



(19) **United States**

(12) **Patent Application Publication**

**Hans**

(10) **Pub. No.: US 2021/0312391 A1**

(43) **Pub. Date: Oct. 7, 2021**

(54) **MULTI-PATH ELECTRONIC PRESCRIPTION PROCESSING SYSTEM**

(52) **U.S. Cl.**

CPC ..... *G06Q 10/10* (2013.01); *G06Q 10/107* (2013.01); *G16H 40/67* (2018.01); *G16H 20/10* (2018.01)

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(21) Appl. No.: **17/351,603**

(57)

**ABSTRACT**

(22) Filed: **Jun. 18, 2021**

**Related U.S. Application Data**

(63) Continuation of application No. 14/959,971, filed on Dec. 4, 2015, which is a continuation of application No. 12/337,422, filed on Dec. 17, 2008, now abandoned.

(60) Provisional application No. 61/014,218, filed on Dec. 17, 2007.

**Publication Classification**

(51) **Int. Cl.**

*G06Q 10/10* (2006.01)  
*G16H 20/10* (2006.01)  
*G16H 40/67* (2006.01)

An electronic prescription processing system which is capable of direct two-way electronic communication between the physician and the pharmacist, in one example, uses a multi-path clearinghouse between the physician's office practice management system and a pharmacy computer system. In one example, the multi path electronic prescription processing system allows a physician to create electronic prescriptions using an electronic signature, and using the multi-path clearinghouse, allow for interface with the pharmacy computer system such that an image of an electronic prescription and prescription information are directly auto-populated into an entry screen of the pharmacy computer system.

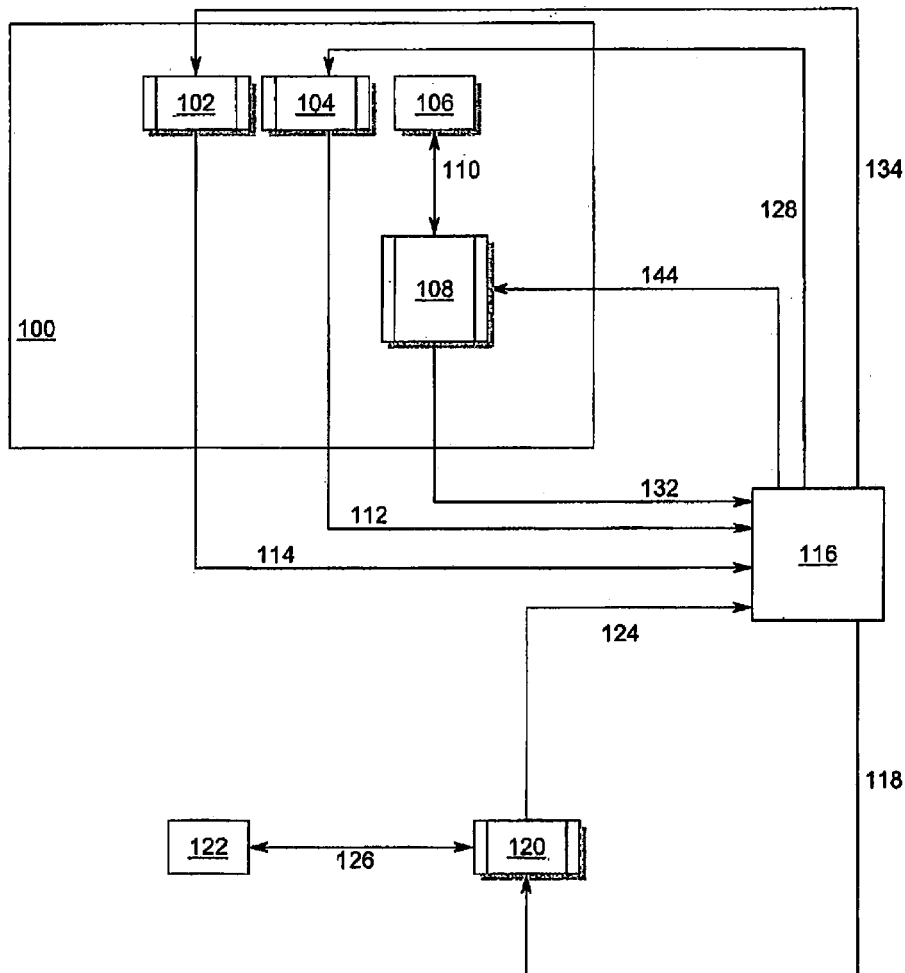


FIGURE 1

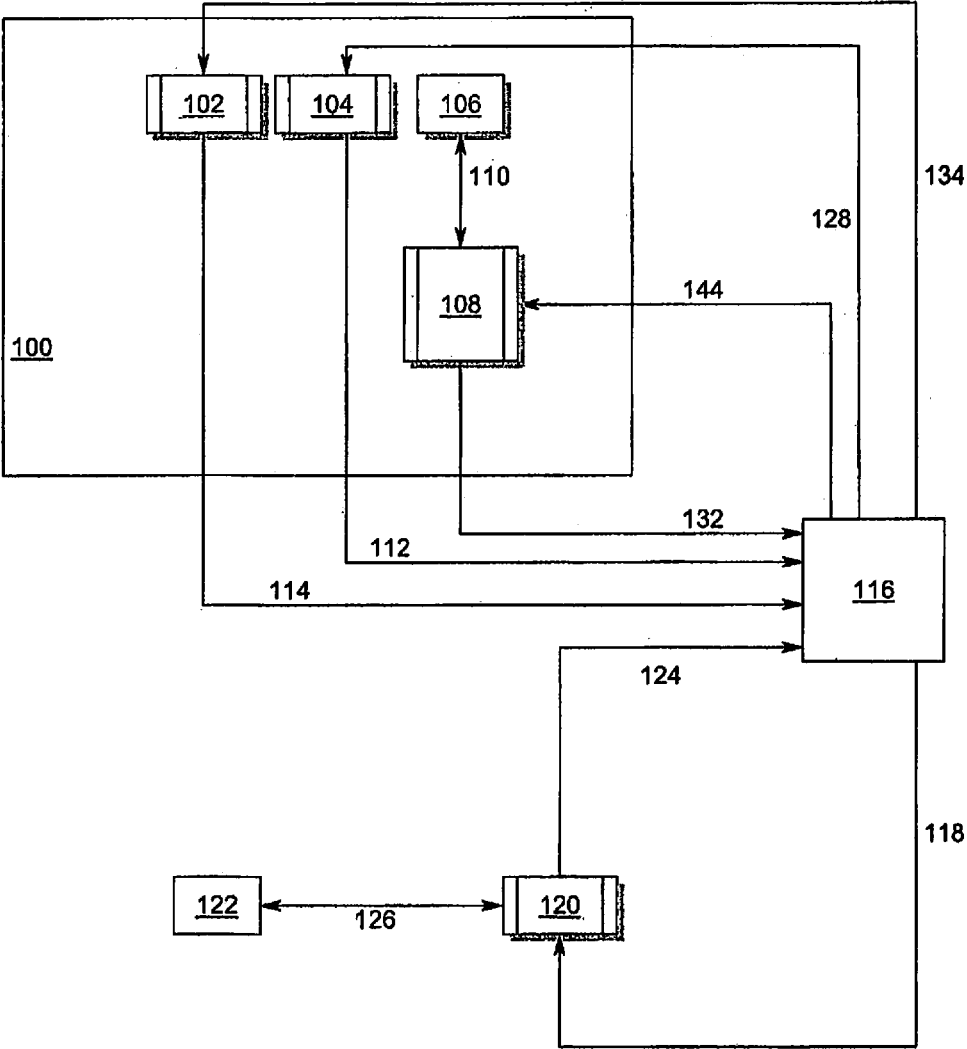
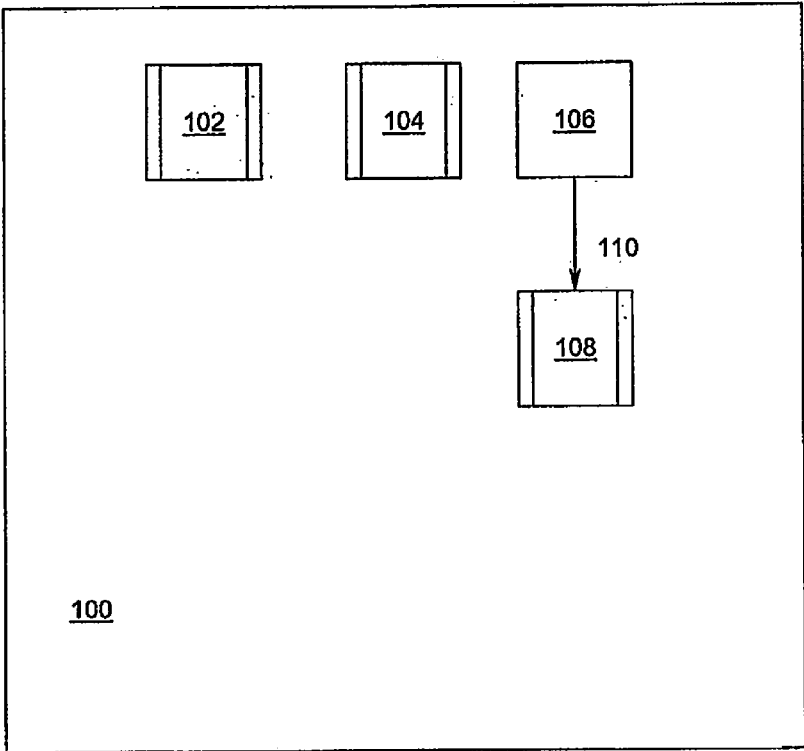


FIGURE 2



**FIGURE 3**

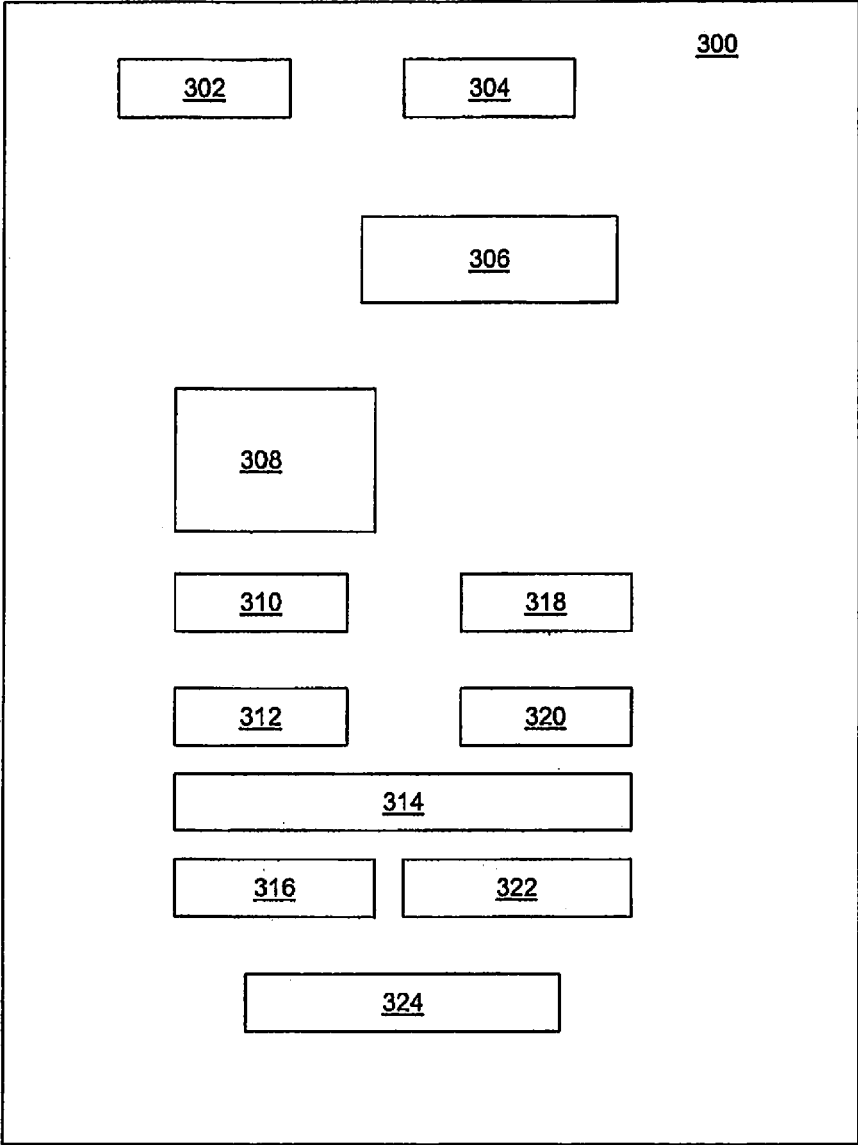


FIGURE 4

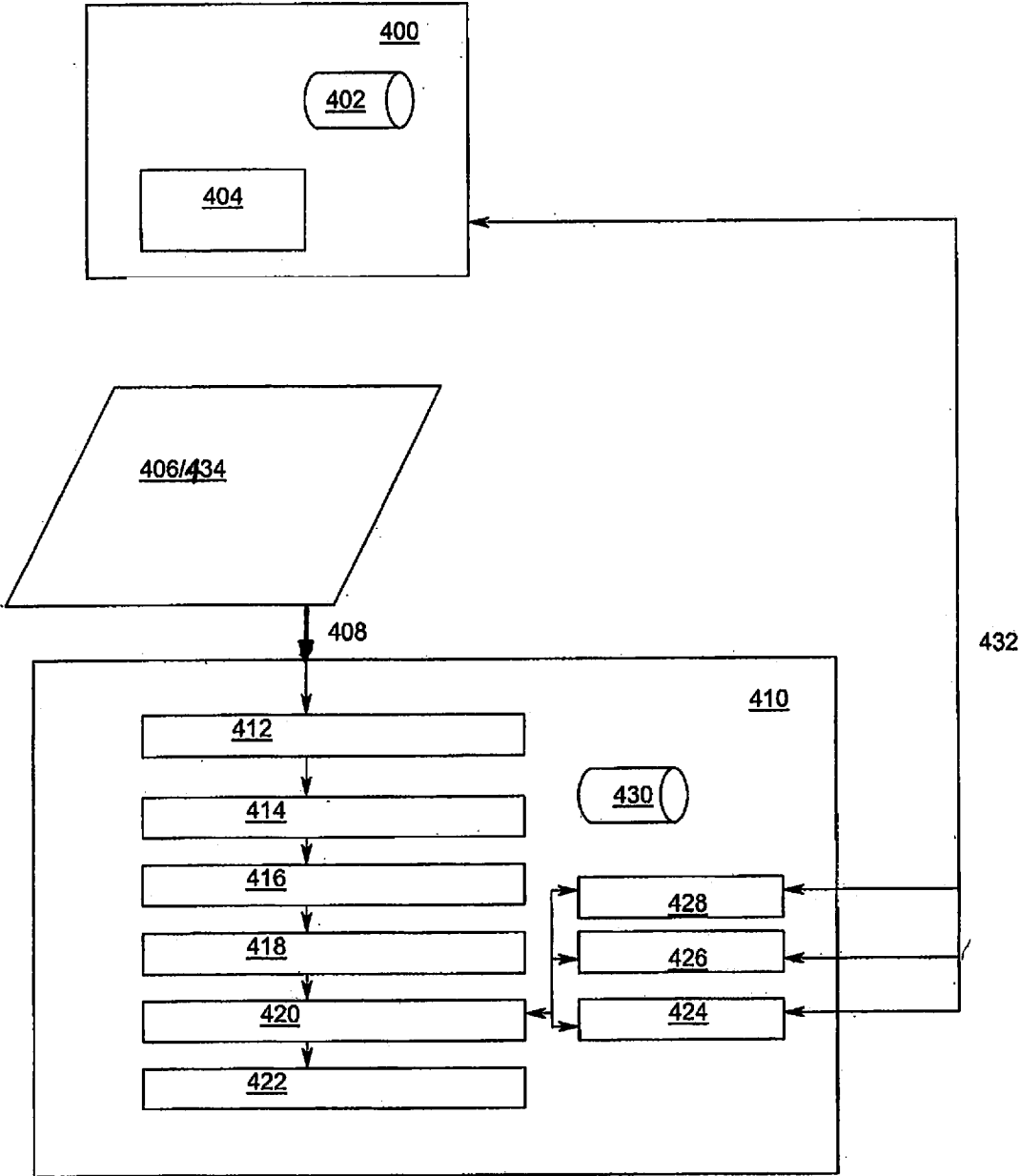


FIGURE 5

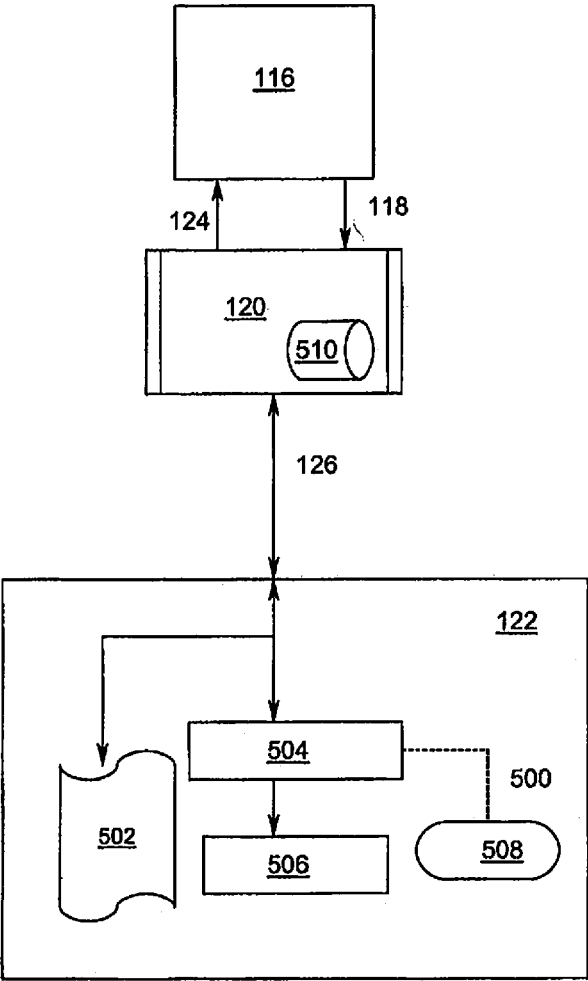
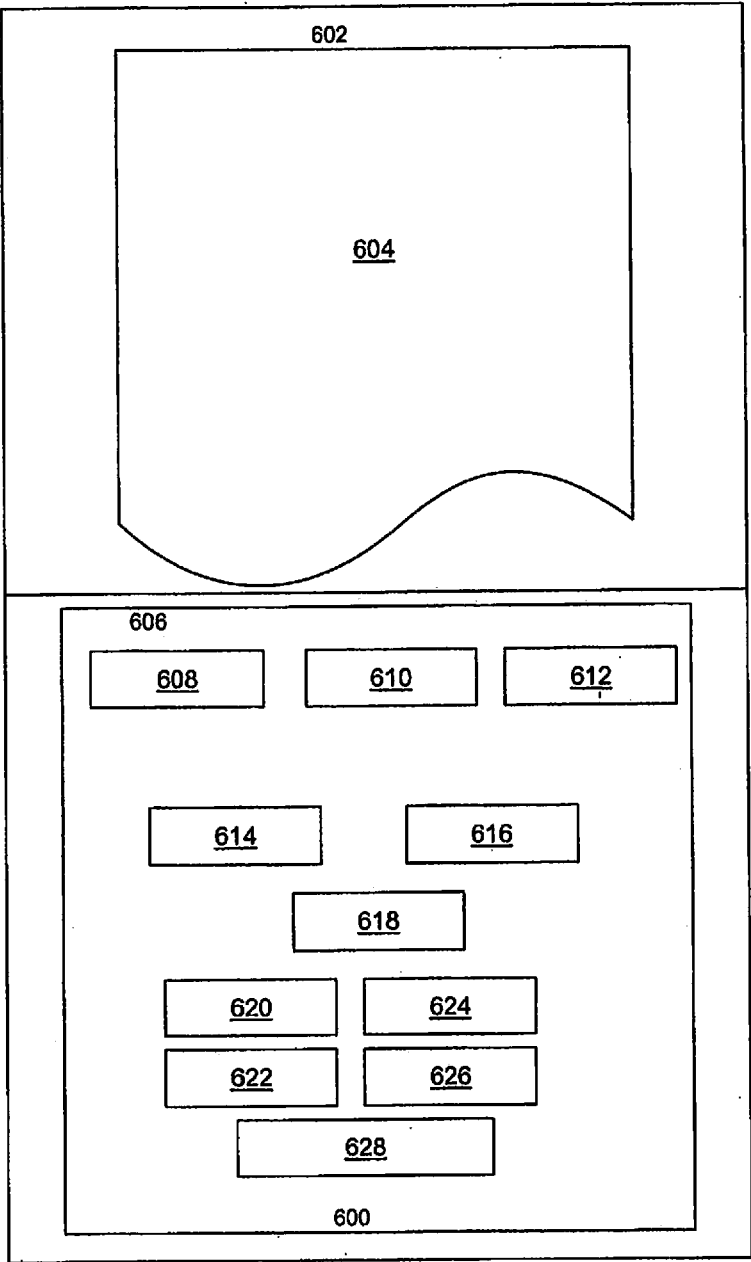


FIGURE 6



## MULTI-PATH ELECTRONIC PRESCRIPTION PROCESSING SYSTEM

### REFERENCE TO RELATED APPLICATIONS

[0001] This application is a continuation of U.S. patent application Ser. No. 14/959,971 filed Dec. 4, 2015 which is a continuation of U.S. patent application Ser. No. 12/337,422 filed Dec. 17, 2008 which claims the benefit of Provisional Patent Application No. 61/014,218 filed Dec. 17, 2007, the disclosures of which are hereby incorporated herein by reference.

### FIELD OF THE INVENTION

[0002] The field relates to electronic prescription systems.

### BACKGROUND

[0003] Currently, many pharmacists or technicians contact the physician directly through telephone or facsimile, if they have questions with a particular prescription but such a process is time consuming and can be expensive.

[0004] U.S. Pat. No. 5,883,370, describes how the physician writes a prescription by entering the prescription into a computer which prints out a bar-coded prescription that may be taken by the patient to the pharmacy, or a future modern path, which would enable the physician to send the prescription directly to a particular pharmacy computer. However, the pharmacist would have to scan the bar code on the prescription and manually enter the prescription into the pharmacy computer or scan the prescription slip bar code into the pharmacy computer directly and the system described is only a one-way system, from the physician to the pharmacist, as disclosed in col. 5, Ins. 16-27. Prior art systems, such as the one described in this reference, do not provide for seamless, automated two-way communications between a prescriber and a pharmacist, however.

[0005] U.S. Pat. No. 7,072,840, describes a prescription generation system where patient-identifying data, prescribed drug identification data, drug quantification data, and other prescription information are entered, which are then used to create a prescription. The system does not provide for seamless, automated two-way communications between a prescriber and a pharmacist, and the system has no way of notifying a prescriber if a particular drug in a drug formulary is available at a pharmacy or the price of the drug or the cost of the drug to the patient and/or the patient's insurance company.

### SUMMARY OF THE INVENTION

[0006] An electronic prescription processing system is capable of two-way electronic communication between a physician and a pharmacy or pharmacist. The system may use a multi-path clearinghouse between the physician's office practice management (OPM) system and a pharmacy computer system. A physician may create electronic prescriptions using an electronic signature. An interface is provided with a pharmacy computer system such that an image of an electronic prescription and prescription information may be directly auto-populated into an entry screen of a pharmacy computer system for checking and fulfilling prescriptions. In addition, the system processes communications between the pharmacy and the physician's OPM system. A pharmacist may query the physician's office; without any need to speak with the physician or staff by

telephone. Preferences may be entered into the processing system for messages internal to the processing system or for notifications by email, text messages, instant messages and the like. The physician's office may respond to individual messages or may batch process a plurality of communications.

[0007] In one example, an electronic prescription processing system includes at least one pharmacy system connected to a network capable of two-way digital communications between a plurality of physician office practice management systems and the at least one pharmacy system. The at least one pharmacy system displays an image of the information entered as an electronic prescription by a prescriber using one of the plurality of physician office practice management systems on a display and the information entered as an electronic prescription is auto-populated in entries for a prescription entry screen of the at least one pharmacy system. In one example, a clearinghouse is electronically disposed between physicians' office practice management systems and computer systems for a plurality of pharmacies. One advantage of using a clearinghouse is that each pharmacy system may query, electronically, any of the prescribers, seamlessly and automatically, without speaking by telephone, to resolve questions about the electronic prescription. A multi-path clearinghouse automatically correlates the query with an answer from the prescriber, such as using a unique, query identifier, when a prescriber of one of the plurality of physician office practice management systems responds to the query from the at least one pharmacy system.

[0008] In one example, a clearinghouse system correlates each of the queries with each of the answers from the prescriber, when the office management systems' responds to the pharmacy using a batch process for answering a plurality of queries from one or more pharmacies. A single electronic transmission from the office management system to the clearinghouse may be used to communicate with a plurality of pharmacies, for example.

[0009] In one example, the clearinghouse provides access to information from a drug file database from one or more pharmacy systems. Then, a prescriber has access to drug inventory and prices, immediately, and can discuss with the patient whether a lower cost alternative that is pharmacologically equivalent or acceptable as an alternative is desired, rather than a more expensive alternative. In another example, a lower cost pharmacy may be recommended within a reasonable distance from the patient's preferred pharmacy. For example, the clearinghouse is capable of automatically providing notification to the prescriber of alternative prescription items available at at least one pharmacy and the alternative pricing, and the clearinghouse allows the prescriber the opportunity to substitute an alternative prescription item or alternative pharmacy, electronically, in response to a query generated by the prescriber's system for entry of an electronic prescription. For example, a clearinghouse system may notify the prescriber, or may provide to the prescriber's system for notifying of the prescriber, generic equivalents available at a pharmacy or an alternative pharmacy, together with pricing information, such as cost to the patient and/or the patient's insurance company.

[0010] In one example, the clearinghouse automatically provides notification to the prescriber of a recalled drug or information that a drug is not recommended for the indications entered into the prescriber's practice management



system or electronic health record of the patient. Alternatively, a pharmacy system may provide such information to a physician, either automatically or using an automated, two-way communication protocol between the pharmacist and the prescriber. In addition, a clearinghouse automatically may provide a suggestion of an acceptable alternative to the recalled drug or a drug not suitable for treating a patient with the indications indicated in the patient's electronic health records. The clearinghouse may provide the prescriber an opportunity to substitute the at least one acceptable alternative of a recalled drug, electronically, in response to a query, for example. Alternatively, the query may originate from a pharmacy system upon receipt of a prescription from the pharmacy system.

**[0011]** In one example, an electronic prescription processing system verifies the identity and authority of the prescriber to enter the electronic prescription using an electronic signature, biometric data, a password or a combination thereof. For example, the clearinghouse may be used to authenticate the prescriber using an electronic signature. In another example, a biometric data reader may be used to capture biometric data of a prescriber, and the electronic prescription processing system, the clearinghouse or the pharmacy system uses the biometric data of the prescriber to authenticate a prescription or a change to a prescription authorized by the prescriber. For example, after a prescription is authenticated by the electronic prescription processing system, the information may be encrypted for transmission to a pharmacy system, such as by a standard public key encryption system, which may be decrypted by the clearinghouse and/or the pharmacy system using a private key, for example.

**[0012]** In one example, an interface system may be coupled to a physician's office management system, such that the interface system couples the office management system to the clearinghouse and/or the pharmacies' systems, wherein two-way communications are established with the interface system. The interface system is coupled to a data input and editing device and a display, for example. The data input and editing device may include a keyboard, a voice recognition system, a pointing device, a touch screen, a bar code reader, a scanner or a combination thereof, for example.

**[0013]** In one example, an insurance formulary from an insurance company or a government insurer is maintained in a clearinghouse, a physician office practice management system, an interface system, or a pharmacy system, and the system is capable of notifying the prescriber, automatically, if a particular prescribed item is not included in the at least one insurance formulary. Then, the system may provide one or more acceptable substitutes for selection by the prescriber, for example.

**[0014]** In one example, the system includes a database, and all queries and answers to the queries are stored in the database and are tracked, such as within a database of a pharmacy system, for example. An alert may be provided automatically to a prescriber, a pharmacist and/or the clearinghouse, if the prescriber and/or the pharmacist does not timely reply to a query or response in the system, for example. Thus, unnecessary delays may be greatly reduced by managing the timeliness of responded in the system. For example, the system may present an alert to a pharmacist responsible for processing the prescription, automatically,

via the pharmacy system, after receipt of an answer from the prescriber to the query by the pharmacist or the pharmacy system.

**[0015]** A method of processing an electronic prescription uses the electronic prescription system to fill prescriptions after installing pharmacy systems and physician practice management systems and/or interfaces, which are each coupled to a clearinghouse, for example. The system is capable of storing an image of a prescription together with auto-populated fields relating to the image of the prescription in a database, and transmits such information from physician office practice management systems to the pharmacies, such as by using the clearinghouse. The pharmacies systems receive the information, which may be stored in a pharmacy database, for processing and filling of a prescription. The information may be displayed on a display of a pharmacist such that the pharmacist is capable of verifying the auto-populated fields of the information in the database against an image of the prescription, for example. A two-way communication protocol for the pharmacist to electronically query a prescribing prescriber about the prescription and for the prescribing prescriber to provide the pharmacy system with an answer to the query is provided by the system. Querying the prescribing prescriber and receipt of answers to the query is seamless and automatic, providing the pharmacy system with the answer to its specific query, automatically notifying the pharmacist who made the query, or another pharmacist, of the receipt of the answer from the prescribing prescriber.

**[0016]** According to one example, the method may automatically provide for verification and authentication of the prescriber and may be used for verifying that the prescription is ready to be filled. The system may automatically monitor the time elapsed between the time that the query is made and receipt of an answer and may flag delays. For example, a level of urgency may be increased if the answer is not received timely. For example, an elapsed time of two hours without receipt of an answer may prompt notification of the prescriber of a degree of urgency in answering the query. In one example, the alert includes a visual alert on the physician office practice management system. The alert may include sending an email, contacting a cellphone number or activating a pager, for example. Preferably, the method of alerting should allow the physician to respond, seamlessly and automatically, by selecting an answer or by providing comments in a response, and the system will match the response to the respective query, providing an answer to the pharmacist. For example, an email flagged as urgent may provide a selection of yes/no for responding to the query, and wherein selecting yes or no from the selection provides a response to the query, transmitting the response to the pharmacist or another pharmacist.

**[0017]** One advantage of the electronic prescription system that it allows a physician to use a drug file of an intended pharmacy such that auto-population occurs when the pharmacy receives information from a physician's office. This reduces transcription errors and eliminates transcription costs.

**[0018]** An additional advantage is that once the physician determines which pharmacy the patient uses, the physician may use the actual uploaded drug file information from the selected pharmacy when choosing the patient's medication. Yet another advantage is that the doctor and patient may be

informed about the cost of a prescribed medication to the patient and may be provided with lower cost alternatives.

[0019] Another advantage is there is no need to have a pharmacy point of sale computer because the electronic prescription system is capable of going directly to and from the physician's practice management system and the pharmacy computer system. All of the normal checks and verifications, such as checking multiple prescriptions for a patient having known adverse interactions may be checked on the pharmacy's computer system. Another advantage is that needless phone calls may be avoided, allowing the pharmacist's question to be resolved, and allowing the prescription to be dispensed.

[0020] Another advantage is that failure of a physician to timely response, such as within two hours, to a query may flag a query as having an increased urgency. Yet another advantage is that the system may alert a physician of an urgent query, such as by an audible, vibrational, visual or other alarm.

[0021] Yet another advantage is that the electronic prescription system allows for a two-way communication between the physician and the pharmacist. Yet another advantage is that the need for technician support and the chances of a prescription error are reduced especially errors in communication and transcription of prescriptions

[0022] Still another advantage is the electronic prescription system allows physician to enter necessary prescription information, reducing errors caused by handwritten prescriptions. Another advantage is a secure system using an electronic signature avoiding prescription fraud. Still another advantage is that an image of the electronic prescription may be directly displayed on the pharmacist computer screen along with the auto-populated information which is found on the prescription entry screen.

[0023] An additional advantage is that the auto-population process is integrated into the system and connects directly to the pharmacy computer system, including access to drug files, listing all the drugs which the specific pharmacy uses, including specified generics. Additionally, the drug file may be constantly updated including recall or advisory notices that the physician might not otherwise be aware of. Still another advantage is that the system identifies preferred drug switches and sends such information to the physician for a possible switch before the physician even sends out an electronic prescription.

#### BRIEF DESCRIPTION OF THE FIGURES

[0024] FIG. 1 depicts an example of an electronic prescription processing system process.

[0025] FIG. 2 shows another example.

[0026] FIG. 3 illustrates an example of an electronic prescription.

[0027] FIG. 4 shows an example of a known prescription process.

[0028] FIG. 5 shows an example of a pharmacy processing a prescription using an example of an electronic prescription processing system.

[0029] FIG. 6 displays an example of a pharmacist computer screen.

#### DETAILED DESCRIPTION

[0030] The examples described and the drawings rendered are illustrative and are not to be read as limiting the scope

of the invention as it is defined by the appended claims. In the drawings, lines of communication are shown by arrows that indicate direction. In each case, the same mode of communication may be used for sending and receiving electronic information or different modes may be used for such as internet, text message, instant message, dial-up access and the like, for sending or receiving electronic information.

[0031] The term "physician" is not limited only to a medical doctor, as used herein, but is used broadly to describe any prescriber of medications or other prescription items, such as prescription medical equipment, biologics and the like. The term physician may include a medical doctor, dentist, psychiatrist, surgeon, or the like. The term "physician's office" is intended to include a physician and staff or a physician practice and staff. The term "pharmacy" is intended to include a pharmacist and staff or a pharmacy including at least one pharmacist and staff.

[0032] In FIG. 1, a plurality of physician's offices may have a computer system which has a type of software used to create prescriptions, billing patient profiles, etc., which is referred to as an office practice management (OPM) system. An OPM system is connected to the Internet another system for effectively communication with the electronic prescription processing system.

[0033] In one example, as illustrated in FIG. 1, a plurality of OPM systems 100 are electronically coupled to a clearinghouse 116, such as by a network such as the internet, for example OPM system 104 is integrated with an electronic prescription processing system. The OPM system 104 may be a third party system licensed for use by the physician's office. A connection 112 electronically couples the OPM system 104 to a clearinghouse 116. Communication between the clearinghouse 116 and the OPM system 104 occurs via clearing house connection 128, for example. The same connection 112 that is used for coupling the OPM system 104 to the clearing house 116 may be used for two-way communication between the physician's office and the pharmacy, for example.

[0034] In one example, a physician purchases or licenses an OPM system 102 that has an integrated electronic prescription processing system 120 of a pharmacy, for example. Another connection 134, as shown in FIG. 1, couples a clearinghouse 116 to another OPM system 102, and a different connection 114 couples the same OPM system 102 to the clearinghouse 116. The electronic connection 114, 134 may be used for two-way communication between the OPM system 102 and the clearinghouse 116, for example.

[0035] In another example, an existing physician practice management system 106, which is not integrated with an electronic prescription processing system, uses an import/export interface with an interface system 108, which may be a stand alone terminal, a virtual machine, or an independent process operating on the same computer system as the OPM system. An interface connection 110 couples the OPM system 106 with the interface system 108, which may include two-way communication between the OPM system 106 and the interface system 108. In one example, a physician's office uses a stand alone terminal 108 to access the electronic prescription system's clearinghouse 116 without the use of any OPM system 106.

[0036] An interface system 108 may be coupled to a clearinghouse 116 by interface connections 132, 144, which may use the same channel of communication or different

channels, provided that electronic information is passed without human intervention. Digital communication of information and queries are sent electronically avoiding transcription errors, for example. Electronic connection **144** couples the clearinghouse **116** to the interface system **108**, using the internet, for example. Alternatively, a single electronic connection may be used for two-way communication. The interface system may be coupled, directly or indirectly, to a data input and editing device and a display, such as a voice recognition system, a keyboard, a pointing device, a touch screen, a bar code reader, a scanner or a combination of these, for example.

**[0037]** A pharmacy connection **124** couples a pharmacy computer system **120** to the clearinghouse **116**. Electronic communication between a multi-path clearinghouse **116** and pharmacy computer system **120** occurs via electronic connection **118**, for example. In one example, a plurality of pharmacies are coupled to a single clearinghouse **116**. In one example, a pharmacy is selected by a patient and/or the physician's office according to availability, price, location or other criteria.

**[0038]** Another pharmacy connection **126** couples a pharmacy computer system **120** to a point of sale system **122** where prescriptions are entered or dispensed. In this example, an internal pharmacy connection **126** is shown as a single two-communication path **126** such as an intranet, an extranet, a wide area network or another private data network. Alternatively, two or more electronic connections may be used, such as the internet or phone lines, power lines, transmitters/receivers, or the like. Information may be secured by encryption during transmissions.

**[0039]** Information, such as patient name, address, insurance information, physician information, and the like, may be entered into any system such as those shown for the OPM systems and/or interface systems **100**. Prescription in format may be entered by a point of care physician, for example. In one example, a drug file from a pharmacy **120** is uploaded to the clearinghouse **116** and is sent to the appropriate practice management system that a point of care physician is using, such as an OPM system **102**, **104**, **106** for example. When a physician's office chooses one or more pharmacies as preferred pharmacies, the physician may have access to the pharmacy drug files, including a list of drugs and generic drugs dispensed by each of the preferred pharmacies, and prices, for example.

**[0040]** Once a particular drug and a pharmacy is selected, then an electronic prescription (e-script) is created. For example, the e-script may include an image **300**, a physician electronic signature, biometric data, electronic information identifying the pharmacy, the specific drug or drugs prescribed, patient insurance information, and the like. The physician may review and send the e-script using one of the systems to a clearinghouse **116**. For example, the clearinghouse **116** forwards the e-script to the selected pharmacy computer system **120** that is selected by the physician/patient.

**[0041]** The clearinghouse **116** is capable of uploading pharmacy drug files and preferred medications on specific drug plans. The drug files provide the electronic prescription processing system with the ability to notify the physician of suitable alternatives that are included in the patient's drug plan or are available at a reduced cost to the patient, allowing the physician and patient to interchange medications in the same drug category, for example. Once the electronic pre-

scription has been routed to the correct pharmacy computer system, the prescription information may be auto-populated on an existing pharmacy prescription entry screen of the pharmacy computer. The auto-populated screen may contain all the fields used by the pharmacy to process a prescription including an e-script image so that the pharmacist could verify the populated fields against an image of the electronic prescription. Since the physician uses the drug file with the same generics that the pharmacy has or utilizes a brand name drug that could be changed to a generic drug if allowed by the physician, the prescription dispensing would continue as if a pharmacy technician imaged a prescription and entered the appropriate drug file information, without the chance of inadvertent transcription errors, for example. For legal purposes, the electronic prescription with the electronic signature may be printed in the pharmacy and identifying marks (i.e., bar codes) may also be printed for filing. In addition or alternatively, biometric data or an encrypted code, entered by a prescribing physician, may be used to verify the authenticity of the prescription. The electronic prescription system is capable of uploading drug formulary of pharmacies and approved drug formulary of other third parties, such as managed care plans, insurance companies, Medicare and the like. Accordingly, the drug formulary may be patient-specific, depending on which pharmacy and insurance company the patient uses, for example.

**[0042]** If there are questions about the prescription or how the prescription affects the patient, such as drug interaction, a particular prescription being filled too soon, duplicate therapy, managed care issues and other issues, the physician may need to be contacted by the pharmacist. The pharmacist may use the system to communicate directly with the prescribing physician, such as typing a question in a comment field **628**, as shown in FIG. 6. Then, the information and question may be routed using the system to the physician via the clearinghouse **116** or directly. The physician may resolve the issue and send back information to the pharmacy system **120** for review by the pharmacist. The pharmacy may fill the prescription, which is delivered to the patient. In one example, a point of sale system is notified of the status of a prescription on hold for information from the physician. While transcription errors and human error are eliminated, surprisingly, costs are reduced, also, compared to the known system of FIG. 4, for example. Costs that may be reduced include insurance costs, patient costs, costs of filling prescriptions by pharmacies, malpractice insurance costs, and the like. In addition, prescription drug prices, may be reduced by increasing awareness of suitable alternatives and generic equivalents of more expensive drugs.

**[0043]** One advantage of the system is HIPAA compliance. The only sharing or exchange of patient identifying information is that required to fill the prescription. Communications between a pharmacist and a physician may be securely encoded, for example. In addition, the pharmacist has the ability to verify patient profile and send in questions to physician's office in order to safely dispense medications without undue delays caused by telephone inquiries. This eliminates the need to call the physician directly, which is a time consuming and costly process that substantially delays filling a prescription. Furthermore, questions may be queued up in a physician's computer, which may be accessed at any time by the physician. Accordingly, the physician's office may answer questions by pharmacists and return answers

efficiently as a batch process using the system. In this way, delays in filling prescriptions may be reduced and costs of telephone inquiries eliminated, without interrupting point of care services.

[0044] In one example, a communication from a pharmacy computer system **120** is routed through a clearinghouse **116**. Unlike known systems, the pharmacy communicates back with the physician using the system. Because of this two way communication feature, communications are improved, costs are reduced and errors reduced. A clearinghouse **116** may upload information about medications, which may be used to notify physician/patient about drugs available at a pharmacy from a pharmacy computer system and/or reimbursed by a specific insurance plans according to an insurance formulary. The system may identify generic equivalents and may provide a mechanism for switching to a preferred drug based on suitable indications, price, availability or a combination of these, for example. The clearinghouse **116** may identify these preferred drugs and may present such information to the physician's office in a standardized electronic form for the physician and/or patient to consider as a better alternative, such as a more suitable alternative for indications or a less costly alternative, for example. Such information may be queued on the physician's office and accessed at the convenience of the physician. If the physician selects an alternative or prefers not to select an alternative, such information may be transmitted to the pharmacy using the system. In one example, this all occurs as the physician is preparing and reviewing the e-script, prior to transmitting the e-script to the pharmacy. In another example, the system automatically provides alternatives after the e-script is received by the clearinghouse but prior to receipt by the pharmacy. The physician may consider if the alternatives are acceptable and may confirm substitution of an alternative prescription, easily. This eliminates phone calls and a wasting of a pharmacist's time, and also has the potential of saving substantial health care costs. Alternatively, messages from and to the physician/pharmacist may be queued up and accessed at a later time. This batch processing improves convenience and has the potential of increasing efficiency. In one example, the pharmacy system may automatically provide suitable alternatives for selection by a physician, based on lower cost, availability, or indications, for example.

[0045] In FIG. 2, an example of a plurality of OPM systems **100** are illustrated, schematically. An integrated OPM system **102** is an example of a computer system having a practice management system that has an electronic prescription processing system built into it. The integrated practice management system **102** meets multiple office needs (i.e., billing, storing of patient information, appointment schedules, etc.). The vendor of the OPM system incorporates the electronic prescription processing system integrally with these other functions, providing an integrated software package.

[0046] Another OPM system **104** is operable with an electronic prescription processing system, seamlessly, but the electronic prescription processing system operates as a separate program either accessing the same database, such as an SQL database, or communicating information to an from the OPM system **104**. Such a system **104** would license an electronic prescription processing system utility that is installed together with the OPM system **104**.

[0047] A pre-existing OPM system **106** may be an older system that is not capable of integrating or communicating with an electronic prescription system directly, for example. Instead, the pre-existing OPM system may communicate **110** with an interface system **108**. The interface system **108** may be capable of extracting data from the pre-existing OPM system **106** and transferring e-script and other communications of the electronic prescription processing system to a pharmacy. Alternatively, the interface system **108** may be used as a stand alone system.

[0048] In FIG. 3, one example of an image on electronic prescription **300** is schematically represented. For example, a name field **302** displays the name of the sender, such as a physician. Issue date field **304**, for example, is the location the issue date. Doctor information field **306**, describes the doctor's name, address, DEA number, and fax number, for example. Patient data field **308** describes the patient's name, address, date of birth, insurance company, insurance group, and insurance ID number, for example. Drug data field **310** illustrates the drug name and strength. Drug amount field **318** shows the drug quantity to be dispensed. Prescribed usage field **312** provides instructions for the use of the medication. Refill data field **320** indicates refills. Signature field **314** shows an electronic signature by the physician, which is accepted in most states as a valid prescription. In addition, biometric data or a password may be required to authenticate a valid prescription and to reduce counterfeit and fraudulent prescription. Substitution authorization fields **316** and **322**, respectively illustrate that the pharmacist may substitute or may not substitute an equivalent for the prescribed medication. Rx ID field **324** depicts the prescription ID mark. In one example, the Rx ID mark/field **324** includes a barcode.

[0049] In FIG. 4, an example of a conventional process is shown. Doctor's office **400** includes a database **402**, and a practice management system **404**. Such a system transmits info to the pharmacy via steps **406** or **434**. For example in step **406**, the written prescription may be brought in by the patient, or may be mailed, a facsimile may be transmitted if the image of the scrip or otherwise transmitted. In another example, through step **434**, information relating to prescriptions may be communicated to a pharmacy by telephone, telephone network; fax or email without an image of the written scrip. Regardless, either method requires a human to enter the information into the pharmacy system, which is prone to transcription errors, and is time consuming, inefficient, and leaves opportunities for errors to occur.

[0050] The data entered from the prescription is transmitted **408** by the pharmacy system **110**, which includes a pharmacy database **430**. The actual written prescription is received **412** by the pharmacy and is then scanned **414** by the scanning department creating image of the prescription in the computer system. The header entry department enters pertinent information such as physician's name, office information, patient name, insurance information and any other type of information to identify the patient into the pharmacy computer **416**, which may be recorded in the database **430**. The drug name, strength, quantity, refills, generic indication, brand indication, and directions are entered **418** by a pharmacy technician.

[0051] The pharmacist verifies **420** and then dispenses **422** the prescription. In the verification process **420**, the pharmacist may need to call the doctor **428**, conduct drug utilization review **426**, or contact the managed care depart-

ment 424, if there is managed card issue. The pharmacy contacts 432 the appropriate office or physician when there are issues about the prescription 428, a drug utilization issue 426, or managed care issue at step 424, for example. In some cases, multiple calls may be necessary to get a complete answer to a question or questions.

[0052] When comparing this example with a system using an electronic prescription processing system of the present invention, many differences stand out. By eliminating certain steps a system that provides for direct two-way electronic communication and auto-population of prescription information substantially reduces errors and time required of a pharmacist the physician and their staff to resolve errors or to request additional information.

[0053] Eliminating unnecessary steps, such as scanning 414, data entry 416, 418 and the like reduces costs and errors, for example. Using an auto-populated pharmacy entry screen of the prescription image, such as shown in the example of FIG. 6 allows a pharmacist to quickly verify prescription information, including any alerts, recalls, adverse drug interactions and the like. A pharmacist may pull the information on the screen, scroll down to see additional information about patient information, and verify or check the prescription, without the assistance of a technician that is normally required for data entry and reconciliation, reducing delays and eliminating pharmacy-side labor costs.

[0054] Redundant steps, such as contacting 432, multiple offices or physicians about prescription errors 428, drug utilization 426 and/or managed care issues 424, may be eliminated. For example, automated, two-way physician-pharmacist communication eliminates any need to call 432. The two-way system allows the pharmacist to enter questions in a pharmacist comment field 628, as shown in FIG. 6, for example. Then, the question, alert or notification may be sent to the physician designated to respond in the electronic prescription. Any response from the physician is routed to the e-script, may automatically alert the pharmacist and may be reviewed by the pharmacist, which may be the same pharmacist or another pharmacist working at the same pharmacy who may be designated in the system.

[0055] In FIG. 5, one example of how a pharmacy processes an electronic prescription is schematically illustrated. Many large pharmacies have a pharmacy computer system that is capable of connecting to all the pharmacy's locations. This may be a network, such as a cloud network, a wide area network or the like. Each computer at a particular location of the pharmacy communicates with the pharmacy's computer system, which may be a centralized server or mainframe in one example. A clearinghouse 116 sends information to the pharmacy including an e-script. The e-script is delivered 118 to the pharmacy's computer 120 and a pharmacist then verifies the information. A hard copy of an image of the electronic prescription is printed and filed, if desired. One verified prescription is released 126 to the point of sale location 122 for dispensing to a patient.

[0056] In one example, a pharmacy computer system of a chain of pharmacy point of sale locations 122 stores all pharmacy data, electronically, in a centralized database 510. Each chain pharmacy and computer terminal of the chain of pharmacies may be connected to the pharmacy computer system 120 and communications 126 occurs seamlessly. In one example, internal pharmacy communications 126 occur seamlessly with a mainframe, for example. In an alternative

example, a centralized server replaces the mainframe, and all communications are seamless. In yet another example, the pharmacy computer system is a distributed system, and only the database 510 is centralized. A centralized system may inform a distributed system of a newly released prescription ID, and the distributed system accesses information from a centralized database 510. Herein, a centralized database 510 does not infer that all data is stored at a single location. Instead, it means that all distributed systems have access to the same data, which, may be stored as a SQL database at one or more storage locations.

[0057] Communication 124, 118 between a clearinghouse 116 and pharmacy computer system 120 may provide for two-way communication, for example. A single electronic connection may be used for two-way communication or multiple modes and pathways may exist to provide two-way communications 118, 124.

[0058] A pharmacy computer system 120 includes a database 510. Information relating to an electronic prescription is transmitted 126 to the individual pharmacy locations 122. In one example, a local pharmacist verifies the information provided by the electronic prescription 504, an e-script may be printed 502, and the pharmacy dispenses medication associated with a verified e-script to the patient 506. The pharmacist may opt to use a conventional process 508 of filling a prescription by forwarding 500 the prescription for processing according to FIG. 4, for example. Two-way communication 126, electronically, between the pharmacy and the pharmacy system 120 and the clearing house 116 permits safe, secure queries between a pharmacist and the prescribing physician to occur rapidly. Delivery and read status indicators can be used to track progress in resolving discrepancies with one or more offices and/or physicians. Answers may alert the appropriate pharmacist to review the answer and to take further actions as appropriate. All queries and answers may be automatically logged to the pharmacy system database 510 by the pharmacy system 120. Timeliness of responses to queries may be tracked and an additional query may be transmitted or the urgency of a query may be increased. In one example, a query may be flagged for immediate response or may present an audible, vibrational or other alert, when a response is not timely.

[0059] In FIG. 6, an example of a pharmacist computer screen 600 is shown. The pharmacist entry screen 606 includes an image of the prescription on the screen as well as an area to enter information from the image into the pharmacist computer. The system allows information from the physician to be directly presented to the pharmacist. All fields may be auto-populated with information reducing entry and transcription errors. In one example, the pharmacist may edit information on the entry screen 606. The pharmacist may hit a single key or button to release the e-script for filling. Then, a label may be printed, the label may be adhered to a bottle and/or attached to a bag and the corresponding medication may be dispensed. This eliminates many of the steps shown in FIG. 4. Furthermore, communications between pharmacist and physician are greatly enhanced and timeliness is measured and improved.

[0060] Prescription image viewer 602 allows visual verification between art image of the prescription 604 and the entry screen 606. In one example, the entry screen 606 includes physician information 608, patient information 610, insurance information 612, drug name 614, drug strength 616, directions 618, quantity 620, days of supply

622, dosages per day 624, refills 626 or any other information necessary for verifying and filling the prescription. The pharmacist comment area 628, may be used by the pharmacist to enter comments or questions for an office or physician. For example, if a prescription needs to be sent back through the system to the prescribing physician for clarification of any questions or alert the physician about any other matter requiring physician interaction, then a pharmacist may enter or select a specific query question, alert or notification and may press a key or button (on screen or otherwise), to transmit the question, alert or notification to designated physician office or other responsible party. For example, the physician or office may receive an alert by text message, email, instant message or the like. An alert may provide notification to the physician to access the physician's OPM system, for example, or may provide a link or access to a reply server. In one example, a clearinghouse 116 sends a message allowing the physician to answer a yes/no question using a cell phone, mouse, pointing device or voice command, for example. Then a response may be transmitted answering the posed question(s). Biometric data, a password or an electronic signature may be required for authenticating an answer.

[0061] In another example, the physician may not have entered a prescription and a pharmacy may enter a prescription subject to approval by the physician. An e-script is may be transmitted to the doctor for his or her approval with questions or comments. Once the physician answers the questions, which may be required prior to proceeding, the physician may send the electronic prescription to the pharmacy for further processing. In one example, unique ID and/or password is required to update information stored on a pharmacy computer system, for example.

[0062] In one example, the generation system disclosed by U.S. Pat. No. 7,072,840, may be used to generate an e-script, for example. Alternatively, an e-script may be generated by a third party OPM system. A clearinghouse 116 may automatically require population of certain required fields necessary for verification of an e-script by a pharmacist, for example. In one example, the e-script is automatically rejected by the clearinghouse 116 with a request for specific information to be entered into fields of an e-script. An interface program, capable of coupling to a MEPPS system, for example, may auto-populate prescription information for a pharmacist entry screen such as illustrated in FIG. 6. The system may further upload drug formulary of a specific pharmacy or pharmacies and insurance company or companies. For example, a formulary for a managed care plan may alert a physician to availability of alternatives to a drug not included in the formulary or drugs that are less expensive. Thus, alternative prescription items may be suggested or recommended for selection by the physician.

[0063] Alternative combinations and variations of the examples provided will become apparent based on this disclosure. It is not possible to provide specific examples for all of the many possible combinations and variations of the embodiments described, but such combinations and variations may be claims that eventually issue.

1. An electronic prescription processing system for at least one pharmacy system coupled to a network, the electronic processing system comprising:

a multi-path clearinghouse coupled to the network and coupling over the network the at least one pharmacy system to a plurality of physician office practice man-

agement systems, each of the plurality of physician office practice management systems having at least one prescriber, wherein the multi-path clearinghouse automatically correlates any query initiated by one of the at least one pharmacy system, and directed to a specific one of the at least one prescriber of the plurality of physician office practice management systems, with an answer from the specific one of the at least one prescriber of the plurality of physician office practice management systems, when the specific one of the at least one prescriber of the plurality of physician office practice management systems answers the any query; the multi-path clearinghouse comprises automated two-way digital communications between the at least one pharmacy system and any of the plurality of physician office practice management systems having access to the multi-path clearinghouse, wherein two-way digital communications is defined as comprising delivery of any electronic prescription from a specific prescriber of any of the plurality of physician office practice management systems directed to one of the at least one pharmacy system such that the multi-path clearinghouse directs the any electronic prescription to the one of the at least one pharmacy system and receipt of any query initiated by the one of the at least one pharmacy system about the any electronic prescription back to the specific prescriber via the multi-path clearinghouse such that, when the specific prescriber provides an immediate response to the any query of the one of the at least one pharmacy system using the any of the plurality of physician office practice management systems via the multi-path clearinghouse, the multi-path clearinghouse immediately directs the immediate response back to the at least one pharmacy system that initiated the any query; and

the multi-path clearinghouse is electronically arranged between the plurality of physician office practice management systems and the at least one pharmacy system, such that an electronic prescription is transmitted to the multi-path clearinghouse from any of the plurality of physician office practice management systems and is directed to any of the at least one pharmacy system; and the automated two-way digital communications of the multi-path clearinghouse includes a reply server, and the reply server correlates the any query by any of the at least one pharmacy system about any electronic prescription transmitted through the multi-channel clearinghouse to the any of the at least one pharmacy system for any specific one of the at least one prescriber of the plurality of physician office practice management systems that originally transmitted the any electronic prescription to the multi-path clearinghouse, such that the reply server of the automated two-way digital communications of the multi-path clearinghouse automatically correlates an answer from the any specific one of the at least one prescriber to the any query by the any of the at least one pharmacy system and directs the answer back to the any of the at least one pharmacy system that originated the any query, without speaking by telephone, such that the two-way digital communications protocol directs the answer to the any of the at least one pharmacy system that sent the any query.

2. The electronic prescription processing system of claim 1, wherein, the reply server includes a batch processor for

automatically correlating any of a plurality of queries from one or more of the at least one pharmacy system in a batch process using a single electronic transmission from one of the plurality of physician office practice management systems.

3. The electronic prescription processing system of claim 1, wherein the multi-path clearinghouse includes an alternative drug selection system for automatically providing one or more alternatives to a drug identified in an electronic prescription, when the electronic prescription is received by the multi-path clearinghouse from one of the plurality of physician office practice management systems; and the alternative drug selection system provides the one or more alternatives to the plurality of physician office practice management systems for selection by the specific prescriber on a display of the one of the plurality of physician office practice management systems, the electronic prescription processing system awaiting selection of the one or more alternatives before the multi-path clearinghouse submits the electronic prescription to the at least one pharmacy system, wherein the electronic prescription processing system intercepts the electronic prescription and automatically queries the prescriber whether the alternative drug should be substituted before the multi-path clearinghouse submits the electronic prescription to the at least one pharmacy system.

4. The electronic prescription processing system of claim 1, wherein the multi-path clearinghouse includes a verification system for verifying the identity and authority of the specific prescriber to enter the electronic prescription using an electronic signature, biometric data, a password or a combination thereof.

5. The electronic prescription processing system of claim 4, wherein the verification system of the multi-path clearinghouse verifies the identity and authority of the prescriber to enter the electronic prescription using an electronic signature.

6. The electronic prescription processing system of claim 1, wherein the multi-path clearinghouse correlates a single transmission from a prescriber operating in a batch mode to a plurality of queries from one or more of the at least one pharmacy system.

7. The electronic prescription processing system of claim 1, further comprising a biometric data reader, wherein the biometric data reader captures biometric data of a prescriber, and the electronic prescription processing system uses the biometric data of the prescriber to authenticate a prescription or a change to a prescription authorized by the prescriber.

8. The electronic prescription processing system of claim 1, further comprising an interface system coupled to at least one of the plurality of physician office practice management systems such that the interface system couples the at least one of the plurality of physician office practice management systems to the multi-path clearinghouse, wherein two-way digital communications are established between the interface system and the multi-path clearinghouse.

9. The electronic prescription processing system of claim 1, wherein the multi-path clearinghouse comprises a notification system arranged to provide a notification of an alternative pharmacy or a substitute prescription item to the plurality of physician office practice management systems, if a drug or at least one acceptable alternative drug is not available from the at least one pharmacy system originally selected or if the drug or the at least one alternative drug is available at lower cost to a patient or an insurance plan, the

notification system presenting the plurality of physician office practice management systems an option for selecting the alternative pharmacy or a substitute prescription item, and waiting for a response before transmitting a prescription.

10. The electronic prescription processing system of claim 1, wherein the multi-path clearinghouse includes a timer and the timer triggers if one of the plurality of physician office practice management systems does not timely reply to the any query.

11. A method of processing an electronic prescription using the electronic prescription processing system of claim 1, the method comprising:

coupling, over a network, a multi-path clearinghouse to at least one pharmacy system and to a plurality of physician office practice management systems, each of the plurality of physician office practice management systems having at least one prescriber;

receiving, at the multi-path clearinghouse, an electronic prescription prescribed by the at least one prescriber;

transmitting, from the multi-path clearinghouse, the electronic prescription prescribed by the at least one prescriber to one of the at least one pharmacy system;

receiving, at the multi-path clearinghouse, a query about the electronic prescription prescribed by the at least one prescriber from the one of the at least one pharmacy system;

automatically directing, using the multi-path clearinghouse, a message about the query about the electronic prescription prescribed by the at least one prescriber to the at least one prescriber;

receiving, at the multi-path clearinghouse, an answer as an immediate response from the prescriber relating to the query about the electronic prescription prescribed by the at least one prescriber;

automatically directing, using the multi-path clearinghouse, the answer from the prescriber relating to the query about the electronic prescription prescribed by the at least one prescriber to the one of the at least one pharmacy system;

wherein the multi-path clearinghouse facilitates automated two-way digital communications between the at least one pharmacy system and any of the at least one prescriber of each of the plurality of physician office practice management systems having access to the multi-path clearinghouse; and

arranging the multi-path clearinghouse electronically between the plurality of physician office practice management systems and the at least one pharmacy system, such that the electronic prescription is transmitted via the multi-path clearinghouse from one of the plurality of physician office practice management systems to the at least one pharmacy system; and

wherein the multi-path clearinghouse includes a reply server, the reply server comprising a two-way digital communications protocol, correlating the query about the electronic prescription as submitted to the multi-path clearinghouse by the at least one pharmacy system using the two-way digital communications protocol, and

correlating, using the two-way digital communications protocol, the answer to the query from the one of the plurality of physician office practice management systems with the query by the at least one pharmacy

system, without speaking by telephone, such that the two-way digital communications protocol directs the answer to the at least one pharmacy system that sent the query to the multi-path clearinghouse, without human intervention; and the answer providing an immediate response to the query.

**12.** The method of processing an electronic prescription of claim **11**, further comprising:

monitoring a time elapsed between a time that the query is made in the step of querying and receipt of the answer, if any; and

flagging the query as having a higher urgency if the answer is not timely received.

**13.** The method of processing an electronic prescription of claim **12**, wherein the step of flagging occurs if two hours is elapsed from the time that the query is made in the step of querying without receipt of the answer.

**14.** The method of processing an electronic prescription of claim **12**, further comprising:

alerting, automatically, the at least one prescriber of the query if the query is flagged as urgent.

**15.** The method of processing an electronic prescription of claim **14**, wherein the step of alerting includes an email sent by the multi-path clearinghouse to the prescribing prescriber, wherein the email is flagged as urgent.

**16.** The method of processing an electronic prescription of claim **15**, wherein the email flagged as urgent provides a selection of yes/no for responding to the query, and wherein selecting yes or no from the selection of the email sent by the multi-path clearinghouse automatically transmits a response from the reply server of the multi-path clearinghouse to the at least one pharmacy system via the two-way digital communications provided by the reply server of the multi-path clearinghouse.

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