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(54) **METHOD AND SYSTEM FOR SELF-CHECKOUT COUPON SHARING SYSTEM**

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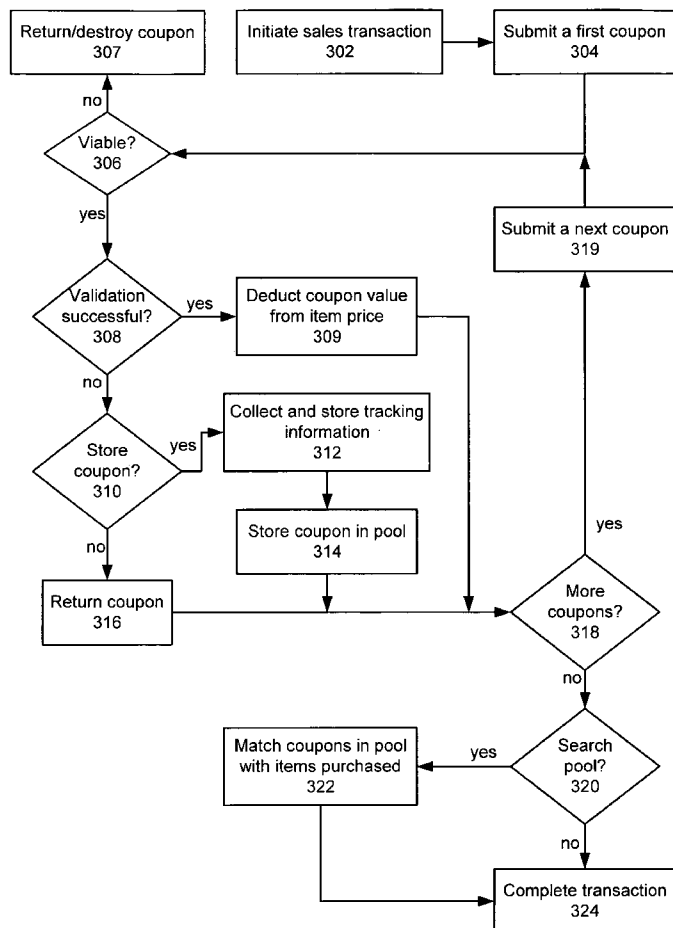(73) Assignee: **International Business Machines Corporation**, Armonk, NY

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(57) **ABSTRACT**

The present invention is directed to a method and system for processing coupons by a self checkout system, where the self checkout system includes at least one self checkout station coupled to a server. In a first aspect, the present invention includes receiving a coupon from a customer by one of the at least one self checkout stations, attempting to validate the coupon against at least one item scanned by the customer, and storing the coupon in a coupon pool at the server if the coupon fails to validate against the at least one item, such that the stored coupon can be utilized at a subsequent sales transaction. In a second aspect, a self checkout system includes a server for managing the self checkout system and at least one self checkout station coupled to the server, where the self checkout station includes a scanner for scanning at least one item for purchase by a customer, a coupon reader for receiving a coupon from the customer, and a coupon manager. The coupon manager attempts to validate the coupon against the at least one item scanned by the customer, and if the coupon fails to validate, the coupon manager stores the coupon in a coupon pool at the server such that the stored coupon can be utilized at a subsequent sales transaction.

FIG. 1

Retailer Server 20

Coupon tracking file 180

Personal pool 50a

Global pool 50b

Coupon 165

Electronic Coupon 165'

SCO Station 100

Memory 120

CPU 110

Item Scanner 130

Display 140

Coupon Manager 170

Coupon Reader 160

Bus 115

Input Device 150

FIG. 2

Return/destroy coupon
307

Initiate sales transaction
302

Submit a first coupon
304

no

Viable?
306

yes

Submit a next coupon
319

Validation
successful?
308

yes

Deduct coupon value
from item price
309

no

Store
coupon?
310

yes

Collect and store tracking
information
312

Store coupon in pool
314

no

Return coupon
316

yes

More
coupons?
318

no

Match coupons in pool
with items purchased
322

yes

Search
pool?
320

no

Complete transaction
324

FIG. 3

Access coupon pools via web site
402

Browse global pool
404

Transfer selected coupons to personal pool
406

Apply selected coupons to items purchased
408
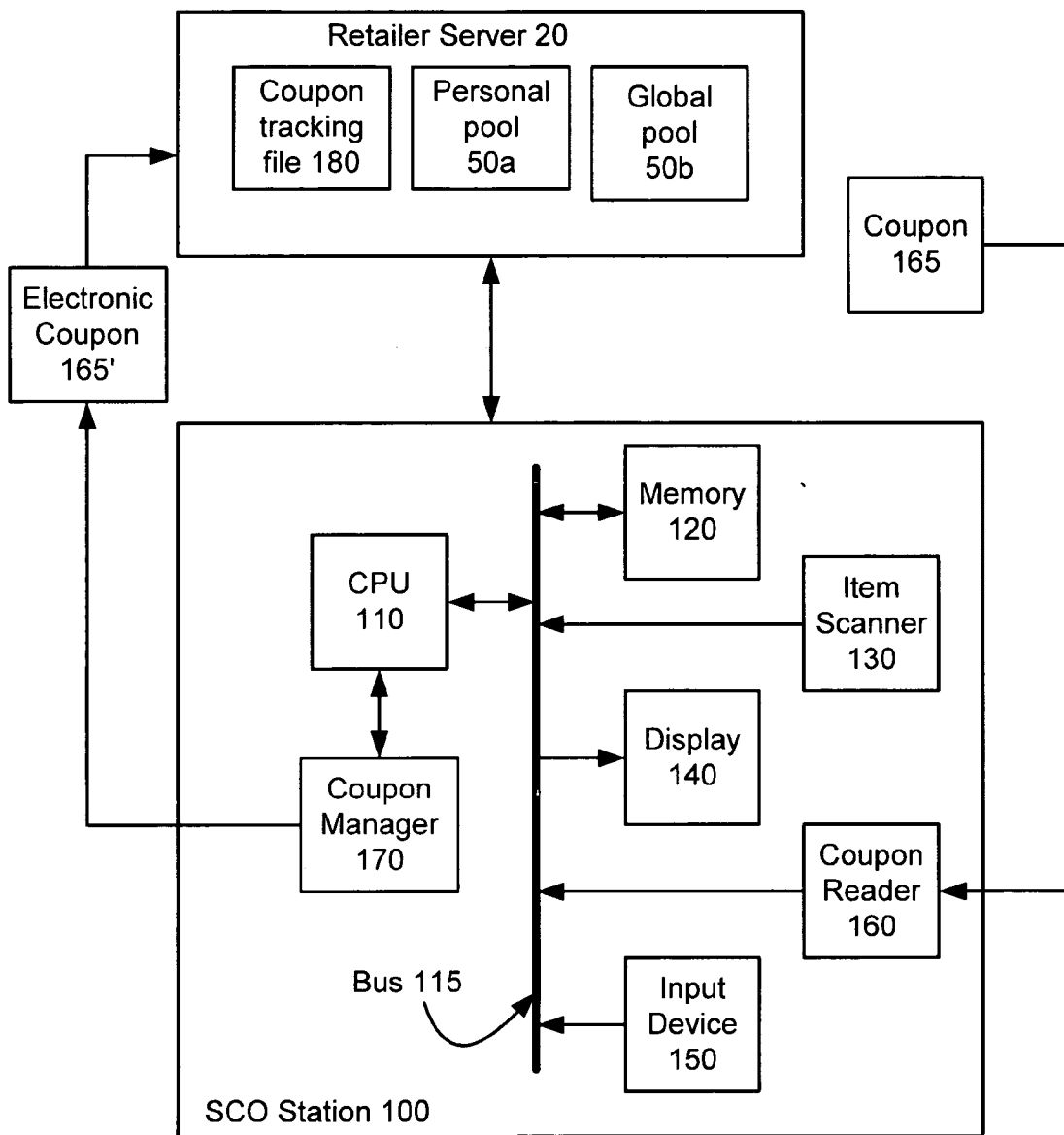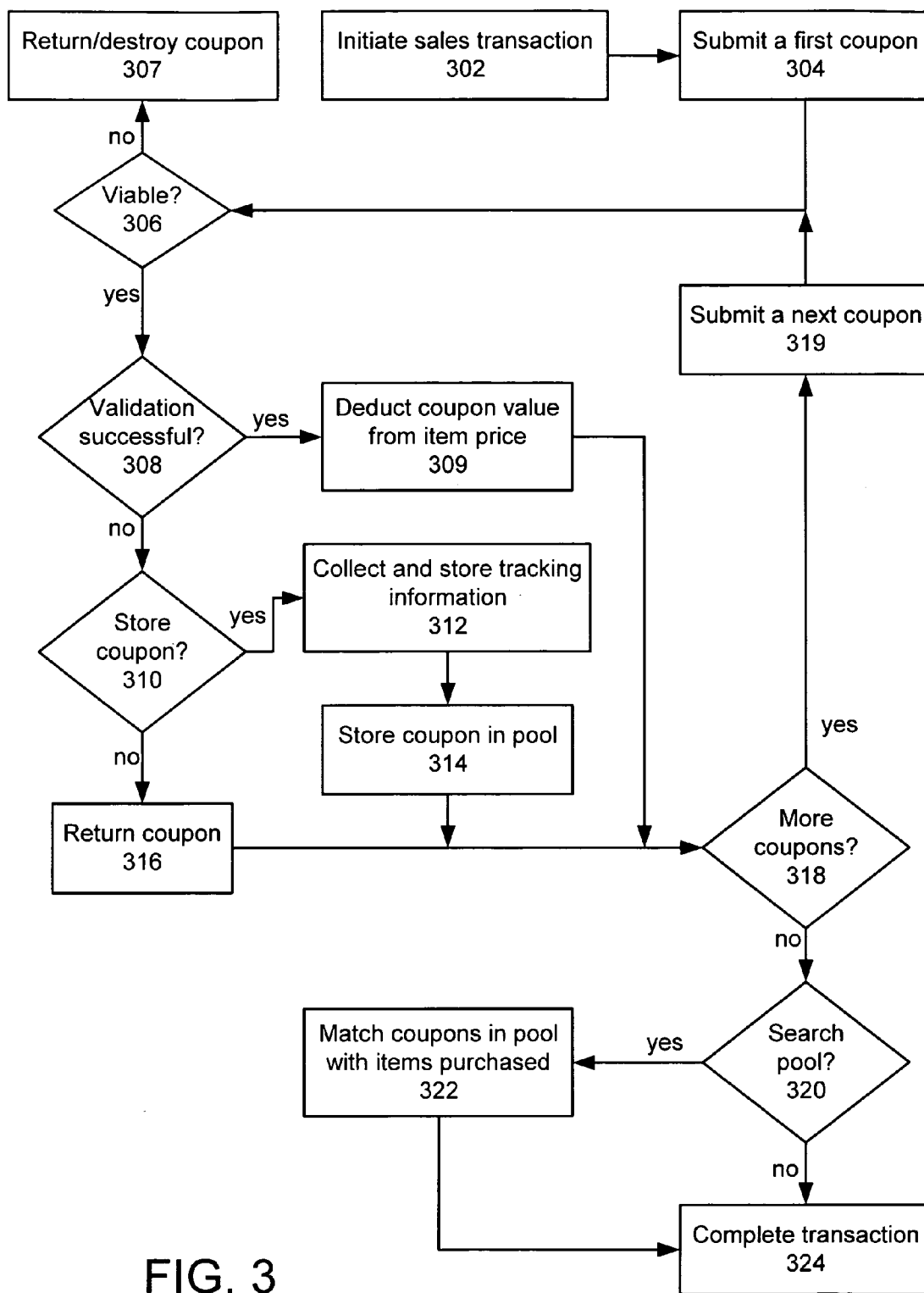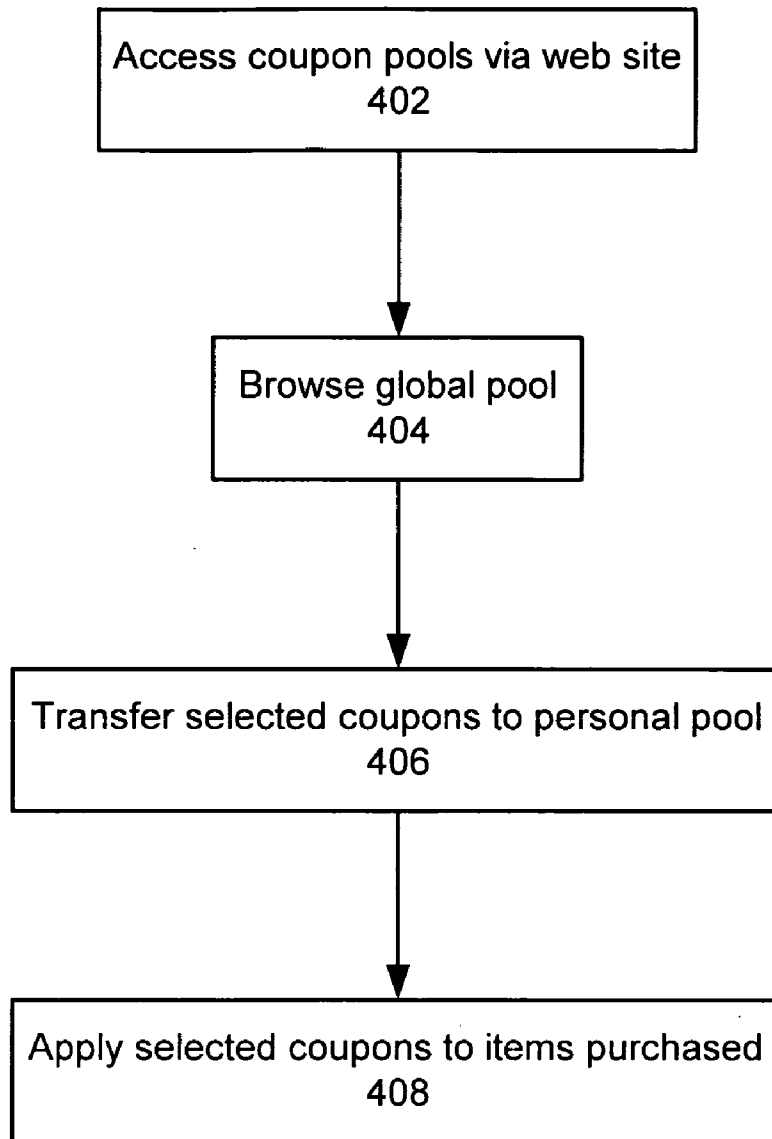
FIG. 4

METHOD AND SYSTEM FOR SELF-CHECKOUT COUPON SHARING SYSTEM

FIELD OF THE INVENTION

[0001] The present invention relates to a Self Check Out system and more particularly to a method and system for processing coupons in a Self Check Out system.

BACKGROUND OF THE INVENTION

[0002] In the retail sales industry, a customer is able to pay for items at a Self Check Out (SCO) station without the aid of a checkout clerk. During operation, the customer typically scans each item across a scanner. When all items have been scanned, the SCO station aggregates the items, indicates the aggregate purchase price to the customer, and allows the customer to pay either at the SCO station or at a central payment area staffed by an employee. Although SCO stations are typically stationary structures, "mobile" SCO stations have been developed recently that allow the customer to self-check out on-the-fly. Such devices are well known in the art and will not be described further.

[0003] In addition to the described functionality, most SCO stations also provide a means for accepting paper coupons. Typically, such paper coupons offer discounts on items to encourage customers to purchase the items. The paper coupons are issued by the retailer or by the manufacturer of an item. The paper coupons are scanned by the SCO system, which then deducts the value of the coupons from the aggregate purchase price. While most SCO systems scan coupons, they differ as to how the coupons are then input into the system for accounting and processing purposes. Some SCO systems provide a slot into which the customer can insert the coupons. Nevertheless, a problem exists when the SCO system does not validate the coupon inserted into the slot against the coupon that was scanned during the sales transaction. If the customer inserts a different coupon, the customer can reuse the scanned coupon and the retailer cannot redeem the value of the coupon from the manufacturer.

[0004] Accordingly, what is needed is a system and method for processing paper coupons in a SCO system. The system should validate coupons against items scanned and should also provide a means for handling coupons that fail to validate such that customers and manufacturers/retailers who issue the coupons benefit. The present invention addresses such a need.

SUMMARY OF THE INVENTION

[0005] The present invention is directed to a method and system for processing coupons by a self checkout system, where the self checkout system includes at least one self checkout station coupled to a server. In a first aspect, the present invention includes receiving a coupon from a customer by one of the at least one self checkout stations, attempting to validate the coupon against at least one item scanned by the customer, and storing the coupon in a coupon pool at the server if the coupon fails to validate against the at least one item, such that the stored coupon can be utilized at a subsequent sales transaction. In a second aspect, a self checkout system includes a server for managing the self checkout system and at least one self checkout station coupled to the server, where the self checkout station

includes a scanner for scanning at least one item for purchase by a customer, a coupon reader for receiving a coupon from the customer, and a coupon manager. The coupon manager attempts to validate the coupon against the at least one item scanned by the customer, and if the coupon fails to validate, the coupon manager stores the coupon in a coupon pool at the server such that the stored coupon can be utilized at a subsequent sales transaction.

BRIEF DESCRIPTION OF THE DRAWINGS

[0006] FIG. 1 is a block diagram of a Self Check Out system according to a preferred embodiment of the present invention.

[0007] FIG. 2 is a block diagram detailing a Self Check Out station according to a preferred embodiment of the present invention.

[0008] FIG. 3 is a flowchart illustrating a method for managing coupons in a SCO system according to a preferred embodiment of the present invention.

[0009] FIG. 4 illustrates a process for utilizing the coupon pools by a customer according to a preferred embodiment of the present invention.

DETAILED DESCRIPTION

[0010] The present invention relates to a Self Check Out (SCO) system and more particularly to a method and system for processing coupons by a SCO system. The following description is presented to enable one of ordinary skill in the art to make and use the invention and is provided in the context of a patent application and its requirements. Various modifications to the preferred embodiment and the generic principles and features described herein will be readily apparent to those skilled in the art. Thus, the present invention is not intended to be limited to the embodiment shown but is to be accorded the widest scope consistent with the principles and features described herein.

[0011] According to a preferred embodiment of the present invention, the SCO system includes a retailer server and at least one SCO station coupled to the server. The SCO station includes a coupon reader, which receives and reads a paper coupon. A coupon manager in the station verifies the status of the coupon and then attempts to validate the coupon against any of the items scanned by the customer during the concurrent sales transaction. If the coupon fails to validate, the coupon manager allows the customer to deposit the unused coupon at the server in one of at least two collections or pools. One pool can be dedicated to the customer for his or her personal use. Another pool can be a global pool for use by any shopper. During a subsequent visit, the customer can apply the unused coupons in either the personal or global pool to items purchased. The resulting system benefits customers as well as manufacturers that sponsor the coupon promotion.

[0012] FIG. 1 is a block diagram of an SCO system according to a preferred embodiment of the present invention. As is shown, several SCO stations 100 are coupled to a retailer server 20. The SCO stations 100 can be located in a single facility, such as a department store, or they can be located in different locations. Similarly, the retailer server 20 can be located on site with the SCO stations 100 or at another location. The SCO stations 100 and server 20 can

communicate directly or via a wired or wireless private network, such as a LAN, WAN, intranet or internet, as is well known.

[0013] According to a preferred embodiment of the present invention, the retailer server **20** includes at least one coupon pool **50** for storing coupons that have been submitted to, but failed to validate against an item scanned by, one of the SCO stations **100**. As is shown, a customer **70** and an item manufacturer **80** can access the retailer server **20** via a network **60**, such as the Internet. This access will be described in more detail below.

[0014] **FIG. 2** is a block diagram detailing a SCO station **100** according to a preferred embodiment of the present invention. Here, the station **100** includes a central processing unit (CPU) **110** in communication with a plurality of devices **120-160** via a communication bus **115**, or some other similar means well known in the art. The plurality of devices includes, but is not limited to, a memory device **120**, an item scanner **130**, a display **140**, an input device **150**, and a coupon reader **160**. While one input device **150** is depicted, those skilled in the art appreciate that several input devices can be implemented, such as a keyboard, a mouse, and a microphone. Moreover, the input device **150** can be integrated with the display **140** as a "touch-screen" type of input device **150**.

[0015] During operation, the CPU **110** receives data about an item from the item scanner **130**, which it then stores in the memory device **120**. Instructional information is displayed to the customer via the display **140**, and the customer is able to input information associated with a sales transaction through the input device **150**.

[0016] According to a preferred embodiment of the present invention, the SCO station **110** also includes a coupon reader **160**, which is capable of receiving a paper coupon **165** submitted by a customer and of reading the information on the coupon **165**, e.g., a barcode. The data collected by the coupon reader **160** is transmitted to a coupon manager **170** coupled to the CPU **110**. The coupon manager **170** processes the coupon **165** and determines if the coupon is viable, e.g., whether the coupon has expired, etc. If appropriate, the coupon manager **170** converts the coupon **165** into an electronic coupon **165'** and transmits the electronic coupon **165'** to the retailer server **20** where it is stored in a personal pool **50a** or a global pool **50b** or both. Simultaneously, the coupon manger **170** collects information about the coupon **165'** and stores it in a coupon tracking file **180** in the retailer server **20**.

[0017] The personal pool **50a** is preferably associated with the customer such that any coupon **165'** stored therein is accessible by the customer only. The global pool **50b** is a shared pool where the coupons **165'** stored therein are available for all shoppers. Those skilled in the art will recognize that other coupon pools can be defined, such as family pools or company pools, and the types of pools should not be limited to those described here.

[0018] To describe how the coupon manager **170** processes a coupon **165**, please refer to **FIG. 3**, which is a flowchart illustrating a method for managing coupons in a SCO system according to a preferred embodiment of the present invention. The method begins when a customer initiates a sales transaction in step **302**. Here, the customer

typically presents, e.g., scans, his or her loyalty card, which identifies the customer to the SCO station **110**. Then, the customer starts scanning the item(s) for purchase using the item scanner **130**. As stated above, the information collected by the item scanner **130** is stored in memory **120**.

[0019] When the customer has finished scanning all of the items for purchase, the SCO station **110** preferably prompts the customer, e.g., via the display **140** or a speaker (voice prompt), to apply any coupons **165** to the sales transaction. In response, the customer submits a first coupon **165** in step **304** by feeding the coupon **165** into the coupon reader **160**, which then transmits the coupon **165** to the coupon manager **170**. In step **306**, the coupon manager **170** determines whether the coupon **165** is viable, e.g., by comparing the expiration date with the present date. If the coupon **165** is not viable, it is destroyed or returned to the customer (step **307**). In a preferred embodiment, the coupon manager **170** collects tracking information related to the rejected coupon **165** and stores the tracking information in the coupon tracking file **180** in the retailer server **20**.

[0020] If the coupon **165** is viable, the coupon manager **170** then determines whether the coupon can be validated against any of the items in the sales transaction (step **308**). If the coupon **165** validates against an item, then normal coupon processing occurs in step **309**, i.e., the item price is reduced by the value of the coupon. If the coupon **165** does not validate, e.g., because the coupon does not apply to any items in the sales transaction, or the coupon applies to an item, but the number of units of the item does not correspond to the coupon promotion, etc., then in step **310**, the customer decides whether to store the unvalidated coupon **165**.

[0021] If the customer chooses to store the unvalidated coupon **165**, the coupon manager **170** converts the paper coupon **165** into an electronic coupon **165'** and collects and stores tracking information about the electronic coupon **165'** in the coupon tracking file **180** (step **312**). The tracking information can include the manufacturer, the item, reason(s) for non-validation, and the pool(s) in which the coupon is stored. This tracking information can be distributed to interested parties, e.g., manufacturers, for purposes of evaluating product promotions and the like.

[0022] After the coupon manager **170** has converted the coupon **165** into an electronic coupon **165'**, the coupon **165** is destroyed. The coupon manager **170** then transmits the electronic coupon **165'** to the retailer server **20** where the electronic coupon **165'** is stored in a coupon pool **50a**, **50b** in step **314**. Here, the electronic coupon **165'** can be used in subsequent sales transactions by the customer, e.g., if the coupon **165'** is stored in the personal pool **50a**, or by any other shopper, e.g., if the coupon **165'** is stored in the global pool **50b**. If the customer chooses not to store the unvalidated coupon **165**, the coupon manager **170** simply returns the paper coupon **165** to the customer in step **316**. In a preferred embodiment, the coupon manager **170** collects and stores the tracking information about the coupon **165** before the coupon **165** is returned to the customer. If the customer has more coupons **165** (step **318**), the customer submits a next coupon **165** for processing in step **319**, and steps **306** through **316** are repeated.

[0023] After the customer has submitted all of his or her coupons **165** (step **318**), the coupon manager **170** asks the customer whether he or she would like to search the coupon

pool(s) **50***a*, **50***b* for unvalidated electronic coupons **165'** that may be applied to any of the items scanned (step **320**). If yes, then the coupon pool(s) **50***a*, **50***b* is searched for coupons **165'** that match the items in the sales transaction (step **322**). If the customer chooses not to search the coupon pools **50***a*, **50***b*, then the coupon manager **170** returns control to the CPU **110** so that the sales transaction can be completed in step **324**, e.g., the CPU **110** totals the sale and the customer is prompted to provide payment.

[0024] In another preferred embodiment, the coupon manager **170** can ask the customer whether he or she would like to search the coupon pool(s) **50***a*, **50***b* while the customer is scanning the items in the sales transaction. By performing the search as the items are being scanned, the coupon manager **170** can take advantage of the idle time that is inherent in the SCO process to spawn a separate thread to search for coupons in the coupon pool(s) **50***a*, **50***b* that match items as they are being scanned in real time. This approach may optimize the overall throughput of the SCO process.

[0025] According to the preferred embodiment of the present invention, unvalidated electronic coupons **165'** are stored in coupon pools **50***a*, **50***b* at the retailer server **20**. Because the retailer server **20** is accessible to customers **70** and item manufacturers **80** via the network **60**, such as the Internet, customers **70** and item manufacturers **80** can examine the coupon pools **50***a*, **50***b*. This provides benefits to both customers **70** and manufacturers **80**.

[0026] For example, **FIG. 4** illustrates a process for utilizing the coupon pools **50***a*, **50***b* by a customer **70**. In step **402**, a customer **70** can access the coupon pools **50***a*, **50***b* via the retailer's web site, browse the electronic coupons **165'** stored in the global pool **50***b* (step **404**), and in step **406**, transfer selected coupons **165'** to his or her personal pool **50***a* before visiting the retailer's store. Once the customer visits the store and scans selected items, the electronic coupons **165'** stored in his or her personal pool **50***a* can be used in step **408**. By transferring selected coupons **165'** to his or her personal pool **50***a*, the customer is not required to carry paper coupons and a search of the global pool **50***b* is avoided during the SCO process, thereby saving time.

[0027] For manufacturers **80**, valuable information about customer preferences and product management can be gleaned from the contents of the global pool **50***b*. For instance, an item manufacturer **80** can monitor the popularity of an item based on the rate at which a coupon **165'** for that item is transferred out of the global pool **50***b*. Based on that information, the manufacturer can readjust the coupon value and/or expiration date. Moreover, because the coupons **165'** are now electronic, the manufacturer can modify the coupon **165'**, e.g., extend an expiration date or change a value, through well known web service technology.

[0028] In another preferred embodiment, the manufacturer **80** can utilize the information gleaned from the global pool **50***b* to price the item "on-the-fly." For example, the number and value and expiration date of the coupons **165'** for an item in the global pool **50***b* may be used with other factors, e.g., quantity on hand, item movement data, competitor's pricing, current and planned promotions, to ultimately derive a price in real time. Thus, if the global pool **50***b* contains a large number of coupons **165'** for an item, there may be no need to drastically reduce the price in order to provide an incen-

tive to sell the item. On the other hand, if the global pool **50***b* contains a small number of the coupons **165'** for an item, then the manufacturer may decrease the selling price as an incentive to sell the item. This price can then be implemented immediately via electronic shelf labels (ESLs).

[0029] The information gleaned from the global pool **50***b* can be supplemented by the information stored in the coupon tracking file **180**. In a preferred embodiment, the coupon tracking file can be distributed to the item manufacturer **80** periodically so that it can analyze the information to discern patterns of use. For example, if a large number of coupons for an item were rejected because they were fraudulent, the item manufacturer **80** can take action to stop the improper reproduction of the fraudulent coupons. In another example, if a large number of coupons were rejected because they had expired, the item manufacturer **80** might decide to extend the expiration date.

[0030] Through aspects of the present invention, a system and method for processing coupons that fail to validate in a sales transaction at an SCO station is disclosed. If a coupon fails to validate, i.e., it cannot be applied to any items purchased by the customer, the customer has the option to store the coupon in a pool of unused coupons. The coupons in the pool can then be used by the customer or any other shopper in subsequent sales transactions. During the sales transaction, a search of the pool of unused coupons can be performed to match the items in the sales transaction.

[0031] Although the present invention has been described in accordance with the embodiment shown, one of ordinary skill in the art will readily recognize that there could be variations to the embodiment and those variations would be within the spirit and scope of the present invention. Accordingly, many modifications may be made by one of ordinary skill in the art without departing from the spirit and scope of the appended claims.

What is claimed is:

1. A method for processing coupons by a self checkout system, wherein the self checkout system comprises at least one self checkout station coupled to a server, the method comprising:

   (a) receiving a coupon from a customer by one of the at least one self checkout stations;

   (b) attempting to validate the coupon against at least one item scanned by the customer; and

   (c) storing the coupon in a coupon pool at the server if the coupon fails to validate against the at least one item, such that the stored coupon can be utilized at a subsequent sales transaction.

2. The method of claim 1, wherein the coupon is a paper coupon and the storing step (c) further comprises:

   (c1) converting the paper coupon into an electronic coupon;

   (c2) transmitting the electronic coupon from the one self checkout station to the server; and

   (c3) destroying the paper coupon.

3. The method of claim 1, wherein storing step (c) further comprises:

   (c1) converting the paper coupon into an electronic coupon;

(c2) collecting tracking information related to the coupon and storing the tracking information in a file at the server; and

(c3) storing the coupon in a global pool at the server, wherein the global pool is accessible by all customers.

4. The method of claim 3 further comprising:

(d) allowing a second customer in the subsequent sales transaction to utilize the coupon in the global pool.

5. The method of claim 4, wherein the allowing step (d) further comprises:

(d1) searching the global pool for a coupon that validates against an item scanned by the second customer during the subsequent sales transaction; and

(d2) deducting a value of the coupon from a price of the item if the coupon and the item are validated.

6. The method of claim 1, wherein storing step (c) further comprises:

(c1) storing the coupon in a personal pool at the server, wherein the personal pool is associated with the customer.

7. The method of claim 3 further comprising:

(d) accessing the global pool at the server by the customer;

(e) selecting at least one coupon in the global pool; and

(f) transferring the selected coupon to a personal account at the server.

8. The method of claim 3 further comprising:

(d) receiving the tracking information in the file by an item manufacturer;

(e) accessing the global pool at the server by the item manufacturer;

(f) selecting at least one coupon in the global pool;

(g) analyzing the tracking information for the selected coupon; and

(h) modifying the selected coupon.

9. The method of claim 8 wherein the modifying step (h) further comprising:

(h1) modifying a price of the item based on the analysis.

10. The method of claim 9, further comprising:

(i) implementing the modified price immediately via an electronic shelf label associated with the item.

11. The method of claim 8 wherein the modifying step (h) further comprising:

(h1) modifying an expiration date of the selected coupon.

12. A computer readable medium containing program instructions for processing coupons by a self checkout system, wherein the self checkout system comprises at least one self checkout station coupled to a server, the program instructions for:

(a) receiving a coupon from the customer by one of the at least one self checkout stations;

(b) attempting to validate the coupon against at least one item scanned by the customer at the one self checkout station; and

(c) storing the coupon in a coupon pool at the server if the coupon fails to validate against the at least one item, such that the stored coupon can be utilized at a subsequent sales transaction.

13. The computer readable medium of claim 12, wherein the coupon is a paper coupon and the storing instruction (c) further comprises:

(c1) converting the paper coupon into an electronic coupon;

(c2) transmitting the electronic coupon from the one self checkout station to the server; and

(c3) destroying the paper coupon.

14. The computer readable medium of claim 12, wherein storing instruction (c) further comprises:

(c1) converting the paper coupon into an electronic coupon;

(c2) collecting tracking information related to the coupon and storing the tracking information in a file at the server; and

(c3) storing the coupon in a global pool at the server, wherein the global pool is accessible by all customers.

15. The computer readable medium of claim 14 further comprising:

(d) allowing a second customer in the subsequent sales transaction to utilize the coupon in the global pool.

16. The computer readable medium of claim 15, wherein the allowing instruction (d) further comprises:

(d1) searching the global pool for a coupon that validates against an item scanned by the second customer during the subsequent sales transaction; and

(d2) deducting a value of the coupon from a price of the item if the coupon and the item are validated.

17. The computer readable medium of claim 12, wherein storing instruction (c) further comprises:

(c1) storing the coupon in a personal pool at the server, wherein the personal pool is associated with the customer.

18. The computer readable medium of claim 14 further comprising:

(d) accessing the global pool at the server by the customer;

(e) selecting at least one coupon in the global pool; and

(f) transferring the selected coupon to a personal account at the server.

19. The computer readable medium of claim 14 further comprising:

(d) receiving the tracking information in the file by an item manufacturer;

(e) accessing the global pool at the server by the item manufacturer;

(f) selecting at least one coupon in the global pool;

(g) analyzing the tracking information for the selected coupon; and

(h) modifying the selected coupon.

20. The computer readable medium of claim 19 wherein the modifying instruction (h) further comprising:

(h1) modifying a price of the item based on the analysis.

21. The computer readable medium of claim 20, further comprising:

(i) implementing the modified price immediately via an electronic shelf label associated with the item.

22. The method of claim 19 wherein the modifying instruction (h) further comprising:

(h1) modifying an expiration date of the selected coupon.

23. A self checkout system comprising:

a server for managing the self checkout system; and

at least one self checkout station coupled to the server, wherein the at least one self checkout station comprises:

a scanner for scanning at least one item for purchase by a customer;

a coupon reader for receiving a coupon from the customer; and

a coupon manager for validating the coupon against the at least one item scanned by the customer, wherein if the coupon fails to validate, the coupon manager stores the coupon in a coupon pool at the server such that the stored coupon can be utilized at a subsequent sales transaction.

24. The self checkout system of claim 23, wherein the server comprises a global pool for storing the unvalidated coupon, wherein the global pool is accessible by all customers.

25. The self checkout system of claim 24, wherein the server further comprises communication means for allowing a customer or item manufacturer to access the global pool.

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