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(54) **DATA PROCESSING FOR AN EXCHANGE TRADED FUND**

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(57) **ABSTRACT**

An accounting system allows posting transactions to a general ledger of an Exchange Traded Fund. The accounting system includes a computer-assisted process that nets subscription and redemption orders that occurred over a particular time (e.g., one day) and records a transfer of securities into or out of the fund based on the net of the subscription and redemption orders.

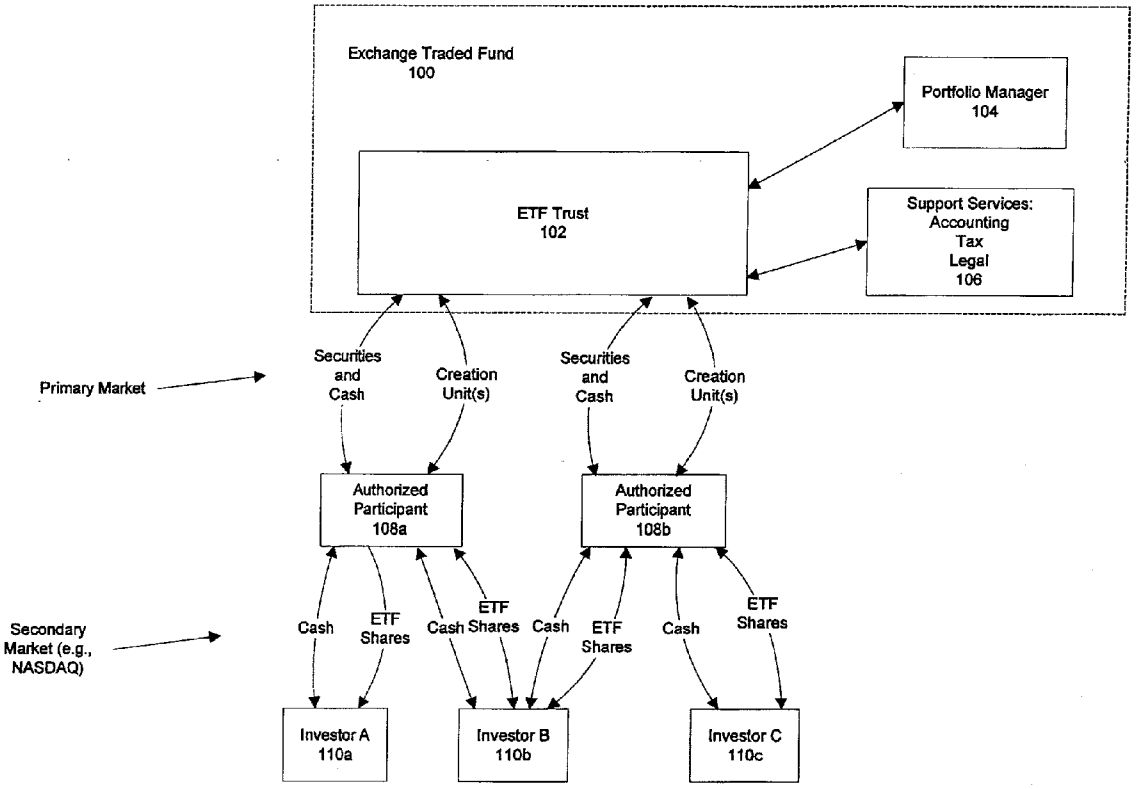


FIG. 1

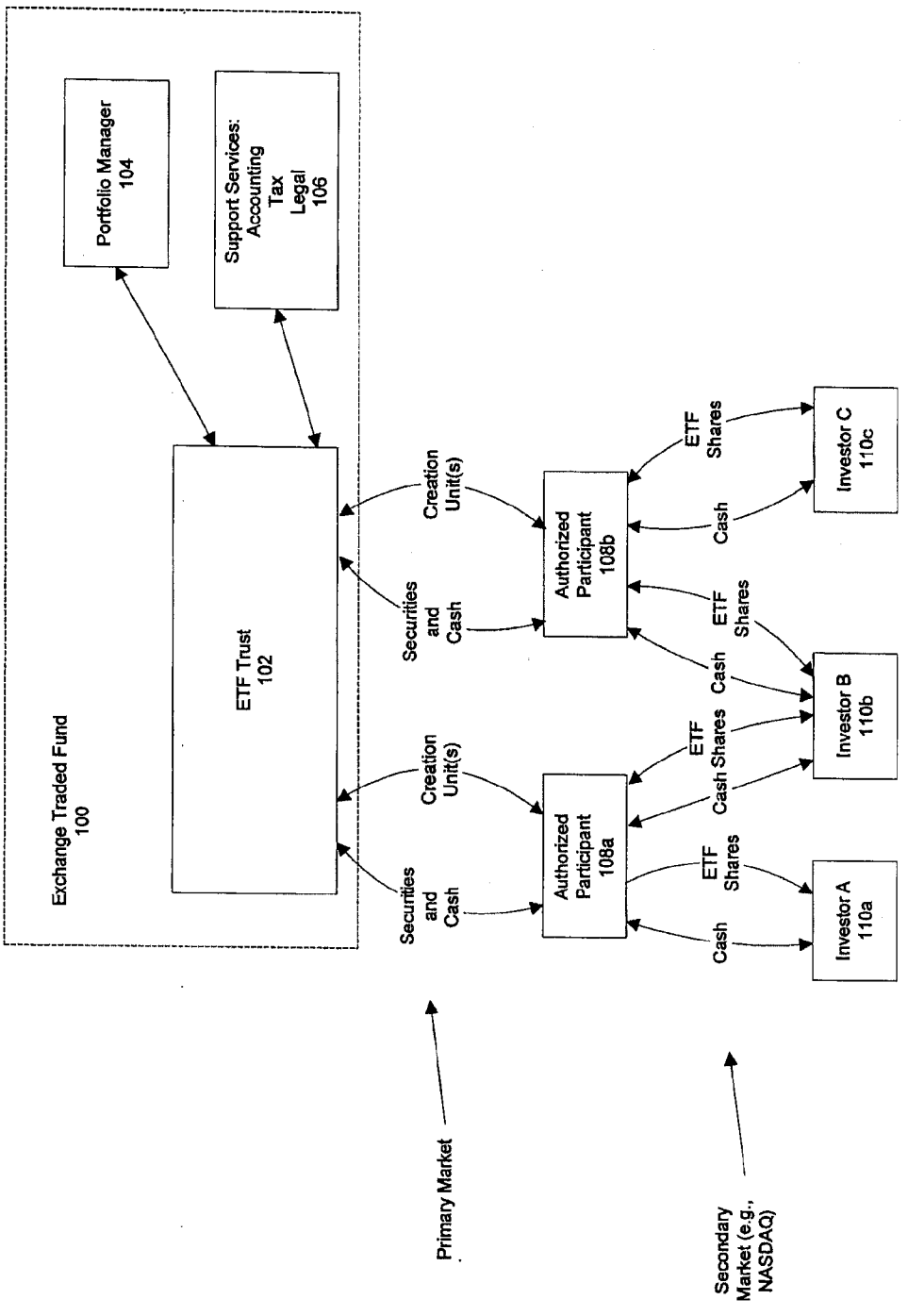

Exchange Traded Fund
100
Portfolio Manager
104
Support Services:
Accounting
Tax
Legal
106
ETF Trust
102
Creation
Unit(s)
Securities
and
Cash
Authorized
Participant
108b
Authorized
Participant
108a
ETF
Shares
Cash
Investor C
110c
Investor B
110b
Investor A
110a
Primary Market
Secondary
Market (e.g.,
NASDAQ)

FIG. 2

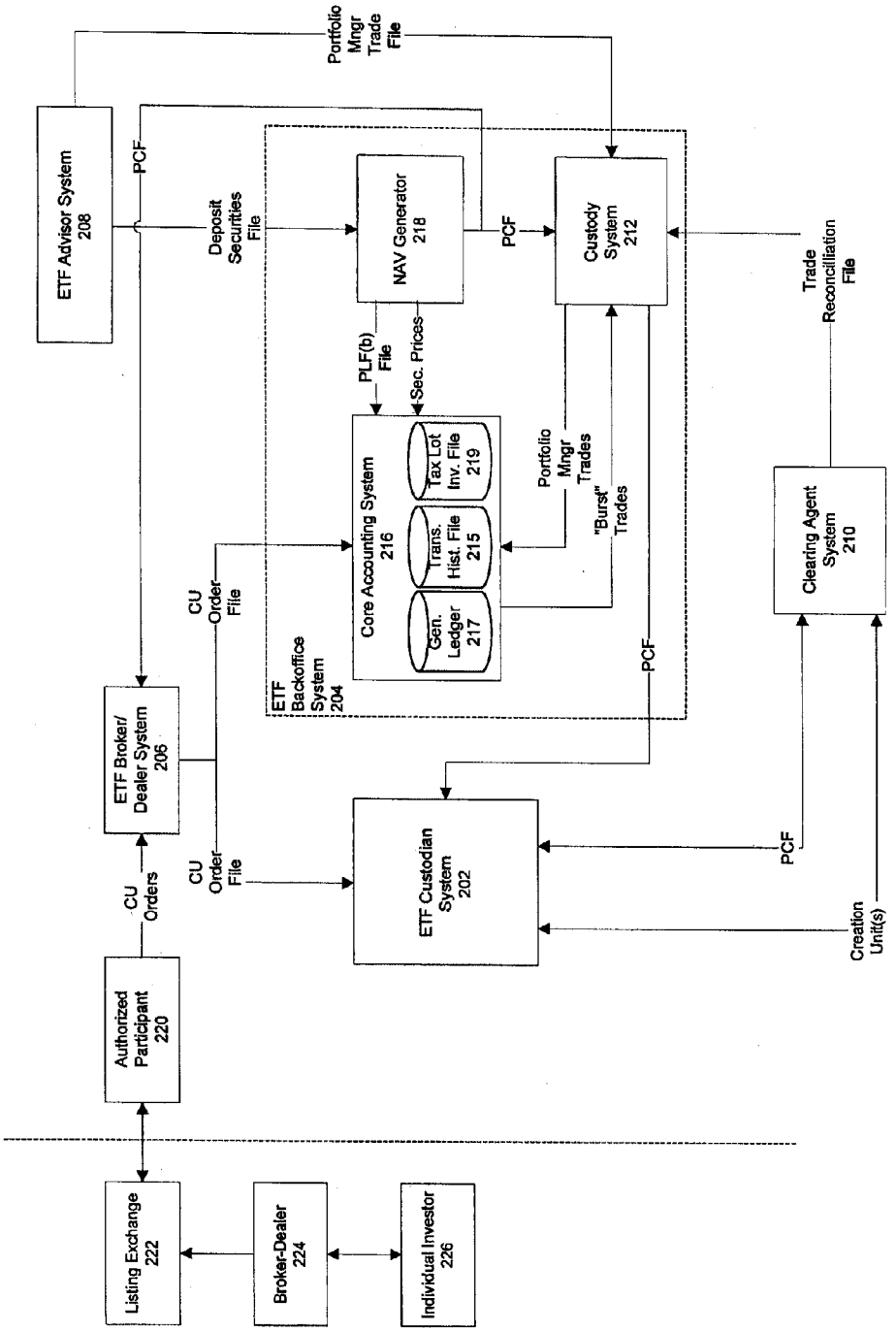

Portfolio Mngr Trade File
ETF Advisor System 208
PCF
Deposit Securities File
NAV Generator 218
PCF
Custody System 212
Trade Reconciliation File
PLF(b) File
Sec. Prices
Tax Lot Inv. File 219
Trans. Hist. File 215
Gen. Ledger 217
Core Accounting System 216
Portfolio Mngr Trades
"Burst" Trades
ETF Backoffice System 204
CU Order File
Clearing Agent System 210
ETF Broker/ Dealer System 206
PCF
CU Order File
ETF Custodian System 202
PCF
CU Orders
Creation Unit(s)
Authorized Participant 220
Listing Exchange 222
Broker-Dealer 224
Individual Investor 226

FIG. 3

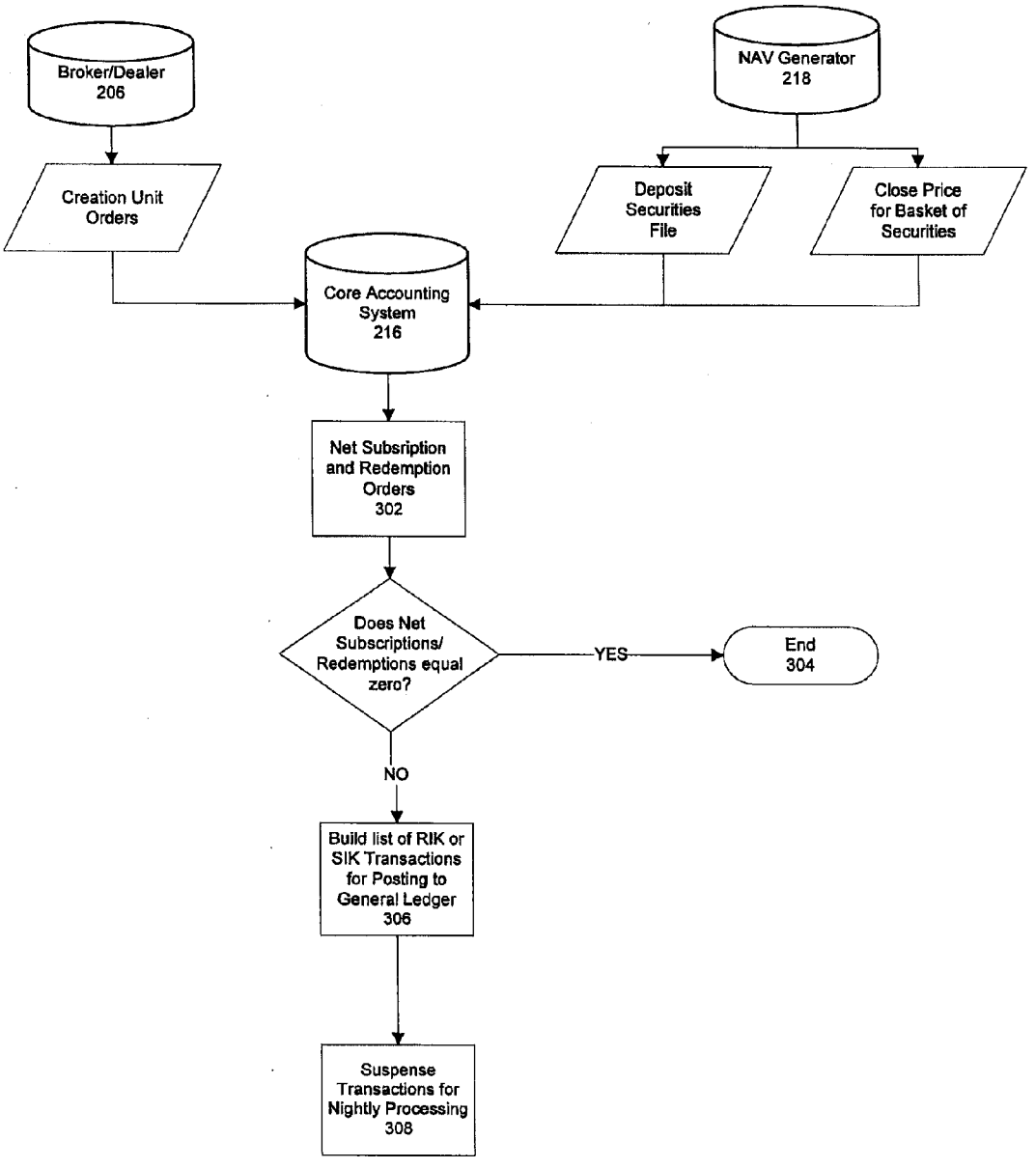
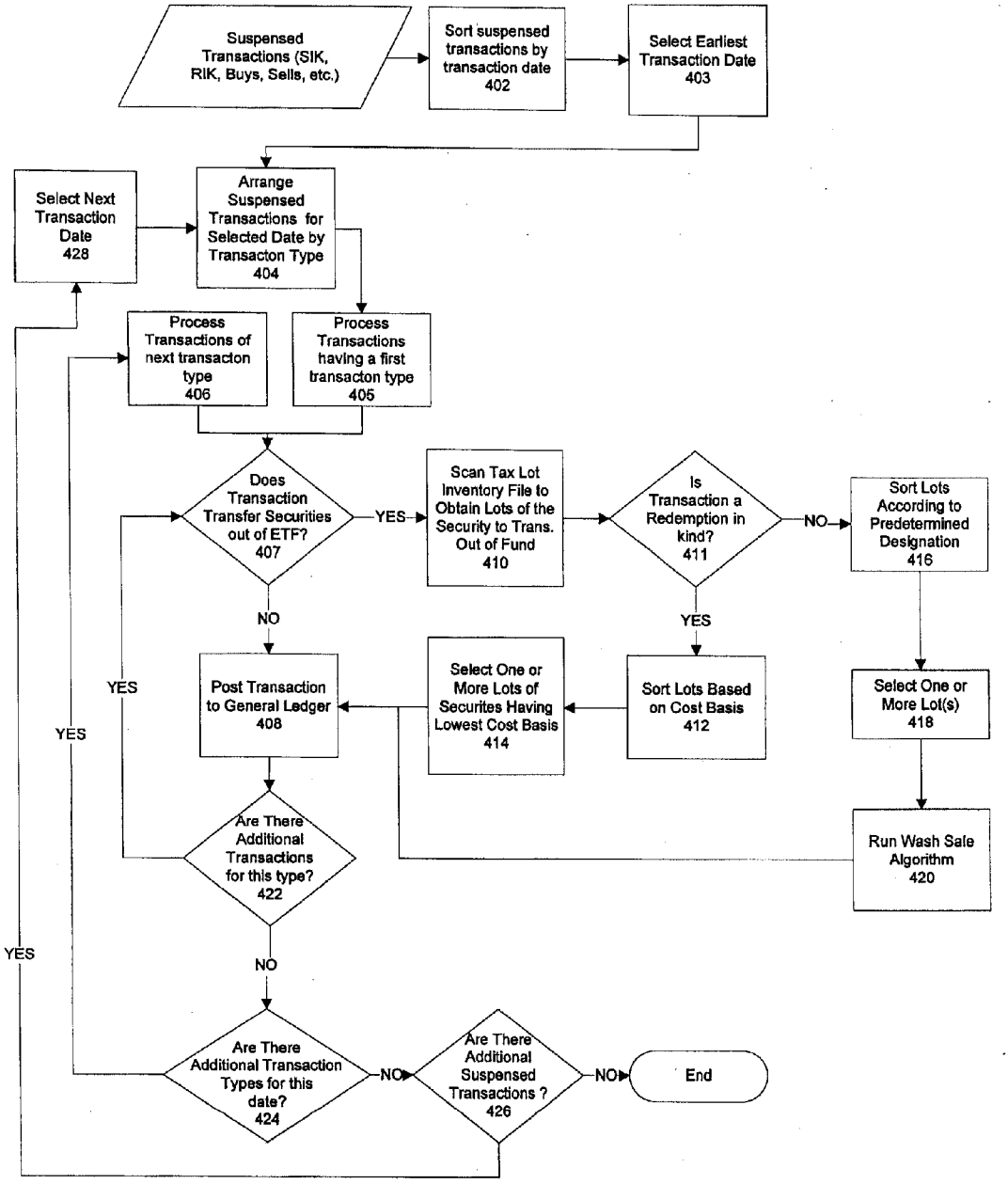

Broker/Dealer
206
Creation Unit
Orders
NAV Generator
218
Deposit
Securities
File
Close Price
for Basket of
Securities
Core Accounting
System
216
Net Subsription
and Redemption
Orders
302
Does Net
Subscriptions/
Redemptions equal
zero?
YES
End
304
NO
Build list of RIK or
SIK Transactions
for Posting to
General Ledger
306
Suspense
Transactions for
Nightly Processing
308

FIG. 4


Suspensed Transactions (SIK, RIK, Buys, Sells, etc.)
Sort suspensed transactions by transaction date 402
Select Earliest Transaction Date 403
Select Next Transaction Date 428
Arrange Suspensed Transactions for Selected Date by Transacton Type 404
Process Transactions of next transacton type 406
Process Transactions having a first transacton type 405
Does Transaction Transfer Securities out of ETF? 407
YES
Scan Tax Lot Inventory File to Obtain Lots of the Security to Trans. Out of Fund 410
Is Transaction a Redemption in kind? 411
NO
Sort Lots According to Predetermined Designation 416
NO
YES
YES
Post Transaction to General Ledger 408
Select One or More Lots of Securites Having Lowest Cost Basis 414
Sort Lots Based on Cost Basis 412
Select One or More Lot(s) 418
YES
Are There Additional Transactions for this type? 422
Run Wash Sale Algorithm 420
NO
YES
Are There Additional Transaction Types for this date? 424
NO
Are There Additional Suspensed Transactions ? 426
NO
End

DATA PROCESSING FOR AN EXCHANGE TRADED FUND

CROSS-RELATED APPLICATION

[0001] Under 35 U.S.C. 119(e)(1), this application claims the benefit of provisional application Ser. No. 60/612,194, filed Sep. 22, 2004 entitled, "Data Processing for an Exchange Traded Fund."

TECHNICAL FIELD

[0002] This description relates to exchange traded funds.

SUMMARY

[0003] In one aspect, the invention features an accounting system for posting transactions to a general ledger of an Exchange Traded Fund. The accounting system includes a computer-assisted process that nets subscription and redemption orders that occurred over a particular time (e.g., one day) and records a transfer of securities into or out of the fund based on the net of the subscription and redemption orders.

[0004] In one particular implementation, the accounting system selects securities held by the fund for redemption based on the cost basis of the securities held by the fund if there is a net redemption of shares of the fund.

[0005] In another aspect, the invention features a computerized accounting system for an ETF that ranks lots of the security held by the fund based on the tax liability of each lot and selects lots of the security based on whether the trade order is an order to sell the security or an order to redeem the security. Such a tax lot selection method is particularly advantageous in the context of an ETF since there are different tax implications depending upon whether the securities are transferred out of the fund due to a sale (which incurs a tax liability to the fund) versus due to a redemption (which does not incur a tax liability).

[0006] In one particular implementation, the accounting system selects tax lots having the lowest cost basis if the order is a redemption and selects tax lots having the least tax liability if the order is a sale.

DESCRIPTION OF DRAWINGS

[0007] FIG. **1** is a diagram illustrating the exchange of shares of an Exchange Traded Fund on a primary and secondary market.

[0008] FIG. **2** is a diagram of an implementation of an ETF.

[0009] FIGS. **3-4** are flow charts illustrating accounting processes for an ETF.

DETAILED DESCRIPTION

[0010] An Exchange Traded Fund, or ETF, is a hybrid investment vehicle that combines characteristics of both open and closed end funds. Like an open-end mutual fund the ETF provides investors with its net asset value once daily, but similar to a closed end fund it also lists its shares on a secondary market such as an exchange. Thus an ETF may be bought and sold in the primary market directly from the ETF via a market intermediary referred to as an Authorized Participant (or AP), or on a secondary market at market prices which fluctuate based on supply and demand.

[0011] APs in the primary market purchase large increments of shares (referred to as Creation Units), while secondary market shares are available to individual investors involving transactions in smaller share increments via brokers.

[0012] As part of their investment strategy, ETFs may seek to track a particular stock market index, such as the NASDAQ Composite Index. To accomplish this index tracking, ETFs commonly bundle together the some or all of the constituent securities that are part of the index in the ETF's investment portfolio.

[0013] Investment company sponsors, such as Fidelity Investments®, may offer different types of funds that each issue shares representing the same portfolio of assets. For example, an investment company sponsor may offer a traditional open-end mutual fund and an ETF that both track the NASDAQ Composite Index. Similarly, if eventually permitted by securities regulations, an investment company sponsor may want to offer an ETF-version of an actively managed open end fund, such as the Fidelity Magellan® fund. Because the two (or more) funds represent the same portfolio of assets, it may be advantageous for an investment company sponsor to pool the funds' assets into a single "master" trust to achieve certain economies of scale, which ultimately could lead to lower management fees for both funds.

[0014] As shown in FIG. **1**, an Exchange Traded Fund **100**, for example the Fidelity® NASDAQ Composite Index® Tracking Stock, is part of a trust **102** that holds the assets of the fund. The ETF **100** is managed by the Portfolio Manager **104**, and receives a number of services **106** such as accounting, tax, and legal.

[0015] The ETF **100** issues and redeems shares to APs **108***a*, **108***b* in large increments termed Creation Units via the Depository Trust Company or the Continuous Net Settlement System of the National Securities Clearing Corporation. Purchases of Creation Units are made by tendering a basket of designated stocks to the fund (known as Deposit Securities) in exchange for a Creation Unit. The fund's Portfolio Manager **104** creates the list of Deposit Securities that an AP must deliver tomorrow in order to exchange for one Creation Unit (a block of 100,000 shares) of the ETF. Similarly, a Creation Unit may be redeemed by an AP presenting the Creation Unit of the ETF (e.g., a block of 100,000 shares) in return for a basket of stocks which should approximate the composition of the NASDAQ index (in the case where the ETF tracks the NASDAQ index).

[0016] Both the subscription and redemption of Creation Units are known as "in-kind" transactions in the ETF since payments are made in-kind via a basket of securities, along with a smaller cash component. The cash component (sometimes referred to as the Balancing Amount) is equal to the difference between the NAV of a Creation Unit (as calculated by a NAV Generator) and the market value of the Deposit Securities on the day the subscription or redemption transaction takes place. The Balancing Amount serves to equalize the amount paid for a Creation Unit with the value of the Creation Unit itself. Unlike typical mutual fund purchase and sale transactions involving cash, subscription and redemption transactions of Creation Units are not taxable events for the fund under current Federal tax law.

[0017] As shown in FIG. **2**, an Exchange Traded Fund is implemented via an ETF Custodian System **202**, an ETF Back office System **204**, an ETF Broker/Dealer system **206**, an ETF Advisor System **208**, and a Clearing Agent System **210**.

[0018] The ETF broker/dealer system **206** is maintained by a licensed broker/dealer associated with the ETF, such as

National Financial Services (NFS), and is configured to receive subscription and redemption orders from Authorized Participants in the fund, such as Authorized Participant **220**. Authorized Participants may place subscription or redemption orders with the Broker/Dealer System **206** between specified hours during a trading day, for example, between 9:00 am and 3:00 pm. As the Broker/Dealer System **206** receives creation unit orders from Authorized Participants during this time, it records each orders in a file called the CU Order file. At the end of order period, the Broker/Dealer System **206** transmits the CU Order file to the ETF Back Office System **204** and the ETF Custodian System **202**. The ETF Custodian System **202** executes each of the CU orders on the next trading day through Clearing Agent **214**. When an Authorized Participant receives a creation unit, it may list shares of the ETF on a listing exchange **222**, e.g., NASDAQ, where individual investors **226** may trade ETF shares through various broker/dealers **224**.

[0019] The ETF advisor system **208** is associated with the Portfolio Manager of the ETF and provides two functions. First, the ETF Advisor System **208** executes trades directed by the Portfolio Manager (typically through a clearing agent) and transmits a record of these trades to the Core Accounting System **216** through the Custody System **212**. Second, the ETF Advisor System **208** determines once per trading day (i) the basket of securities plus (ii) an estimated balancing amount (or cash component) necessary to acquire a Creation Unit on the next trading day. The ETF Advisor System records the basket of securities in a text file named the Deposit Securities file and transmits this file to NAV Generator **218** in the ETF Backoffice System **204**. The ETF Advisor System **208** also disseminates both pieces of information (i.e., the basket of securities and estimated balancing amount) to the Authorized Participants, which provides the Authorized Participants an estimated "price" of a creation unit for the next day (although the actual price may vary because the actual balancing amount is not known until the end of the trading day on which the order was placed when the daily NAV is computed).

[0020] The ETF Custodian System **202** is maintained by the trustee of the ETF and, as mentioned above, receives the CU Order File from the ETF Broker/Dealer System **206**. The ETF Custodian System **202** settles each of the orders listed in the CU Order file through Clearing Agent **214** to transfer the underlying basket of securities plus the balancing amount into or out of the fund. In some instances the actual cash component may be negative, which in the case of a subscription transaction, would mean that the ETF would pay the Authorized Participant the cash component, and in the case of a redemption transaction, would mean that the Authorized Participant would pay the ETF the cash component.

[0021] The ETF back office system **204** includes a Core Accounting System **216**, a Net Asset Value (NAV) generator **218**, and a Custody System **212**.

[0022] The NAV Generator **218** receives the closing prices of securities from various exchanges and computes the daily NAV for the ETF based on the number of outstanding fund shares and the securities held by the fund and their closing prices. The NAV Generator **218** also receives and stores the Deposit Securities files (which lists the identity and amount of each required security) and computes the Portfolio Composition File (PCF), which, includes the quantity of each of the requisite Deposit Securities and the actual balancing amount necessary to acquire a creation unit. The PCF is distributed to the ETF Broker Dealer **206** and the ETF Custodian **202** (via the Custody System **212**).

[0023] The NAV Generator **218** is also configured to provide the Deposit Securities file and the closing prices of various securities to the Core Accounting System **216**, which, as explained in more detail below, uses this information to post net subscription and redemption transactions to the fund's General Ledger **217**.

[0024] The Custody System **212** receives the Portfolio Manager Trade file from the ETF advisor system **208** and forwards it to the Core Accounting System **216** for posting to the General Ledger **217**. The Custody System **212** also receives a Trade Reconciliation file from the Clearing Agent System **210**, which is used to reconcile actual trades conducted via the Clearing Agent with transactions posted to the general ledger by the Core Accounting System **216**.

[0025] The Core Accounting System **216** maintains the General Ledger **217**, a Transaction History file **215** and a Tax Lot Inventory file **219**. The Transaction History file provides the principal audit trail of trade and adjustment activity for the entire life of every tax lot created. It includes all trade-based transactions of the fund, such as buys and sells, as well as information about non-trade based core accounting activities, such as corporate actions, mark-to-market activity, and internally generated cost adjustment transactions. Each record in the Transaction History file includes three parts. The first part contains the data about the actual trade such as the transaction type (e.g., buy), CUSIP number of the security, trade date, settle date, quantity/par of the trade and execution price. The second part of the record contains tax lot information for the trade, including the original, book, and tax cost information. The third part of the record contains position level data related to the average cost positions for the fund's holdings in the affected CUSIP identification.

[0026] The Tax Lot Inventory file **219** provides a comprehensive list of the current tax lot positions of the ETF. Tax lots that have been disposed of by the ETF are purged from the file and thus only open tax lost positions are maintained in the Tax Lot Inventory file. Each tax lot record maintained in the Tax Lot Inventory file **219** includes data about the current quantity and cost basis for each tax lot. The cost basis for the tax lots reflect all sales, cost adjustments and amortization accruals that have occurred since the tax lot was purchased.

[0027] In operation, the ETF Advisor System **208** determines at the close of each trading day the basket of securities and an estimated balancing amount required to acquire a Creation Unit for the next trading day and creates a text file, called the Deposit Securities file, that lists the quantity required for each security. For example, if the ETF tracks the NASDAQ Composite Index, ETF fund manager would require that the basket of securities include a certain quantity of the securities that make up the NASDAQ Composite Index. For some securities that comprise the NASDAQ Composite Index, the ETF fund manager may not include any shares in the basket of securities, especially where the percentage of the index weight of the security is very small. Thus, for example, if "XYZ Corp." comprises only 0.0002% of the NASDAQ Composite Index, the ETF fund manager may choose not to require any shares of this company within the basket of securities tendered for a CU.

[0028] At the same time the ETF Advisor System **208** determines the requisite basket of securities, it also estimates the balancing amount that will be required for each CU transaction and disseminates both the basket of securities and esti-

mated balancing amount to the Authorized Participants. In addition, the ETF Advisor System **208** transmits the Deposit Securities file to the NAV Generator **218**, where it is stored.

[0029] The NAV Generator **218** computes both a NAV of the fund and a Portfolio Composition File at the end of each trading day. The Portfolio Composition file includes Deposit Securities file and the actual balancing amount for CU orders placed on the trading day. The NAV Generator **218** computes the actual balancing amount by multiplying the net assets of the ETF by the number of shares per CU and dividing by the number of outstanding shares and then subtracting the value of the Deposit Securities file. The NAV Generator **218** transmits the Portfolio Composition File to the ETF Custodian System **202** and ETF Broker/Dealer System **206** via the Custody System **212**.

[0030] The ETF Advisor System **208** lists all trades, if any, executed by the fund manager during the trading day in the Portfolio Manager Trade file and transmits this file at the end of each trading day to the Core Accounting System **216** through the Custody System **212**.

[0031] At the end of a trading day, the ETF broker/dealer transmits the CU Order file (which lists all of the Creation Unit orders received for the day) to the Core Accounting System **216** and the ETF Custodian System **202**.

[0032] Referring to FIG. **3**, the Core Accounting System **216** receives the CU Order file, Deposit Securities file, and close prices for the basket of securities at the end of each trading day. The Core Accounting System **219** reads the CU Order file and nets **302** the subscription and redemption orders to a single value. If the subscription and redemption orders net to zero, the process ends **304** and no redemptions or subscriptions are entered into the fund's general ledger.

[0033] If the subscription and redemption orders do not net to zero, the Core Accounting System builds **306** a list of transactions that require entry in the general ledger based on the net subscription and redemption orders, the required amount of deposit securities, and the close prices of the deposit securities. In particular, the Core Accounting System takes the securities in the basket (provided in the Deposit Securities file received from the NAV Generator) and multiplies them by the net Creation Units and their respective closing price (also received from the NAV Generator). For example, if there is a net of two (2) subscription orders for the day and if the 'basket' calls for 1,000 shares of Microsoft® Corporation as part of the delivery and the security closed at $50.00, the Core Accounting System would create a subscription in kind transaction for 2,000 shares of Microsoft at a cost of $100,000 (i.e., 1,000×2×$50.00). In the event that there was a net of two (2) redemption orders, the Core Accounting System **216** would create a redemption in kind for 2,000 shares at $50.00 per share. After building a list of redemption/subscription transactions, the Core Accounting System suspenses **308** the net subscription/redemption orders for posting to the general ledger along with any other transactions the need to be posted to the general ledger.

[0034] As shown in FIG. **4**, the Core Accounting System processes every night after trading all suspensed transactions for posting to the general ledger. The suspensed transactions include not only the redemption or subscription in kind transactions, but also any buys, sells, puts, calls, cancels, re-bookings (i.e., a transaction that was mistakenly booked to another fund), wash sales, expires, short sells, cover shorts, paydowns, payups, maturities, cost adjustments, open futures contracts, close futures contracts, receives, delivers, or other transactions that require posting to the general ledger.

[0035] Referring to FIG. **4**, the Core Accounting System arranges **402** the suspensed transactions by transaction date and then selects **403** the earliest transaction date. The Core Accounting System then arranges **404** the suspensed transactions for the selected date by transaction type (e.g., redemption in kind, subscription in kind, buys, sells, etc.). While most of the suspensed transaction occur on same day in which the nightly processing occurs, occasionally transactions that occurred on a previous day must be processed for posting to the general ledger. For example, a previous transaction may have been mistakenly booked to another fund and would have to be rebooked to the proper fund.

[0036] The Core Accounting System processes **405**, **406** each transaction type (e.g., buy, sell, net redemptions/subscriptions, etc.) for posting to the general ledger. As the Core Accounting System processes the suspensed transactions, it determines **407** if the transaction transfers securities out of the ETF. Sell transactions and redemption transactions are examples transactions in which securities are transferred out of the ETF. If the transaction type does not transfer securities out of the ETF, then the Core Accounting System records **408** the transaction to the general ledger. For example, if the transaction type is a buy, the Core Accounting System will write the date and time of the transaction, an identification of the security purchased, the amount of shares purchased, the price paid per share, and other transaction-related information as an entry in the general ledger database. Similarly, if the transaction type is an open futures contract, the Core Accounting System will write the date and time the contract was purchased, an identification of the underlying security, the contract price and the contact date as a separate entry in the general ledger database.

[0037] If the Core Accounting System determines **407** that the transaction transfers securities out of the ETF, it queries **410** the Tax Lot Inventory file obtain the lots of the security which is to be transferred out of the fund.

[0038] The Core Accounting System also determines **411** if the transaction type is a redemption in kind. If the transaction is a redemption in kind, then the Core Accounting System, in this particular implementation, sorts **412** the tax lots (from the Tax Lot Inventory file) from the lowest cost basis to the highest cost bases and selects **414** the lot(s) having the lowest cost bases for posting **408** to the general ledger. based on a predetermined designation, which is typically elected by the Portfolio Manager. In another implementation, the Core Accounting System ranks lots of the security having the highest potential tax liability by factoring in the cost basis and whether the tax lot is subject to long-term or short term capital gains and then selects one or more lots of the security having the highest potential tax liability for posting to the general ledger.

[0039] If the transaction type is not a redemption in kind, the Core Accounting System sorts **416** and selects **418** tax lots based on a preselected preference for the fund, which may be determined by the Portfolio Manager. In many cases, the predetermined preference for a fund is for the accounting system to select lots of securities yielding the greatest tax advantage for the fund. In this case, the Core Accounting System sorts the lots based on potential tax liability. In this regard, the Core Accounting System multiplies the unit cost for each lot by the potential gain or loss on each unit (using the current close price of the security). For lots that have been

held for less than a year (and thus subject to short term capital gains or losses), the core accounting system multiplies the potential loss or gain lots by 1.8, which is the short term capital gain tax rate (0.36) divided by the long term capital gain tax rate (0.20). This factor is subject to change based on current tax rates. After sorting the lots based on potential tax liability, the Core Accounting System **216** selects **418** one or more lots of securities having the lowest potential tax liability to record for the sale. Other tax lot selection algorithms may be specified for the fund, including selection of lots having the highest cost, lowest cost, minimum gain, maximum gain, and minimum tax.

[0040] After selecting the lots for potential sale, the Core Accounting System runs **420** a wash sale process on the selected lots. The wash sale rule specifies that a taxpayer cannot claim a loss on a security that was bought back within 30 days, and, therefore, the wash sale process examines (i) purchases to the fund and sales from the fund sold at a loss traded within the prior 30 days that have not been applied to another wash sale and (ii) sales at a loss and purchases traded within the prior 30 days that have not been applied to another wash sale. Adjustments are made on the purchase lots cost basis for the amount of the disallowed loss and holding period to include the period held on the disallowed loss. After the wash sale process is applied to the selected lots, the transaction is posted **408** to the general ledger using the selected lots.

[0041] The core accounting system repeats this process for each suspensed transaction until all of the suspensed transactions are posted to the general ledger.

[0042] A number of embodiments of the invention have been described. Nevertheless, it will be understood that various modifications may be made without departing from the spirit and scope of the invention. Accordingly, other embodiments are within the scope of the following claims.

1. A machine-implemented method for accounting for in-kind transactions of an Exchange Traded Fund, the method comprising:
- netting subscription transactions and redemption transactions that occurred over a particular time; and
- recording a transfer of securities into or out of the fund based on the net of the subscription and redemption transactions that occurred over the particular time.

2. The method of claim **1** further comprising:
- selecting securities held by the fund for redemption based on the cost basis of the securities held by the fund if there is a net redemption of shares of the fund.

3. A machine-implemented method for accounting for in-kind transactions that occur in an exchange traded fund, the method comprising:
- receiving orders to acquire one or more creation units over a particular time period, wherein each acquisition order represents a transfer of a basket of securities into the fund;
- receiving orders to redeem one or more creation units over the particular time period, wherein each redemption order represents a transfer of a basket of securities out of the fund; and
- recording an in-kind transaction based on the net number of orders to acquire and redeem creation units.

4. A machine-implemented method for selecting one or more lots of a security held by an exchange traded fund, the method comprising:
- receiving an order to transfer a lot of a security out of the fund;
- ranking lots of the security held by the fund based on the tax liability of each lot; and
- selecting one or more lots of the security based on whether the trade order is an order to sell the security or an order to redeem the security.

5. The method of claim **4** wherein selecting one or more lots of the security based on whether the trade order is an order to sell the security or redeem the security comprises:
- determining whether the order is an order to sell the security or redeem the security;
- if the order is an order to redeem the security, then selecting one or more lots of the security having the lowest cost basis.

6. The method of claim **5** further comprising:
- if the order is an order to sell the security, then selecting one or more lots of the security having the least tax liability.

7. The method of claim **4** further comprising:
- recording a selected lot of the security as a transaction.

8. A machine-implemented method for selecting a lot of securities held by an exchange traded fund, the method comprising:
- receiving an order to transfer a lot of a security out of the fund;
- ranking lots of the security held by the fund based on the tax liability of each lot; and
- selecting one or more lots of the security based on whether the trade order is an order to sell the security or redeem the security.

* * * * *