

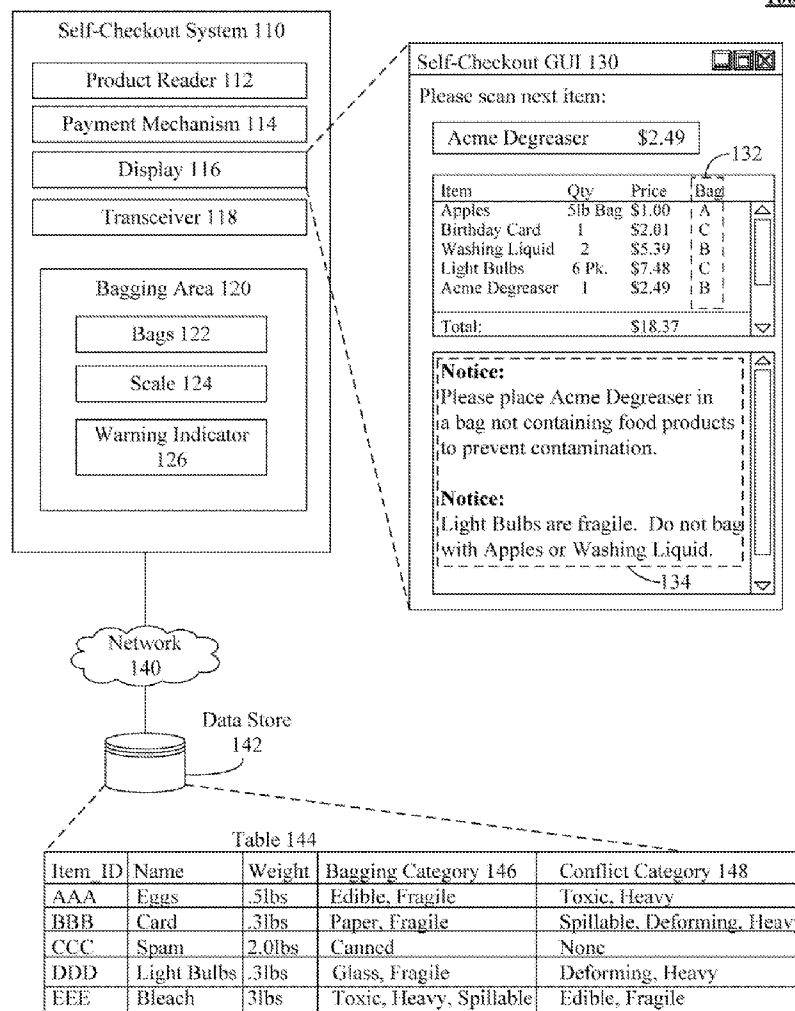


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CHAKRA et al.(10) **Pub. No.: US 2009/0090584 A1**(43) **Pub. Date: Apr. 9, 2009**(54) **PROVIDING ITEM BAGGING ADVISEMENTS
TO BAGGERS****Publication Classification**(75) Inventors: **AL CHAKRA**, APEX, NC (US);
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A47F 10/02 (2006.01)(52) **U.S. Cl.** **186/61; 186/66**(57) **ABSTRACT**

The present invention discloses a solution for providing item bagging advisements to individuals bagging purchased items during a check-out situation. The solution can include a self-checkout system and/or a human assisted checkout system capable of providing bagging assistance. A bagged item can be detected based on information such as weight, barcode data, and the like. Based on a set of rules for preferred item grouping, items can be determined to be appropriately bagged or to be in conflict with another item. Item bagging assistance can include, but is not limited to, item conflict warning, item compatibility confirmation, and assistance based on item categorization. Visual and aural confirmation and/or warning notifications can be presented to a user based on item compatibility or incompatibility.

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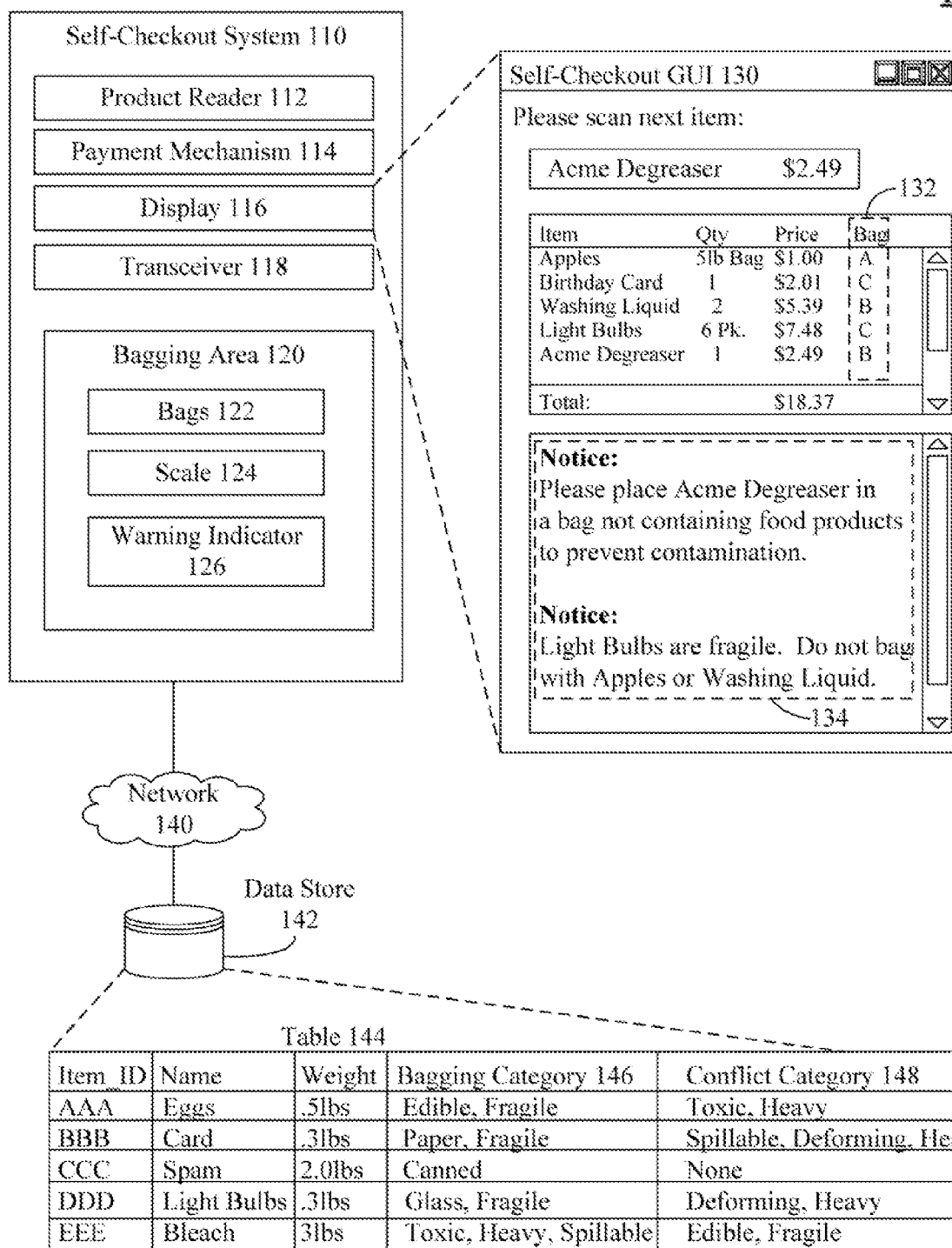


FIG. 1

200

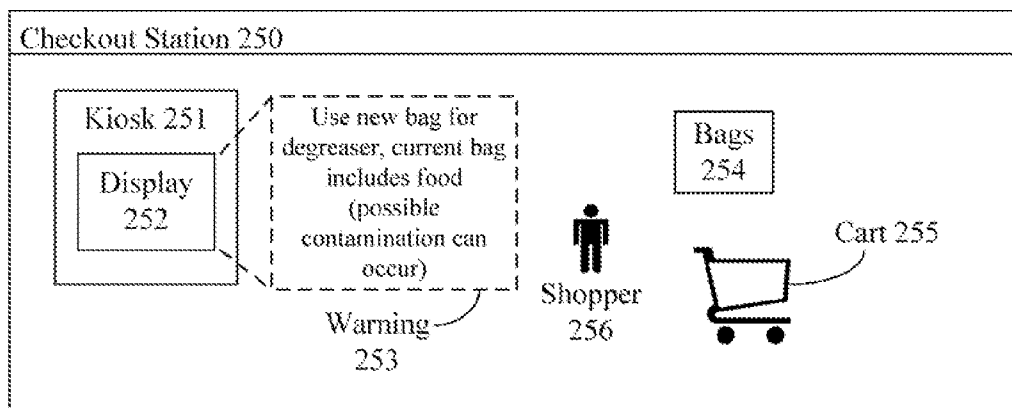
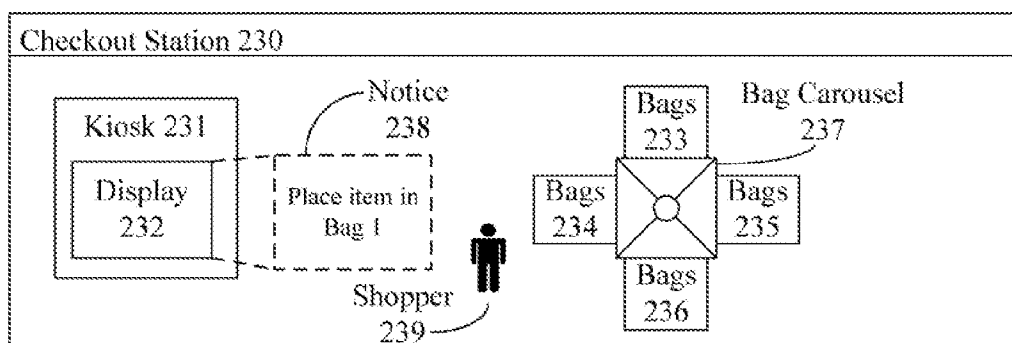
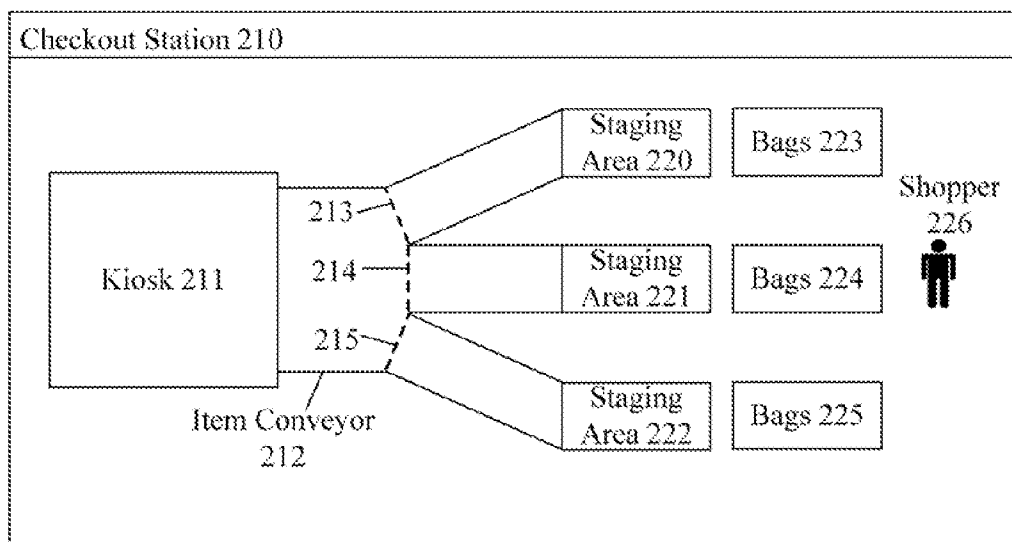


FIG. 2

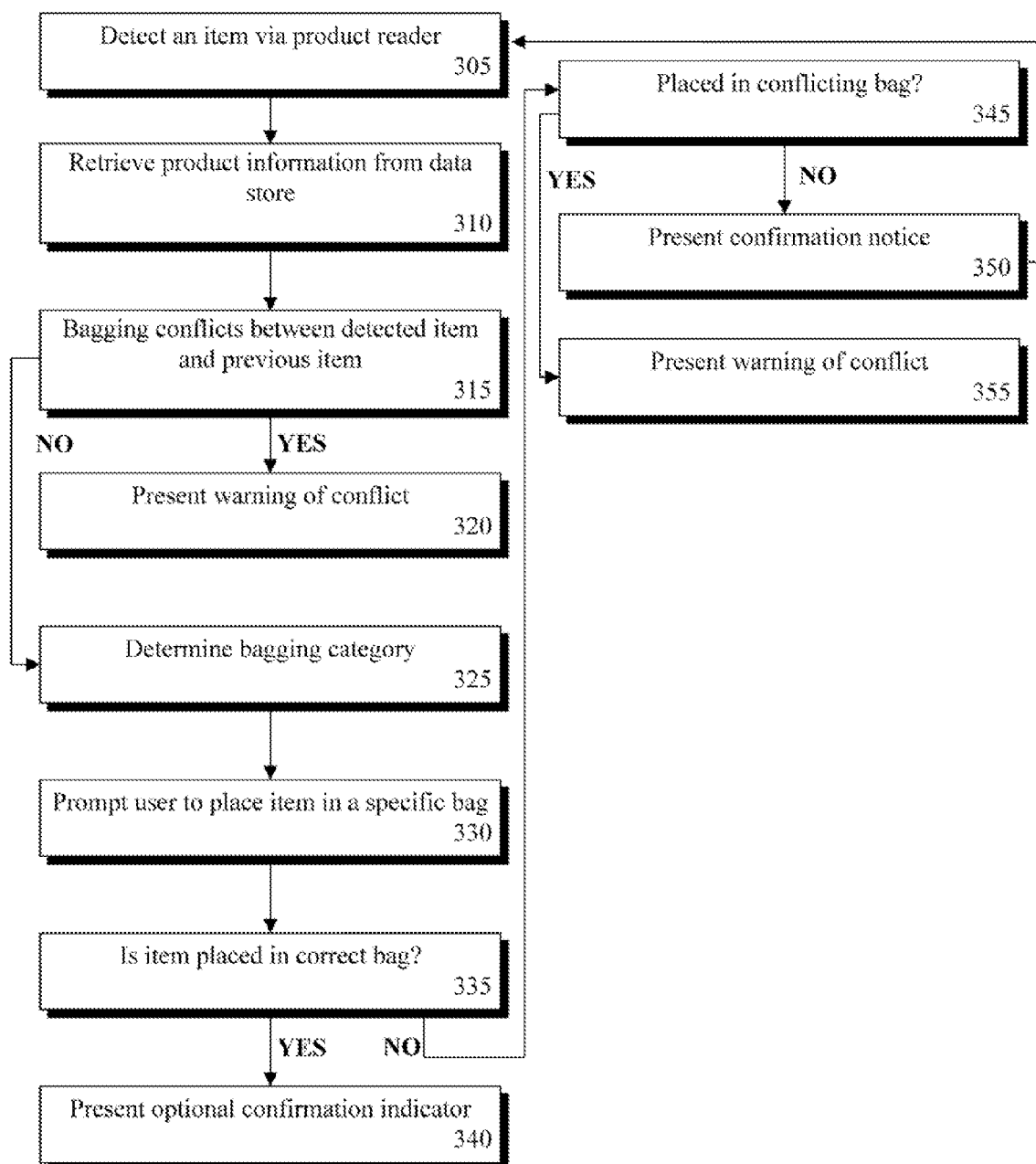
300

FIG. 3

PROVIDING ITEM BAGGING ADVISEMENTS TO BAGGERS

BACKGROUND

[0001] 1. Field of the Invention

[0002] The present invention relates to the field of retail commerce and, more particularly, to providing item bagging advisements to baggers.

[0003] 2. Description of the Related Art

[0004] Many retail stores, such as supermarkets and groceries, have established self-checkout lanes. A majority of these checkout lanes are self-checkout stations, which allow customers to scan, bag, and pay for items themselves via an automated kiosk. A growing problem associated with self-checkout stations is that customers often bag conflicting items together. For example, when customers place raw meat next to toxic items, such as bleach, a potential health hazard can occur. Other problems, such as bagging glass jars adjacent to each other, can cause breakage, which can lead to dangerous situations for customers.

[0005] Additionally, certain heavy items, such as canned products, when bagged with fragile items, such as light bulbs or eggs, can crush the fragile items. Additionally, wet or frozen items placed in bags with paper products, such as greeting cards or paper plates, can lead to disastrous results, ruining the paper products. Another consequence of improper item bagging can result in bruised or damaged fresh fruits and/or vegetables.

[0006] Although most prominent at self-checkout kiosks, bagging issues are not so limited. Improper bagging instances also occur during human assisted check-out situations, where either a customer "helping" by bagging items will make bagging mistakes or bagging agents of a store will, through oversight or a lack of training, make bagging mistakes. Situations involving improper bagging can lead to safety risks, unwanted problems, and a diminished shopping experience. These problems could be avoided, however, if baggers were assisted in the bagging of purchased items.

SUMMARY OF THE INVENTION

[0007] The present invention discloses a solution for providing item bagging advisement to customers in a self-checkout environment based on preferred grouping characteristics. The solution can include a self-checkout system capable of allowing a user to obtain bagging assistance for bagging purchased items. A bagged item can be detected based on information, such as weight, barcode data, and the like. Based on a set of rules for preferred item grouping, items can be determined to be appropriately bagged or in conflict with another item. Item bagging assistance can include, but is not limited to, item conflict warning, item compatibility confirmation, and assistance based on item categorization. Visual and aural confirmation and/or warning notifications can be presented to a user based on item compatibility or incompatibility.

[0008] The present invention can be implemented in accordance with numerous aspects consistent with the material presented herein. For instance, the invention can be embodied by a self-checkout kiosk comprising of a barcode scanner component providing a means for a shopper to register a for-sale item with the kiosk, at least one of a set of bags, such that the items can be grouped and collected in the bags by the shopper, an item data store configured to maintain informa-

tion specific to the for-sale item, and a display device for presenting the shopper with notifications and advisements for grouping of for-sale items in the bags.

[0009] Another aspect of the present invention can include a method for providing bagging assistance to a bagger. The method can identify and determine bagging categorical/grouping information a for-sale item, can determine at least one of a compatibility and conflict with a previously determined and bagged for-sale item based on categorical/grouping information, and can present a notification about a for-sale item to the bagger.

[0010] Still another aspect of the present invention can include a bagging interface that includes an output region for viewing at least one of a series for-sale items. A second output region can be present in the interface that is designed for viewing proposed bagging suggestions for one of a set of for-sale items. Further, another output sub-region can exist for viewing notifications triggered by the item identification.

[0011] It should be noted that various aspects of the invention can be implemented as a program for controlling computing equipment to implement the functions described herein, or as a program for enabling computing equipment to perform processes corresponding to the steps disclosed herein. This program may be provided by storing the program in a magnetic disk, an optical disk, a semiconductor memory or any other recording medium. The program can also be provided as a digitally encoded signal conveyed via a carrier wave. The described program can be a single program or can be implemented as multiple subprograms, each of which interact within a single computing device or interact in a distributed fashion across a network space.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012] There are shown in the drawings, embodiments which are presently preferred, it being understood, however, that the invention is not limited to the precise arrangements and instrumentalities shown.

[0013] FIG. 1 is a schematic diagram illustrating a system for providing item bagging advisement to customers in a self-checkout environment based on preferred grouping characteristics in accordance with the embodiment of inventive arrangements disclosed herein.

[0014] FIG. 2 is a schematic diagram illustrating a set of scenarios in which item bagging advisement can be provided in accordance with the embodiment of inventive arrangements disclosed herein.

[0015] FIG. 3 is a flowchart diagram illustrating a method for providing item bagging advisements in accordance with the embodiment of inventive arrangements disclosed herein.

DETAILED DESCRIPTION OF THE INVENTION

[0016] FIG. 1 is a schematic diagram illustrating a system 100 for providing item bagging advisement to customers in a self-checkout environment based on preferred grouping characteristics in accordance with the embodiment of inventive arrangements disclosed herein. System 100 is not limited to a self-checkout environment and can be adapted to provide bagging advisements during a human assisted checkout situation. In system 100, a self-checkout system 110 can assist a user (e.g., a customer, a check-out clerk, a bagging assistant) in the process of bagging purchased items. A user interacting with self-checkout system 110 can scan products into the system via product reader 112, bag items being assisted by

bagging advisement presented on display 116, and pay for items using payment mechanism 114. When an item is scanned, system 110 can obtain information about the item via stored item data in data store 142.

[0017] Information from data store 142 can include additional information for a scanned item, which is useful for assisting the user in bagging items. Bagging area 120 can include scale 124, located under bags 122, which can determine when specific items are placed into bags 122 based on weights and item data available in table 144. Section 134 and warning indicator 126 can indicate when one or more conflicts have occurred with items in bags 122. Items can be determined to be in conflict based upon bagging category 146 and conflict category 148 information. For example, Item AAA (eggs) are deemed to be in conflict with items that have a bagging category of heavy, such as Item EEE (bleach), as shown by conflict category 148.

[0018] Self-checkout graphical user interface (GUI) 130, using display 116, can present information about items scanned into the system. Self-checkout GUI 130 can include a bagging guide 132, indicating appropriate bags for listed items. Guide 132 can determine the appropriate bags 122 or bagging areas using table 144 category data. Section 134 can present information regarding item conflicts or alternatively provide confirmation when an item is placed in the appropriate bag. For example, a notice can be presented to direct the user that degreaser should not be placed in a bag containing edible items. In one embodiment, section 134 can present a list of other bags 122 containing compatible items based on a category matching system. Warning and confirmation notification can be stored throughout the user's session, allowing the user to correct mistakes, or refer back to a past notification. Additional advisements can include notifying the user when a bag exceeds a certain weight based upon scale 124 obtained measurements. Section 134 and warning indicator 126 can act in concert responsive to item bagging conflict or compatibility.

[0019] Warning indicator 126 can be used to notify the user that an item conflict has occurred. The warning indicator 126 can be located in proximity of the bagging area 120 and can include, but is not limited to, a light bulb, a light emitting diode (LED), a liquid crystal display (LCD), an audio speaker and the like. For example, an LED can appear red when an item conflict has occurred and green when there are no item conflicts. In one embodiment, an LCD can present a list of items currently in bags 122 and indicate which, if any, items that are in conflict. In another embodiment, voice output can emit from an audio transducer (indicator 126) to provide a spoken warning of a potential bagging issue.

[0020] In one embodiment of system 100, products can be entered into the system using product reader 112, which can be a barcode scanner, a radio frequency identification (RFID) scanner, or other product identification device. As such, item data can be stored in a local or remote data store 142 reachable via a network 140 using transceiver 118. In another instance, item data can be stored in RFID tags in item packaging. RFID tags can be read, via transceiver 118, by product reader 112, which can be an RFID tag reader. For example, item-specific data shown in data store 142 can be stored upon RFID tags associated with items in one contemplated implementation, where network 140 and/or data store 142 can be absent.

[0021] System 100 can include self-checkout kiosks, human agent assisted checkout stations, and the like. In human agent assisted stations, the bagging advisements and

warnings can aid the human agent assisting a customer and/or can aid a customer attempting to help by bagging items that have been checked-out. In system 100, bags 122 can include, but are not limited to, plastic bags, paper bags, canvas bags, cardboard boxes, polyurethane containers and the like. Different bagging instructions can be associated with different bag 122 types. For example, a risk of heavy items breaking fragile items can be less when a "bag" 122 is a rigid structure, such as a cardboard box, as opposed to a situation where the bag 122 is a plastic bag. Payment mechanism 114 can include, but is not limited to, bank note scanner, coin slot feeder, debit card, credit card, gift cards, and the like.

[0022] As shown herein, data store 142 can be physically implemented within any type of hardware including, but not limited to, a magnetic disk, an optical disk, a semiconductor memory, a digitally encoded plastic memory, a holographic memory, or any other recording medium. Data store 142 can be stand-alone storage unit as well as a storage unit formed from a plurality of physical devices, which may be remotely located from one another. Additionally, information can be stored within the data store 142 in a variety of manners. For example, information can be stored within a database structure or can be stored within one or more files of a file storage system, where each file may or may not be indexed for information searching purposes.

[0023] Network 140 can include any hardware/software/and firmware necessary to convey digital content encoded within carrier waves. Content can be contained within analog or digital signals and conveyed through data or voice channels and can be conveyed over a personal area network (PAN) or a wide area network (WAN). The network 140 can include local components and data pathways necessary for communications to be exchanged among computing device components and between integrated device components and peripheral devices. The network 140 can also include network equipment, such as routers, data lines, hubs, and intermediary servers which together form a packet-based network, such as the Internet or an intranet. The network can further include circuit-based communication components and mobile communication components, such as telephony switches, modems, cellular communication towers, and the like. The network 140 can include line based and/or wireless communication pathways.

[0024] FIG. 2 is a schematic diagram illustrating a set of scenarios 210, 230, and 250 in which item bagging advisement can be provided to customers in a self-checkout environment based on preferred grouping characteristics in accordance with the embodiment of inventive arrangements disclosed herein. Scenarios 210, 230, and 250 can be performed in the context of system 100. Scenarios 210, 230, and 250 illustrate checkout stations capable of providing bagging assistance to a shopper with varying levels complexity and user participation.

[0025] In scenario 210, a checkout station can include a kiosk 211 capable of automatically sorting items based on categorical and grouping data. This data can be accessed from a data store 142. Items can be grouped and sorted into a series of staging areas 220-222 to be placed into bags 223-225. Sorting can occur through the use of gates 213-215 along an item conveyor 212 which can be automated to route items to the appropriate staging area. A shopper 226 can retrieve items from staging area 220-222 and place the items into bags 223-225. For example, kiosk 211 can route raw meat products

to staging area **220**, route breakable items into staging area **221**, and route breads and cereals to staging area **222**.

[0026] Although illustrated as having separate conveyor **212** equipped regions, station **210** can also be implemented with a single conveyor **212**. For example, one or more fixed guides or partitions can be positioned above a moving conveyor and/or staging area **220-222** to separate items into regions. Using guides and a single conveyor can be particularly useful when retrofitting an existing checkout station **210** having a single conveyor **212** to add an item sorting capability to the station **210**. Additionally, use of gates **213-215** is optional, as a shopper **226** or other user can instead manually place items upon a partitioned conveyor **212** in accordance with bagging categories indicated by the kiosk **211**.

[0027] In scenario **230**, a kiosk **231** with an associated display **232** can assist a shopper **239** using a bag carousel **237** to bag items. Bag carousel **237** can include multiple bags **233-236** arranged around a central rotary base. A notice **238** can be presented for each item to be bagged by shopper **239**. Notice **238** can indicate which item is currently under consideration and the proper bag **233-236** in the bag carousel **237** to use. In one embodiment, the appropriate bag **233-236** can be presented in front of shopper **239** via the automatic rotation of the bag carousel **237**. For example, when shopper **239** is notified to place an item into bag **1**, the bag **233** (predetermined as bag **1**), can be rotated to be in front of the shopper **239** for easy access.

[0028] In scenario **250**, a kiosk **251** with an associated display **252** can assist a shopper **256** with placing items into bags **254**. Display **252** can direct the shopper **256** to select and place specific items into bags **254**. Alternatively, kiosk **251** can allow shopper **256** to select and place items in bags before presenting recommendations. Based on the appropriateness of the items placed into the bag, the kiosk **251** can respond with a warning **253** or a confirmation message (not shown). If an item conflict occurs, warning **253** can be presented to shopper **256** on display **252**. The shopper can optionally remove the conflicting item and select another item to place into bags **254**. As each bag is filled, shopper **256** can place the bag into cart **255**, and begin to fill a new bag with items.

[0029] FIG. **3** is a flowchart diagram illustrating a method **300** for providing item bagging advisements in accordance with the embodiment of inventive arrangements disclosed herein. Method **300** can be performed in the context of system **100**. In method **300**, a user in a self-checkout or agent assisted environment can be assisted by a bagging advisor system.

[0030] In step **305**, a user can place an item on the scanner and the item can be detected by a product reader. In step **310**, a data store can be polled and product information can be retrieved. In step **315**, the system can attempt to detect if any conflicts have occurred between the detected item and the previous item. If a conflict has occurred, the system can present a warning of the conflict, as shown in step **320**. In step **325**, the bagging category for the detected item can be determined.

[0031] In step **330**, the user can be prompted to place the detected item into a specific bag. The next step can be step **335**, wherein the system attempts to determine if the item is placed in the correct bag. If the item is placed in the correct bag an optional confirmation indicator can be presented, as shown in step **340**. In step **345**, if the item is not placed in a conflicting bag the method can proceed to step **350**. In step **350**, a confirmation notice can be presented, and the method

can return to step **305**. If a conflict is determined, a conflict warning can be presented, as shown in step **355**.

[0032] The present invention may be realized in hardware, software or a combination of hardware and software. The present invention may be realized in a centralized fashion in one computer system or in a distributed fashion where different elements are spread across several interconnected computer systems. Any kind of computer system or other apparatus adapted for a carrying out methods described herein is suited. A typical combination of hardware and software may be a general purpose computer system with a computer program that, when being loaded and executed, controls the computer system such that it carries out the methods described herein.

[0033] The present invention also may be embedded in a computer program product, which comprises all the features enabling the implementation of the methods described herein, and which when loaded in a computer system is able to carry out these methods. Computer program in the present context means any expression, in any language, code or notation, of a set of instructions intended to cause a system having an information processing capability to perform a particular function either directly or after either or both of the following: a) conversion to another language, code or notation; b) reproduction in a different material form.

1. A self-checkout kiosk comprising:

a product reader configured to permit a self-checkout kiosk to identify for-sale items and to determine a unique item key for each of the identified for-sale items;

at least one bagging area configured to permit a shopper to bag the for-sale items, which have been identified by the product reader;

at least one item data store configured to store a item information specific to the for-sale items, wherein the item information is indexed against the unique item keys, and wherein the at least one item data store comprises information indexed against the unique item keys that comprises bagging specific data; and

a presentation component configured to present the shopper with an advisement on how to bag the for-sale items based at least in part upon the bagging specific data contained in the item data store, wherein the presentation component is configured to dynamically present the advisement to the shopper to place each for-sale item in a specific bag responsive to that item being scanned by the product reader based upon previously stored category data, which is information indexed against the unique item keys, wherein the advisement is presented for that item before a subsequent item is scanned by the product reader.

2. The kiosk of claim 1, wherein the presentation component comprises a display configured to visually show a name for each of the for-sale items as the for-sale items are identified by the product reader and a price of the identified for-sale item, and wherein the display visually shows a total purchase price of all the for-sale items that have been identified by the product reader, wherein said advisement is a visual advisement appearing within the display, wherein said advisement comprises a bagging guide value for each item, wherein said bagging guide value is based upon a category associated with a scanned item, wherein different categories equate to different bagging guide values.

3. The kiosk of claim 2, wherein the bagging area comprises a scale, wherein said scale is utilized to determine

whether each scanned item is placed in the specific bag indicated by the presentation component, wherein the presentation component is configured to present a warning when the scanned item is not placed in the indicated specific bag and when a bagging conflict results.

4. The kiosk of claim 1, wherein said at least one bagging area comprises a plurality of distinct bagging areas, wherein said self checkout kiosk categorizes each of the for-sale items into one of the distinct bagging areas, and wherein the shopper is presented with an indication of which of the bagging areas is associated with which of the for-sale items in accordance with categories established by the self-checkout kiosk.

5. The kiosk of claim 2, further comprising: at item conveyor configured to convey each of the for-sale items into the bagging area associated with the for-sale items, wherein a plurality of different conveyers exist, each conveying the scanned for-sale items to different staging areas based upon bagging guide values associated with the scanned items, wherein the different conveyers are configured to convey each of the scanned for-sale items to the corresponding staging area associated with that scanned for-sale item after an item is scanned and before a subsequent item is scanned.

6. The kiosk of claim 4, wherein the plurality of distinct bagging areas are established via a bag carousel, wherein the bagging carousel is configured to automatically rotate as said for-sale items are scanned so that the bagging carousel is continuously positioned by automatic rotation for the shopper to place the scanned item in the specific bag as advised by said presentation component.

7. The kiosk of claim 4, further comprising: a plurality of scales associated with each of the distinct bagging areas, wherein each scale is configured to weigh each for-sale item as the for-sale item is bagged, wherein the item information comprises an item weight, and wherein the presentation component is configured to present a warning when a for-sale item is placed in an improper one of the distinct bagging areas as determined by measurements of the plurality of scales.

8. The kiosk of claim 1, wherein bags available within the at least one bagging area comprise of at least one of plastic bag, paper bag, canvas bag, cardboard box, and a polyurethane container.

9. The kiosk of claim 1, wherein the item data store is a network data store remotely located from the self-checkout kiosk, which is communicatively linked to the kiosk via a network, wherein the item data store comprises a plurality of item data stores that are digital content storage areas of Radio Frequency Identification (RFID) tags attached to the for-sale items, wherein the product reader is configured to read digital content stored in the Radio Frequency Identification (RFID) tags.

10. The kiosk of claim 2, wherein said category upon which the bagging guide value is based comprises values selected from a group of values comprising at least two of: edible, fragile, paper, canned, glass, toxic, heavy, and spillable.

11. The kiosk of claim 1, wherein said presentation component comprises a display and at least one of a light emitting source other than the display and an audio speaker, wherein the light emitting source or the audio speaker are configured to provide an warning when a product identified by the product reader has a bagging conflict with another for-sale item that has already been identified by the product reader as determined by the self-service kiosk, wherein the bagging conflict comprises at least one of placing an edible next to a toxic item, placing items proximate to each other that is likely

to result in breakage of at least one item, placing heavy items proximate to fragile items, and placing frozen items proximate to paper products.

12. A method for providing bagging assistance to a bagger comprising:

using a product reader to identify for-sale items and to determine a unique item key for each of the identified for-sale items;

querying at least one data store containing bagging specific information that is indexed against the unique item key to determine bagging specific information for the for-sale items;

determining at least one of a compatibility and conflict with a newly identified one of the for-sale items and at least one for-sale item that has previously been identified by the product reader; and

presenting a notification via a computing device concerning the determined at least one of the compatibility and conflict, wherein the querying, determining, and presenting steps of the method is performed by a checkout system to assist with bagging the for-sale items, and wherein the notification comprises an advisement to place each for sale item in a specific bag responsive to that item being scanned by the product reader based upon a previously stored category data, which is information indexed against the unique item keys, wherein said notification comprising said advisement is dynamically presented for each bagged item before a next for-sale item is scanned.

13. The method of claim 12, wherein the checkout system comprises a self-checkout kiosk.

14. The method of claim 12, wherein said advisement comprises a bagging guide value for each item, wherein said bagging guide value is based upon a category associated with a scanned item, wherein different categories equate to different bagging guide values, wherein said category upon which the bagging guide value is based comprises values selected from a group of values comprising at least two of: edible, fragile, paper, canned, glass, toxic, heavy, and spillable.

15. The method of claim 12, further comprising:

receiving a reading from a sensor, which indicates that a for-sale item has been placed in one of a plurality of possible bags that includes at least one item for which the for-sale item has a bagging conflict, wherein said notification is a warning indicating the bagging conflict, wherein the bagging conflict comprises at least one of placing an edible next to a toxic item, placing items proximate to each other that is likely to result in breakage of at least one item, placing heavy items proximate to fragile items, and placing frozen items proximate to paper products.

16. The method of claim 12, further comprising: for each of the for-sale items identified by the product reader, displaying a name for each of the for-sale items, a price for each of the for-sale items, and a bagging category for each of the for-sale items, wherein a determination for the bagging category is based at least in part upon the querying and determining steps, wherein values for the bagging category comprise a group of values comprising at least two of: edible, fragile, paper, canned, glass, toxic, heavy, and spillable.

17. A bagging interface comprising:

a first output section for viewing information specific to a plurality of for-sale item identified by a product reader, which is a device configured to determine a unique key

value associated with each of the for-sale items, wherein said viewing information comprises a name of the identified for-sale item, a cost of the for-sale item, and a bagging guide value for the for-sale item that indicates an appropriate group of said for-sale items, wherein for-sale items having a common bagging guide value are to be bagged together, wherein the viewing information for each item is automatically and dynamically presented in the first output section responsive to the associated for-sale item being scanned by the product reader, wherein a unique presentation line of the viewing information is presented for each for-sale item within the first output section; and

- a second output section for viewing proposed bagging suggestions specific to the set of for-sale items that have been identified by the product reader, wherein the bagging suggestions are programmatically determined based upon information contained within at least one item data store containing item specific information indexed by the unique key value, and wherein the item specific information comprises bagging specific data, wherein said second output section provides textual notifications indicating explicitly when a recently scanned item is not to be placed in a same bag as a previously scanned for-sale item.

18. The interface of claim **17**, wherein the interface is an interface of a self-checkout kiosk, wherein said bagging interface comprises a running total for all of the for-sale items that have been scanned by the product reader, which represents a sum of said costs of each for-sale item minus any session specific discounts, wherein said viewing information for each for-sale item comprises a quantity of the for-sale item purchased.

19. The interface of claim **17**, wherein said first output section and said second output section are the same output section of the shopper interface, said same output section displaying a name for each of the for-sale items, a price for each of the for-sale items, and a bagging category for each of the for-sale items.

20. The bagging interface of claim **17**, wherein said textual notifications of the second output section are dynamically presented as a warning when a for-sale item is detected as being placed in a bag and when a bagging conflict results from placing the for-sale item in the bag, wherein the bagging conflict comprises at least one of placing an edible next to a toxic item, placing items proximate to each other that is likely to result in breakage of at least one item, placing heavy items proximate to fragile items, and placing frozen items proximate to paper products.

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