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Buentello

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(54) **SYSTEMS AND METHODS FOR LIVE VIDEO FINANCIAL DEPOSIT**

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CPC ***G06Q 40/06*** (2013.01)

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CPC G06Q 40/06
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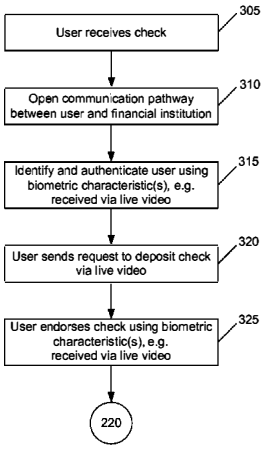
(57) **ABSTRACT**

A live video of a negotiable instrument may be provided to a financial institution so that an image of the negotiable instrument may be obtained from the live video, processed, and funds associated with the negotiable instrument may be deposited in an account of a user. The user may be identified and authenticated to the financial institution by one or more biometric characteristics. One or more biometric characteristics may be used to endorse the negotiable instrument. A holder may be used to hold the negotiable instrument while live video is being taken and provided from a user to a financial institution.

15 Claims, 5 Drawing Sheets



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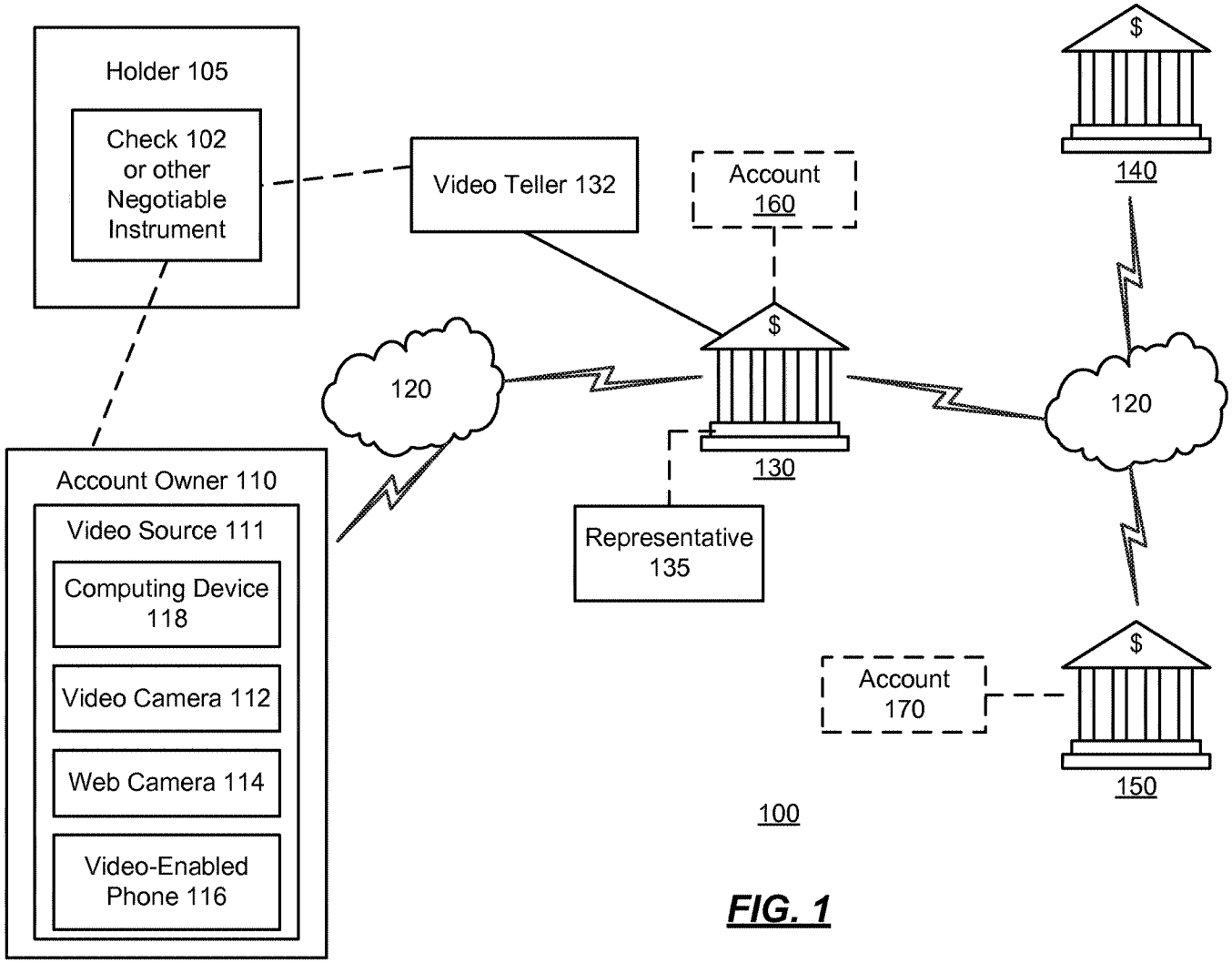
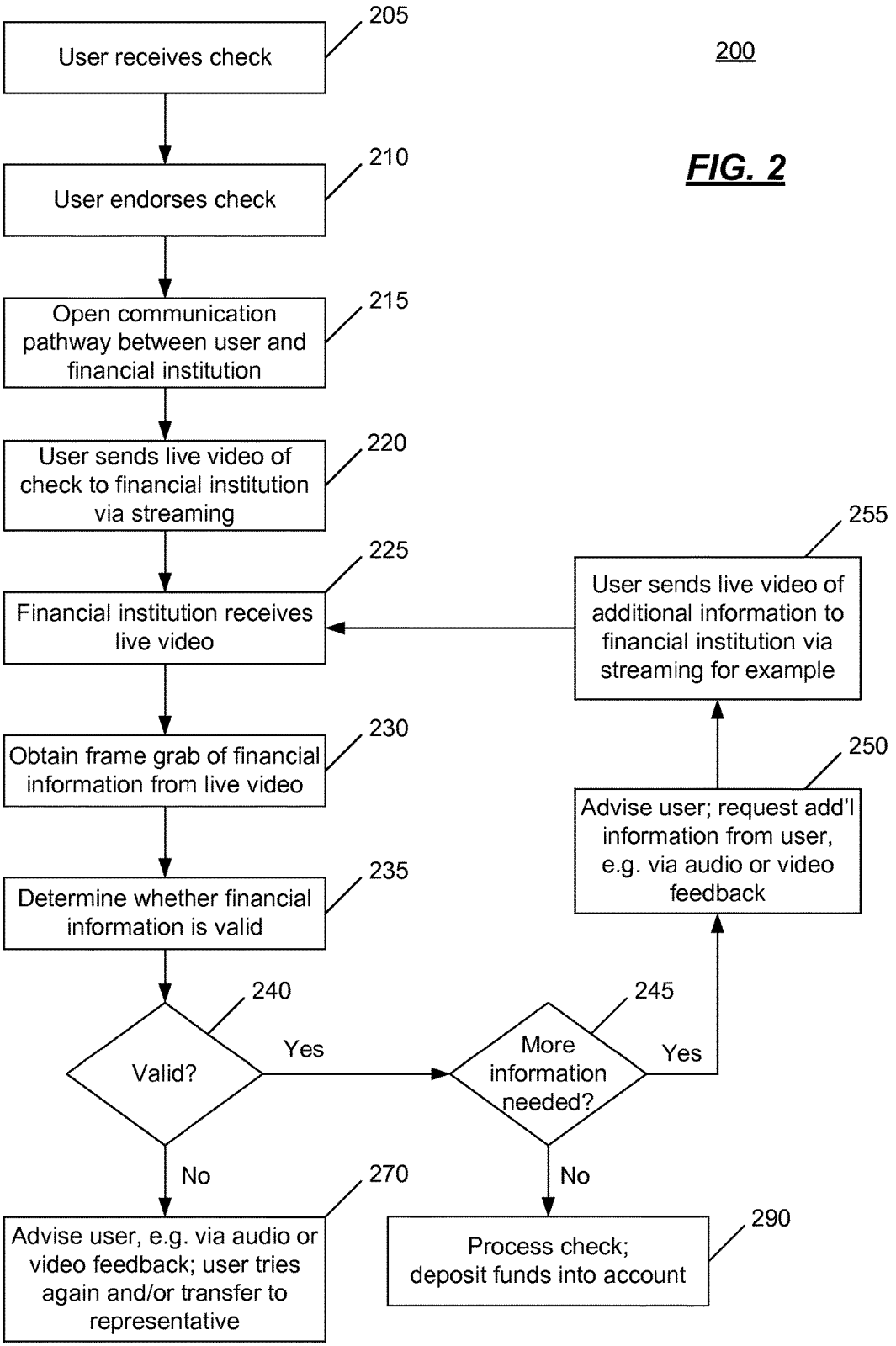

Holder 105
Check 102 or other Negotiable Instrument
Video Teller 132
Account 160
140
120
130
120
Representative 135
Account Owner 110
Video Source 111
Computing Device 118
Video Camera 112
Web Camera 114
Video-Enabled Phone 116
Account 170
150
100

FIG. 1


200
FIG. 2
205
User receives check
210
User endorses check
215
Open communication pathway between user and financial institution
220
User sends live video of check to financial institution via streaming
225
Financial institution receives live video
230
Obtain frame grab of financial information from live video
235
Determine whether financial information is valid
240
Valid?
Yes
No
245
More information needed?
Yes
No
250
Advise user; request add'l information from user, e.g. via audio or video feedback
255
User sends live video of additional information to financial institution via streaming for example
270
Advise user, e.g. via audio or video feedback; user tries again and/or transfer to representative
290
Process check; deposit funds into account

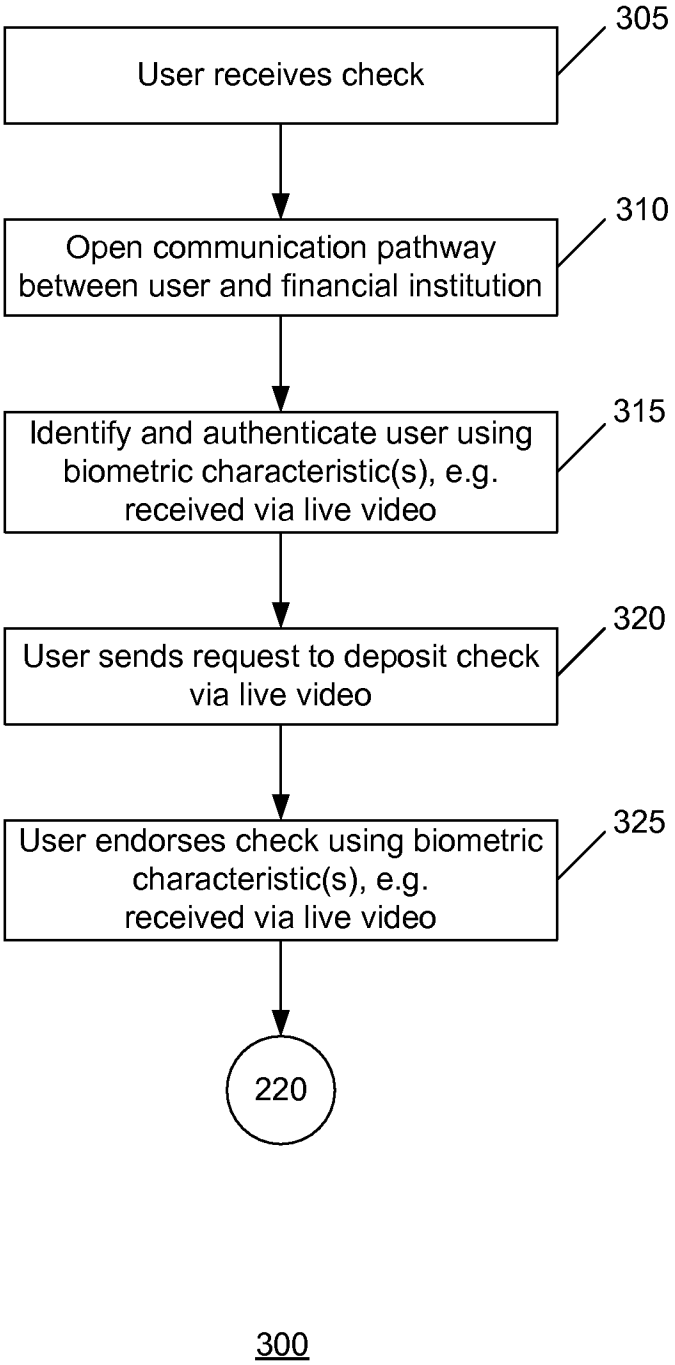
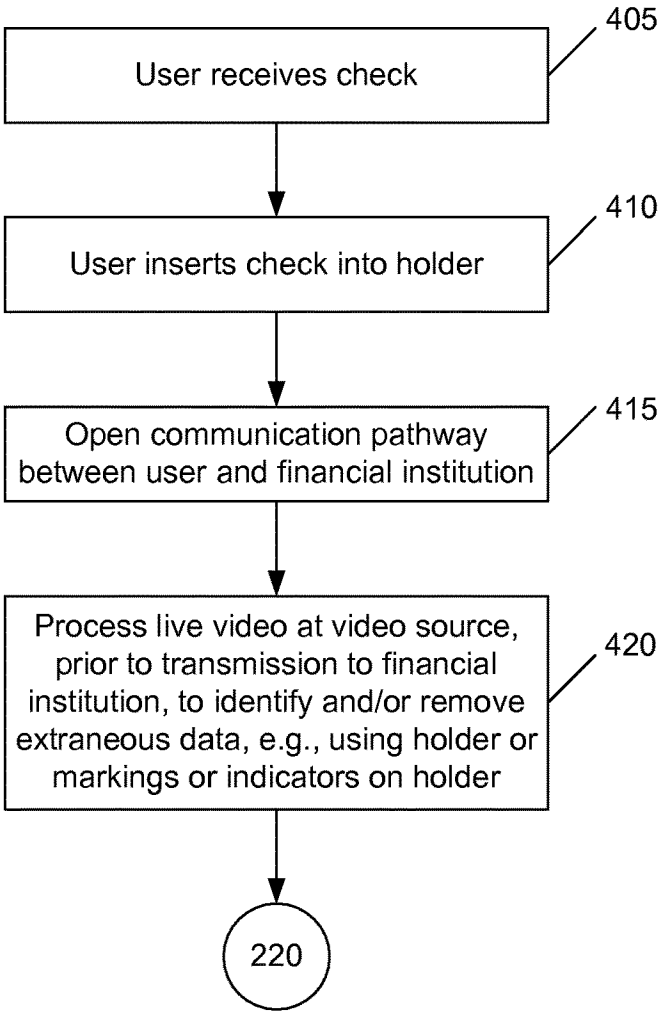

305
User receives check
310
Open communication pathway between user and financial institution
315
Identify and authenticate user using biometric characteristic(s), e.g. received via live video
320
User sends request to deposit check via live video
325
User endorses check using biometric characteristic(s), e.g. received via live video
220
300

FIG. 3


405
User receives check
410
User inserts check into holder
415
Open communication pathway between user and financial institution
420
Process live video at video source, prior to transmission to financial institution, to identify and/or remove extraneous data, e.g., using holder or markings or indicators on holder
220

400

FIG. 4

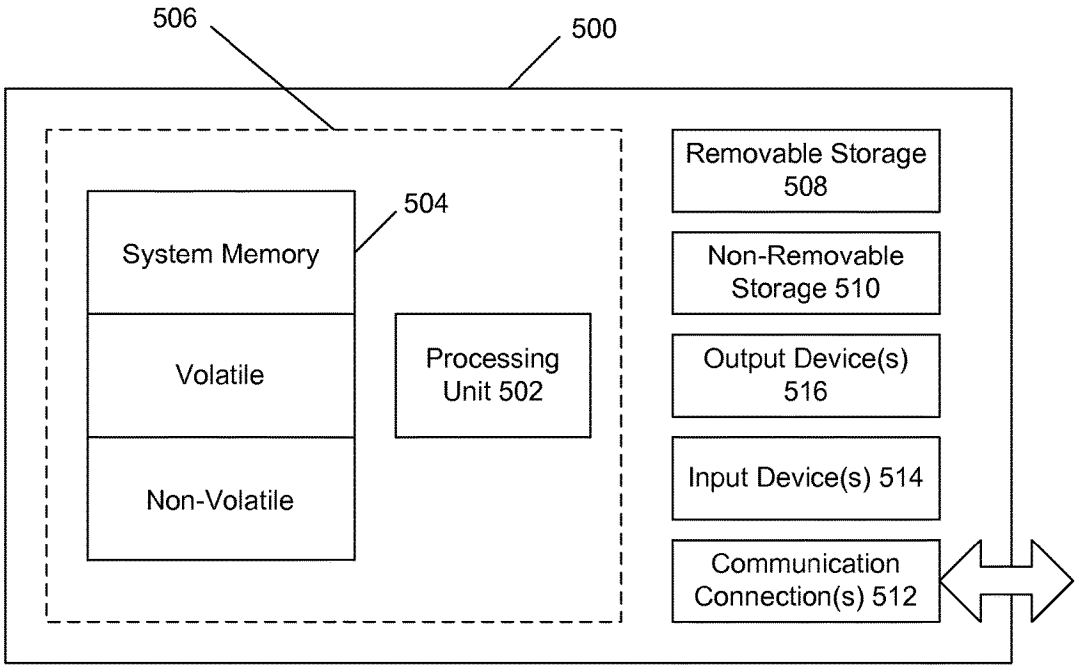

506
500
504
System Memory
Volatile
Non-Volatile
Processing Unit 502
Removable Storage 508
Non-Removable Storage 510
Output Device(s) 516
Input Device(s) 514
Communication Connection(s) 512

FIG. 5

SYSTEMS AND METHODS FOR LIVE VIDEO FINANCIAL DEPOSIT

CROSS-REFERENCE TO RELATED APPLICATIONS

This application is related by subject matter to that disclosed in the following commonly assigned applications, the entirety of which are hereby incorporated by reference herein: U.S. patent application Ser. No. 12/205,996, and U.S. patent application Ser. No. 12/206,007, each filed on even date and each entitled "Systems And Methods For Live Video Financial Deposit."

BACKGROUND

Checks typically provide a safe and convenient method for an individual such as a payor to purchase goods and/or services. To use a check, the individual usually opens a checking account, or other similar account, at a financial institution and deposits funds, which are then available for later withdrawal. To pay for goods and/or services with a check, the payor (i.e., the buyer) usually designates a payee (i.e., the seller) and an amount payable on the check. In addition, the payor often signs the check. Once the check has been signed, it is usually deemed negotiable, meaning the check may be validly transferred to the payee upon delivery. By signing and transferring the check to the payee, the payor authorizes funds to be withdrawn from the payor's account on behalf of the payee in return for the goods and/or services provided by the payee.

While a check may provide a payor with a convenient and secure form of payment, receiving a check may put certain burdens on the payee, such as the time and effort required to deposit the check. For example, depositing a check typically involves going to a local bank branch and physically presenting the check to a bank teller. To reduce such burdens for the payee, systems and methods have been developed to enable the remote deposit of checks. For example, the payee may scan a check in an electronic image using a scanning device and a computing device. The financial institution may then receive from the payee the electronic image of the check. The financial institution may then use the electronic image to credit funds to the payee. However, such a technique requires the generation and transmission of a still electronic image.

SUMMARY

A live video of a negotiable instrument may be provided from a user to a financial institution so that an image of the negotiable instrument may be obtained from the live video, processed, and funds associated with the negotiable instrument may be deposited in an account of the user.

In an implementation, after endorsing a check, a user may use a video source such as a video camera, a web camera, or a video-enabled phone to send a live video of the front and/or back of the check to the financial institution, where it may be processed and deposited in an account associated with the user. The video may be provided by the user to the financial institution via live streaming video.

In an implementation, a user may be identified and authenticated to the financial institution by one or more biometric characteristics. One or more biometric characteristics may be used to endorse the negotiable instrument. The biometric characteristic(s) may be provided from the user to the financial institution or an associated authentication authority via live video. The financial institution or authentication authority may capture the biometric characteristic(s) from the live video and process the biometric characteristic(s) to identify and authenticate the user and to verify an endorsement of the negotiable instrument.

In an implementation, a holder may be used to hold a negotiable instrument while live video is being taken and provided from a user to a financial institution. The holder may comprise a sleeve into which the user may slide or otherwise insert the negotiable instrument. The holder may comprise a template into which the user may place the negotiable instrument. The holder may position the negotiable instrument in a predetermined manner and/or may comprise predetermined markings or features and the financial institution may identify the positioning of the negotiable instrument and may retrieve the data therefrom based on the position, markings, and/or features of the negotiable instrument and/or the holder.

This summary is provided to introduce a selection of concepts in a simplified form that are further described below in the detailed description. This summary is not intended to identify key features or essential features of the claimed subject matter, nor is it intended to be used to limit the scope of the claimed subject matter.

BRIEF DESCRIPTION OF THE DRAWINGS

The foregoing summary, as well as the following detailed description of illustrative embodiments, is better understood when read in conjunction with the appended drawings. For the purpose of illustrating the embodiments, there are shown in the drawings example constructions of the embodiments; however, the embodiments are not limited to the specific methods and instrumentalities disclosed. In the drawings:

FIG. **1** is a block diagram of an implementation of a system in which example embodiments and aspects may be implemented;

FIG. **2** is an operational flow of an implementation of a method that may be used to provide live video financial deposit;

FIG. **3** is an operational flow of another implementation of a method that may be used to provide live video financial deposit;

FIG. **4** is an operational flow of another implementation of a method that may be used to provide live video financial deposit; and

FIG. **5** is a block diagram of an example computing environment in which example embodiments and aspects may be implemented.

DETAILED DESCRIPTION

FIG. **1** is a block diagram of an implementation of a system **100** in which example embodiments and aspects may be implemented. System **100** may include account owner **110** (also referred to herein as a user) and financial institutions **130**, **140** and **150**, which may be any type of entity capable of processing a transaction involving a negotiable instrument. For example, financial institutions **130**, **140** and **150** may be a retail bank, an investment bank, an investment company, a regional branch of the Federal Reserve, a clearinghouse bank and/or a correspondent bank.

A negotiable instrument typically includes a type of contract that obligates one party to pay a specified sum of money to another party. Negotiable instruments may include checks, money orders, cashier's checks, drafts, bills of exchange, promissory notes, and the like. A check instructs

a financial institution to pay an amount of money from a specific account held in the payor's name with that financial institution to an account held in the payee's name. A money order is a trusted financial instrument that is a payment order for a pre-specified amount of money. It is a more trusted method of payment than a personal check because the funds for the amount shown on the money order must be prepaid. A cashier's check (also known as a bank check, official check, teller's check, bank draft or treasurer's check) is a check guaranteed by a bank and may be purchased from a bank. Cashier's checks are usually treated as cash since most banks clear them instantly.

Account owner **110** may be an individual who owns account **160** that may be held at financial institution **130**. Account **160** may be any type of account for depositing funds, such as a savings account, a checking account, a brokerage account, and the like. Account owner **110** may communicate with financial institution **130** by way of communications network **120** such as an intranet, the Internet, a local area network (LAN), a wide area network (WAN), a public switched telephone network (PSTN), a cellular network, a voice over Internet protocol (VoIP) network, and the like. Account owner **110** may communicate with financial institution **130** by phone, email, instant messaging, text messaging, facsimile, and the like. Financial institutions **130**, **140** and **150** also may communicate with each other by way of communications network **120**.

In an implementation, account owner **110** may receive payment from another individual such as a payor in the form of a check **102** or other negotiable instrument that is drawn from account **170** at financial institution **150**. Account owner **110** may endorse the check **102** (e.g., sign the back of the check **102**) and indicate an account number on the check **102** for depositing the funds. It is noted that although examples described herein may refer to a check, the techniques and systems described herein are contemplated for, and may be used for, the deposit of any negotiable instrument.

As described further herein, a live video of a check **102** or other negotiable instrument such as a money order or cashier's check, etc. may be provided in real-time from a video source **111** of account owner **110** to financial institution **130** so that an image of the check **102** or negotiable instrument may be obtained from the live video, processed, and funds associated with the check **102** or negotiable instrument may be deposited in the account **160**. Any technique for sending live video to financial institution **130** may be used.

Account owner **110** may deposit the check **102** into account **160** by sending a live video of the check **102** to financial institution **130** via streaming using a video source **111**. For example, after endorsing the check **102**, account owner **110** may use a video source such as a video camera **112**, a web camera **114**, or a video-enabled phone **116**, for example, to stream a live video of the check **102** (e.g., the front and/or back of the check **102**) to financial institution **130**. Generation of a live video of a check **102** is not limited to a video camera, a web camera, and a video-enabled phone, and it is contemplated that any device that is capable of generating a live video may be used to make a video of the check **102** which may be sent live in real-time to financial institution **130**. Additional devices that may be used in the generation and/or transmission of a live video include a web-enabled video computing device, a mobile phone, a camcorder, and a computer camera, for example. It is contemplated that account owner **110** may use any mobile device, live video monitor, or video game console comprising a camera, or any other video source to capture and provide live video over a network or any type of communications channel(s) to financial institution **130**.

In an implementation, a personal computer (PC) to PC video call between account owner **110** and financial institution **130** may be used to transmit a live video of the check **102** to financial institution **130**. In an implementation, video instant messaging between account owner **110** and financial institution **130** may be used. Account owner **110** may use a television having a channel dedicated to financial institution **130** and an associated video source-enabled television to access financial institution **130** and provide live video to financial institution **130**.

A computing device **118** may be integral with a device used to capture and provide the live video or separate from such a device. An example computing device **118** is described with respect to FIG. **5**.

In an implementation, financial institution **130** may control the video source **111** used in the capturing and providing of live video (e.g., of the check **102**, of biometric characteristics of account owner **110** (described further herein), etc.) to financial institution **130**. Financial institution **130** may instruct the video source **111** to set parameters such as a compression rate, resolution, and the like to use in capturing live video.

Financial institution **130** may receive live video representing the check **102** and may use any known video processing software or other application(s) to obtain check **102**'s relevant data from the live video. Financial institution **130** may determine whether the financial information associated therewith may be valid. For example, financial institution **130** may include any combination of systems and sub-systems such as electronic devices including, but not limited to, computers, servers, databases, or the like. The electronic devices may include any combination of hardware components such as processors, databases, storage drives, registers, cache, random access memory (RAM) chips, data buses, or the like and/or software components such as operating systems, database management applications, or the like. According to an embodiment, the electronic devices may include a network-based server that may process the financial information and may receive the live video from the account owner **110**.

The electronic devices may receive the live video and may perform an initial analysis on the quality of the video, the readability of the data contained therein, or the like. For example, the electronic devices may determine whether the account number, amount payable, and the like may be readable such that it may be parsed or otherwise obtained and processed by the financial institution **130** to credit an account (such as account **160**) associated with account owner **110** and debit an account (such as account **170**) associated with the payor. In an implementation, representative **135** of financial institution **130** may provide assistance to account owner **110** and may provide assistance in determining whether the financial information may be readable and/or of a good enough quality to be processed, as described further herein.

In an implementation, a holder **105** may be provided and may be used to hold the check **102** or other negotiable instrument while live video is being taken and provided to financial institution **130**. Because retrieving check information from a live video is computer processor-intensive, the check **102** or other negotiable instrument may be put in the holder **105** by account owner **110**, so that a processor at financial institution **130** may quickly and easily parse the check data from an image captured or grabbed from the live video.

In an implementation, the holder **105** may comprise a sleeve into which account owner **110** may slide or otherwise insert the check **102**. The holder **105** may also comprise a template into which account owner **110** may place the check **102**. The account owner **110** may thus more easily handle the check **102** or other negotiable instrument with the holder **105** (e.g., when holding the check **102** in front of a video source **111**, when turning the check **102** over from one side to another side, etc.).

The holder **105** may allow financial institution **130** to more quickly and easily separate the check data to be used in subsequent processing from extraneous data such as background data. The holder **105** may position the check **102** in a predetermined manner and/or comprise predetermined markings or features so that a processor at financial institution **130** may identify the positioning of the check **102** and may retrieve the data therefrom based on the position, markings, and/or features of the check **102** and/or the holder **105**.

In an implementation, the video source **111** may perform some processing on the live video prior to the live video being sent to financial institution **130**. A portion of the data of the live video of the check **102**, such as extraneous or background data unrelated to the check **102** itself, may be identified and/or removed by the video source **111**. The video source **111** may identify the extraneous or background data using the position, markings, and/or features of the check **102** and/or the holder **105** into which account owner **110** inserted the check. The data that may be removed may be extraneous to the holder **105** or may include the holder **105** (which may be considered to be background). In this manner, less data may be sent to financial institution **130** for processing.

It is contemplated that the holder **105** may be adapted to receive or hold more than one check **102** or other negotiable instrument, such that financial institution **130** may process more than one check **102** or other negotiable instrument from live video.

Video image processing may be performed by financial institution **130**. Financial institution **130** may receive live video as a bitstream and use a frame grab of the check **102** (e.g., the front of the check, the back of the check, etc.) to capture an image for further processing. The readability and/or resolution of the image may be checked and if it is acceptable, the check **102** (i.e., the image of the check **102**) may be further processed for deposit.

Upon receipt and approval of live video and data retrieved therefrom, financial institution **130** may credit the funds to account **160**. Financial institution **130** may clear the check **102** by presenting a digital image of the check **102** captured from the live video to an intermediary bank, such as a regional branch of the Federal Reserve, a correspondent bank and/or a clearinghouse bank. For example, the check **102** may be cleared by presenting the digital image to financial institution **140**, which may be a regional branch of the Federal Reserve, along with a request for payment. Financial institutions **130** and **150** may have accounts at the regional branch of the Federal Reserve. Financial institution **130** may create a substitute check using the image obtained from the live video provided by account owner **110** and present the substitute check to financial institution **140** for further processing. Upon receiving the substitute check, financial institution **140** may identify financial institution **150** as the paying bank (e.g., the bank from which the check **102** is drawn). This may be accomplished using a nine-digit routing number located on the bottom left hand corner of the check **102**. A unique routing number is typically assigned to every financial institution in the United States. Financial institution **140** may present the substitute check to financial institution **150** and request that the check be paid. If financial institution **150** verifies the check (i.e., agrees to honor the check), financial institution **140** may then settle the check by debiting funds from financial institution **150** and crediting funds to financial institution **130**. Financial institution **150** may then debit funds from account **170**.

It will be appreciated that the preceding examples are for purposes of illustration and explanation only, and that an embodiment is not limited to such examples. For example, financial institution **150** may be a correspondent bank (i.e., engaged in a partnership with financial institution **130**). Thus, financial institution **130** may bypass the regional branch of the Federal Reserve and clear the check directly with financial institution **150**. In addition, account **160** and account **170** may both be held at financial institution **130**, in which case the check may be cleared internally.

A video teller **132** may be in communication with financial institution **130** via a network or any other type of communications channel(s). The video teller **132** may be local to financial institution **130** or remote to financial institution **130**. The video teller **132** may capture live video of the check **102** from account owner **110** and provide the live video to financial institution **130** for processing. In an implementation, the video teller **132** may perform some processing of the video prior to transmitting the video to financial institution **130** for further processing and deposit of the check **102**.

In an implementation, account owner **110** may use the video teller **132** to transmit a live video of the check **102** to the representative **135** of financial institution **130**. The representative **135** may process the check **102** that is received via live video.

In an implementation, the video teller **132** may be comprised within an automated teller machine (ATM) of financial institution **130** or another financial institution or may comprise a kiosk. The ATM or kiosk may act as a mobile branch of financial institution **130**.

FIG. **2** is an operational flow of an implementation of a method **200** that may be used to provide live video financial deposit. A check or other negotiable instrument may be deposited in a financial institution, such as a bank, using a live video of the check or negotiable instrument which is transmitted to the financial institution from the user. The streamed video may be provided from a live streaming video feed.

At **205**, an account owner (i.e., the payee, referred to herein as a user) may receive a check from a third party (i.e., the payor). At **210**, the user may endorse the check by signing the back of the check in the designated field. If the user wishes to deposit the check into an account, such as a savings and/or checking account, the user also may write an account number below the signature.

At **215**, the user may open a communication pathway with a financial institution that may be associated with an account for depositing funds, by logging into a website for the financial institution, for example. There may be several ways in which a communication pathway may be established, including, but not limited to, an Internet connection via a website of financial institution. The user may access the website and log into the website using credentials, such as, but not limited to, a password and a username. The user may send a request to deposit the check via live video and may select a type of account in which to deposit the check.

At **220**, a live video may be sent to the financial institution for processing, e.g. via streaming using a live video feed

using various means, including, but not limited to, an Internet connection via the website or a wireless cellular transmission. Streaming refers to playing or otherwise processing data such as video in real-time as it is downloaded over the Internet as opposed to storing the data in a local file first. Streaming video avoids the delay entailed in downloading an entire video file and then playing or processing it. Thus, data is streaming when it is moving quickly from one computing device to another and does not have to be all in one place for the destination device to do something with it. In an implementation, a video provided by the user of a negotiable instrument, such as a check, does not have to be fully downloaded or received by the financial institution before the financial institution can begin processing it.

A video stream may be live. Live streams are only available at one particular time, as when a user is providing a video of their endorsed check live in real-time to the financial institution. Any known streaming techniques and technologies may be used to provide a video of a negotiable instrument, such as a check, from a user to a financial institution. The live video may be in the form of video data that is generated and provided by any video source, such as a video camera, a web camera, a video-enabled phone, a web-enabled video computing device, a mobile phone, a camcorder, a computer camera, a PC, and the like, for example. In an implementation, the user may hold an endorsed check in front of a video camera which transmits a video of the check to the financial institution (e.g., a website of the financial institution).

Additionally, the live video may be augmented by secondary data which may be information relating to the check, such as an account number, a deposit amount, or a routing number associated with the check, and/or relating to the account for depositing funds, such as the account number and/or the name on the account. The secondary data may be provided to the financial institution via live video or other techniques, such as via a previously recorded video data file or image file, an email, a facsimile, instant message, text message, or selection via a website associated with the financial institution (e.g., after the user opens a communication pathway with the financial institution, before or after the user sends the live video of the check or other negotiable instrument to the financial institution, etc.), for example. The user may send the secondary data to the financial institution along with a request to deposit the check into a particular user account.

At **225**, the financial institution may receive the live video of the endorsed check via streaming (along with financial information pertaining to the account for depositing funds and any secondary data in an implementation) and may obtain a frame grab from the video at **230**. The frame grab may comprise a still image that is captured from the video stream. An automated system or a representative of the financial institution may initiate the frame grab.

The video may be processed as it is received to retrieve financial information regarding the check using any known video processing technology, such as video editing, capturing still frames from video, filtering to remove imagery except the check in the received video, image sharpening, and technologies to distinguish between the front and the back sides of the check.

In an implementation, the financial institution may determine that there are multiple user accounts in which to deposit the check. The accounts may be the same type of account, such as a checking account, or different types of accounts, such as checking, savings, or investment accounts. The user may make a selection among a list of accounts in which to deposit the check. The selection may be transmitted to the financial institution, which may process the deposit request according to the live video, the secondary data if any, and the selected account.

At **235**, the financial institution may determine whether the financial information received from the live video (e.g., the frame grab in an implementation) may be readable and valid. Retrieved information may include the amount payable to the user, the account associated with the user to deposit funds, an account associated with a payor to debit funds, and a financial institution associated with the payor and/or the user. For example, the financial institution may include electronic devices such as computers, servers, databases, or the like that may be in communication with each other. The electronic devices may receive an electronic data representation and may perform an initial analysis on the quality of the data representation, the readability of the data representation, or the like. For example, the electronic devices may determine whether the account number, amount payable, or the like may be readable such that they may be parsed and processed by the financial institution to credit an account associated with the user and debit an account associated with the payor. In an implementation, the financial institution may check that that the resolution of the image meets at least a predetermined threshold, such as 200 dots per inch (dpi), 400 dpi, 500 dpi, etc.

In an implementation, after retrieving the financial information from the check in an electronic data representation form, the financial institution may determine whether the financial information such as the amount payable to the user, the account associated with the user to deposit funds, an account associated with a payor to debit funds, and a financial institution associated with the payor and/or the payee may be valid.

At **240**, if the financial information is determined to be valid, it is determined at **245** if more information is needed from the user before depositing the check. Such information may include data from another side of the check (e.g., the back of the check, the front of the check, or some other information). If no additional information is needed at **245**, the electronic data representation may be processed by the financial institution at **290**, thereby depositing the check in the user's account. The user may receive a notice via email, facsimile, instant message or mail, for example, that the check has been deposited into the appropriate account selected by the user.

In an implementation, at **290**, the financial institution may process the electronic data representation of the check. For example, the financial institution may credit the funds to an account associated with the user if, based on the decision received from the representative, the financial information may be approved. Additionally, the financial institution may credit the funds to an account associated with the user if, based on the determination, the financial information may be valid. The credit may be a provisional credit, enabling the user to access the funds while the check is being cleared. A provisional credit may be voided if the bank determines that the transaction is erroneous and/or fraudulent. Additionally, to credit funds to the account, the bank may generate an Automated Clearinghouse (ACH) debit entry, substitute check, and/or electronic image. ACH transactions typically include payment instructions to debit and/or credit an account. Banks often employ ACH service providers to settle ACH transactions. Examples of ACH service providers include regional branches of the Federal Reserve and the Electronic Payments Network (EPN).

The ACH service provider may process the debit entry by identifying the account and bank from which the check may be drawn. The bank from which the check is drawn (i.e., the payor's bank) may be referred to as a receiving depository financial institution (RDFI). If the payor's bank verifies the transaction, the ACH service provider may settle the transaction by debiting the payor's bank and crediting the user's bank. The payor's bank may then debit the payor's account.

If more information is needed from the user before depositing the check as determined at **245**, the user may be advised at **250** and additional information may be requested from the user. The user may be advised by an email, a web message, an instant message, a text message, or the like transmitted from the financial institution to the user. In an implementation, audio or video feedback may be provided to the user providing status information and/or requesting additional information. The user may send a live video of the requested additional information via streaming for example at **255**, with processing continuing at **225**.

If the financial information is determined to be invalid at **240**, then the user may be advised at **270**. For example, the financial institution may transmit an email, a web message, an instant message, a text message, or the like to the user indicating that the financial information associated with the electronic data representation may be invalid. In an implementation, audio or video feedback may be provided to the user about image quality and may direct the user on what they may do to provide a good image of the check or other negotiable instrument via live video.

The user may determine how to proceed by selecting an option on the message, replying to the email, or the like. In an implementation, if the financial information is held to be invalid, instructions on how the user would like to proceed may be requested from the user, such as whether the user would like to try the live video deposit again (e.g., provide another live video of the check or negotiable instrument to the financial institution) or whether the user would like assistance from a representative, for example. The financial institution may also provide additional options on how to redeem the check to the user such as mailing in the check to the financial institution or the like. The user may indicate how they would like to proceed. Thus, in an implementation, the user may try streaming a video of the check to the financial institution again (e.g., processing may continue at **220**) and/or may be transferred to a representative of the financial institution for assistance.

If the user would like assistance, the financial information may be transferred to a representative for further review. The representative, such as a customer service representative, a bank teller that may be located at a branch, a virtual bank teller that may be located remotely via an electronic device, or the like, may review the financial information associated with the electronic data representation to determine whether to allow the electronic data representation to be processed by the financial institution. For example, the initial analysis may require a certain quality requirement, a certain readability requirement, or the like, thus, leading to a high failure rate even though the electronic data representation may otherwise be valid. The representative may review the electronic data representation to determine whether the financial information may be readable and/or of a good enough quality to be processed. If so, the electronic data representation of the financial information may be processed by the financial institution, thereby depositing the check in the user's account.

In an implementation, the financial institution may receive a decision from a representative on whether to credit the funds to an account. For example, a representative such as a virtual teller may make a decision such as to approve or deny processing of the electronic data representation. According to an embodiment, a virtual teller may fill in the invalid financial information. For example, the virtual teller may issue a decision to approve the electronic data representation and may fill in the financial information deemed invalid from the initial analysis based upon inspection or review by the teller. The financial institution may then receive the information (e.g., the information that was deemed invalid but has been approved by the teller) from the virtual bank teller such that the electronic data representation may be processed.

In this manner, there may be real-time two-way communication between the financial institution and the user. For example, a user may hold one side of a check (e.g., the front) up to a web-enabled video camera, webcam, other video source, etc., and the financial institution may read the data on the front of the check. When the financial institution has captured the needed data, the user may be advised (e.g., via a website, instant messaging, video instant messaging, an applet of the Internet, a text interface with the video interface, etc.) and instructed to turn the check over. The financial institution may then read the other side of the check (e.g., the back), and advise the user when the data has been captured. The financial institution may then deposit the check based on the captured data and advise the user. The user may then destroy or otherwise void the check (e.g., by writing "void" on the check).

FIG. **3** is an operational flow of an implementation of a method **300** that may be used to provide live video financial deposit. At **305**, a user may receive a check. At **310**, a communication pathway with a financial institution may be opened. The communication pathway may be established by any of a number of techniques, such as by logging into a website for the financial institution, using a video teller or a kiosk, or otherwise accessing the financial institution.

At **315**, the user may be identified and authenticated to the financial institution by any one or more biometric characteristics, such as face recognition, fingerprints, hand geometry, and iris recognition. The biometric characteristic(s) may be provided from the user to the financial institution or an associated authentication authority via live video. The financial institution or authentication authority may capture the biometric characteristic(s) from the live video (e.g., via a frame grab from the live video) and process the biometric characteristic(s) to identify and authenticate the user using known biometric techniques. The financial institution or authentication authority may provide feedback to the user regarding the capture and processing of the biometric characteristic(s) as well as confirming (or denying) authentication and access to the financial institution.

At **320**, the user may send a request to the financial institution to deposit the check via live video and may select the account in which to deposit the check. At **325**, the user may endorse the check using one or more biometric characteristics. As with the authentication, the biometric characteristic(s) may be provided from the user to the financial institution via live video. The biometric endorsement may be verified by the financial institution, such as by an automated system or a representative of the financial institution. The same biometric characteristic(s) may be used for authentication and endorsement, or different biometric characteristics may be used. Alternatively, the endorsement may be made by signing the back of the check in the designated field.

It is noted that if biometric characteristics are used for authentication or endorsement, the user may be previously enrolled. During enrollment, biometric information from the user may be captured and stored for subsequent use. During authentication or endorsement, biometric information is detected from the user and compared with the stored biometric information. If there is a match, the user may be authenticated or the endorsement may be verified or otherwise held to be valid.

Processing may proceed as described with respect to the method **200** of FIG. **2**, e.g., at **220** with a live video of the check sent to the financial institution for processing. If the endorsement of the check is performed using biometrics, a live video of the back of the check may not be captured or processed by the financial institution in an implementation.

FIG. **4** is an operational flow of an implementation of a method **400** that may be used to provide live video financial deposit. At **405**, a user may receive a check. At **410**, after endorsing the check in an implementation, the user may insert the check into the holder. The check may be inserted in the holder in a predetermined position or manner. For example, the check or portions of the check such as one or more corners of the check, the signature line, the MICR (magnetic ink character recognition) line, etc., may be aligned with respect to one or more markings or indicators on the holder. It is contemplated that different holders may be used for the front of the check and for the back of the check. The positioning or alignment may allow for more efficient processing of the live video of the check.

At **415**, a communication pathway may be opened with a financial institution that may be associated with an account for depositing funds and the user may be identified and authenticated, e.g., using techniques described with respect to the methods **200** and **300** of FIGS. **2** and **3**, respectively.

At **420**, the video source that may be used to provide live video of the check to the financial institution may process the live video, prior to transmission to the financial institution, to identify and/or remove at least a portion of data that is extraneous to the check, such as background and/or holder data. The holder, or markings or indicators on the holder, may be used in the identification of data that is extraneous to the check and which may be removed by the video source and/or the financial institution. Processing may proceed as described with respect to the method **200** of FIG. **2**, e.g., at **220** with a live video of the check sent to the financial institution for processing.

Exemplary Computing Arrangement

FIG. **5** shows an exemplary computing environment in which example embodiments and aspects may be implemented. The computing system environment is only one example of a suitable computing environment and is not intended to suggest any limitation as to the scope of use or functionality.

Numerous other general purpose or special purpose computing system environments or configurations may be used. Examples of well known computing systems, environments, and/or configurations that may be suitable for use include, but are not limited to, personal computers, server computers, handheld or laptop devices, multiprocessor systems, microprocessor-based systems, network PCs, minicomputers, mainframe computers, embedded systems, distributed computing environments that include any of the above systems or devices, and the like.

Computer-executable instructions, such as program modules, being executed by a computer may be used. Generally, program modules include routines, programs, objects, components, data structures, etc., that perform particular tasks or implement particular abstract data types. Distributed computing environments may be used where tasks are performed by remote processing devices that are linked through a communications network or other data transmission medium. In a distributed computing environment, program modules and other data may be located in both local and remote computer storage media including memory storage devices.

With reference to FIG. **5**, an exemplary system for implementing aspects described herein includes a computing device, such as computing device **500**. In its most basic configuration, computing device **500** typically includes at least one processing unit **502** and system memory **504**. Depending on the exact configuration and type of computing device, system memory **504** may be volatile (such as RAM), non-volatile (such as read-only memory (ROM), flash memory, etc.), or some combination of the two. This most basic configuration is illustrated in FIG. **5** by dashed line **506**.

Computing device **500** may have additional features and/or functionality. For example, computing device **500** may include additional storage (removable and/or non-removable) including, but not limited to, magnetic or optical disks or tape. Such additional storage is illustrated in FIG. **5** by removable storage **508** and non-removable storage **510**.

Computing device **500** typically includes a variety of computer-readable media. Computer-readable media can be any available media that can be accessed by computing device **500** and includes both volatile and non-volatile media, and removable and non-removable media. By way of example, and not limitation, computer-readable media may comprise computer storage media and communication media.

Computer storage media include volatile and non-volatile, and removable and non-removable media implemented in any method or technology for storage of information such as computer-readable instructions, data structures, program modules or other data. System memory **504**, removable storage **508**, and non-removable storage **510** are all examples of computer storage media. Computer storage media include, but are not limited to, RAM, ROM, Electrically Erasable Programmable Read-Only Memory (EEPROM), flash memory or other memory technology, CD-ROM, digital versatile disks (DVD) or other optical storage, magnetic cassettes, magnetic tape, magnetic disk storage or other magnetic storage devices, or any other medium which can be used to store the desired information and which can be accessed by computing device **500**. Any such computer storage media may be part of computing device **500**.

Computing device **500** may also contain communication connection(s) **512** that allow the computing device **500** to communicate with other devices. Communication connection(s) **512** is an example of communication media. Communication media typically embody computer-readable instructions, data structures, program modules, or other data in a modulated data signal such as a carrier wave or other transport mechanism, and include any information delivery media. The term "modulated data signal" means a signal that has one or more of its characteristics set or changed in such a manner as to encode information in the signal. By way of example, and not limitation, communication media include wired media such as a wired network or direct-wired connection, and wireless media such as acoustic, radio frequency (RF), infrared, and other wireless media. The term computer-readable media as used herein includes both storage media and communication media.

Computing device **500** may also have input device(s) **514** such as a keyboard, a mouse, a pen, a voice input device, a touch input device, etc. Output device(s) **516** such as a display, speakers, a printer, etc., may also be included. All these devices are well known in the art and need not be discussed at length here.

Computing device **500** may be one of a plurality of computing devices **500** inter-connected by a network. As may be appreciated, the network may be any appropriate network, each computing device **500** may be connected thereto by way of communication connection(s) **512** in any appropriate manner, and each computing device **500** may communicate with one or more of the other computing devices **500** in the network in any appropriate manner. For example, the network may be a wired or wireless network within an organization or home or the like, and may include a direct or indirect coupling to an external network such as the Internet or the like.

It should be understood that the various techniques described herein may be implemented in connection with hardware or software or, where appropriate, with a combination of both. Thus, the methods and apparatus of the presently disclosed subject matter, or certain aspects or portions thereof, may take the form of program code (i.e., instructions) embodied in tangible media, such as floppy diskettes, CD-ROMs, hard drives, or any other machine-readable storage medium wherein, when the program code is loaded into and executed by a machine, such as a computer, the machine becomes an apparatus for practicing the presently disclosed subject matter. In the case of program code execution on programmable computers, the computing device generally includes a processor, a storage medium readable by the processor (including volatile and non-volatile memory and/or storage elements), at least one input device, and at least one output device. One or more programs may implement or utilize the processes described in connection with the presently disclosed subject matter, e.g., through the use of an application programming interface (API), reusable controls, or the like. Such programs may be implemented in a high level procedural or object-oriented programming language to communicate with a computer system. However, the program(s) can be implemented in assembly or machine language, if desired. In any case, the language may be a compiled or interpreted language and it may be combined with hardware implementations.

Although exemplary embodiments may refer to utilizing aspects of the presently disclosed subject matter in the context of one or more stand-alone computer systems, the subject matter is not so limited, but rather may be implemented in connection with any computing environment, such as a network or distributed computing environment. Still further, aspects of the presently disclosed subject matter may be implemented in or across a plurality of processing chips or devices, and storage may similarly be effected across a plurality of devices. Such devices might include personal computers, network servers, and handheld devices, for example.

Although the subject matter has been described in language specific to structural features and/or methodological acts, it is to be understood that the subject matter defined in the appended claims is not necessarily limited to the specific features or acts described above. Rather, the specific features and acts described above are disclosed as example forms of implementing the claims.

The invention claimed is:

1. A processor-implemented method of depositing a negotiable instrument, comprising:

authenticating a user using a biometric characteristic;

receiving, at a remote processor, a live video of a negotiable instrument, the live video being transmitted over a communications network from a video source of a mobile device operated by the user;

extracting via the remote processor deposit information from the live video of the negotiable instrument; and

depositing funds of the negotiable instrument into an account based on the deposit information extracted from the live video of the negotiable instrument.

2. The method of claim **1**, wherein the live video further comprises the biometric characteristic used in authenticating the user.

3. The method of claim **1**, further comprising verifying an endorsement of the negotiable instrument using a second biometric characteristic.

4. The method of claim **3**, wherein the second biometric characteristic is the same as the biometric characteristic used in authenticating the user.

5. The method of claim **3**, wherein the live video further comprises the second biometric characteristic used in verifying the endorsement of the negotiable instrument.

6. The method of claim **1**, wherein the live video is received via streaming from a video source maintained by the user.

7. A system for depositing a negotiable instrument, comprising:

at least one memory; and

a processor in communication with the at least one memory, the processor configured to:

authenticate a user using a biometric characteristic;

receive a live video from the user, the live video comprising live video of the negotiable instrument and being transmitted over a communications network from a video source of a mobile device operated by the user;

extract deposit information from the live video of the negotiable instrument; and

deposit funds of the negotiable instrument into an account based on the deposit information extracted from the live video of the negotiable instrument.

8. The system of claim **7**, wherein the live video further comprises the biometric characteristic used in authenticating the user.

9. The system of claim **7**, wherein the processor is further configured to verify an endorsement of the negotiable instrument using a second biometric characteristic.

10. The system of claim **9**, wherein the second biometric characteristic is the same as the biometric characteristic used in authenticating the user.

11. The system of claim **9**, wherein the live video further comprises the second biometric characteristic used in verifying the endorsement of the negotiable instrument.

12. The system of claim **7**, wherein the live video is received via streaming from a video source maintained by the user.

13. The method of claim **1**, wherein the video source operated by the user is a mobile device, and wherein the live video is transmitted via a wireless cellular transmission.

14. The method of claim **1**, wherein extracting deposit information from the live video comprises analyzing the live video, as it is received, to determine whether the negotiable instrument is readable.

15. The method of claim **1** further comprising transmitting information to the mobile device advising the user regarding a status of the deposit process, while the live video is being received.

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