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INTELLECTUAL PROPERTIES PORTFOLIO

Pharmacy Automation

Я-pharmacy™
Patented Solutions

- ***Providing Guaranteed Quality Prescription Medications***
- ***Improving Customer Services, including 24-hrs un-attended***
- ***Green Technology Contributing to Community and Environmental Safety***
- ***Expanding Pharmacy Business and Improving Profits***

Zachary L. Braunstein

Patented and Patent Pending Applications
On file with the USPTO

June 28, 2015

LISTED DRAWINGS, ART – ARE NOT TO SCALE, AND FOR ILLUSTRATION PURPOSES ONLY.

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Automatic Distributed Vending System

The invention – apparatus Automatic Distributed Vending System (ADVS). The CLAIMS (5 total) include: a configurable conveyor comprising a timing belt with embedded and/or insertable bearings serving as a support of a carrier; the conveyor advancing the carriers maintaining the carriers in generally upright position at all times; an inner enclosure configured to contain the conveyor; an outer enclosure configured to allow the inner enclosure to be slideably inserted into the outer enclosure; system monitoring inventory including use of barcode labels.

Application - Pharmacy automation (FIG. 1). Configurable automation technology solutions improving quality of Prescription Medications and quality of Customer Services, while reducing costs of Pharmacy operations.

(a) ADVS on-site configuration: Provider loading of Prescription Medications into conveyor (FIG. 1: 11, 13) of an Automatic Vending Module (AVM, "outer enclosure with a single or multiple stationary inner enclosure(s), with each inner enclosure containing conveyor", FIG. 1: 10, 15, 16), where the Prescription Medications are sustained within Specifications.

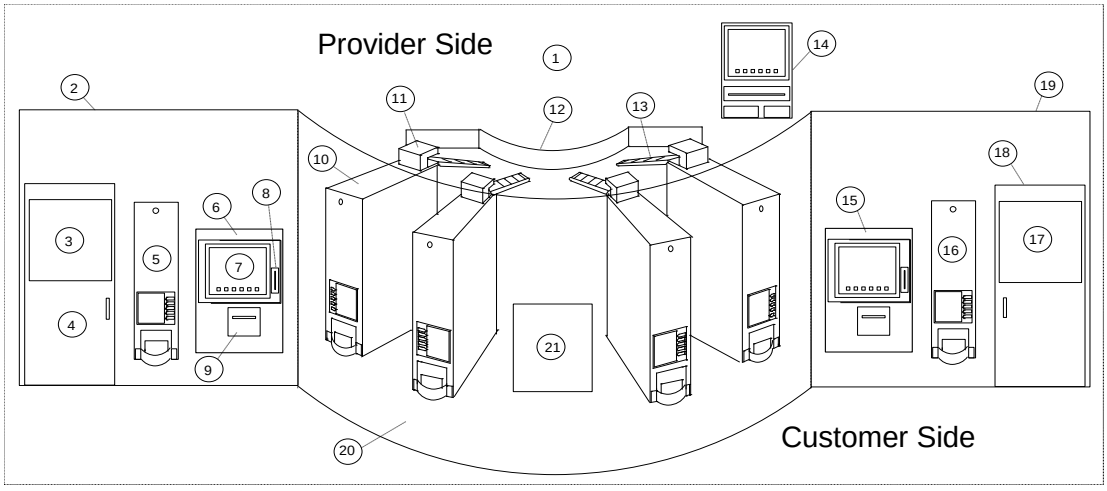
(b) ADVS off-site configuration: Provider at a centralized location loading Prescription Medications into a Portable Vending Cartridges (PVC – "inner enclosure with conveyor") which are then transported to destination Pharmacy or a stand-alone Kiosk, where the PVC's are inserted by Provider into mating AVM.

(a, b) ADVS sustaining Prescription Medications within Specifications. Only quality confirmed Prescription Medications are automatically dispensed by AVM to authorized Customers.

All year round, including peak demands for Prescription Medications during a flu season, ADVS delivers:

- *Improved Quality: ADVS sustains Prescription Medications within Specifications, including ambient environment and safety.*
- *Increased Productivity: ADVS auto-dispensing quality Prescription Medications to authorized Customers.*
- *Improved Services: ADVS supports un-attended 24-hours services to authorized Customers at convenient locations.*
- *Improved Business: Provider choices of on-site and/or centralized processing, with distributed unattended Customer services.*

ADVS enhances Pharmacy business, providing cost-efficient configurable technology solutions for all type of Pharmacies: from a large scale franchise Pharmacy down to a small stand-alone "mom and pop" pharmacy.



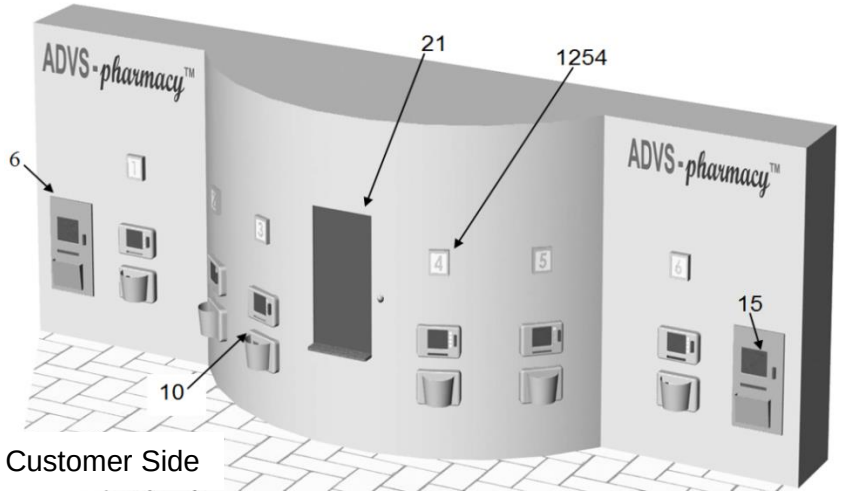


FIG. 1

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Optimization of Pharmacy Operations using Automatic Distributed Vending System

The invention ads new features to ADVS. The CLAIMS (18 total) are described below.

The ADVS quality process control is enhanced by expanding the Prescription Medication Specifications to include several new Parameters. Parameter #1 - calculated WEIGHT of container with Prescription Medication. Based on information provided by authorized personnel (Provider), ADVS will initially calculate expected weight of each container with Prescription Medication, and then monitor the compliance in real-time. ADVS using built-in scales (FIG. 2: 1108) will monitor in real-time weight of a selected section of AVM. ADVS will verify the expected change in weight for each transaction in respect to Prescription Medication being either added or removed from ADVS. The transactions are executed by ADVS directly and/or performed by Provider. Parameter #2: AMBIENT ENVIRONMENT, including: temperature, humidity, vibrations. ADVS configurations include: open-loop mode of operation with ADVS monitoring in real-time compliance; and closed-loop mode of operation with ADVS sustaining the Parameter #2 within Specifications. Parameter #3: Provider entered DUE DATE by which the Medication should be dispensed to an authorized Customer, or returned back to Provider. Parameter #4: SAFETY of the Medication inside ADVS, which is monitored by ADVS via respective sensors detecting un-authorized access and/or a process failure. Prescription Medication out of compliance in respect to Specifications will be rejected and auto-dispensed back to Provider. ADVS will auto-dispense Prescription Medications in full compliance to Specifications to authorized Customers. ADVS, as needed, will generate a report of compliance, or state reasons for rejection. The enhanced ADVS quality process control, operating ADVS state-of-the art hardware components, including non-volatile operation during a power loss, will significantly reduce probability of an ERROR caused by Provider and/or ADVS, outperforming by large the existing quality processes implemented by the Pharmacies.

The ADVS dispensing rates have increased supporting nearly simultaneous auto-dispensing of several quality verified Prescription Medications to a single authorized Customer. The dispensing rates can be as high as five (5) Prescription Medications per ten (10) seconds.

The ADVS space utilization has improved. ADVS layout configurations with a vertical indexing conveyor system utilize available height of a building housing the Pharmacy. ADVS layout configurations support multi-floor Pharmacy, including configuration with a Pharmacy on a first floor and Customer services provided on the first and upper floors.

The ADVS configurations are expanded to include individual Patient-specific configuration (FIG. 3), with ADVS operating per Instructions (computer entered Algorithm, FIG. 3: 1196) provided by an authorized Physician. The Algorithm includes ADVS operating modes. The ADVS open-loop mode of operation includes ADVS auto-dispensing of specific type and amount of Medication per date/time schedule. The ADVS closed-loop mode includes ADVS in real time periodically monitoring and reporting to the Algorithm status of the Patient. The status is based on various sensors assigned to the Patient (FIG. 3: 1133), which report respective measurements to ADVS (FIG. 3: 1132, 1119). The measurements include Patient's vital signs: temperature, blood pressure, etc. Based on status, the Algorithm will direct ADVS to auto-dispense specific type and amount of Medication. The ADVS interface with the Patient includes: visual and audio instructions to the Patient; touch-screen (FIG. 3: 1140) or single button entry allowing the Patient to confirm administering dispensed Medication (FIG. 3: 1130). ADVS will generate reports per request of the Algorithm. The reports include: real-time graphs illustrating the actual status of the Patient vs. dispensed Medication. The Algorithm can instruct ADVS to inform authorized Physician of specific events, including when the Status of the Patient is out of a range defined by the Algorithm. The authorized Physician can adjust and/or fine-tune the Algorithm in real-time.

The ADVS configurations are enhanced with addition of stand-alone un-attended dispensing ADVS Kiosks. The Kiosk configurations of operating environment include: indoor, outdoor, onsite, off-site, stationary and mobile. The Kiosks offer reliability, durability, safety and security equal or better to ATM machines. Mobile ADVS Kiosk includes configurations supporting delivery and dispensing Prescription Medications at a location specified by a Patient.

SUMMARY: Prescription Medications, as any product, have respective Specifications. Due to potentially serious consequences to a Patient while administering a Medication out of compliance, it is highly important for any system to monitor and ensure that only quality Prescription Medications in full compliance to Specifications are serviced to the Patient. ADVS is the only system sustaining and confirming by a written REPORT that the dispensed Prescription Medication have remained in full compliance to Specifications from the point of entry into ADVS to the point of being dispensed to the Customer. This includes ADVS dispensing on-site at a Pharmacy, and ADVS dispensing at a remote location using ADVS Kiosk. Other (non-ADVS) methods, in particular the ones relying on sustaining Specifications (specifically ambient, safety) during shipping Medications by mail, do fail this important requirement!

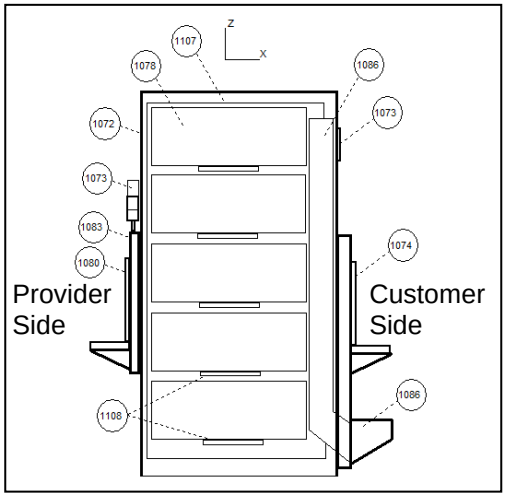

FIG. 2

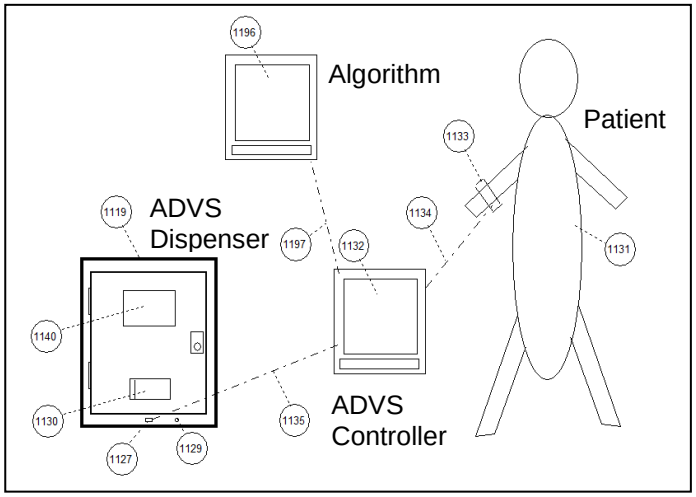

FIG. 3

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Improving Quality of Prescription Medications and Quality of Customer Services at Pharmacies Using Automatic Distributed Vending System

Invention ads new features to ADVS, ultimately eliminating probability of ADVS issuing a wrong Prescription Medication to a Patient.

New ADVS configurations supporting processing, distribution and dispensing of medications and/or accessories for a multi-floor facility, such as Hospitals. ADVS configured Pharmacy can be located on one floor, while ADVS distribution and dispensing components extending services from the Pharmacy to the floors above and/or below the Pharmacy, providing reliable distribution and dispensing of Medications and/or Accessories to authorized personnel at the specified floors. FIG. 4: example of ADVS extending services from the Pharmacy floor (3558) to upper floor (3555), with ADVS configured to include three (3) independent conveyor systems, supporting simultaneous services of up to five (5) independent Providers. ADVS configured Pharmacy can be located on a middle floor (FIG. 5), while ADVS distribution and dispensing components extending services from the Pharmacy to the floors above (ADVS conveyor system 3608) and below (ADVS conveyor system 3609) the Pharmacy, providing reliable distribution and dispensing of Medications and/or Accessories to authorized personnel at the specified floors. ADVS configurations include Patient-specific conveyor systems, delivering requested Medications and/or Accessories directly to the Patient's room.

Expanded configurations for ADVS conveyor systems, designed in compliance to Provider defined system level acceptance criteria, including: optimized utilization of available space; reliable operation, minimizing stress on ADVS and building components; effective operation optimizing ADVS distribution of Medications and Accessories per specified demand; efficient operation maintaining acceptable power consumption level; convenient operation with minimum disturbance in vibrations and noise; indoor operation, suitable for ADVS installations during the original construction; outdoor operation, suitable for ADVS add-on to an existing facility or Hospital. ADVS configurations for a multi-floor facility (Hospital, as an example) in respect to distribution of Medications requested from the Pharmacy by authorized personnel located on each of the floors of the facility, includes configuration supporting sequential floor-indexed loading of Medications by the Pharmacy into ADVS conveyors followed by simultaneous dispensing of the requested Medications at all or selected floors of the Hospital. Sequential loading for ADVS system (FIG. 4) can support simultaneous delivery services from the Pharmacy to up to six Providers per each floor.

New enhanced ADVS quality control algorithm with configurable quality acceptance criteria. The configuration of acceptance criteria include ADVS controller verifying expected weight of prescription medication during the initial processing of a prescription by Provider. The expected weight is calculated by ADVS controller based on: information provided by the original prescription issued by authorized Physician, and the raw materials selected by Provider. ADVS algorithm based on: quality acceptance criteria; prescription medication weight and volume; existing inventory of empty containers; existing inventory of other containers with prescription medications located inside respective ADVS vending modules - will instruct Provider to use a specific container for storing the prescription medication. After medication is placed inside the container, and required labels are attached by Provider, ADVS controller will verify and record the size and the weight of the container with medication, and add these parameters to Specifications. ADVS will accept Medications in compliance to Specifications, and then sustain the Medications within Specifications. ADVS. quality acceptance based on verifications of Medication Specifications, including: ID (such as barcode label attached to container), WEIGHT and SIZE of the container – will practically eliminate probability of an error. The enhanced list of Specification parameters includes: LOCATION of container within ADVS; WEIGHT and SIZE of container with medication; container ID; AMBIENT ENVIRONMENT; DUE DATE; and SAFETY. ADVS controller performing: incoming, in-process and final quality verifications of Specifications parameters related to specific Medication. Medications in full compliance to Specifications from the point of their origination are dispensed to authorized Customer, while rejected - are returned to Provider.

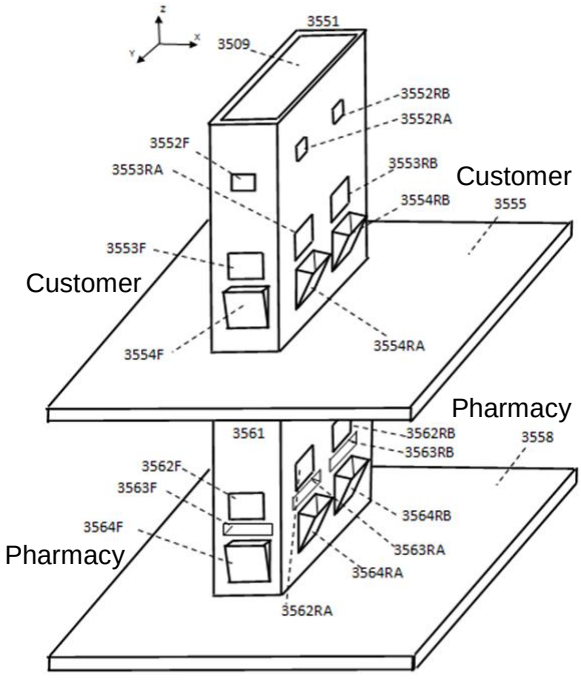

FIG. 4

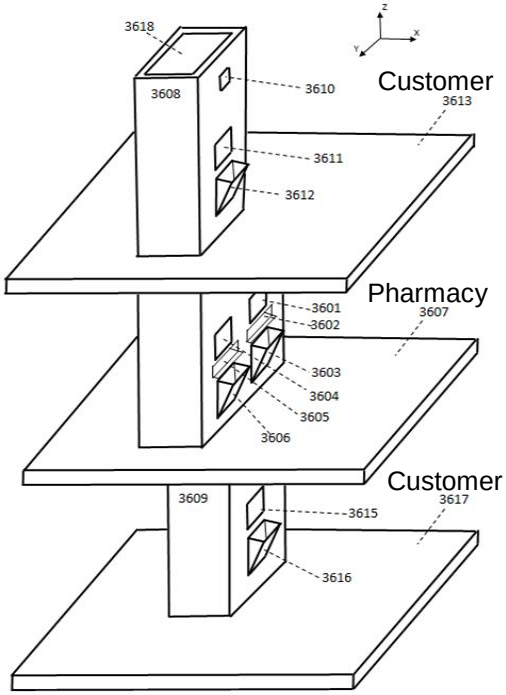

FIG. 5

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Zachary L. Braunstein owns intellectual rights to the following Trademarks:

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