii)) for all designations*

Published:

— *without international search report and to be republished upon receipt of that report*

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

ELECTRONIC SHOPPING INFORMATION SYSTEM

1. Field of the Invention

This invention relates generally to shopping information, and, more particularly, to a computer based system for assisting shoppers to locate products in a shopping venue, provide shoppers with useful product information and provide an enhanced system for automating the check-out procedure.

2. Description of the Related Art

Retail stores today, especially supermarkets, compete fiercely to attract shoppers to their stores. One mode of attraction is via savings offered to shoppers in the two areas which are valued highly by most: time and money.

Most modern retail stores today use point of sale (POS) systems for providing shoppers with better, faster service. A POS system generally has one or more automated check-out terminals which is capable of sensing and interpreting the bar code printed on each item of merchandise to be checked out. Contained in the bar code is the item's Stock Keeping Unit (SKU) code. Each of the check-out terminals is connected to a computer which processes the SKU information. The computer's database includes a list of items of merchandise in the store, an SKU for each of these items, and various types of information, including pricing and inventory information, associated with each SKU. When a shopper is ready to make a purchase, the store clerk simply uses an automated terminal to sense the bar code on each of the shopper's selections. The computer interprets the SKU contained in the bar code, looks up the price for each item, and keeps a running total of the purchase.

Savings in money are offered to shoppers by the stores through lower prices on particular items of merchandise. To inform shoppers of such sales items, stores advertise through direct mail, radio, television, and/or newspapers, and often offer coupons for taking advantage of the promotional items. Furthermore, within the store itself, signs on shelves and on shopping carts, as well as bold pricing indicators on the products for sale, aim to catch a shopper's attention and cause him or her to purchase the sales products. The existing systems and programs designed to enable a shopper to save time and money, however, leave a lot to be desired. For instance, despite the advances brought about by

POS systems to speed the checkout process, the checkout process still represents a bottleneck in the eyes of most shoppers.

Moreover, although POS systems aid shoppers to speed the checkout process, they do not help reduce time during the shopping experience. Once in the store, a shopper continues to spend a considerable amount of time trying to locate the items that need to be purchased. Although in many supermarkets, signs throughout the store give shoppers a general indication as to the location of various categories of products, these signs fail to give shoppers precise location and direction information of specific products. Thus, many shoppers will roam the aisles trying to locate the items he or she wants to purchase.

A further failing of the present system is that shoppers often fail to obtain the full benefit of the savings offered by a store. Despite the advertisements and signs within the store, it is not uncommon for a shopper to walk by a sales item without realizing that it is on sale. Even if a shopper does attempt to purchase an item advertised as being on sale, when the item is scanned during check-out, the price charged to the shopper will sometimes not reflect the sales price and will go by unnoticed by the shopper. Therefore, there is a need for a shopping information system which will aid shoppers to save time and money and provide shopper conveniences during shopping.

The subject invention concerns an electronic shopping information system for use in a shopping venue, such as a supermarket, to assist shoppers to save time and money while shopping. The electronic shopping system is able to provide navigational directions to the shopper to various products in the shopping venue based on the shopper's current location and is also able to provide shoppers with store information such as notifying shoppers about sale items as the shoppers pass through the store aisles and provide shoppers with electronic discount coupons based on a shopper preference profile.

In accordance with one aspect of the invention, the shopping information system includes a portable electronic handset carried by shoppers, referred to as an electronic shopping card (ESC). The ESC is a microprocessor controlled unit and includes an optical transceiver configured to request and receive pricing information directly from electronic price tags associated with store items upon a shopper's request. In addition to requesting and receiving pricing data, the optical transceiver provides a capability for

receiving the afore-mentioned positioning and shopper information data from a central computer via a plurality of artificial light sources located throughout the shopping venue. The light sources being adapted to optically transmit position data and store information in addition to performing a conventional lighting function.

The ESC device further comprises an item profile database comprising at least an item profile table configured to include identification indicia for each item of merchandise sold in the store, such as brand name, generic name, and the like and also includes location information for each item of store merchandise. In the event the shopper makes a request to locate a particular item, the request is processed by the control unit of the ESC whereby the ESC, using the location information component from the item profile database and the positioning information transmitted via the light sources, computes a directional path to the item and displays the computed directional path and/or a navigational map to the shopper in response to the requested item. Alternatively, the ESC could provide the computed directional path to the shopper using a synthesized voice.

In one particular aspect of the invention, an automated check-out device for use at a checkout register is configured to wirelessly receive a shopper's pricing information stored on the ECS for items in the shopper's cart thereby removing a need to perform a bar-code scan of the cart items. An extraordinary time-savings may be realized in this regard.

In yet another aspect of the invention, the shopping venue includes a shopper profile database comprising at least a shopper preference table configured to include identification indicia of shoppers and shopper preference data, such as, for example, snack, beverage, condiment and cereal preferences and the like. Shopper preference data is transmitted from the shopper profile database, via a check-in device, to the ESC device upon the shopper entering the store.

The shopping information system provides numerous advantages to a shopper including: the elimination of price scanning at the checkout register by recording prices optically transmitted by the electronic price tags when items are selected by shoppers; guiding shoppers in locating items on the retail shelves and; providing electronic coupons

and supplemental product information targeted to shoppers based on a shopper preference profile.

Furthermore, the shopping information system provides numerous advantages to the retail chain including: (1) reduced labor costs by facilitating shopper self-service checkout; reduced coupon distribution costs by issuing electronic coupons on the spot when a shopper approaches an item in a supermarket; (2) increased shopper satisfaction resulting from reduction of checkout time by eliminating scanning at the checkout register; reduction of search time by shoppers trying to locate specific items on the shelves and savings on products of interest to the shoppers. A further advantage includes increased sales resulting from targeted electronic coupons based on shopper preferences.

The foregoing features of the present invention will become more readily apparent and may be understood by referring to the following detailed description of an illustrative embodiment of the present invention, taken in conjunction with the accompanying drawings, where:

FIG. 1 illustrates a schematic view of a general layout of a communication arrangement that uses a data link provided by a modulated, fluorescent light system;

FIG. 2 is illustrates a functional block diagram of a typical ESC device, according to one embodiment, which is carried by a user of the shopping information system of the invention; and

FIG. 3 is illustrates an exemplary embodiment of the shopping information system of the invention.

In the following detailed description of the present invention, numerous specific details are set forth in order to provide a thorough understanding of the present invention. However, it will be apparent to one skilled in the art that the present invention may be practiced without these specific details. In some instances, well-known structures and devices are shown in block diagram form, rather than in detail, in order to avoid obscuring the present invention.

The present invention will be described in terms of a shopping information system in a shopping venue. However, it will be understood by those skilled in the art that the present invention may be utilized in any data collection environment in which data is

communicated from a central host to an end user employing a portable data collection terminal.

FIG. 1 is a block diagram showing the present invention and its novel use in a shopping venue 130. The shopping venue 130 comprises a series of shelves 165 on which store items (i.e, products) are stored. Between the shelves 165 are access areas or aisles 167. The aisles 167 permit people to access the objects on the shelves 165. People/shoppers 162 move through the aisles 167 to select objects from the shelves 165. Stores like this are well known. For example, any retail or wholesale type of store will have objects stored on shelves 165 with aisle access as shown in the figure. Objects could include food, can goods, produce, package goods, hardware, lumber, house-wares and any other item that is sold and can be carried in a cart or container.

In addition to the conventional aspects of FIG. 1, there is also shown the information shopping system of the invention, generally designated as 100. The system 100 includes a control center (i.e., central host) 110 including a store computer 120 and a database 122 for storing at least shopper preference data. The store computer 120 will control a data link that can send optically encoded data (see arrows 52) to be communicated to mobile hand held units, ESCs 160 carried by shoppers 162 traveling through aisles 167 in the shopping venue. The data link is implemented by a fluorescent lighting system 140 comprised of a plurality of fluorescent lighting luminaires or luminaries 141. One method for transmitting data via a fluorescent light ballast is described in U.S. Patent 5,838,116, "Fluorescent Light Ballast with Information Transmission Circuitry", issued to Katyl et al. on November 17, 1998, incorporated by reference herein in its entirety. The data to be transmitted is generated at the computer 120 and connected to input data ports located on the ballasts 143 of the fluorescent lighting luminaries 141. Emitted light (shown as arrows 52) is modulated providing a way to transmit data from lamps in the fluorescent lighting luminaries 141 to the ESC devices 160 which are preferably carried around the shopping venue 130 on the person of the shopper 162.

A. THE ELECTRONIC SHOPPING CARD

FIG. 2 illustrates a functional block diagram of a typical ESC device 160, according to one embodiment, which is carried by a user of the shopping information system. The ESC device 160, according to one embodiment, includes an ESC control unit 201. The control unit 201 can comprise any standard processing system such as a CPU. The control unit 201 allows centralized control of the other components as discussed below, together with general operational conditions of the ESC device 160, data and power checks, compatibility checks and so forth as appropriate.

Shown separate from the controller 201 is a memory unit 211, although this may be incorporated in the same unit as the control unit 201. The memory unit 211 allows long or short term data storage, for example, of data received, via the optical transponder 203, to be described. Memory control, management and transfer can be controlled by the control unit 201. The memory unit 211 may suitably comprise a small form factor hard disk drive, a PCMCIA programmable memory card, a high-capacity flexible media cartridge and floppy drive combination, an array of FROM (Flash ROM), SRAM or DRAM memory chips, or the like.

The ESC device 160 further includes a voice storage unit 205 for storing predetermined voice data, a voice synthesizer 207 for converting the store information transmitted from the central computer, and a speaker 209 (or an earphone) for outputting the voice signal.

The ESC device 160 further includes an optical transponder 203 for performing receive and transmit functions to transmit/receive data associated with the shopping experience. Receive (Rx) functions performed by the ESC device 160 include capabilities for receiving optically encoded data from the plurality of fluorescent lighting luminaries 141 distributed throughout the shopping venue 130; capabilities for receiving pricing information from electronic price tags 170 located on the shelves near each store item and; capabilities for receiving shopper preference data from a check-in device 190 located at an entry portal to the shopping venue 130. Transmit (Tx) functions performed by the ESC device 160 include capabilities for transmitting pricing requests to any of the plurality of electronic price tags 170 located throughout the shopping venue 130 on each shelf 165 for each store item; transmitting pricing information on purchased store items

as part of an automated check-out procedure to a check-out device 180 located near the store exit. A check-out procedure is described below.

The ECS device 160 further includes a display 213 for displaying information to the shopper 162. For example the display 213 may represent navigational data (instructions) to locate store items, a navigational map for the same purpose, electronic coupon information, store specials, and other data in accordance with the invention as will be described further below. The display 213 may comprise any unit capable of displaying information, such as, for example, a VGA or SVGA liquid-crystal-display (LCD) screen, and LED display screen, or any other suitable display apparatus. Pressure sensitive (touch screen) technology may be incorporated into the display 213 so that a user may access the ECS device 160 by merely touching certain portions of the screen.

In a preferred embodiment, the ESC device 160 is also provided with a limited number of activation buttons 215, 217, 219 and 221 for performing various user functions such as a "price-request" key 215 to request pricing information from electronic price tags associated with each item for purchase in the shopping venue 130, a "plus" key 217 to "add" an item selected by a shopper 162 to a list of purchased items, a "minus" key 219 to "delist" a previously selected item from the purchase list which is to be returned to the shelves of the store, and an "equals" key 221 to display the total cost of the items selected for purchase.

The ECS 160 preferably incorporates power management/distributed power management (not shown) to ensure that, for the portable components at least the power supply is as efficiently used as possible ensuring that the full life of a power supply is obtained. In particular where the terminal is capable of performing different tasks using different components, the power usage for each component is.preferably distributed by individual adjustment in relation to each component to optimize power demand to meet the necessary power requirements.

A person skilled in this art having the benefit of the instant disclosure would readily appreciate that a variety of modifications could be made to the specific embodiment exemplified herein without departing from the spirit of the instant invention. For example, a numeric or alpha-numeric button or keypad arrangement may be provided in combination with the display 213 in order to define an input device.

B. SYSTEM OPERATION

The interactive shopping information system 100 in accordance with the inventive arrangements is particularly useful in food markets, as such a supermarket can utilize all of the advantageous features of the system 100. Accordingly, the inventive arrangements will be described in this context. However, the example should not be construed as limiting.

A supermarket application of the invention is shown in FIG. 3 as being representative of the shopping venue 130 of FIG. 1. To use the system 100, a shopper 162 entering the supermarket environment 300 first proceeds to a check-in counter 190 preferably located near an entrance 195 to the supermarket. The supermarket 300 automatically provides a plurality of portable ESC devices 160 stored at a convenient location near the check-in counter 190. The shopper 162 selects one of the ESC devices 160 from the check-in counter area 190 for use while shopping. After selecting an ESC device 160, the shopper will scan a personal identification card with stored identification data, such as, for example, a supermarket loyalty card at a check-in apparatus 191 located at or near the check-in counter 190. The check-in apparatus 191 reads the information stored on the supermarket loyalty card and checks with the central computer 120 to confirm that a corresponding shopper data file exists and that the shopper is authorized to use the system 100. Once system approval is obtained, the identification data stored on the shopper loyalty card is uploaded to a central host 120 to obtain shopper preference data from a shopper preference database 122 associated with the central computer (host) 110. The shopper preference data, once obtained, is transferred to the shopper's ESC device 160 via optical transmission from the check-in counter 191. In addition to the shopper preference data, electronic coupons may be transferred to the ESC device 160 for products included in the shopper preference database 122.

As the shopper 162 moves about the shopping venue 130 the fluorescent luminaries 141 broadcast store information to the ESC devices 160 about products available in the locality of the ESC device 160, such as store specials, and the like. In addition to the store information, the fluorescent luminaries 141 also optically transmit position data to the ESC devices 160. The position data is used to provide suitable

directions or location indicia to selected items, on the basis of a shopper's current location, to locate, upon shopper request, for example, the next item on a particular shopper's shopping list or to proposed replenishment items chosen on the basis of an analysis of a shopper's personal shopping history, as defined in the shopper preference database 122. In this case, the shopper 162 would make a request for the location of a particular store item via voice command using speaker 209. The request is processed by the ESC control unit 201 and using a locally stored map of the supermarket 130, the ESC 162 displays on the display device 213 either a text string of directions for locating the requested product and/or a map describing how to navigate the store aisles to locate the requested store item.

As a further feature of the invention, pricing information is readily obtained by the ESC devices 160 for any store item by positioning the ESC device 160 in proximity to an electronic price tag 170 associated with each store item and pressing the "price check" button 215 on the ESC device 160 to initiate a data transfer request for pricing information from the electronic price tag 170 to the ESC device 160. In response to the "price check" request, the electronic price tag 170 will transfer the requested data to the ESC device 160. The "price check" request/response process is effected by short-distance bi-directional optical transmission enabled by the shopper's manual intervention.

In addition to having a capability for performing "price checks", in a preferred embodiment of the present invention, the ESC device 160 also permits a shopper 162 to add an item to his or her shopping cart through the selection of an "add" key 217 located on an ESC keypad, return an item previously selected by selecting a "minus" key 219 or provide the shopper 162 with a running total of the products selected. The shopper can be provided with a running cost total for all selected items, as well as a running indication of savings, as a default display or upon request. This running cost total display can be part of the screen display. Running cost totals can also be supplied audibly, for example after each item is selected, or upon request.

A key feature of the invention is the method used to effect payment for the store items purchased at check-out time. When a shopper 162 has finished shopping, the shopper 162 proceeds to the checkout station 180 which includes means for transferring the stored prices from the ESC device 160 to the check-out station 180. In this manner,

there is no waiting time associated with conventional point-of-sale (POS) systems which require each item to be scanned and recorded. The time savings in this regard can be significant. After the display of the total is presented to the shopper 162, the shopper 162 can be queried whether or not it is time to pay for the objects/items carried in the cart. The shopper 162 can pay for the purchased items in a conventional manner, i.e., by using a credit card or other bill paying device.

The herein described embodiments of the present invention are intended to provide the preferred embodiments of the present invention as currently contemplated by the applicants. It would be obvious to anyone of skill in the relevant art based on the herein described examples without straying from the present invention that numerous modifications could be made to the described preferred embodiments. Moreover, the preferred embodiment has been described in the context of a supermarket application, the system could be used in any type of retail application. For example, in a hardware store (e.g., home depot), the electronic shopping card could be used to provide information pertaining to the location of various store items and pricing information of the multitude of items for sale by simply interrogating an electronic price tag. Accordingly, the herein described embodiments are merely exemplary in nature and are not intended to represent every possible embodiment of the present invention.

CLAIMS:

1. A hand-held, electronic shopping apparatus (160) comprising:

a processor (201) configured to calculate distance and direction to store items relative to the shopper's (162) current location using position data received from a remote store computer (120) and pre-stored item location information;

a storage device (211) coupled to the processor (201) that is operative to store an item database that includes said pre-stored item location information;

a display (213) controlled by the processor (201) that is operative to display information;

a tactilely activatable input (215, 217, 219, 221);

a speech user interface (205, 207, 209) operatively coupled to the processor (201) for receiving spoken queries and commands and supplying audible responses; and

an optical transceiver (203) coupled to the processor (201) for communication with one of a remote store computer (120) and a plurality of store electronic price tags (170).

2. The hand-held electronic shopping apparatus (160) of Claim 1, wherein said speech user interface (205, 207, 209) comprises a microphone and a speaker (209) built into said apparatus.

3. The hand-held electronic shopping apparatus (160) of Claim 1, wherein the storage device (211) is further operative to store position data and store information data received from said remote store computer (120) and product pricing data received from a plurality of store electronic price tags (170).

4. The hand-held electronic shopping apparatus (160) of Claim 3, wherein the shopper convenience data comprises electronic product coupons, product sales information and product marketing information.

5. The mobile, electronic shopping apparatus (160) of Claim 1, wherein displaying information comprises displaying navigational information to direct said shopper (162) from a current location to a desired store item and/or displaying a store map graphic on the display unit in conjunction with the displayed navigational information.

6. The mobile, electronic shopping apparatus of Claim 1, wherein said tactilely activetable input (215, 217, 219, 221) comprises at least one of a touch display screen and a plurality of buttons.

7. A system (100) for providing shopping information to shoppers (162) in a shopping venue (130), the system (100) comprising:

(a) a central processor (120) associated with said shopping venue (130) configured to:

1. generate position data;
2. generate store information data; and
3. maintain a shopper profile database (110);

(b) a plurality of data distribution lighting elements (141), coupled to said processor (120) and adapted to optically transmit said position data and shopper convenience data from said processor (120) throughout said shopping venue (130);

(c) a plurality of wireless devices (160), each device (160) including an optical transceiver (203) configured to receive said optically transmitted position data and said optically transmitted shopper convenience data from said plurality of data distribution lighting elements (141); and

(d) a plurality of electronic price tags (170)configured to optically transmit pricing information to said plurality of wireless devices (160) responsive to said plurality of wireless devices (160) initiating product pricing requests.

8. The system (100) of Claim 7, wherein said plurality of wireless devices (160) are further configured to receive pricing data responsive to said wireless devices (160) initiating said product pricing requests.

9. The system (100) of Claim 7, wherein said shopper profile database (110) comprises at least a shopper preference table, the shopper preference table configured to include:

identification indicia of shoppers for identifying a shopper when entering said shopping venue; and

shopper preference data relating at least in part to a shopper's prior purchasing history, including at least one shopper product preference indicia in each of a plurality of product categories.

10. The system (100) of Claim 7, further comprising a check-in device (190) for transmitting a shopper identification indicia to said central processor (120) and for receiving shopper preference data from said central processor (120) and re-transmitting said received shopper preference data to one of said plurality of wireless devices (160) at a shopper check-in time.

11. The system (100) of Claim 7, wherein said shopping venue (130) is associated with a merchandiser.

12. A method of providing shopping information to shoppers (162) in a shopping venue (162) comprising the steps of:

(a) issuing a shopper (162) a wireless device (160) upon entering said shopping venue (130);

(b) acquiring shopper identification indicia from said shopper (160) upon entering said shopping venue (160);

(c) retrieving shopper profile information from a database (110) associated with said shopping venue (130) using said acquired shopper identification indicia;

(d) optically transmitting store information and position data to said shopper's wireless device (160); and

(e) initiating an interrogation signal to be issued by the wireless device (160), by said shopper (162), said interrogation signal for interrogating an electronic price tag (170) associated with a store item in said shopping venue (130) to acquire pricing data for said store item; and

(f) acquiring said pricing data from said electronic price tag (170) responsive to said electronic interrogation.

13. The method of Claim 12 wherein the store information optically transmitted to said shopper (162) at said step (d) is based on said shopper profile information.

14. The method of Claim 12 wherein said step (f) of acquiring said pricing data is initiated by said shopper (162) by one of exercising an appropriate keystroke (215, 217, 219, 221) on said wireless device (160) and selecting an appropriate key from a

touch screen display.

15. The method of Claim 12, further comprising the steps of:

storing pricing data in said wireless device (160) for items contemplated for purchase by said shopper (162) while moving about said shopping venue (130);

processing in said wireless device (130) the stored pricing data for each of said items contemplated for purchase to define a total cost; and

transferring said total cost from said wireless device (16) to a check-out station (180).

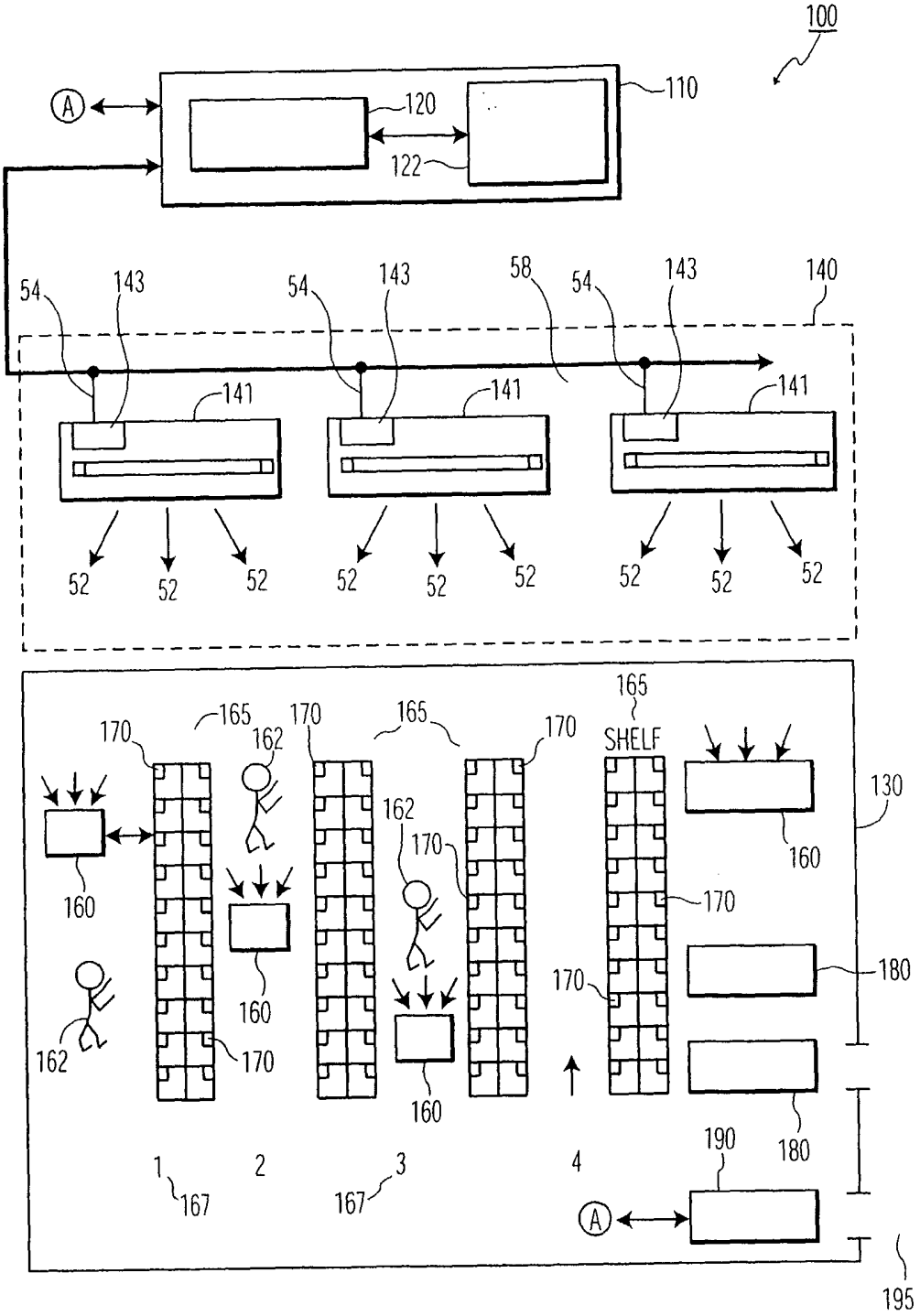

100
110
120
122
A
140
54
143
58
141
52
130
160
162
165
170
SHELF
180
190
195
1
2
3
4
167

FIG. 1

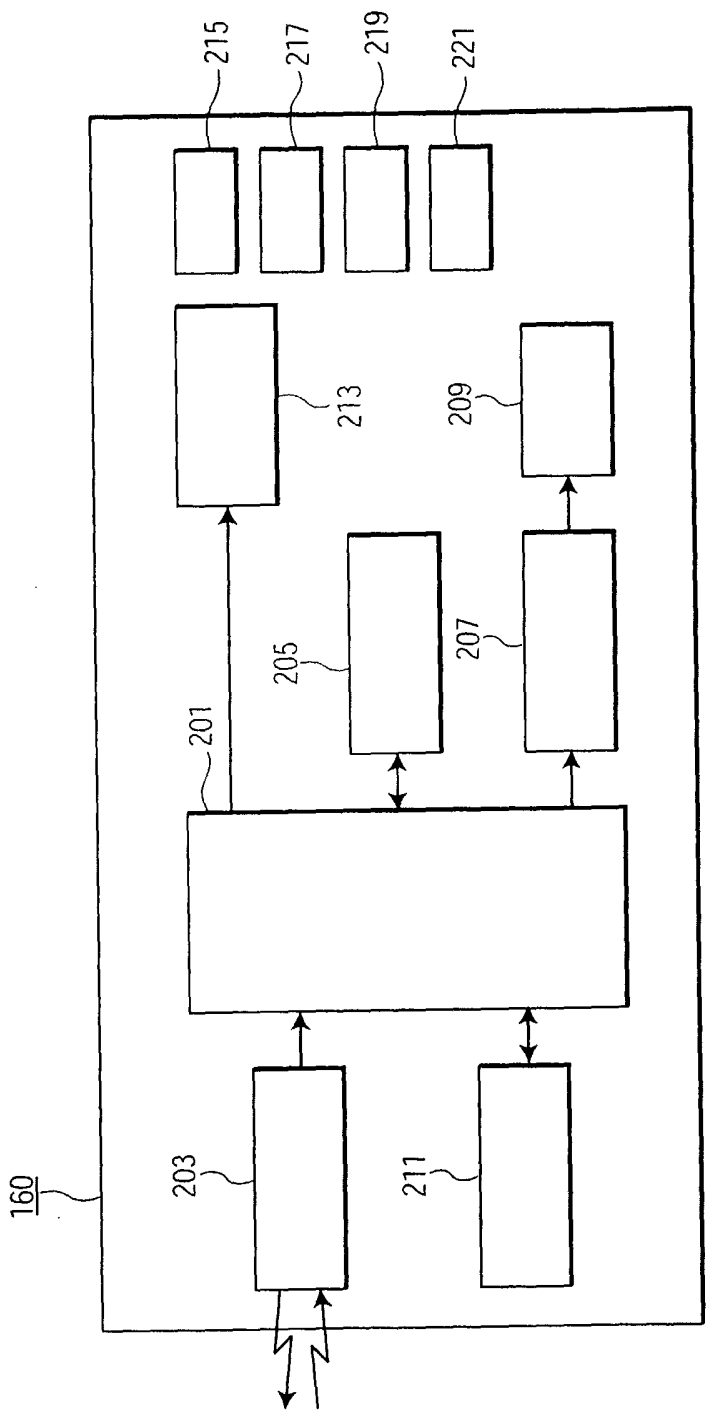


FIG. 2

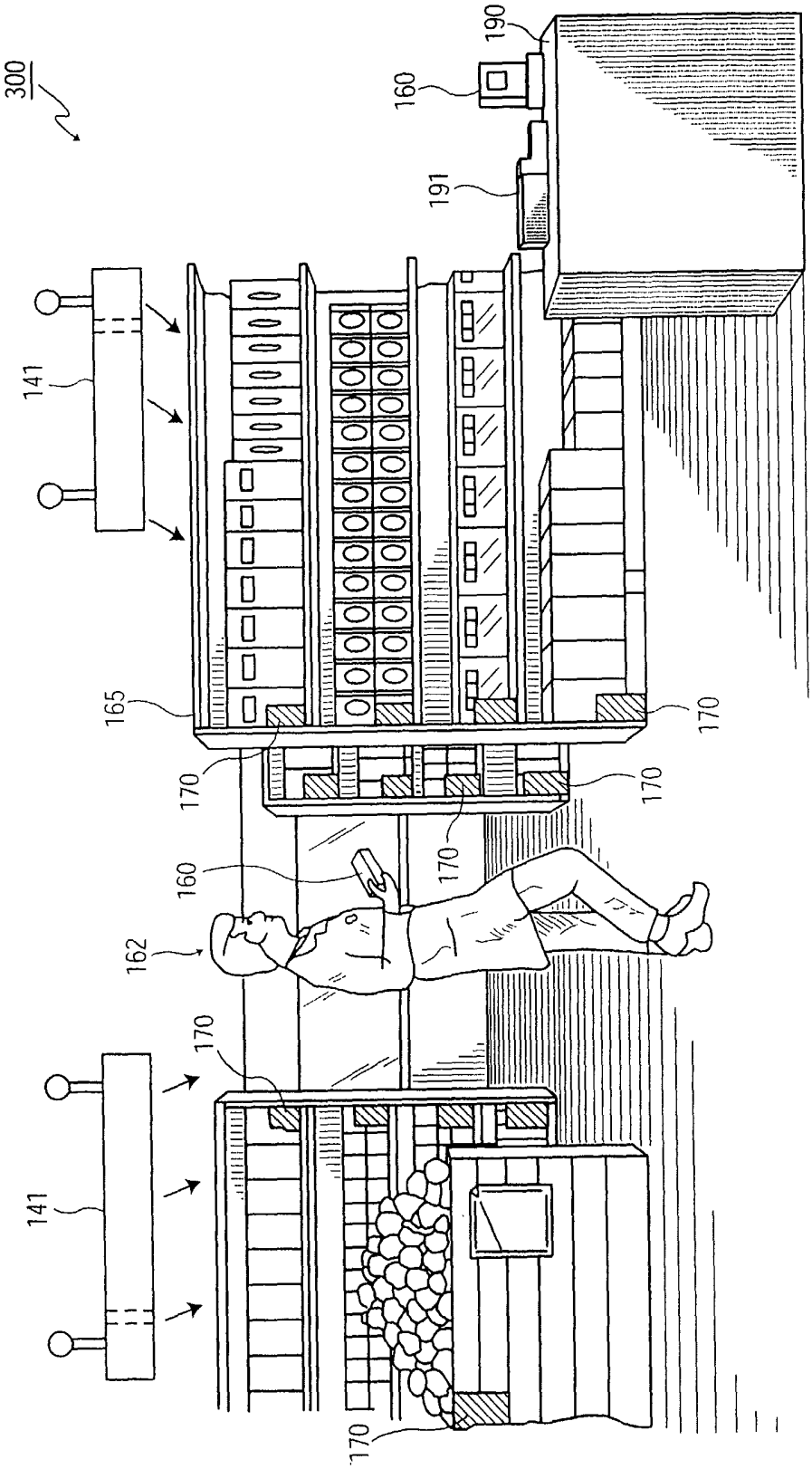


FIG. 3