Consignment Inventory Management and Reconciliation System

Field of Invention

The present invention relates to a consignment inventory management and reconciliation system and preferably, though not exclusively, than can track and age all relevant items in a consignment inventory.

Background to the Invention and Definitions

In July 1998 the Electronics Industry Data Exchange (EIDX) published a paper entitled "Inventory Management Business Models for Consignment Processes". In that paper was a definition of consigned inventory:

Consigned inventory is inventory that is in the possession of one party (for example, customer, dealer, agent, and so forth), but remains the property of another party (for example, manufacturer, prime contractor, and so forth) by mutual agreement.

The possessor of the inventory does not hold title to the inventory. Liability for the inventory is per contractual agreement. Title may or may not pass to the possessor depending on the contractual agreement.

Title may pass from a seller to a buyer when the buyer consumes the inventory.
Inventory may be consigned by a buyer to a third-party warehouse, to whom liability may pass but not title.
Inventory maybe consigned by a buyer to a contract manufacturer; title may or may not transfer depending on the contractual agreement;

It has the synonyms:

- Supplier-owned inventory (from the buyer's perspective)
- Customer-owned inventory (from the contract manufacturer's perspective)
- In-house stores (from consignee's perspective)
- Line-side stocking
- Remote warehouse (from seller's perspective)

That definition applies throughout this specification.

Inventory item tracking systems are widely used for the tracking and management of items in a warehouse or retail location.

Current consignment inventory methods and systems only track the amount of consignment inventory that has been shipped to the buyer's consignment location by the seller. This is traditionally referred to as the on-hand quantity. Current consignment inventory systems will increment the on-hand quantity when items are shipped to the buyer and decrement the on-hand quantity when ownership is transferred from the seller to the buyer; the buyer returns the item to the seller; the item is determined to be missing and seller writes-off the item.

Currently there are no methods or systems to track and age items that:

- were shipped from the seller to the buyer;
- have not been billed by the seller; and
- cannot be found at the buyer's consignment location.

This is identified as the **Unbilled** quantity in this specification.

Currently there are no methods and systems to track and age items that:

- were not shipped to the buyer from the seller
- can be found at the buyer's consignment location and are the same as items provided by the seller to the buyer on consignment

This is identified as the Excess quantity in this specification.

Consignment inventory management methods and processes today rely on the transfer of ownership for an item between the buyer and seller in order for consigned inventory to be reduced. The current methods and systems do not allow for the tracking of items that have been shipped from the seller to the buyer and used by the buyer or removed from the buyer's consignment location with out notification to the seller.

Summary of the Invention

In one preferred aspect the present invention provides a consignment inventory management and reconciliation system wherein there is tracking and reconciliation of:

a. first items shipped to a buyer from a seller and that are located at the buyer's consignment inventory location;
b. second items shipped to the buyer by the seller, that have not been billed by the seller and cannot be found at the buyer's consignment inventory location; and
c. third items not shipped to the buyer by the seller, can be found at the buyer's consignment inventory location, and are of the same identity as items provided on consignment by the seller to the buyer

Preferably, the system, also ages the first items and the second items;

There may be tracking of one or more selected from the groups consisting of: item number, item lot number, and item expiry date. Tracking may take place whenever a transaction is processed. A transaction may be represented by a transaction description and a transaction amount. The transaction amount may be zero, a positive number, and a negative number, with a number of decimal places. The transaction may be one or more of: bill, use, dispose, return, transfer-out, receive, transfer-in, order, set, and count.

Bill may be used when the item is no longer at the buyer's consignment location but ownership has to been transferred from the seller to the buyer.

Use may be used when the buyer has used the item and the process of transferring ownership from the seller to the buyer should be initiated or has been competed.

Dispose may be used when the item is no longer at the buyer's consignment location and seller is writing off the item. Ownership will not be transferred from the seller to the buyer.

Receive may be used when the item is physically being moved from the seller to the buyer's consignment location. Ownership will not be transferred from the seller to the buyer.

Transfer-in is used when the item is physically being moved to the buyer's consignment location from a third party location. Ownership will not be transferred from the seller to the buyer.

Return may be used when item is physically being moved from the buyer's consignment location back to the seller. Ownership will not be transferred from the seller to the buyer.

Transfer-out is used when the item is physically being moved from the buyer's consignment location to a third party location. Ownership will not be transferred from the seller to the buyer.

Order may be used when a request has been made to increase the buyer's consignment item(s) quantity.

Set may be used when. the quantity of items that the seller and the buyer agree is at the consignment location. Can be used as a starting point for consignment inventory On-hand quantity.

Count may be used when the quantity can be physically found and verified by the seller and buyer at the buyer's consignment location at a time.

Preferably, reconciliation takes place after a stock count process. Reconciliation may note the first items as Unbilled and the third items as Excess to enable the seller to track quantities of first items and third items over time to provide a more accurate history of consignment inventory.

The seller may use the tracking of the item lot number and item expiry date to determine which of the first, second and third items are approaching an expiry date and thus need to be adjusted. Adjustment may be based on a reconciliation between what is counted (i.e. what is actually there) and what was thought to be there because it was shipped there.

One or more of the first, second and third items may be grouped together in a plurality of categories. Adjustment may be according to one or more of the plurality of categories.

An inventory total may be determined as being the sum of the first items and the second items, less the third items.

In a further form, there is provided a consignment inventory management and reconciliation system wherein there is tracking and reconciliation of first items shipped to a buyer from a seller and that are located at the buyer's consignment inventory location; and second items shipped to the buyer by the seller, that have not been billed by the seller and cannot be found at the buyer's consignment inventory location.

There may also be tracking of third items not shipped to the buyer by the seller, that can be found at the buyer's consignment inventory location, and are of the same identity as items provided on consignment by the seller to the buyer.

In yet another form there is provided a consignment inventory management and reconciliation system wherein there is tracking and reconciliation of first items shipped to a buyer from a seller and that are located at the buyer's consignment inventory location; and third items not shipped to the buyer by the seller, that can be found at the buyer's consignment inventory location, and are of the same identity as items provided on consignment by the seller to the buyer.

There may also be tracking and reconciliation of second items shipped to the buyer by the seller, that have not been billed by the seller and cannot be found at the buyer's consignment inventory location.

Finally, there may be provided a consignment inventory management and reconciliation system wherein there is tracking and reconciliation of second items shipped to the buyer by the seller, that have not been billed by the seller and cannot be found at the buyer's consignment

inventory location; and third items not shipped to the buyer by the seller, can be found at the buyer's consignment inventory location, and are of the same identity as items provided on consignment by the seller to the buyer.

The present invention also extends to a computer useable medium having a computer program code that is configured to cause a processor to execute one or more functions to perform the process steps described above.

Description of the Drawings

In order for the present invention to be readily understood and put into practical effect there shall now be described by way of non-limitative example only preferred embodiments of the present invention, the description being with reference to the accompanying illustrative drawings, in which:

Figure 1 is a flow chart of an overview of a consignment inventory management process according to a preferred form of the present invention;
Figure 2 is a flow chart of the update consignment inventory process of Figure 1;
Figure 3 is a flow chart of purchase order process of Figure 1;
Figure 4 is a flow chart of restock process of Figure 1;
Figure 5 is a flow chart of billing process of Figure 1;
Figure 6 is a flow chart of stock count process of Figure 1;
Figure 7 is a flow chart of the return process of Figure 1;
Figure 8 is a flow chart of reconciliation process of Figure 1;
Figure 9 is a flow chart of adjust excess & unbilled process of Figure 1; and
Figure 10 is a flow chart of order picking process of Figure 1.

Description of Preferred Embodiments

To first refer to Figure 1, there is shown an overview of the overall process. Reference numbers starting with 2, 3, 4, 5, 6, 7, 8, 9 and 10 are for processes illustrated in Figures 2, 3, 4, 5, 6, 7, 8, 9 and 10 respectively.

The consignment inventory management process may be initiated by many different events including but not limited to item usage, order, and count. There are several ways the seller can be made aware of these events. Figure 1 identifies these events. It also identifies all the other processes that impact on the several processes. In the first table is described the various elements and the process of Figure 1.

No.	Business Process	Process Description
1.1	Electronic Usage and or Order Information	Does the seller provide the buyer with electronic usage/order information? If Yes then go to 2.0 (Valid Transactions are Bill, Use, Order) – see Figure 2 and its description below. If No then go to 1.2 EDI and XML are examples of electronic formats that the buyer can send item use and order information to the seller: a. Electronic Data Exchange (EDI) that works by providing a collection of standard message formats and element dictionary in a simple way for businesses to exchange data via any electronic system; and b. eXtensible Markup Language (XML) is a simplified subset of the Standard Generalised Markup Language (SGML, ISO 8879) that provides a file format for representing data, a schema for describing data structure, and a mechanism for extending and annotating HTML with semantic information.
1.2	Allow Checking of Usage Information	Does the buyer allow usage checking? If Yes then go to 1.3 If No then go to 1.4
1.3	Examine Usage Information	The buyer provides the seller with an electronic or written paper usage log/report, or the buyer may allow the seller to review an internal usage log/report, so that they may copy the usage information.
1.4	Allow Visual Inspection	Does the buyer allow the seller to physically inspect the items? If Yes then go to 2.0 (Valid Transactions are Bill, Use, Order) – see Figure 2 and its description below If No then go to 1.5
1.5	Perform Visual Stock Check	The seller physically view/inspect the consignment inventory and determine if more items need to be ordered for placement at the buyer's consignment location.
1.6	Need to replenish Stock?	Does the seller believe that more items are required at the buyer's consignment inventory location? If Yes then go to 2.0 (Valid Transaction: Order) If No then go to END
2.0	Update Consignment Inventory Process	Go To 2.0 – see Figure 2 and its description below
1.7	Transaction Processed?	If Bill or Order Transaction then go to 5.0 Billing – see Figure 5 and its description If Order Transaction then go to 4.0 Restock Process – see Figure 4 and its description
3.0	Purchase Order Process	Go to 3.0 – see Figure 3 and its description
No.	Business Process	Process Description
4.0	Restock Process	Go to 4.0 – see Figure 4 and its description
5.0	Billing Process	Go to 5.0 – see Figure 5 and its description
6.0	Stock Count	Go to 6.0 – see Figure 6 and its description
7.0	Returns Process	Go to 7.0 – see Figure 7 and its description

8.0	Reconciliation Process	Go to 8.0 – see Figure 8 and its description
9.0	Adjust Excess & Unbilled Process	Go to 9.0 – see Figure 9 and its description
10.0	Pick Order Process	Go to 10.0 – see Figure 10 and its description

To now refer to Figure 2 items that were shipped to the buyer from the seller and are physically located at the buyer's consignment inventory located at a time are identified as the **On-hand** quantity.

Accounting methods and systems required the seller to keep track of the total consignment items shipped to the buyer and that should be at any time. This is called the **Total** quantity.

Total = On-hand + Unbilled – Excess

Like current consignment inventory methods and systems, On-Order represents consignment items that have been requested for the buyer's consignment location but have not been shipped at a time from the seller to the buyer.

A transaction is represented by a transaction description and a transaction amount. A transaction description is a code used to identify the transaction. It may be alpha, numeric or alphanumeric. The code may be of any suitable or desired length. The transaction amount can be a: zero, positive, or negative number with any number of decimal places.

Transactions (Trxn) used by this method and system include:

- **Bill:** the item is no longer at the buyer's consignment location but ownership has to been transferred from the seller to the buyer.
- **Use:** the buyer has used the item and the process of transferring ownership from the seller to the buyer should be initiated or has been competed.
- **Dispose:** the item is no longer at the buyer's consignment location and seller is writing off the item. Ownership will not be transferred from the seller to the buyer.
- **Return:** item is physically being moved from the buyers consignment location back to the seller, ownership will not be transferred from the seller to the buyer.
- **Transfer-Out:** item is physically being moved from the buyers consignment location to the a third party location, ownership will not be transferred from the seller to the buyer.
- **Receive:** Item is physically being moved from the seller to the buyer's consignment location. Ownership will not be transferred from the seller to the buyer.
- **Transfer-In:** item is physically being moved to the buyer's consignment location from a third party location. Ownership will not be transferred from the seller to the buyer.
- **Order:** a result has been made to increase the buyer's consignment item(s) quantity.

- **Set:** the quantity of items that the seller and the buyer agree is at the consignment location. Can be used as a starting point for consignment inventory On-hand quantity.
- **Count:** the quantity that can be physically found and verified by the seller and buyer at the buyer's consignment location at a time.

The method and system tracks item number, item lot number and item expirations date. The transactions are processed for the item or item/lot numbers based on the transaction being passed into the Update Consignment Inventory Process. In most cases there is more than one possible transaction that can be processed. Which transaction is process is determined by:

- the agreement between the buyer and seller; and
- other systems and methods used by the buyer and seller.

While the transactions processed may vary depending on the buyer and seller the desired result is the same. A consignment inventory management and reconciliation method and system that tracks and reconciles Total, on-hand, unbilled and excess quantities at a given time.

No.	Business Process	Process Description
2.1	Bill Transaction?	Is a Bill transaction being processed? If Yes then go to 2.2 If No then go to 2.5
2.2	Bill Transaction Date Less Than Last Reconciliation Date?	Is the Bill transaction date before the last reconciliation date? If Yes then go to END If No then go to 2.3
2.3	Increment Unbilled by Bill Transaction Amount	2.2 Yes: Unbilled = Unbilled + Bill Transaction Amount
2.4	Decrement On-Hand by Transaction Amount	2.2 Yes then On-hand = On-hand – Bill Transaction Amount 2.6 No then On-hand = On-hand – Use or Dispose Transaction Amount 2.9 Yes then On-hand = On-hand – Return or Transfer-Out Transaction Amount Then go to END
2.5	Used or Disposed Transaction?	Is a Used or Disposed transaction being processed? If Yes then go to 2.6 If No then go to 2.8
2.6	Is Unbilled > 0	If No go to 2.4 If Yes then go to 2.7
2.7	Decrement Unbilled by Transaction Amount	2.6 Yes then Unbilled = Unbilled – Use or Dispose Transaction Amount 2.9 No & 2.6 Yes then Unbilled = Unbilled – Return or Transfer-Out Transaction Amount Then go to END
2.8	Return or Transfer-Out Transaction?	Is a Return or Transfer-Out Transaction being processed? If Yes then go to 2.9 If No then go to 2.10
2.9	Is On-hand > 0	If Yes than go to 2.4 If No then go to 2.6
2.10	Receive or Transfer-In Transaction?	Is a Receive or Transfer-In Transaction being processed?

		If Yes then go to 2.11 If No then go to 2.14
2.11	Is On Order > 0	If Yes then go to 2.12 If No then go to 2.13
2.12	Decrement On Order by Transaction Amount	On-order = On-order – Receive or Transfer-in Transaction Amount
2.13	Increment On-hand by Transaction Amount	On-hand = On-hand + Receive or Transfer-in Transaction Amount Then go to END
2.14	Order Transaction?	Is an Order Transaction being processed? If Yes then go to 2.15 If No then go to 2.16
2.15	Increment On-order by Transaction Amount	On-order = On-order+ Order Transaction Amount Then go to END
2.16	Set Transaction?	If Yes then go to 2.17 If No then go to 2.18
No.	Business Process	Process Description
2.17	On-hand = Set Transaction	On-hand = Set Transaction Amount Then go to END
2.18	Count Transaction?	If Yes then go To 2.19 If No then go to END
2.19	Set Last Count to Transaction Amount	Last Count = Count Transaction Amount
2.20	Set Last Count Date to Transaction Date	Last Count Date = Count Transaction Date

In Figure 3, there is illustrated the Purchase Order Process. There are many different purchase order methods and systems. Purchase Order Process only focuses on the processes that are required for this consignment inventory management and reconciliation system. It does not attempt to go into details relating to other purchase order systems.

No.	Business Process	Process Description
3.1	Prepare and Send Purchase Order (PO)	The purchase order process is initiated when the buyer sends the seller a purchase order that identifies the items, item quantity, item price, and other terms and conditions of the purchase. The purchase order can be electronic or hardcopy.
3.2	Extract Consignment Stock from Purchase Order	The buyer can included two types of consignment orders on the purchase order: 2) Consignment items that have been used. The buyer is using the purchase order to notify the seller to transfer ownership of the item to the buyer. i.e. seller bills/invoices the buyer for the item. 3) An order for new/additional consignment items to be placed by the seller at the buyer's consignment location. Ownership remains with the seller until the buyer uses the consignment items. A common practice in consignment inventory management is for the items on the purchase order

		to be treated as both a bill and an order. This allows the seller to invoice the buyer and restock the consignment item. A contract is usually in place to help manage such arrangements.
3.3	Invoice or Order?	Are the consignment items on the purchase order to be billed and/or ordered/restocked? If Bill then go to 5.6 Prepare Invoice for Billing – see Figure 5 and its description If Order then go to 10.0 Pick Order Process Both bill and order are possible in this case
No.	Business Process	Process Description
5.6	Prepare Invoice for Billing	Go To 5.6 – see Figure 5 and its description
2.0	Update Consignment Inventory Process	Go To 2.0 – see Figure 2 and its description
10.0	Pick Order Process	Go To 10.0 – see Figure 10and its description

The Restock Process is illustrated in Figure 4. This is a standard method in the management of consignment inventory. The restock process focuses on the movement of consignment inventory from the seller to the buyer's consignment location. No transfer of ownership takes place. Various approvals and signatures may be required in the process.

No.	Business Process	Process Description
4.1	Calculate Order Quantity	The order quantity refers to the amount of consignment stock that will be moved from the seller to the buyer's consignment location. There are many different methods available to day to calculate the order quantity such as average Usage over a period of time or standard deviation based on: • PAR • Reorder Point / Safety Stock ◦ Minimum Order Quantity ◦ Maximum Order Quantity ◦ Lead Time In addition, the order quantity can be derived from the buyer's purchase order or the visual inspection of the consignment location by the seller. In all cases an agreement between the buyer and seller will determine how and when restock orders are processed
4.2	Order > 0	If Yes then go to 4.3 If No then go to END
4.3	Order Approval Required?	Does the buyer or seller require an approval for consignment restocking orders If Yes then go to 4.4 If No then go to 2.0
4.4	Approve Order	There are many standard methods, electronic and hardcopy, for approving orders. The order approval must be consistent with the agreement between the buyer and seller
2.0	Update Consignment Inventory Process	Go To 2.0 process order transaction - see Figure 2 and its description above.
10.0	Pick Order Process	Go To 10.0 - see Figure 10 and its description.

The Billing Process is illustrated in Figure 5. This is a standard method in the management of consignment inventory. The billing process initiates the transfer of consignment inventory ownership from the seller to the buyer.

No.	Business Process	Process Description
5.1	Purchase Order (PO) Required?	Does the contract between the buyer and the seller require a purchase order to initiate the billing process? If Yes then 3.0 – see Figure 3 and its description above. If No then 5.2
3.0	Purchase Order Process	Go To 3.0
5.2	Determine Usage Details	If the buyer has not provided a purchase order then the seller must determine what items have been used by the buyer. This method is determined by the contract between the buyer and the seller.
5.3	Usage Details	An electronic or hardcopy of the items used is created by the seller to initiate the billing process.
5.4	Approval Required?	Does the buyer require the seller to provide a list of the used items to be billed for approval? If Yes then go to 5.5 If No then go to 5.6
5.5	Approve Usage Details	This is a standard method in the management of consignment inventory. If the buyer reviews and approves, electronic or hardcopy, the usage details for billing.
5.6	Prepare Invoice for Billing	This is a standard method in the management of consignment inventory. An electronic or hardcopy invoice is prepared.
5.7	Is 1.7 Transaction = Bill?	Was the process that resulted in the Billing Process being executed a Bill Transaction in process 1.7? If yes then go to 2.0 Use Transaction – see Figure 2 and its description above. If No END
2.0	Update Consignment Inventory Process	Go To 2.0 – see Figure 2 and its description above.

Figure 6 illustrates the Stock Count Process. This is a standard method in the management of consignment inventory. The stocking counting process can take place on a daily, weekly, monthly, and quarterly or on a yearly cycle as well as at any time that the buyer and seller agree to a stock count.

The stock count process (or cycle count as it is sometimes called) consists of taking a physical count of all or a specific group of items at the buyer's consignment location at a time. This may also include counting the lot/batch associated with each item. The lot/batch usually contains the item expiration date and thus the stock count usually includes the identification and removal of expired items.

No.	Business Process	Process Description
6.1	Count Items	A variety of methods and systems can be used to

		count items including but not limited to an automated mobile device that includes a barcode reader. A stock count can also be taking using paper and pen/pencil.
2.0	Update Consignment Inventory Process	Go To 2.0, Count Transaction – see Figure 2 and its associated description above.
6.2	Item Expires?	Is the item being counted expired? A policy may be set that requires the identification of not only items that have expired but also items that will expire in a preset time. If Yes go to 7.0 Returns Process - see Figure 7 and its description If No go to 8.0 Reconciliation Process - see Figure 8.0 and its description
7.0	Returns Process	Go To 7.0 – see Figure 7 and its description
8.0	Reconciliation Process	Go To 8.0 – see Figure 7 and its description

The Returns Process is illustrated in Figure 7. This is a standard method in the management of consignment inventory. The return process focuses on the movement of consignment inventory from the buyer's consignment location back to the seller. No transfer of ownership takes place. Various approvals and signatures may be required in the process.

An item can be returned for many reasons including but not limited to an item has expired, is being phased out and the buyer does not want it in the consignment location.

No.	Business Process	Process Description
7.1	Identify Return Items	A variety of methods and systems can be used to record return items including but not limited to and automated mobile devices with a barcode reader. A return can also be taking using paper and pen/pencil.
2.0	Update Consignment Inventory Process	Go To 2.0 Return Transaction – see Figure 2 and its description.
7.2	Return Notification Required?	Does the buyer require a notification, electronic or hardcopy, identifying what items have been returned? If Yes then go to 7.3 If No then END
No.	Business Process	Process Description
7.3	Goods Returned Notification	Seller provides the buyer with an electronic or hardcopy return notification identifying what items have been returned.
7.4	Return Signature Required?	Does the buyer or seller require the buyer to sign, electric or hardcopy, for the returned items? If Yes then go to 7.5 If No then END
7.5	Customer Signs Return Form	The customer provides verification usually with a signature, electric or hardcopy, that the items on the return notification are the items being returned.
7.6	Signed Goods Returned Form	The seller gets a copy of the signed form

Figure 8 illustrates the Reconciliation Process. Current consignment inventory methods and systems refer to the need for a reconciliation process as a method for the buyer and seller to

identify what items are missing from the consignment location. Current methods also refer to a need for a contract between the buyer and seller to determine who should bear the costs for the missing items and the need for reports to identify the missing items

The reconciliation process usually follows the Stock Count Process. In current consignment inventory methods and systems, the supplier will then either bill the buyer for the missing items or write off the missing items based on the contract between the buyer and seller. This results in decrementing the On-hand quantity by the missing amount. The missing amount is the different between the count and the On-hand amount. Currently the seller has no way to track the missing items over a period of time.

In addition the count process may find items that are at the buyer's consignment location but the seller has no record of shipping these items. This can happen for a number of reasons including:

- an unrecorded transfer from one buyer's consignment location to another. In this case the seller actually owns the item
- a non-consignment item is placed and counted with the consignment items. In this case the buyer actually owns the items.

The buyer and the seller have no way of knowing who owns the item and the current systems and methods have no way of tracking these items.

As discussed in relations to Figure 2, update consignment inventory process, the method and system of the present invention tracks the missing items as **Unbilled** and the extra items as **Excess**. This allows the seller to age (track the amounts over time) and research the unbilled and excess to better determine what action to take. Thus providing a more accurate visibility into the consignment inventory.

The reconciliation process adjusts the On-Hand, Unbilled and Excess amounts to accurately reflect what items are actually at the buyer's consignment inventory location at any time.

No.	Business Process	Process Description
8.1	Select Buyer	The seller identifies which buyer's consignment inventory is to be reconciled
8.2	Select Buyer Location	A buyer may have more than one consignment inventory location and the seller identifies which consignment inventory location is to be reconciled
8.3	Select Item Category(s)	The items can be grouped together in any number of logical ways and the seller may choose to reconcile a set group of items
8.4	Select Item(s)/Lot(s) to be reconciled	The seller can specify specific items and specific lots for an item to be reconciled
8.5	Count Date Less than	Is the last count date less than the last reconciliation

	Reconciliation Date	date? If Yes then go to 10.6 – see Figure 10 and its description If no then go to 10.7 – see Figure 10 and its description
8.6	Set Last Count = 0	This enables a count of 0 for items that are not found (counted) at the consignment location.
8.7	Last Count less than On-Hand?	Is the last count quantity less than the On-hand quantity? If Yes then 8.8 If No then 8.10
8.8	Increase Unbilled by On-hand minus Count	Unbilled = Unbilled + (On-hand – Count)
8.9	Decrease On-hand by On-hand minus Count	On-hand = On-hand - (On-hand – Count)
8.10	Last Count Greater than On-hand?	Is the last count quantity greater than the On-hand quantity? If Yes then go to 8.11 If No then END (This means that Count = On-hand and no adjustments are required)
8.11	Increase Excess by Count minus On-hand	Excess = Excess + (Count – On-hand)
No.	Business Process	Process Description
8.12	Increase On-hand by Count minus On-hand	On-hand = On-hand + (Count – On-hand)

The Adjust Excess & Unbilled Process is illustrated in Figure 9. A seller may track items at the lot level. Lots are used to group items together based on when they were manufacture. The Lot also identifies the items expiration date. A seller will track the lots in order to determine exactly where a group of products are located. A seller will also track lots to better manage item expiration date so that consignment items can be moved to a location where they are more likely to sell before they expire. Lots are used in the manufacturing of most items. Lots are especially important in the healthcare and food industries where products have a short life span, and people's lives may be at risk.

The seller usually knows what lot has been shipped to the buyer's consignment location, but the buyer may not track which lots are used. Thus seller does not know which lots have been used and which lots are still on the shelf.

The current methods and systems require the seller to bill a specific lot if they shipped a specific lot. Since the seller does not know what lot has been used they often bill the wrong lot. This is usually of no concern to the buyer but it can be a problem for the seller since it gives them an inaccurate view of what item/lots are on consignment at the buyer's location

The adjust excess & unbilled process of Figure 9 uses the information from the reconciliation to net out the excess and unbilled lots for an item. The result is an accurate view of what lots are On-hand, Unbilled and Excess.

No.	Business Process	Process Description
9.1	Select Buyer	The seller identifies which buyer's consignment inventory is to be adjusted
9.2	Select Buyer Location	A buyer may have more than one consignment inventory location and the seller identifies which consignment inventory location is to be adjusted
9.3	Select Item Category(s)	The items can be grouped together in an number of logical ways and the seller may choose to adjust a specific group of items
9.4	Select Item(s) to be adjusted	The seller can specify specific items to be adjusted
9.5	Select Lot(s) to be adjusted	The seller can specify specific lots for an item to be adjusted
9.6	Excess Greater than Zero?	Is the Excess quantity greater than zero? If Yes then 9.7 If no then END
9.7	Unbilled Grater than Zero?	Is the Unbilled quantity greater than zero? If Yes then 9.8
9.8	Excess = Excess minus 1	Excess = Excess – 1
9.9	Unbilled = Unbilled minus 1	Unbilled = Unbilled – 1, Go to 9.6

In Figure 10 is illustrated the Order Selection Process. Order picking (sometimes called order fulfilment) is the process for matching the buyer's consignment restock order with the seller's stock in a warehouse. The seller then selects the stock from the warehouse to fill the buyers restock order. There are many standard methods, electronic and hardcopy, for order selecting.

No.	Business Process	Process Description
10.1	On Order Items Available?	Is the item(s) available in the sellers warehouse If Yes the go to 10.3 If not then go to 10.2
10.2	Order Item	The seller generates a purchase order the item required the buyers consignment inventory location
10.3	Generate Pick Slip	An electronic or hardcopy notification is generated to alert an individual to what items to be selected for delivery to the buyers consignment inventory location
2.0	Update Consignment Inventory Process (Receive, Order Transaction)	Go to 2.0 – see Figure 2 and its description. The picked order quantity will generate a receive transaction of the same amount and an order transaction of the negative of that amount.
10.4	Pick Slip	The electronic or hardcopy notification
10.5	Pick Items	The items are identified and selected for deliver from the seller to the buyers consignment location
10.6	Deliver Items	The items are physically placed at the buyer's consignment location. Some from of electronic or hardcopy verification may be require upon deliver.

The consignment inventory management and reconciliation method and system described above tracks and reconciles *on-hand quantity* which represents consignment items that were placed at the consignment location and are physically located at the consignment location at a given time; *unbilled quantity* which represents consignment items which were placed at the consignment location and are not physically present at the consignment location and have not

been purchased at a given time, *excess quantity* which represents items found at the consignment location but are not considered consignment items at a given time; and *total or perpetual quantity* which represents the consignment items which have been delivered to the consignment location at a given time.

The tracking of unbilled and excess consignment quantity provides visibility to the supplier that has not been available before in previous inventory tracking systems and methods. This visibility allows the supplier to accurately manage the consignment inventory items and identify the potential financial exposure (write off) as well as guard against lost sales.

The consignment inventory management and reconciliation method and system work as an enhancement to traditional consignment inventory methods and systems by provided a method and system for processing specific transactions that increase and decrease the on-hand, unbilled and excess quantities. This is accomplished with the update consignment inventory process, reconciliation process and adjust excess & unbilled process.

The present invention also extends to a computer useable medium having a computer program code that is configured to cause a processor to execute one or more functions to perform the process steps described above.

Whilst there has been described in the foregoing description preferred embodiments of the present invention, it will be understood by those skilled in the technology and business systems that many variations or modifications in details of operation maybe made without departing from the present invention.

The claims:

1. A consignment inventory management and reconciliation system wherein there is tracking and reconciliation of:
   a. first items shipped to a buyer from a seller and that are located at the buyer's consignment inventory location;
   b. second items shipped to the buyer by the seller, that have not been billed by the seller and cannot be found at the buyer's consignment inventory location; and
   c. third items shipped to the buyer by parties other than the seller, the third items can be found at the buyer's consignment inventory location, and are of the same identity as items provided on consignment by the seller to the buyer.

2. A system as claimed in claim 1, wherein the system also ages the first items, the second items, and the third items; and there is tracking of one or more selected from the group consisting of: item number, item lot number, and item expiry date.

3. A system as claimed in claim 2, wherein tracking takes place whenever a transaction is processed; and the transaction is represented by a transaction description and a transaction amount.

4. A system as claimed in claim 3, wherein the transaction amount can be one: zero, a positive number, and a negative number, with a number of decimal places; and the transaction is one or more selected from the group consisting of: bill, use, dispose, return, transfer-out, receive, transfer-in, order, set, and current.

5. A system as claimed in claim 4, wherein

bill is used when the item is no longer at the buyer's consignment location but ownership has not been transferred from the seller to the buyer;

use is used when the buyer has used the item and the process of transferring ownership from the seller to the buyer should be initiated or has been competed;

dispose in used when the item is no longer at the buyer's consignment location and seller is writing off the item with ownership not being transferred from the seller to the buyer;

receive is used when the item is physically being moved from the seller to the buyer's consignment location with ownership not being transferred from the seller to the buyer;

transfer-in is used when the item is physically being moved to the buyers consignment location from a third party location with ownership not being transferred from the seller to the buyer;

return-in is used when the item is physically being moved from the buyer's consignment location back to the seller with ownership not being transferred from the seller to the buyer;

transfer-out is used when the item is physically being moved from the buyer's consignment location to a third party location with ownership not being transferred from the seller to the buyer;

order is used when a result has been made to increase the buyer's consignment item(s) quantity;

set is used when the quantity of items that the seller and the buyer agree is at the consignment location and is used as a starting point for consignment inventory On-hand quantity; and

count is used when the quantity can be physically found and verified by the seller and buyer at the buyer's consignment location at a time.

6. A system as claimed in any one of claims 1 to 5, wherein reconciliation takes place after a stock count process; and the reconciliation notes the second items as Unbilled and the third items as Excess to enable the seller to track quantities of second items and third items over time to provide a more accurate history of consignment inventory.

7. A system as claimed in any one of claims 2 to 5 wherein the seller uses the tracking of the item lot number and item expiry date to determine which of the first and second items are approaching an expiry date and thus need to be adjusted.

8. A system as claimed in any one of claims 1 to 7 wherein the first items are grouped together in a plurality of categories; the second items are grouped together in a plurality of categories; and the third items are grouped together in a plurality of categories.

9. A system as claimed in claim 8, wherein adjustment is according to one or more of the plurality of categories.

10. A system as claimed in claim 1, wherein an inventory total is the sum of the first items and the second items, less the third items.

11. A consignment inventory management and reconciliation system wherein there is tracking and reconciliation of:

(a) first items shipped to a buyer from a seller and that are located at the buyer's consignment inventory location; and

(b) second items shipped to the buyer by the seller that have not been billed by the seller and cannot be found at the buyer's consignment inventory location.

12. A system as claimed in claim 11, wherein there is also tracking and reconciliation of third items not shipped to the buyer by the seller, that can be found at the buyer's consignment inventory location, and are of the same identity as items provided on consignment by the seller to the buyer.

13. A consignment inventory management and reconciliation system wherein there is tracking and reconciliation of:

(a) first items shipped to a buyer from a seller and that are located at the buyers consignment inventory location; and

(b) third items shipped to the buyer by parties other than the seller, the third items can be found at the buyers consignment inventory location, and are of the same identity as items provided on consignment by the seller to the buyer,

wherein second items can also be found at the buyer's consignment inventory location.

14. A system as claimed in claim 13, wherein there is also tracking and reconciliation of second items shipped to the buyer by the seller, that have not been billed by the seller and cannot be found at the buyer's consignment inventory location.

15. A consignment inventory management and reconciliation system wherein there is tracking and reconciliation of:

(a) second items shipped to the buyer by the seller, that have not been billed by the seller and cannot be found at the buyer's consignment inventory location; and

(b) third items shipped to the buyer by parties other than the seller, the third items can be found at the buyer's consignment inventory location, and are of the same identity as items provided on consignment by the seller to the buyer,

wherein first items can also be found at the buyer's consignment inventory location.