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**Carlson et al.**

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(45) **Date of Patent: *Dec. 10, 2013**

(54) **SYSTEMS AND METHODS FOR SECURE AND TRANSPARENT CARDLESS TRANSACTIONS**

(75) Inventors: **Mark Carlson**, Half Moon Bay, CA (US); **Surendra Keshan**, Cupertino, CA (US); **Patrick Faith**, Pleasanton, CA (US)

(73) Assignee: **Visa U.S.A., Inc.**, San Francisco, CA (US)

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This patent is subject to a terminal disclaimer.

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(51) **Int. Cl.**
***G06Q 10/00*** (2012.01)

(52) **U.S. Cl.**
USPC ..... **705/39**; 705/26; 705/44

(58) **Field of Classification Search**
USPC ..... 705/39, 44, 26, 26.81; 235/380
See application file for complete search history.

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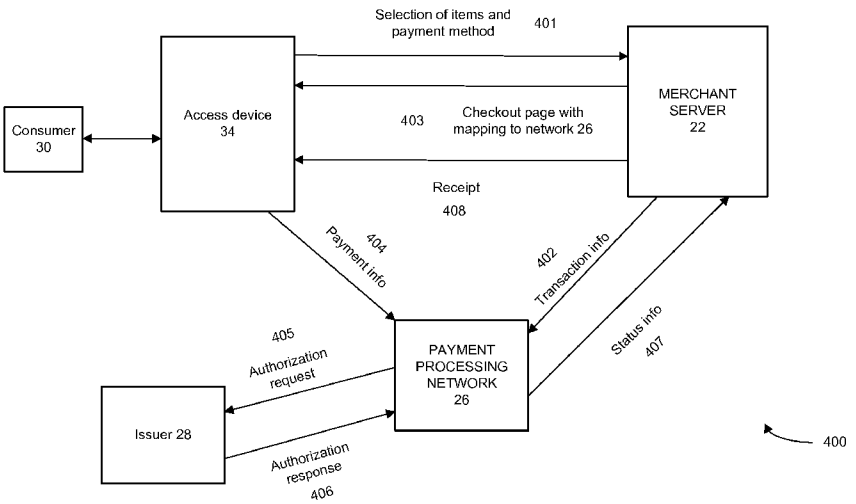
*Primary Examiner* — Samica L Norman
(74) *Attorney, Agent, or Firm* — Kilpatrick Townsend & Stockton LLP

(57) **ABSTRACT**

Systems, methods, and apparatus for handling and/or authorizing payment requests by a consumer for a transaction are provided. Payment information can be sent directly from a consumer to a non-merchant, thereby allowing no new entities to obtain the payment information. Transaction identifiers can be used to facilitate communications among the entities. The payment information can be sent to the non-merchant via a merchant application with a submit payment button directed to the non-merchant so little or no deviations from standard practices are required.

**26 Claims, 10 Drawing Sheets**



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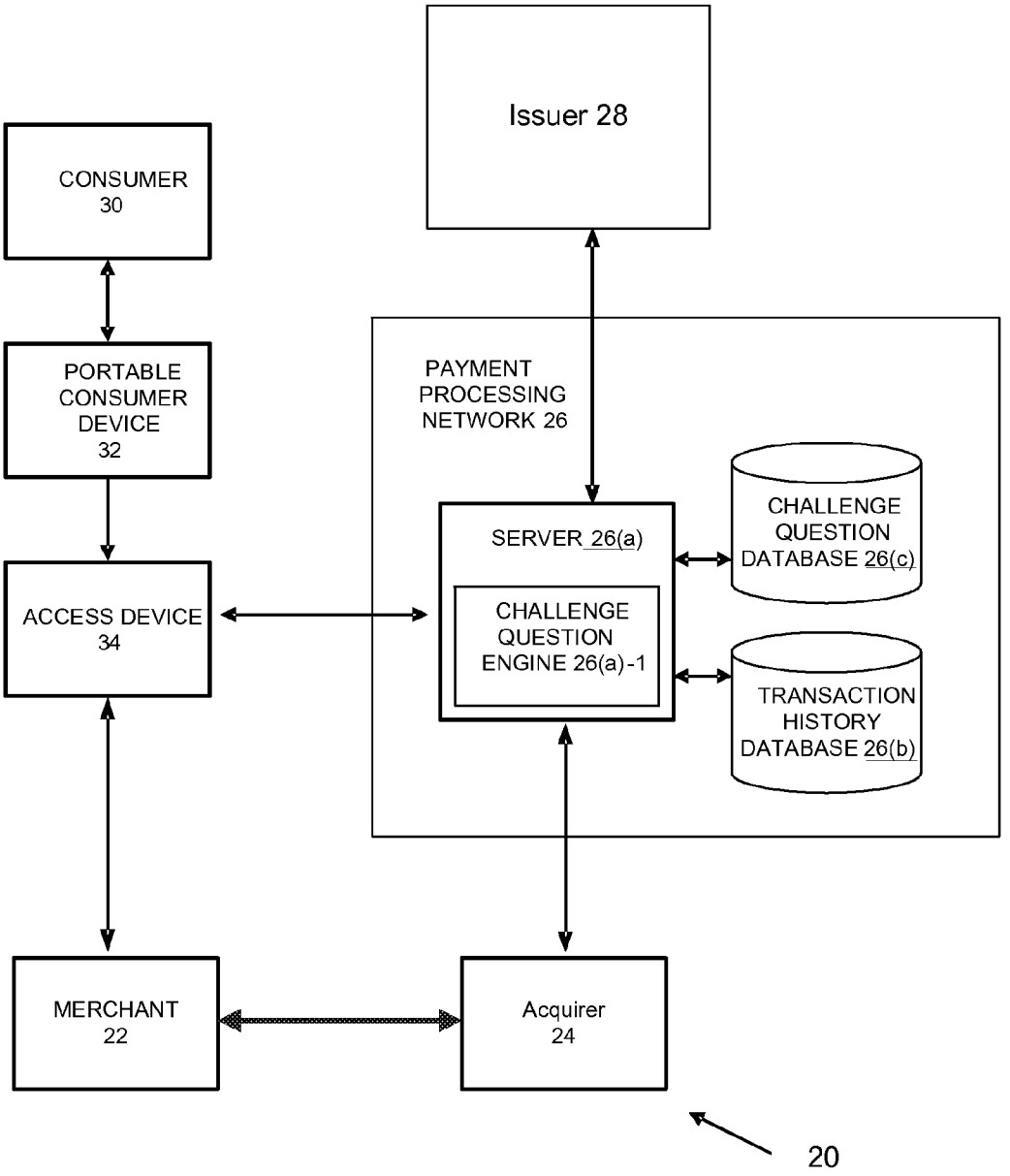
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CONSUMER 30
PORTABLE CONSUMER DEVICE 32
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SERVER 26(a)
CHALLENGE QUESTION ENGINE 26(a)-1
CHALLENGE QUESTION DATABASE 26(c)
TRANSACTION HISTORY DATABASE 26(b)
ACCESS DEVICE 34
MERCHANT 22
Acquirer 24
20

FIG. 1

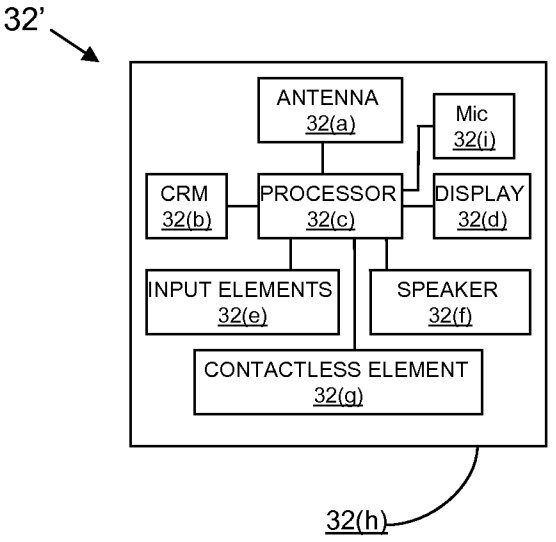
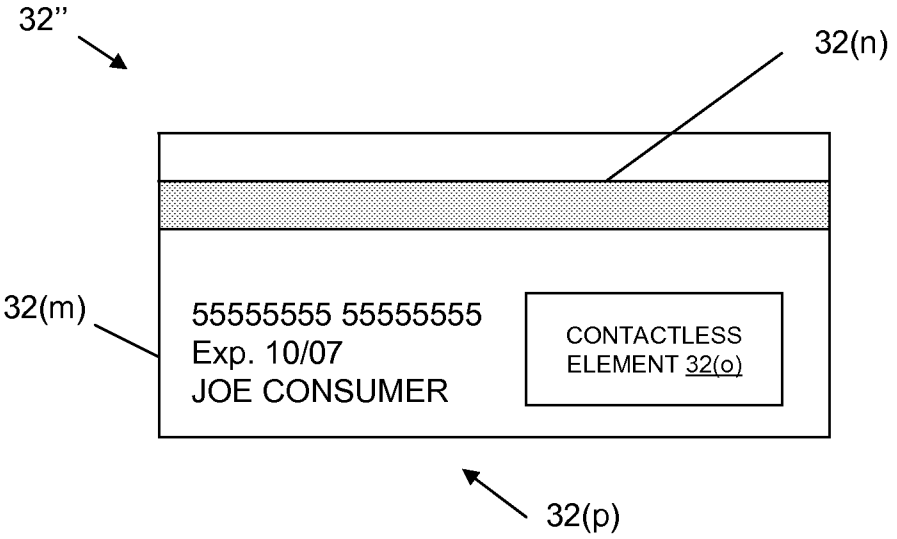

32'
ANTENNA
32(a)
Mic
32(i)
CRM
32(b)
PROCESSOR
32(c)
DISPLAY
32(d)
INPUT ELEMENTS
32(e)
SPEAKER
32(f)
CONTACTLESS ELEMENT
32(g)
32(h)

FIG. 2


32''
32(n)
32(m)
55555555 55555555
Exp. 10/07
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CONTACTLESS
ELEMENT 32(o)
32(p)

FIG. 3

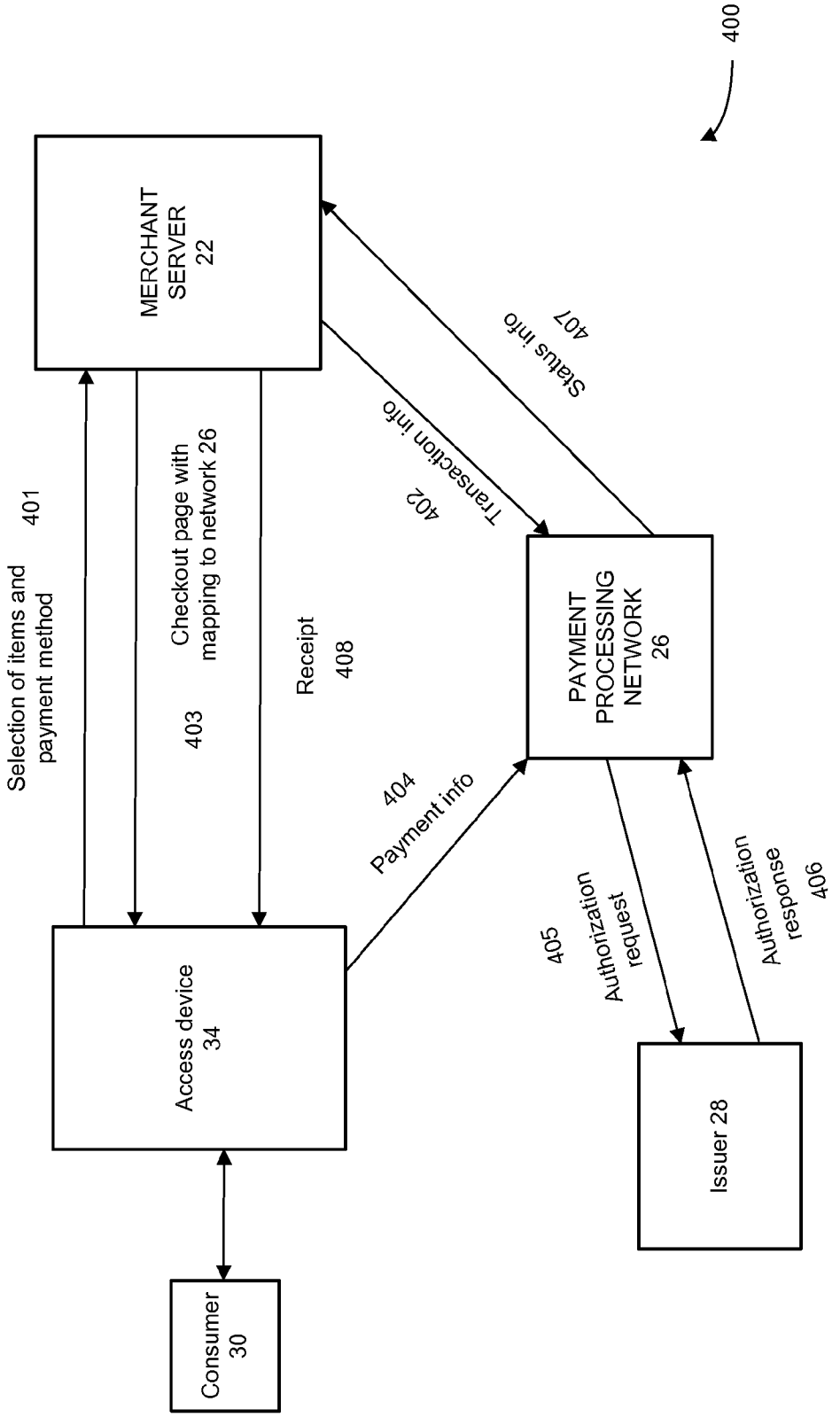
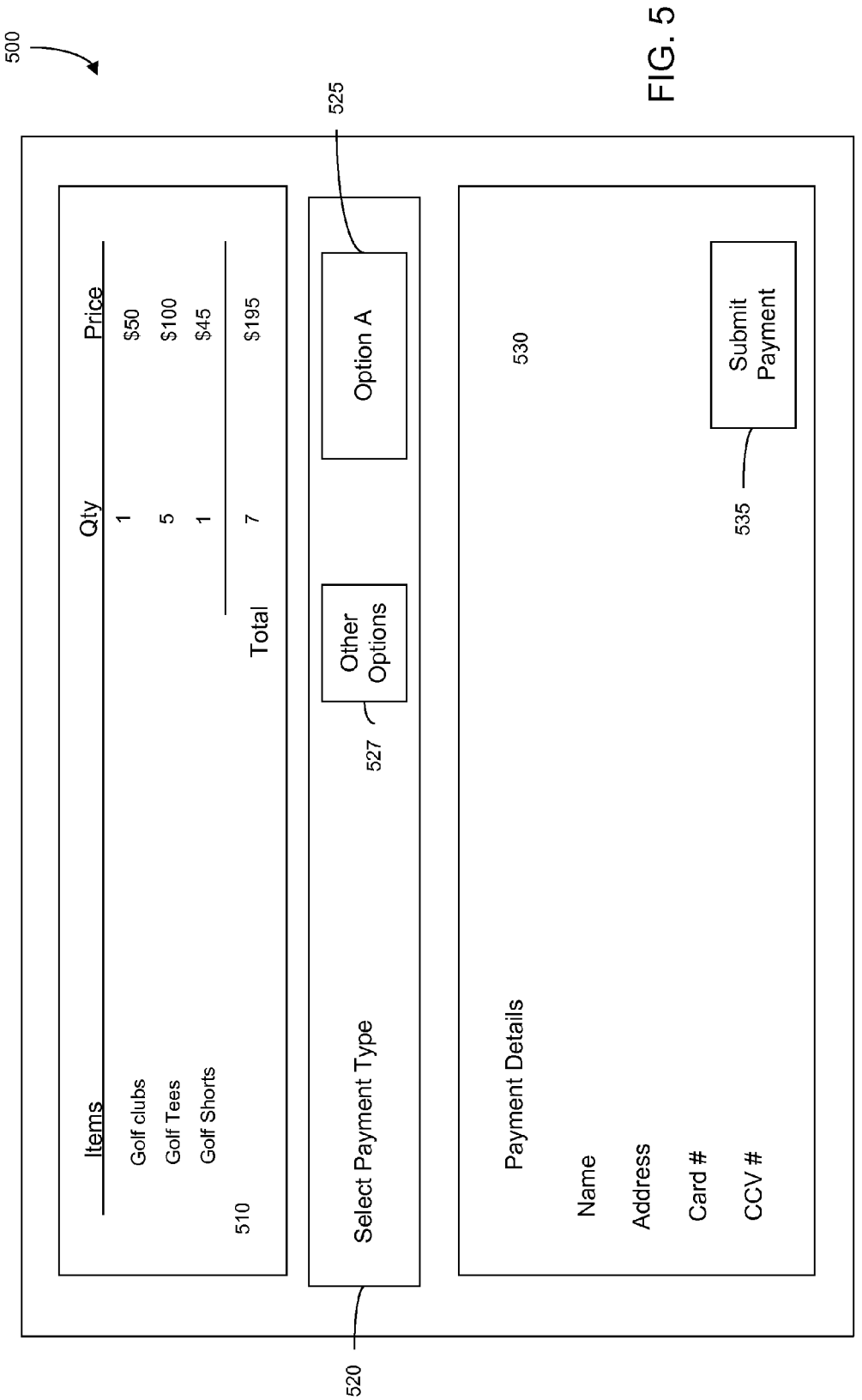

400
MERCHANT SERVER 22
Selection of items and payment method
401
Checkout page with mapping to network 26
403
Receipt
408
Transaction info
402
Status info
407
PAYMENT PROCESSING NETWORK 26
Access device 34
404
Payment info
405
Authorization request
Authorization response
406
Issuer 28
Consumer 30

FIG. 4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Items
Qty
Price
Golf clubs
1
$50
Golf Tees
5
$100
Golf Shorts
1
$45
Total
7
$195
510
Select Payment Type
Other Options
527
Option A
525
520
Payment Details
530
Name
Address
Card #
CCV #
Submit Payment
535

FIG. 5

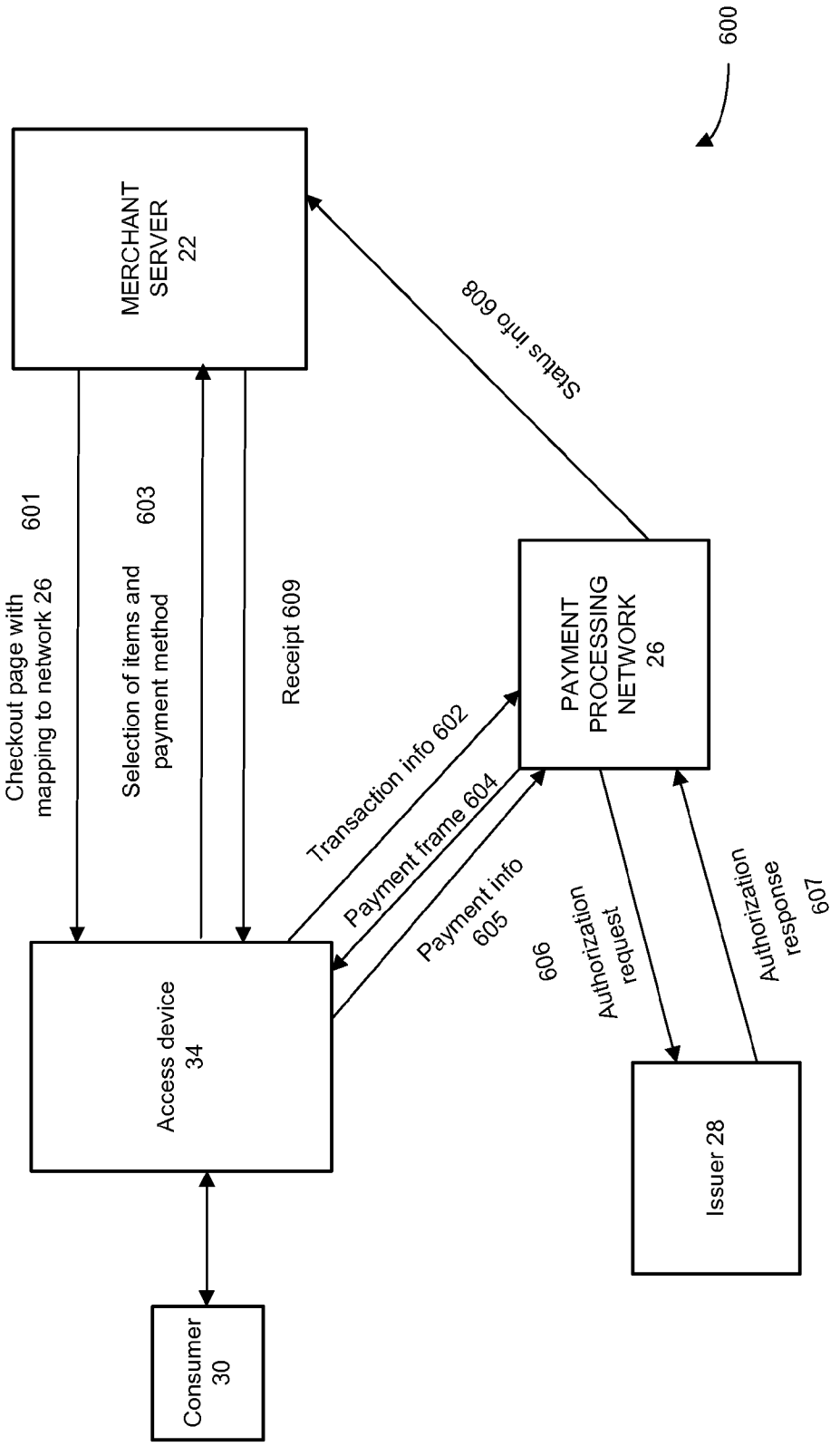
600
MERCHANT SERVER 22
PAYMENT PROCESSING NETWORK 26
Access device 34
Consumer 30
Issuer 28
601
Checkout page with mapping to network 26
603
Selection of items and payment method
Receipt 609
Status info 608
Transaction info 602
Payment frame 604
Payment info 605
606
Authorization request
Authorization response 607

FIG. 6

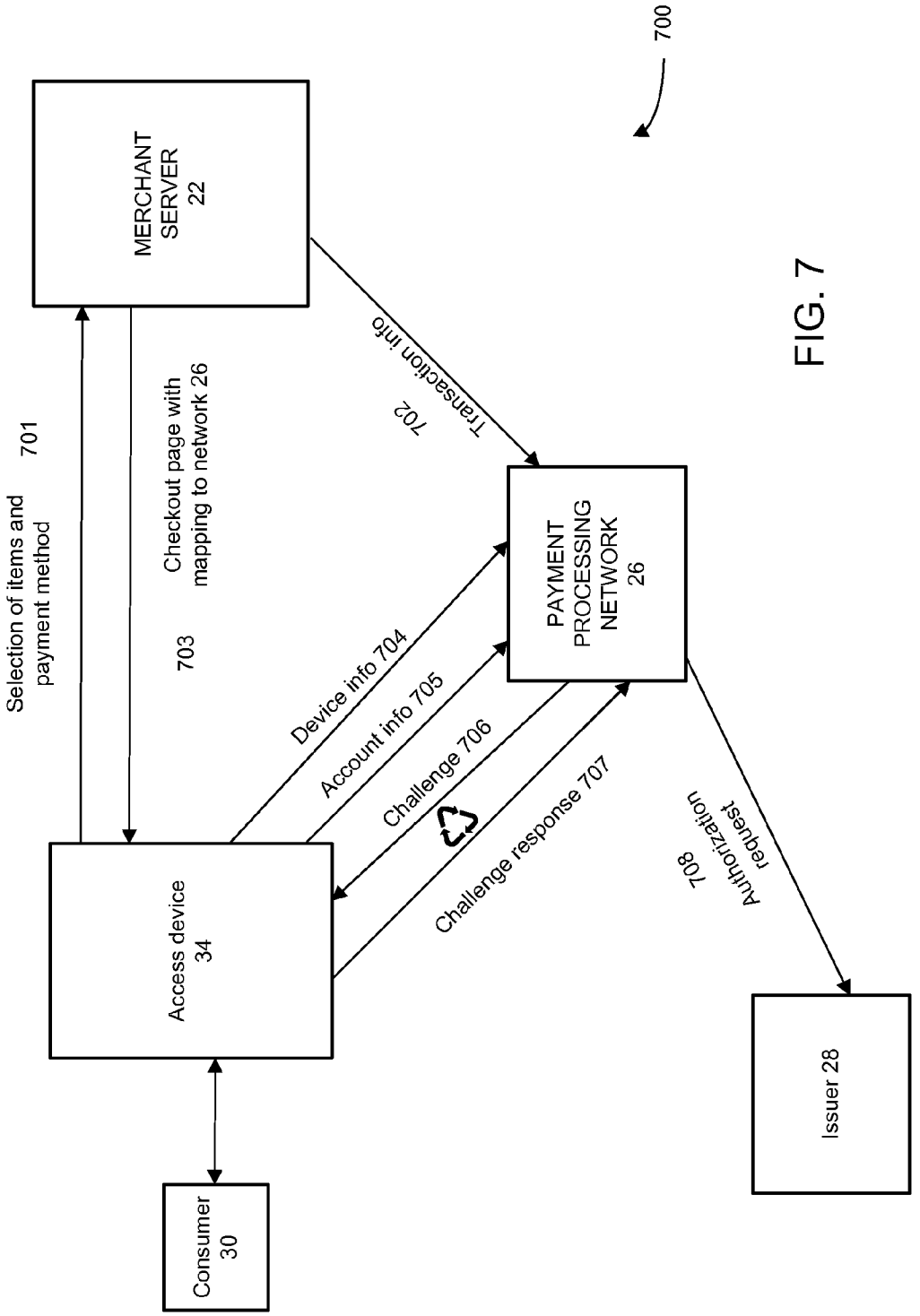
700
MERCHANT SERVER 22
Selection of items and payment method
701
Checkout page with mapping to network 26
703
Transaction info
702
PAYMENT PROCESSING NETWORK 26
Device info 704
Account info 705
Challenge 706
Challenge response 707
Authorization request
708
Access device 34
Consumer 30
Issuer 28

FIG. 7

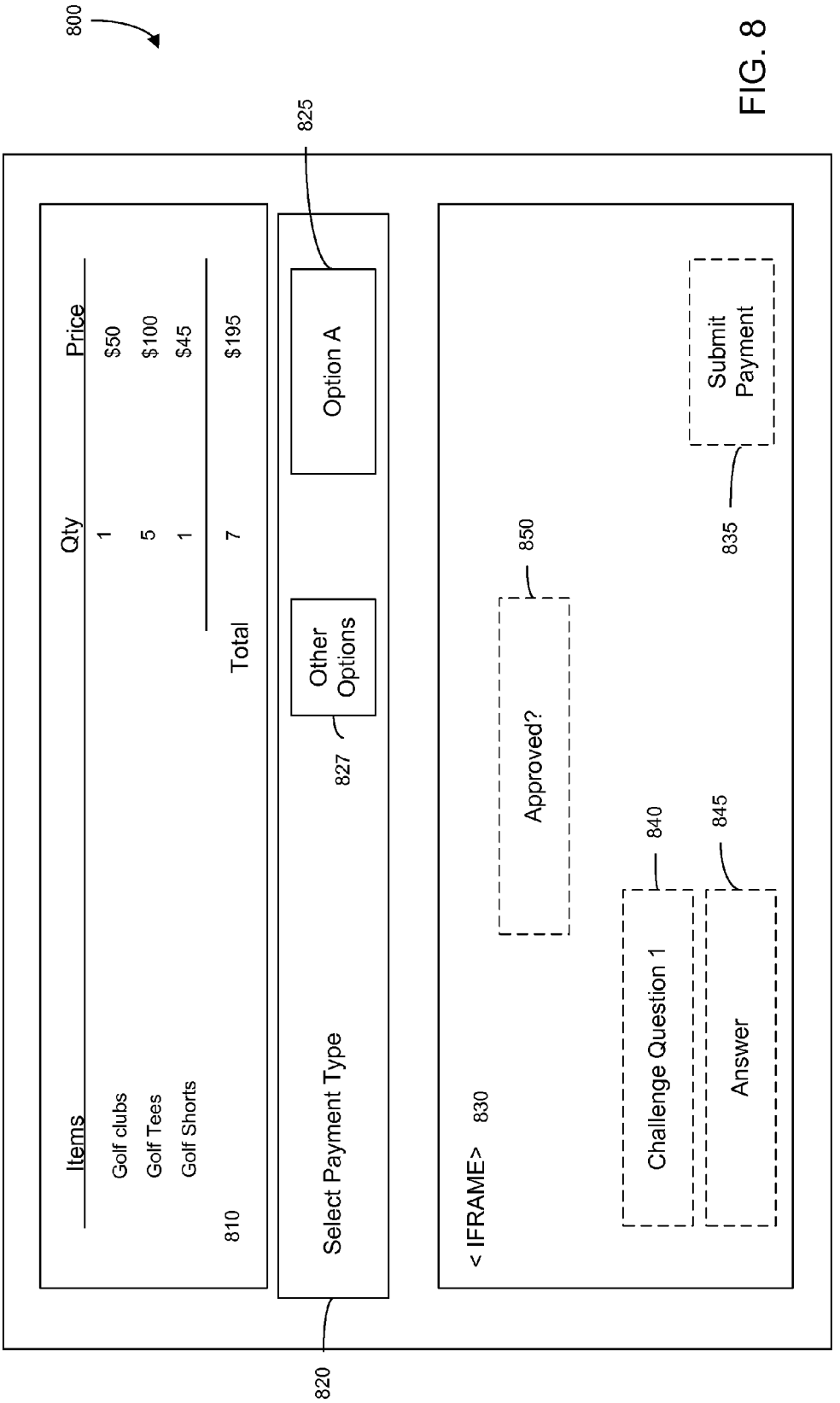
800
Items
Qty
Price
Golf clubs
1
$50
Golf Tees
5
$100
Golf Shorts
1
$45
Total
7
$195
810
Select Payment Type
Other Options
827
Option A
825
820
< IFRAME>
830
Approved?
850
Challenge Question 1
840
Answer
845
Submit Payment
835

FIG. 8

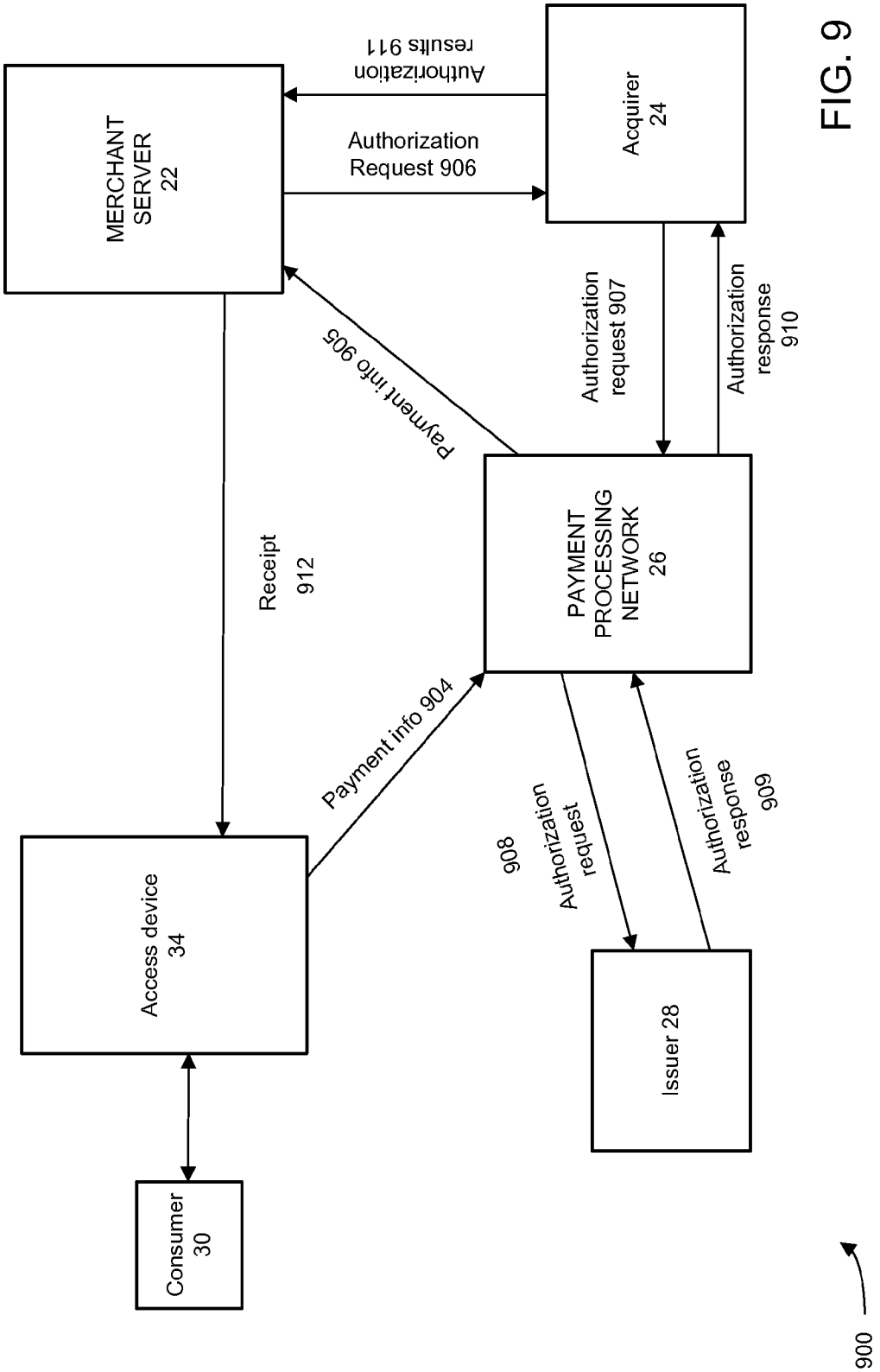
MERCHANT SERVER 22
Acquirer 24
Authorization Request 906
Authorization results 911
Payment info 905
Authorization request 907
Authorization response 910
PAYMENT PROCESSING NETWORK 26
Receipt 912
Payment info 904
Access device 34
908 Authorization request
Authorization response 909
Issuer 28
Consumer 30
900

FIG. 9

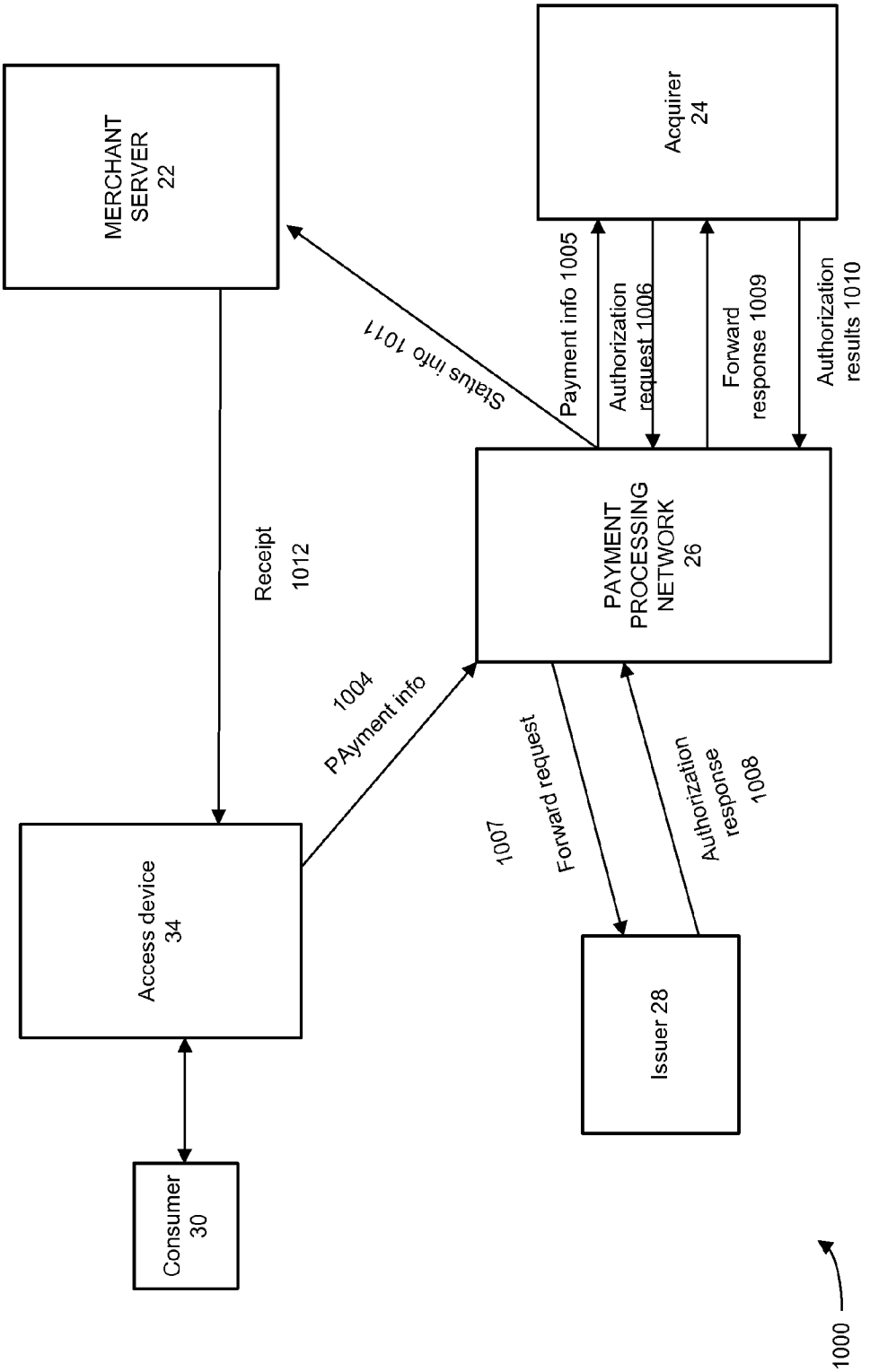
MERCHANT SERVER 22
Acquirer 24
Status info 1011
Payment info 1005
Authorization request 1006
Forward response 1009
Authorization results 1010
Receipt 1012
PAYMENT PROCESSING NETWORK 26
1004 PAyment info
1007 Forward request
Authorization response 1008
Access device 34
Issuer 28
Consumer 30
1000

FIG. 10

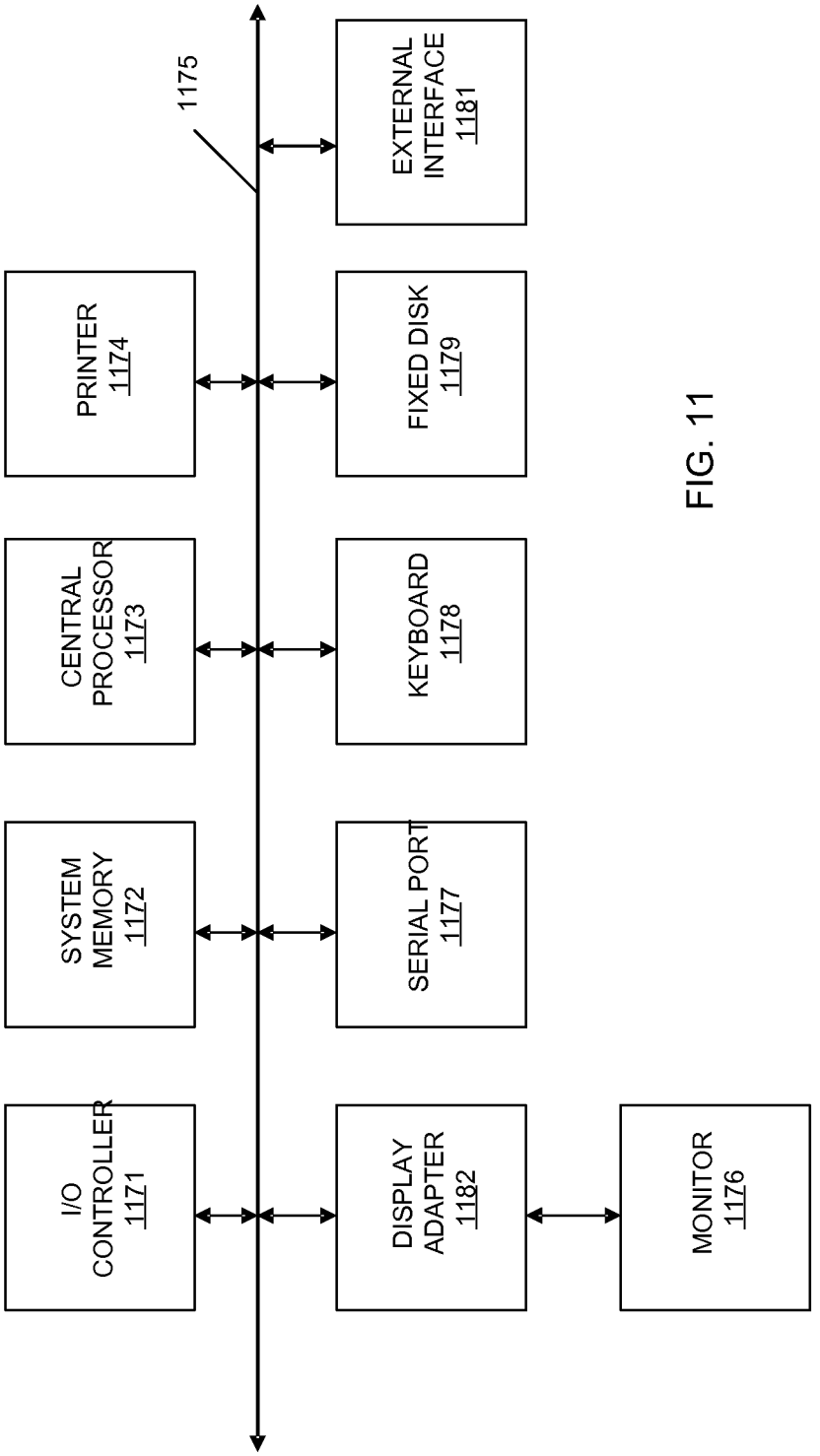
1175
I/O CONTROLLER 1171
SYSTEM MEMORY 1172
CENTRAL PROCESSOR 1173
PRINTER 1174
DISPLAY ADAPTER 1182
SERIAL PORT 1177
KEYBOARD 1178
FIXED DISK 1179
EXTERNAL INTERFACE 1181
MONITOR 1176

FIG. 11

# SYSTEMS AND METHODS FOR SECURE AND TRANSPARENT CARDLESS TRANSACTIONS

## CROSS-REFERENCES TO RELATED APPLICATIONS

The present application is a divisional application of U.S. application Ser. No. 12/143,509 entitled "SYSTEMS AND METHODS FOR SECURE AND TRANSPARENT CARDLESS TRANSACTIONS" filed Jun. 20, 2008 now U.S. Pat. No. 8,121,942, which is a non-provisional application of and claims priority to U.S. Provisional No. 60/946,113, filed on Jun. 25, 2007 entitled "PAYMENT TRANSACTION SYSTEM AND METHOD," and to U.S. Provisional No. 61/034,904, filed on Mar. 7, 2008 entitled "SECURE CHECKOUT AND CHALLENGE SYSTEMS AND METHODS," the entire contents of which are herein incorporated by reference for all purposes.

The present provisional application is related to commonly owned and concurrently filed U.S. application Ser. No. 12/143,394, entitled "CARDLESS CHALLENGE SYSTEM AND METHOD," the entire contents of which are herein incorporated by reference for all purposes.

## BACKGROUND

The present application is generally related to payment transactions, and more specifically to handling and/or authorizing payment requests by a consumer for a transaction.

Many Internet transactions are performed using credit, debit, or other type of account number. If an unauthorized person is able to obtain the account number or other information used in a transaction, the account may be compromised. The result may be unauthorized withdrawals or charges made by the unauthorized person. Most fraud occurs because of compromised merchants and acquirers who have received the account information during the transaction.

Although other systems attempt to prevent the merchant from obtaining the account number, such implementations require enrollment and extensive infrastructure changes. For example, in Google Checkout, a merchant must write new code to interface with a new entity, i.e. Google. Many additional requests and receiving of responses are added to the infrastructure of the merchant web site, e.g., via a plug-in. The merchant also needs to configure settings for the checkout, or monitor a merchant page in order to track an order. The merchant also has to cross-reference its order number with a unique identification number generated by Google. Also, the consumer needs to enroll with Google to obtain the benefit of the Google Checkout procedure. All of these and other steps require a lot of work by the merchant and consumer, and at a minimum frustrate the adoption of Google Checkout, along with the lack of other features.

Additionally, additional steps may be performed to protect a card that is compromised, stolen, or is being used without proper authorization of the cardholder. Prior methods attempt to authenticate the consumer in order to prevent security risks, such as fraud. However, such attempts have met with limited success. With the burgeoning growth of e-commerce and transactions conducted online, opportunities for payment card theft have become more readily available. As a result, online payment card fraud has also accordingly increased over the last few years. Despite many prevention efforts, payment card fraud continues to account for annual losses in the range of hundreds of millions of dollars. In addition to losses incurred due to payment card fraud, transactions lost



due to false-positive declines (i.e., transactions that are incorrectly identified as fraudulent) also annually cost merchants and issuers hundreds of millions of dollars in sales.

Furthermore, existing industry solutions that combat payment card fraud tend to be account- and issuer-oriented. In other words, individual issuers may employ different solutions to detect fraudulent activities on their respective accounts and detection is at a single account level. As a result, payment card fraud that occurs across multiple accounts from multiple issuers often goes undetected. For example, it would be difficult for an individual issuer to determine that an usually high number of payment cards used at a particular merchant have been compromised and subject of fraud, since the fraud may only involve a small number of payment cards issued by that individual issuer.

Additionally, a limited time is typically allowed for an authorization to occur after a consumer has initiated the transaction, e.g., submitting a payment request via button on a web page. Thus, mechanisms that are used to authenticate the person, in order to prevent fraudulent activity, have very little time to run. Thus, only very simple mechanisms have been achieved thus far.

Better ways to perform electronic financial transactions and to authenticate consumers, particularly when the consumer is initiating a transaction over the Internet, are desirable. Embodiments of the invention address the above problems, and other problems, individually and collectively.

## BRIEF SUMMARY

Embodiments of the present invention provide systems and methods for handling and/or authorizing payment requests by a consumer for a transaction. In one aspect, a consumer message including payment information is sent directly from the consumer to a non-merchant entity, such as VISA, instead of to the merchant. The consumer message advantageously may include a transaction identifier, thereby allowing tracking of the transaction between the consumer, merchant, and non-merchant, with little impact on the existing protocol for transactions between consumers and merchants. All or a portion of the payment information can also advantageously not be made available to any entity not already in possession of the payment information.

In another aspect, an application page (e.g. a checkout page) is sent from the merchant to the consumer. In response to a first payment mechanism being selected, the application page has a destination of a submit payment element on the application page directed to a server not operated by the merchant. Payment information is advantageously sent to the non-merchant when the submit payment element is activated, thereby advantageously allowing the consumer experience to be uninterrupted. The consumer may also not have to enroll in any program or create an account, which might prevent adoption of such payment mechanisms.

As used herein, the term "directly" can mean that the contents of a message are not viewed by another entity during the path between the stated sender and receiver of the message. A direct transmission via a network, such as the Internet, will probably be sent through routers on its way to the receiver from the sender; however, such a transmission is still direct. Although the message may be routed by a routing server that is part of the Internet backbone, such a server does not view the contents. Also, as used herein, the term "server" can refer to a computing system of one or more computers and network inputs and/or outputs that act as portals for a local network to a larger (wider) network, such as the Internet. Also, as used herein, the term "based on X" can mean that an analysis,

result, or other determination uses X in a calculation but that other factors may also be used. Also, as used herein, the term "application page" may be a web page, a local page (e.g. a window) of an application running on a POS terminal, or any other window, screen, or page through which an application receives, sends, or displays information to a consumer, including via text messages.

Other embodiments of the invention are directed to systems, portable consumer devices, and computer readable media associated with the above-described methods.

These and other embodiments of the invention are described in further detail below with reference to the Figures and the Detailed Description.

## BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** shows a block diagram of a system **20** according to an embodiment of the invention.

FIG. **2** shows a block diagram of one type of portable consumer device.

FIG. **3** shows a plan view of a second type of portable consumer device.

FIG. **4** shows a block diagram for a method **400** illustrating the flow of data during a transaction according to an embodiment of the present invention.

FIG. **5** shows a screen shot of a checkout page **500** according to an embodiment of the present invention.

FIG. **6** shows a block diagram of a method **600** illustrating the flow of data during a transaction where transaction information is sent from the access device to the payment processing network **26** according to another embodiment of the present invention.

FIG. **7** shows a block diagram for a method **700** illustrating the flow of data during a transaction where challenges are presented to the consumer according to an embodiment of the present invention.

FIG. **8** shows a screen shot of a checkout page **800** used for presenting challenge questions to a consumer according to an embodiment of the present invention.

FIG. **9** shows a block diagram for a method **900** illustrating the flow of data during a transaction where a type of payment information is sent to the merchant **22** from the payment processing network **26** according to an embodiment of the present invention.

FIG. **10** shows a block diagram for a method **1000** illustrating the flow of data during a transaction where a type of payment information is sent to an acquirer **24** from the payment processing network **26** according to an embodiment of the present invention.

FIG. **11** shows a block diagram of an exemplary computer apparatus usable with system and methods according to embodiments of the present invention.

## DETAILED DESCRIPTION

Embodiments of the present invention provide systems and methods for handling and/or authorizing payment requests by a consumer for a transaction. Payment information can be sent from a consumer to a non-merchant, thereby allowing no new, trusted entities to obtain the payment information. Transaction identifiers can be used to facilitate communications among the consumer, the merchant, and a non-merchant, as well as other entities. The payment information can be sent to the non-merchant via an application served by the merchant, but which has a submit payment option directed to the non-merchant entity. Thus, little or no deviations from standard practices may be required for the merchant and consumer.

### I. System and Challenge Overview

FIG. **1** shows an exemplary system **20** according to an embodiment of the invention. Other systems according to other embodiments of the invention may include more or less components than are shown in FIG. **1**.

The system **20** shown in FIG. **1** includes a merchant **22** and an acquirer **24** associated with the merchant **22**. In a typical payment transaction, a consumer **30** may purchase goods or services at the merchant **22** using a portable consumer device **32**. The merchant **22** could be a physical brick and mortar merchant or an e-merchant. The acquirer **24** can communicate with an issuer **28** via a payment processing network **26**. The consumer may interact with the payment processing network **26** and the merchant through an access device **34**, such as a point of sale (POS) terminal, personal computer, and a mobile phone. The merchant **22** may also have, or may receive communications from, an access device **34** that can interact with the portable consumer device **32**, such as a debit card, credit card, smartcard, and a mobile phone.

In one aspect, communications to/from the merchant **22** are provided by one or more servers. A server may be any computer device that is connected to the communication channels provided. As used herein, the term merchant may be used interchangeably with a merchant server. Similar communications involving the acquirer and issuer may also use a server.

As shown in FIG. **1**, the payment processing network **26** may comprise a server **26**(*a*), which may comprise a challenge question engine **26**(*a*)-**1**. The server **26**(*a*) may also be in communication with a transaction history database **26**(*b*) and a challenge question database **26**(*c*). The challenge question engine **26**(*a*)-**1** may simply extract challenge questions from the challenge question database **26**(*c*). Alternatively or additionally, the challenge question engine **26**(*a*)-**1** may generate challenge questions using information in the transaction history database **26**(*b*).

The challenge questions may be static or dynamic in nature, as is described in U.S. patent application Ser. No. 11/763,240, filed on Jun. 14, 2007 entitled "CONSUMER AUTHENTICATION SYSTEM AND METHOD," which is incorporated by reference in its entirety for all purposes. For example, the challenge question engine **26**(*a*)-**1** may receive an authorization request message, for example, in response to a consumer's request to purchase goods. It may thereafter retrieve suitable questions from the challenge question database **26**(*c*) or may generate suitable challenge questions on its own. For instance, in some cases, the challenge question engine **26**(*a*)-**1** may retrieve the question "What is your mobile phone number?" from the challenge question database **26**(*c*) after receiving an authorization request message from a particular consumer. Alternatively, the challenge question engine **26**(*a*)-**1** may generate a dynamic question such as "Did you use this credit card at McDonald's last night?" The information pertaining to the particular restaurant that the consumer **30** was at the preceding day could be retrieved from the transaction history database **26**(*b*).

The challenge question database **26**(*c*) may be populated with questions of any suitable type. The questions may relate to a past location (e.g., the consumer's current home, the city that the consumer recently visited) or current location (e.g., the current location of the store that the consumer is currently at), the type or name of the merchant that the consumer is presently visiting or has visited in the past, the consumer's

family or personal data (e.g., name, phone number, social security number, etc.), etc. The questions in the challenge question database **26**(*c*) may be generated by the challenge question engine **26**(*a*)-**1** and subsequently stored in the challenge question database **26**(*c*). As will be described later, the challenge question engine **26**(*a*)-**1** may determine whether to ask a question and which questions to ask based on device information received from the access device **34** and/or the selection of items to purchase, or type of transaction involved.

Alternatively, or additionally, the challenge questions may be generated from an external source and then subsequently stored in the challenge question database **26**(*c*). For example, the consumer **30** may use a browser on a personal computer or the like to supply specific challenge questions to the server **26**(*a*) via a communication medium (not shown) such as the Internet.

In some embodiments, a consumer may determine the kinds and/or quantity of challenge questions to ask himself or herself. For example, the consumer may specify that the consumer wants to be asked three challenge questions if the consumer visits a jewelry store, but only one question if the consumer visits a fast food restaurant. The types of questions posed by the consumer may be based on the merchant type, frequency of purchasing, etc. Some concepts relating to user-defined authorization parameters are described in U.S. patent application Ser. No. 10/093,002, filed on Mar. 5, 2002, which is herein incorporated by reference in its entirety for all purposes.

In preferred embodiments, the challenge questions are derived from past transaction data in the transaction history database **26**(*b*). The consumer **30** may conduct many, many transactions with the payment processing network **26** (and/or the issuer **28**) over time. This consumer transaction information may be stored in the transaction history database **26**(*b*) over time, and challenge questions may be generated using the transaction information. The past transaction information provides a good basis for authenticating the consumer **30**, since the consumer **30** will know about what transactions that the consumer **30** has conducted in the past. For example, the consumer **30** may have used his credit card to pay for a hotel room in New York the previous day, and on the next day may be asked a question such as "Did you stay at a hotel in New York yesterday?" In another example, the consumer **30** may have purchased an item that is more than $2000 the day before, and on the next day may be asked "Did you make a purchase for more than $2000 yesterday?" The questions/answers that are presented to the consumer **30** may be free form in nature and/or may include pre-formatted answers such as multiple choice or true-false answers from which the user may select.

The description below describes a process where the consumer **30** buys an item over the Internet through a personal computer, e.g. at home or at work. However, in other embodiments the consumer may use an access device at the merchant **22** to select the item, much in the same way as on the Internet. For example, a consumer **30** may obtain items and scan them in to make the selection. In one embodiment, the application page (e.g. a web page) would then already be at the access device and thus would not need to be sent. The scanning device could also communicate with a consumer's phone, where either can communicate with the merchant **22**, and the payment processing network **26**.

## II. Secure and Convenient Transactions

Methods according to embodiments of the invention can be described with reference to FIGS. **1** and **4**. In a typical purchase transaction, the consumer **30** initiates a purchase of a good or service at a merchant server **22** (e.g. through a merchant's website) using a portable consumer device **32** such as a credit card.

FIG. **4** shows a block diagram for a method **400** illustrating the flow of data during a transaction according to an embodiment of the present invention. In step **401**, the items and the type of payment method are selected by the consumer **30**. As part of a checkout request, this information is sent from the access device **34** to the merchant server **22**, also referred to as the merchant. For example, the consumer **30** picks the stock-keeping unit (SKU) number of items desired. In this example, the access device **34** may be a point of sale (POS) terminal at the merchant **22**.

In a pure Internet commerce transaction embodiment, the consumer **30** has selected the items on a merchant's website by placing them in a shopping basket or similar part of the merchant's website. The consumer **30** is then offered various payment options (also termed payment mechanism options herein). Then, once the consumer selects a particular payment option such as a particular credit card (e.g. VISA, MasterCard, American Express, or Discover), the above information (i.e., shopping basket information, and credit card information) is sent to the merchant **22**.

In a POS (point of sale) terminal example, a consumer **30** may scan in items at a checkout kiosk. This effectively fills up a virtual shopping basket. The consumer **30** can then select a type of payment by making a selection on a display screen associated with the POS terminal. Alternatively, the consumer **30** may initiate a payment with the portable consumer device **32**, for example, by swiping a card through an appropriate slot in the POS terminal. In another example, the POS terminal may be a contactless reader, and the portable consumer device **32** may be a contactless device such as a contactless card. The POS terminal can then identify the payment type and send information regarding the type of transaction to the merchant **22**.

In step **402**, the merchant server **22** sends transaction information to the payment processing network **26** or other non-merchant entity. The transaction information may be sent in a transaction message. In one aspect, a server of the payment processing network **26** receives the transaction information, as well as other messages and receiving other messages mentioned herein.

The transaction information includes a merchant identification (ID), an amount of the transaction, and a correlation ID, which ties together messages associated with the same transaction. The correlation ID may be the same ID that the merchant normally uses internally to track a transaction, which is advantageous, since the merchant **22** does not have to create any additional infrastructure. The merchant **22** creates a message and sends it (Method="POST") to the payment processing network **26** in a process via a communication channel that is different than the communication channel that exists between the access device **34** and the merchant **22**. Optionally, information relating to the items (e.g. SKU) selected may also be sent as part of the transaction info.

Note that this step typically involves sending credit card information from the merchant **22** to the payment processing network **26**. However, it is not necessary to do this at this point, particularly in embodiments where the merchant **22** does not receive the credit card information. For example, in some cases, only information related to the shopping basket is sent. This information may just be the amount of the transaction, but also may include information about the items selected, which may be used to select challenge questions as described below. For example, an item being purchased may

be an item that the consumer **30** does not normally purchase and/or the merchant **22** may have a reputation for being a risky merchant (e.g., past fraud has been associated with the merchant).

In step **403**, a checkout page, or other type of application page, with a mapping to the payment processing network **26** is sent to the access device **34**. The page may be sent in response to the consumer **30** selecting an option to check out with the items selected in the virtual shopping cart. In one embodiment, the merchant **22** serves a checkout page to the consumer **30**, where the checkout page has a "Submit Payment" button (or other mapping element) that has a destination address mapped to the payment processing network **26** The destination address can be mapped to one or many computer apparatuses in the payment processing network **26**.

In step **404**, payment information is sent from the access device **34** to the payment processing network **26** or other non-merchant entity. The payment information may be sent via a consumer message from the access device, which may be done by any suitable protocol. A consumer message may be any message sent from the consumer via any device used by the consumer (e.g. access device **34**).

The payment information includes account information (such as the account number or other account identifier) of the consumer's account to be used for the transaction, and may include other numbers such as the credit card verification (CCV) number. In one embodiment of the invention, the payment information is obtained from the consumer entering data into the checkout page. A purpose of sending the identified consumer account is so that the account may be used as a funding source for the transaction, e.g., to buy selected items or otherwise send money to another individual or business.

In another embodiment of the invention, the payment information is obtained from the consumer **30** initiating the transaction with the portable consumer device **32**, for example, at a POS terminal (acting as the access device **34**). Similarly, for this transaction, the destination of the account information is the payment processing network **26**. The access device **34** can be programmed to permanently erase the account information once the transaction is complete.

As the account information is advantageously not sent to the merchant **22**, there is not a risk of a security breach at the merchant **22**, which can cause a compromise in consumer's information (e.g., credit card information).

In one embodiment, the receiver of the account information (i.e. non-merchant, payment processing network **26**) already is aware of the account information. In one aspect, the credit card is created at least partially through or in cooperation with the entity that administers or runs the payment processing network **26** (e.g. a credit card provider). For example, the payment processing network **26** may create a portion of the account identifier as a Bank Identification Number (BIN) that is associated with the issuer **28**. Accordingly, during the transaction, no new entities may become aware of the account information, and the account information is held by a minimum number of entities. In another embodiment, the payment processing network **26** can perform clearing and settlement services. In yet another embodiment, the payment processing network **26** is able to send the account information directly to the issuer **28**.

In step **405**, an authorization request message is sent from payment processing network **26** to the issuer **28**. Note that the merchant **22** does not provide an authorization request message in the example shown. In step **406**, the issuer **28** responds to the authorization request, which was initiated by the payment processing network **26**.

In step **407**, the payment processing network **26** creates and sends a status message, which contains the correlation ID and the status of the transaction, e.g., whether or not the transaction is a success (with receipt) or failure. Accordingly, the merchant server **22** does not see the account information in this embodiment. In some embodiments, the status information may also include the transaction amount and/or items to be purchased, e.g., when the merchant **22** has not received this information yet. The status message is one type of a funding message that is sent from the payment processing network **26** to the merchant server **22**. A funding message may be any message sent from a non-merchant server (such as payment processing network **26**) to a merchant server **22**.

Normally, in a conventional transaction, the merchant **22** would receive an authorization response from the acquirer **24**, which would be in response to the merchant **22** sending an authorization request message after receiving the payment information. In the embodiment of FIG. **4**, the merchant **22** still receives an authorization response message in the form of the status information. The merchant **22** has the convenience of still using this same mechanism after it has matched the correlation ID with the items selected, thus providing simple mechanisms for merchants to adopt more secure methods of conducting transactions.

In step **408**, a receipt or confirmation of the transaction may be sent to the consumer **30**. As shown, the receipt is sent from the merchant **22** to the consumer **30**. In another embodiment, the payment processing network **26** may also send the consumer **30** the receipt.

Specific embodiments of how the payment information is directed to the payment processing network **26** will now be described.

## III. Adoption of Secure Transactions

It is desirable to make it easy for merchants and consumers to adopt the secure transaction processes described herein. Unless the parties of the transaction can perform secure transactions with little or no effort on their part, the secure transaction are less likely to be adopted. If the secure transactions are not adopted, fraud cannot be reduced. Accordingly, the embodiments described herein are easy to use and are likely to be adopted.

FIG. **5** shows a screen shot of a checkout page **500** according to an embodiment of the present invention. The checkout page **500** is served to the consumer **30** (e.g., via an access device that the consumer is operating) from the merchant **22** (e.g., from a merchant's web server). This may occur after the consumer **30** has selected items and activated a general checkout button (checkout request) on the merchant's website or at the merchant's POS terminal. The information relating to the selected items may then be transferred from a previous page to page **500**. Thus, page **500** may already have all or some of the items and quantity information filled in. In another example, the page is presented on a POS display and the items are shown once an item is scanned.

The frame **510** of the window **500** shows the selections made by the consumer. For example, the consumer may have chosen 1 set of Golf Clubs, 5 Golf Tees, and 1 pair of Golf Shorts. The quantity and price (individual and total) for each of the items may be displayed. The frame **520** includes options for selecting the type of payment mechanism desired, such as different types of credit/debit cards or other payment options. The payment frame **530** includes a place to input payment information, such as the name and address of the payee, the account (card) number and a credit card verification number, if applicable. The Submit Payment button **535**

causes the payment information to be sent to either the merchant **22** or the payment processing network **26** depending on which payment option was selected. In one embodiment, the payment frame **530** does not appear until the payment type is selected.

When the consumer clicks on the option A **525**, the shopping basket information from frame **510** is sent to the merchant **22** as described for step **401**. Option A **525** may be a stand alone button as shown, or it may be chosen from a drop-down list or from some other list. When option A **525** is selected, the destination of the payment information when the submit payment button **535** is pressed is the payment processing network **26**. Thus, the payment information may be sent directly to the payment processing network **26**. The submit payment button **535** and the payment options **525** and **527** are payment objects of the application page.

In one embodiment, the destination of the submit payment button **535** is changed to the payment processing network **26**. In another embodiment, the destination of the submit payment button **535** can start out being the payment processing network **26**, and thus the destination stays the same. In yet another embodiment, the destination address has no set value and the destination is set to be the payment processing network **26**.

Option A **525** may be a single option or it may be a subset of options, e.g., a subset of four different options. In one embodiment, these four options correspond to different payment mechanisms that can be processed by the payment processing network **26**. For example, a set of credit cards (such as VISA and MasterCard) may be processed by payment processing network **26**.

In one embodiment, the destination of the submit payment button **535** is changed by a new payment frame **530** being sent from the merchant **22** to the access device **34**. The new payment frame **530** has the "Submit Payment" button **535** with a destination mapped to the network **26**. This may be the only change to the frame so that as far as the consumer is concerned, the page has not changed. In another embodiment, the new payment frame **530** may have a different presentation with different fonts, locations to input the payment information, different payment information to enter, and different logos or advertising.

As to changes that are needed to be implemented by the merchant **22**, the option A button can have functionality for sending the shopping basket information of frame **510** to the merchant **22**. Also, the merchant **22** can have the destination of submit payment **535** changed. The change may be done by sending over a new piece of HTML or other code, or having the destination change dynamically based on code originally sent with the page, when the checkout process was initiated by the consumer **30**.

In one embodiment, the new payment frame **530** is sent by the merchant **22** as an IFrame (an HTML element) that points to a location within the payment processing network **26**, and the payment frame **530** is served from the payment processing network **26**. In this case, the new payment frame **530** is sent from payment processing network **26**. For example, once the IFrame is received by the access device **34**, it then submits a request to the payment processing network **26** for the display information for the Iframe.

Advantageously, the consumer **30** does not have to enroll into a program or create an account to conduct secure transactions. As noted above, payment information can be sent automatically to the payment processing network **26**, even though the consumer **30** does not supply a username and/or password. A secure checkout is automatically performed when the payment option **525** is chosen. Accordingly, it is likely that consumers will adopt embodiments of the invention, since it is easy and convenient to use.

In one embodiment of the invention, as far as the consumer **30** knows, the payment information is still sent to the merchant **22**. Thus, this step can be transparent to the consumer. For example, the URL in the browser that is used by the consumer would not change and the rest of the page also would not change. In other words, the change in the destination of the submit payment button **535** can be hidden from the consumer **30**, so that the consumer's shopping experience is the same as it has been in the past.

When the consumer **30** selects other options **527**, then the transaction may proceed as normal. For example, the destination of the submit payment button **535** would still be directed to the merchant **22**. An authorization request message would be sent from the merchant **22**, to the payment processing network **26**, and back to the issuer **28** in some embodiments. Also, the virtual shopping basket information may not be sent to the merchant **22** when the button **527** is activated, but the virtual shopping basket information may be sent when the submit payment button **535** is pressed.

As mentioned above, the change or selection of the destination of the "submit payment" button **535** may be performed with code sent to the access device **34** operated by the consumer **30** in the initial serving of the page **500**. Also, the transmission of the transaction information may be different from method **400**.

FIG. **6** shows a block diagram of a method **600** illustrating the flow of data during a transaction where transaction information is sent from the access device **34** to the non-merchant, payment processing network **26** according to another embodiment of the present invention. Method **600** shows other embodiments where the initial checkout page **500** includes code for sending payment information to the network **26** when the option A **525** is chosen and/or where the transaction information is sent from the access device **34** to the payment processing network **26**, as opposed to being sent from the merchant **22** to the payment processing network **26**.

In step **601**, a checkout page (e.g. page **500**) is served from the merchant **22** to the access device **34** operated by the consumer **30**. The checkout page **500** may have a place for the consumer **30** to select the items or may already have all or some of the item and quantity information filled in, which may be transferred from a previous page. In one embodiment, this checkout page **500** includes logic to select among a plurality of destinations for the payment information to be sent once a submit payment element (e.g. **535**) is activated. The selection is based on the payment type selected. This may be done with IF statements, a CASE statement, or similar logic.

In one embodiment of the invention, the payment option A **525** has a destination mapped to the payment processing network **26**. Thus, in step **602** at least some of the transaction information is sent to the payment processing network **26** (without first being sent to the merchant **22**) when payment option **525** is selected (e.g., clicked). This transaction information includes at least the amount of the transaction, and a merchant ID or merchant identifier. The transaction information may also include a transaction or correlation ID, which was sent by the merchant **22** in page **500** or that was created at the access device **34**, e.g., by code embedded in page **500**. If the correlation ID is created at the access device **34**, then the correlation ID may be sent from the access device **34** to the merchant **22**, e.g. in step **603** or in another step.

The payment option A **525** may also have a destination mapped to the merchant server **22** so that the same transaction information is also sent to the merchant server **22** in an

optional step **603**. If this information is sent to the merchant **525**, the payment frame may be served from the merchant **22** as described in FIG. **4**. The payment frame may be of a universal type or the merchant can specify one that is designed to it (e.g. includes branding that it desires). Alternatively, the payment processing network **26** can provide its own branding.

In the embodiment shown in FIG. **6**, the web page **500** already includes the IFrame to retrieve the payment page **530** from the network **26**. Once the option **525** is chosen, the code in the checkout page **500** automatically knows to obtain a new payment frame **530** from the payment processing network **26**.

Thus, in step **604**, the payment frame is sent from the payment processing network **26** to the access device **34**. This payment frame has a "Submit Payment" element (e.g. **535**) directed to the network **26**.

Accordingly, in one embodiment, information regarding the payment type is not received by the merchant **22**. The page sent to the consumer via the access device **34** when a general checkout is requested may already have a mapping of the submit payment element to payment processing network **22** even though the consumer has not selected the form of payment yet. Once the consumer **30** has selected the payment option A, the link to the payment processing network **26** is established using the mapping that has already been sent. In one aspect, information indicating that the payment network **26** was chosen is sent to the merchant **22**.

The rest of the steps of method **600** may be performed as the comparable steps in method **400**, or as described herein. For example, step **606** can send an authorization request to issuer **28**; step **607** can send back the authorization response from the issuer **28**; and step **608** can send the status information to merchant **22**.

In one embodiment, the status information sent in step **608** can include the amount of the transaction and the items selected as the merchant **22** may not be aware of this information if step **603** is not performed. In step **609**, a receipt or confirmation of the transaction may be sent to the consumer **30**.

In one embodiment, an entity associated with the payment processing network **26** can incentivize the use of embodiments of the invention by providing a discount in a fee charged to the merchant **22** if the merchant **22** uses embodiments of the invention.

## IV. Complex Challenges and Risk Analysis

The ability of payment processing network **26** to obtain payment information from the access device **34** and not from the merchant **22** allows challenges to be presented from the payment processing network **26** to the consumer and the types of challenges can be more complex than those previously available. For instance, more time can be made available for challenges, thus allowing more challenges and more specific and complex questions.

FIG. **7** shows a block diagram for a method **700** illustrating the flow of data during a transaction where challenges are presented to the consumer according to an embodiment of the present invention. Method **700** presents a process flow similar to method **400** for the first few steps. However, in other embodiments, the first few steps may be similar to that of method **600** or other methods described herein.

In step **701**, the items selected by the consumer **30** and the type of payment method are sent from the access device **34** to the merchant server **22**. In step **702**, the merchant server **22** sends the transaction information to the payment processing network **26** or other non-merchant entity. In one embodiment, the transaction information includes a merchant identification (ID), an amount of the transaction, and a correlation ID, which ties together messages associated with the same transaction. As mentioned above, the payment information may also be sent from the access device **34** directly to the payment processing network **26**.

In step **703**, a checkout page with a mapping to the payment processing network **26** is sent to the access device **34**. This page may be sent in response to the consumer **30** selecting an option to checkout (e.g. a checkout request) with the items selected in the shopping cart. In one embodiment, the merchant **22** serves a checkout page to the consumer, where the checkout page has a "Submit Payment" button that has a destination address mapped to one or more computer apparatuses (e.g. servers) in the payment processing network **26**.

In step **704**, device information may be obtained. In one embodiment, this occurs before the account information is sent. Device information may include an IP address for the access device **34**, an operating system of the access device **34**, a private value (such as a hash or other encrypted value) resulting from code running on the access device **34**, or any other type of information correlated to a computing device. In one embodiment, the merchant **22** serves a checkout page to the consumer **30**, where the checkout page has a "Submit Payment" button mapped to the payment processing network **26**, and renders an Iframe for device information collection, with a correlation ID reference. This is discussed in more detail below. In one aspect, when the payment processing network **26** is chosen, the device information is sent and also then the items and amount are sent, either by the merchant **22** or the consumer **30**.

In one embodiment, the device information is saved in a database or other storage device accessible to the payment processing network **26**. The device information can be stored associated with a particular consumer and/or a particular consumer account. In this manner, the device information for a current transaction can be compared to the device information for previous transaction, which can be used in calculating a risk score as described herein. The database of device information may also include information based on the items that the person has purchased. The information in the database may then be used to deliver an offer to the consumer. For example, if a computer (access device) is known to be of a certain age and the location of the computer is known to be near a particular store, a coupon for that store (possibly targeted specifically for computers) may be sent to the consumer via post mail, e-mail, or mobile application (such as SMS or MMS).

In one embodiment, a merchant ID and the correlation ID are sent when the device information is sent. In one aspect, a specific device server is used in the collection that is different from the server used to verify the transaction.

The device information may also include a user unique ID (UUID), which is not the account number. The device server may also request DNA/pebbles through the user's browser based on the UUID. The device server can then push results to the application tier. The device information may be filed in a local flat activity in, e.g., an XML format.

The use of IFrames allows the device collection to work transparently and to not be compromised by browser controls, such as pop up blockers. In one embodiment, if the device server is not available then a "function not available" message is sent to the application server so that the transaction is not disrupted, thus allowing the user's experience to always be seamless.

In step **705**, payment information is sent from the access device **34** to the payment processing network **26** or other

non-merchant entity. The payment information includes the account number of the consumer, and may include other numbers such as the credit card verification (CCV) number. As mentioned above, the access device **34** may be a personal computing device (e.g. computer, phone, PDA, etc.) of the consumer **30**, or the access device **34** may be associated with a retail establishment, such as a POS terminal.

The payment processing network **26** may use the device information or the transaction information to initiate a risk analysis of the transaction. For example, if the IP address is not in the country, then the transaction would be riskier, or if it is an IP address never used before, e.g., not your home or work computer. Mechanisms may also determine whether an IP address is being spoofed.

Initiating a risk analysis can refer to the start of a risk analysis, parts of which may be partially performed by another entity, or actual performance of the risk analysis.

Also, if an item, the items taken as a whole, or the amount are unusual for the consumer **30** to purchase, then the transaction may be characterized as risky. Past transaction information may be used to determine whether or not an item is an unusual purchase for the consumer **30**. Other information may also be used, such as the person's age, location of residence, or other information. For example, if the consumer **30** is 75 years old and purchased a hang glider, then the transaction might be characterized as risky.

A risk score that represents an account level risk associated with the corresponding transaction may be calculated from any of the information above. Additional discussion for the calculation of a risk score can be found in U.S. Pat. No. 6,658,393 and U.S. patent application Ser. No. 10/863,813, entitled "Method and System for Providing Risk Information in Connection With Transaction Processing" by Bruesewitz et al. A transaction with a high initial risk score compared to a threshold criteria may be supplemented via challenge questions submitted to the consumer.

In step **706**, a challenge message is sent to the consumer **30**. For example, when the device, item, consumer info, or other information suggests that the transaction being conducted is risky, then challenge questions may be presented in order to increase the security. The messages may be in the form of challenge questions. Examples of challenge questions may include questions about the consumer's zip code, mother's maiden name, or more specific questions such as past purchases, etc.

The challenges may be sent to the access device **34** from which the account information was received, or it may be another device associated with the consumer, e.g., the consumer's mobile phone when it is not used as the access device **34**. In one embodiment, a code is sent to the consumer's mobile phone, and the challenge question requests an input of the code. In one aspect, the code may be redeemable for a discount on the current transaction or a future transaction. This code may be sent before the payment mechanism is shown, thus incentivizing use of a payment mechanism that is compatible (processable) by the network **26** (e.g. option A **525**).

In step **707**, the consumer responds to the challenge question, e.g. providing a challenge answer. The process of sending challenge questions and receiving challenge answers may be repeated.

After the challenge response has been validated as being correct or incorrect, a risk score may be provided to the issuer **28** for use in determining whether to authorize the transaction. The risk score may account for correctness of the challenge response, the place of purchase, the history of the card, the amount of the purchase, or any combination of the other criteria mentioned herein. Thus, if an incorrect response is provided, the transaction is not necessarily denied. Also, more than one challenge can be used. If two challenges are used and the response to both are wrong, then there would be a greater chance that person would be turned down, i.e. a greater risk score. If one is wrong and the other right, then the total contribution to the risk score from the challenges may be zero or dependent on the confidence score (see below) of each challenge. One skilled in the art will appreciate the different contributions arising from multiple challenge questions.

Some challenge questions may be more reliable (confidence score) than other ones. The more reliable challenge questions may affect the risk score more. Thus, a more accurate and efficient risk score may be achieved. In one aspect, the confidence score may be used as a weighting in determining the overall risk score, or similarly whether the user is considered to be authenticated.

In one embodiment, the limited time for the authorization to occur after a consumer has initiated the transaction, e.g., submitting a payment request via button on a web page, does not begin until the authorization request is sent to the issuer **28**. Thus, as many challenge questions may be presented as desired. Thus, more complicated mechanisms may be achieved.

In step **708**, the authorization request message is sent from the payment processing network **26** to the issuer **28**. Additional steps may be performed as in methods **400** or **600**, or other methods described herein. The presentation of the challenge questions can be made to integrate with the checkout page presented to the consumer **30**, as described in the embodiment below.

FIG. **8** shows a screen shot of a checkout page **800** used for presenting challenge questions to a consumer according to an embodiment of the present invention. In one embodiment, checkout page **800**, or other type of application page, has a similar layout compared to the checkout page **500**. The items **810-827** may have the same functionality as the corresponding items of checkout page **500**. Option A **825** may also have enhanced functionality.

In one embodiment, embedded software, such as a hidden frame, is included in the checkout page **800** when it is sent to the consumer. This code may be used to initiate the device information collection process. The code may be directly included in the page **800** or a link to the code may be included. An exemplary line of a link to the code sent from the merchant **22** to the access device **34** is <iframe src='http://www.ivisa-.com/zfp_visa/php? Merchid=2000$corrid=123' height=1 width=1 frameborder=0 scrolling=no></iframe>. The device information may be sent at anytime after the page **800** is served to the consumer. For example, it may be immediately after the page is served, i.e. before the Option A **825** is activated. In another embodiment, the device information is sent to the network **26** after the option A **825** is activated, which selects the preferred payment processing network **26**, or payment processing organization (e.g., Visa).

Also, after the option A **825** is chosen, the network-specific frame **830**, which may use an IFrame, is presented to the consumer **30**. The submit payment button **835** has a destination address linked to the payment processing network **26**. After the submit payment button **835** is activated, a challenge question **840** may appear, along with a text box **845** for entering an answer to the challenge question **840**. After any of these buttons or boxes are activated, they may disappear, as signified by the dotted lines. The challenge questions and answers may be used to determine or alter a risk score as defined above. In one embodiment, the incorrect answers may be used to immediately deny the transaction.

The frame **830** may also be used to provide the feedback of whether the transaction is approved or not, e.g., via a box **850**.

The device information may also include information as to the type of browser being used. This information may be used to determine how to provide the frame **830** and the challenge questions. For example, by knowing the browser capabilities, the code may be served in a manner that is easily displayable and functional with the browser of the consumer. For example, different code may be used based on whether or not the access device is using a browser of a mobile phone.

## V. Additional Process Flows

In some embodiments, the organization and processing of the authorization may differ from the embodiments presented above. The payment processing network **26** does not always send an authorization request message to the issuer **28**. For example, after the payment processing network **26** has received the payment information, e.g. in step **404**, or after the payment processing network **26** has finishes the challenge process, e.g. after step **707**, the payment processing network **26** can send some type of payment information to the merchant, a merchant acquirer, or a general use acquirer.

FIG. **9** shows a block diagram for a method **900** illustrating the flow of data during a transaction where a type of payment information is sent to the merchant **22** from the payment processing network **26** according to an embodiment of the present invention. Steps before step **904** may occur as described herein.

In step **904**, payment information is sent from the access device **34** to the payment processing network **26** or other non-merchant entity. The payment processing network **26** may initiate a challenge process with the consumer **30**, continue with a risk analysis, or perform other steps as described herein or known to one skilled in the art. In one embodiment, the payment information includes an account identifier for the account to be used for the transaction.

In step **905**, payment information is sent from the payment processing network **26** (e.g. a server of a non-merchant entity) to the merchant **22**. The payment information may be sent as one type of a funding message that is sent from the payment processing network **26** to the merchant **22**.

In one embodiment, the information sent in this step may include a same account identifier as received in step **904** or it may include a different payment identifier. For example, the payment processing network **26** can create a new or artificial PAN (primary account number) or code from any symbols (possibly at random) and can associate that number with the credit card number received in step **904**. The new number may be of the same size (e.g. # of characters) as the actual PAN.

In this manner, the merchant **22** still does not receive the actual credit card number of the consumer. The new number may also only be associated with the credit card number for a limited time (i.e. temporary), thus preventing that number to be used again. In one embodiment, the new number can have a prefix or other part that signifies that it is not a real card number but an artificial one created for the purpose above.

In step **906**, the merchant **22** sends a first authorization request message to the acquirer **24**. In step **907**, after the acquirer **24** receives the first authorization request message, the first authorization request message is then sent to the payment processing network **26**. At this point, the payment processing network **26** can match the new number with the actual account number of the customer.

In step **907**, the payment processing network **26** then, if necessary, forwards the authorization request message with the account number and amount to the issuer **28** (step **908**). This step is not necessary, e.g., when the payment processing network **26** is also the issuer of the consumer account.

In step **909**, the issuer **28** responds to the authorization request message. For example, the issuer **28** may accept the transaction or decline the transaction, or may refer the transaction. In step **910**, the payment processing network **26** forwards the authorization response to the acquirer **24**, which then forwards the authorization results (step **911**). Finally a receipt may be sent to the consumer (step **912**).

FIG. **10** shows a block diagram for a method **1000** illustrating the flow of data during a transaction where a type of payment information is sent to an acquirer **24** from the payment processing network **26** according to an embodiment of the present invention. Steps before step **1004** may occur as described herein.

In step **1004**, payment information is sent from the access device **34** to the payment processing network **26** or other non-merchant entity. The payment processing network **26** may then perform a challenge process with the consumer **30**, continue with a risk analysis, or perform other steps as described herein or known to one skilled in the art.

In step **1005**, payment information is sent from the payment processing network **26** (e.g. a server of a non-merchant entity) to an acquirer **24**. In one embodiment, the information sent in this step may include a same account identifier as received in step **904** or it may include a different payment identifier as described above. In one embodiment, acquirer **24** may be an acquirer chosen or associated with the merchant **22**, and thus each merchant may have a different acquirer. In another embodiment, the payment processing network **26** may use the same acquirer **24** for all transactions, or at least the same acquirer for a group of merchants.

In step **1006**, the acquirer **24** sends a first authorization request message to the network **26**. At this point, a server computer in the payment processing network **26** can match the new number with the actual account number of the customer.

In step **1007**, the payment processing network **26** then, if necessary, forwards the authorization request message with the account number and amount to the issuer **28** (step **908**). This step is not necessary, e.g., when the payment processing network **26** is also the issuer of the consumer account.

In step **1008**, the issuer **28** responds to the authorization request message. For example, the issuer **28** may accept the transaction or decline the transaction, or may refer the transaction. In step **1009**, the payment processing network **26** forwards the authorization response message to the acquirer **24**, which then responds with the authorization results to the network **26** (step **1010**). In step **1011**, the payment processing network **26** can then send status information to the merchant **22** as in step **407**. Finally a receipt may be sent to the consumer from the merchant **22** (step **1012**). Alternatively, the payment processing network **26** can send the receipt to the consumer **30**, e.g., in parallel with status information sent to the merchant **22**.

## VI. Various Embodiments

As used herein, an "acquirer" is typically a business entity, e.g., a commercial bank that has a business relationship with a particular merchant or an ATM. An "issuer" is typically a business entity (e.g., a bank) which issues a portable consumer device such as a credit or debit card to a consumer. Some entities can perform both issuer and acquirer functions. Embodiments of the invention encompass such single entity issuer-acquirers.

The consumer **30** may be an individual, or an organization such as a business that is capable of purchasing goods or services. In other embodiments, the consumer **30** may simply be a person who wants to conduct some other type of transaction such as a money transfer transaction or a transaction at an ATM.

The portable consumer device **32** may be in any suitable form. For example, suitable portable consumer devices can be hand-held and compact so that they can fit into a consumer's wallet and/or pocket (e.g., pocket-sized). They may include smart cards, ordinary credit or debit cards (with a magnetic strip and without a microprocessor), keychain devices (such as the Speedpass™ commercially available from Exxon-Mobil Corp.), etc. Other examples of portable consumer devices include cellular phones, personal digital assistants (PDAs), pagers, payment cards, security cards, access cards, smart media, transponders, and the like. The portable consumer devices can also be debit devices (e.g., a debit card), credit devices (e.g., a credit card), or stored value devices (e.g., a stored value card).

The access devices **34** according to embodiments of the invention can be in any suitable form. Examples of access devices include point of sale (POS) devices, cellular phones, PDAs, personal computers (PCs), tablet PCs, handheld specialized readers, set-top boxes, electronic cash registers (ECRs), automated teller machines (ATMs), virtual cash registers (VCRs), kiosks, security systems, access systems, and the like.

If the access device **34** is a point of sale terminal, any suitable point of sale terminal may be used including card readers. The card readers may include any suitable contact or contactless mode of operation. For example, exemplary card readers can include RF (radio frequency) antennas, magnetic stripe readers, etc. to interact with the portable consumer devices **32**.

The access device **34** may also be a wireless phone. In one embodiment, the portable consumer device **32** and the access device are the same device. For example, a consumer may use a wireless to phone to select items to buy through a browser.

When the access device **34** is a personal computer, the interaction of the portable consumer devices **32** may be achieved via the consumer **30** or another person entering the credit card information into an application (e.g. a browser) that was opened to purchase goods or services and that connects to a server of the merchant, e.g. through a web site. In one embodiment, the personal computer may be at a checkout stand of a retail store of the merchant, and the application may already be connected to the merchant server.

An exemplary portable consumer device **32'** in the form of a phone may comprise a computer readable medium and a body as shown in FIG. **2**. (FIG. **2** shows a number of components, and the portable consumer devices according to embodiments of the invention may comprise any suitable combination or subset of such components.) The computer readable medium **32**(*b*) may be present within the body **32**(*h*), or may be detachable from it. The body **32**(*h*) may be in the form a plastic substrate, housing, or other structure. The computer readable medium **32**(*b*) may be a memory that stores data and may be in any suitable form including a magnetic stripe, a memory chip, etc. The memory preferably stores information such as financial information, transit information (e.g., as in a subway or train pass), access information (e.g., as in access badges), etc. Financial information may include information such as bank account information, bank identification number (BIN), credit or debit card number information, account balance information, expiration date, consumer information such as name, date of birth, etc. Any of this information may be transmitted by the portable consumer device **32**.

Information in the memory may also be in the form of data tracks that are traditionally associated with credits cards. Such tracks include Track **1** and Track **2**. Track **1** ("International Air Transport Association") stores more information than Track **2**, and contains the cardholder's name as well as account number and other discretionary data. This track is sometimes used by the airlines when securing reservations with a credit card. Track **2** ("American Banking Association") is currently most commonly used. This is the track that is read by ATMs and credit card checkers. The ABA (American Banking Association) designed the specifications of this track and all world banks must abide by it. It contains the cardholder's account, encrypted PIN data, plus other discretionary data.

The portable consumer device **32** may further include a contactless element **32**(*g*), which is typically implemented in the form of a semiconductor chip (or other data storage element) with an associated wireless transfer (e.g., data transmission) element, such as an antenna. Contactless element **32**(*g*) is associated with (e.g., embedded within) portable consumer device **32** and data or control instructions transmitted via a cellular network may be applied to contactless element **32**(*g*) by means of a contactless element interface (not shown). The contactless element interface functions to permit the exchange of data and/or control instructions between the mobile device circuitry (and hence the cellular network) and an optional contactless element **32**(*g*).

Contactless element **32**(*g*) is capable of transferring and receiving data using a near field communications ("NFC") capability (or near field communications medium) typically in accordance with a standardized protocol or data transfer mechanism (e.g., ISO 14443/NFC). Near field communications capability is a short-range communications capability, such as RFID, Bluetooth™, infra-red, or other data transfer capability that can be used to exchange data between the portable consumer device **32** and an interrogation device. Thus, the portable consumer device **32** is capable of communicating and transferring data and/or control instructions via both cellular network and near field communications capability.

The portable consumer device **32** may also include a processor **32**(*c*) (e.g., a microprocessor) for processing the functions of the portable consumer device **32** and a display **32**(*d*) to allow a consumer to see phone numbers and other information and messages. The portable consumer device **32** may further include input elements **32**(*e*) to allow a consumer to input information into the device, a speaker **32**(*f*) to allow the consumer to hear voice communication, music, etc., and a microphone **32**(*i*) to allow the consumer to transmit her voice through the portable consumer device **32**. The portable consumer device **32** may also include an antenna **32**(*a*) for wireless data transfer (e.g., data transmission).

If the portable consumer device is in the form of a debit, credit, or smartcard, the portable consumer device may also optionally have features such as magnetic strips. Such devices can operate in either a contact or contactless mode.

An example of a portable consumer device **32"** in the form of a card is shown in FIG. **3**. FIG. **3** shows a plastic substrate **32**(*m*). A contactless element **32**(*o*) for interfacing with an access device **34** may be present on or embedded within the plastic substrate **32**(*m*). Consumer information **32**(*p*) such as an account number, expiration date, and consumer name may be printed or embossed on the card. Also, a magnetic stripe **32**(*n*) may also be on the plastic substrate **32**(*m*).

As shown in FIG. **3**, the portable consumer device **32"** may include both a magnetic stripe **32**(*n*) and a contactless element **32**(*o*). In other embodiments, both the magnetic stripe **32**(*n*) and the contactless element **32**(*o*) may be in the portable consumer device **32"**. In other embodiments, either the magnetic stripe **32**(*n*) or the contactless element **32**(*o*) may be present in the portable consumer device **32"**.

The payment processing network **26** may include data processing subsystems, networks, and operations used to support and deliver authorization services, exception file services, and clearing and settlement services. An exemplary payment processing network may include VisaNet™. Payment processing networks such as VisaNet™ are able to process credit card transactions, debit card transactions, and other types of commercial transactions. VisaNet™, in particular, includes a VIP system (Visa Integrated Payments system) which processes authorization requests and a Base II system which performs clearing and settlement services.

The payment processing network **26** may include a server computer. A server computer is typically a powerful computer or cluster of computers. For example, the server computer can be a large mainframe, a minicomputer cluster, or a group of servers functioning as a unit. In one example, the server computer may be a database server coupled to a Web server. The payment processing network **26** may use any suitable wired or wireless network, including the Internet.

The issuer **28** may be a bank or other organization that may have an account associated with the consumer **30**. The issuer **28** may operate a server which may have a challenge question engine. A transaction history database and a challenge question database may be in communication with a server of issuer **28**. The issuer server, challenge question engine, transaction history database, and challenge question database may operate in the same way or a different way than the payment processing network server **26**(*a*), challenge question engine **26**(*a*)-**1**, transaction history database **26**(*b*), and challenge question database **26**(*c*).

Embodiments of the invention are not limited to the above-described embodiments. For example, although separate functional blocks are shown for an issuer, payment processing network, and acquirer, some entities perform all or any suitable combination of these functions and may be included in embodiments of invention. Additional components may also be included in embodiments of the invention.

## VII. Computer Apparatus

FIG. **11** shows typical components or subsystems of a computer apparatus. Such components or any subset of such components may be present in various components shown in FIG. **1**, including the access device **34**, server computers **26**(*a*), **28**(*a*), etc. The subsystems shown in FIG. **11** are interconnected via a system bus **1175**. Additional subsystems such as a printer **1174**, keyboard **1178**, fixed disk **1179**, monitor **1176**, which is coupled to display adapter **1182**, and others are shown. Peripherals and input/output (I/O) devices, which couple to I/O controller **1171**, can be connected to the computer system by any number of means known in the art, such as serial port **1177**. For example, serial port **1177** or external interface **1181** can be used to connect the computer apparatus to a wide area network such as the Internet, a mouse input device, or a scanner. The interconnection via system bus **1175** allows the central processor **1173** to communicate with each subsystem and to control the execution of instructions from system memory **1172** or the fixed disk **1179**, as well as the exchange of information between subsystems. The system memory **1172** and/or the fixed disk **1179** may embody a computer readable medium.

Embodiments of the invention provide for a number of advantages. For example, the number of entities that know a credit card number can be kept at a minimum. Also, the amount of changes that a merchant needs to perform are minimal, such as simply placing one or more IFrames into a checkout page. Also, transaction information, such as device info, amount of the transaction, and the subject items of the transaction can be provided to the network **26**, so that the network **26** can, for example, get a head start on a risk analysis and also to determine whether or not to present challenge questions. The challenge questions can also be more complex since an authorization request need not sent until after the challenge questions have been answered and no more questions are deemed necessary.

The specific details of the specific aspects of the present invention may be combined in any suitable manner without departing from the spirit and scope of embodiments of the invention. However, other embodiments of the invention may be directed to specific embodiments relating to each individual aspects, or specific combinations of these individual aspects.

It should be understood that the present invention as described above can be implemented in the form of control logic using computer software in a modular or integrated manner. Based on the disclosure and teachings provided herein, a person of ordinary skill in the art will know and appreciate other ways and/or methods to implement the present invention using hardware and a combination of hardware and software

Any of the software components or functions described in this application, may be implemented as software code to be executed by a processor using any suitable computer language such as, for example, Java, C++ or Perl using, for example, conventional or object-oriented techniques. Computer programs incorporating features of the present invention may be encoded on various computer readable media for storage and/or transmission; suitable media include magnetic disk or tape, optical storage media such as compact disk (CD) or DVD (digital versatile disk), flash memory, and the like. The computer readable medium may be any combination of such storage or transmission devices.

Such programs may also be encoded and transmitted using carrier signals adapted for transmission via wired, optical, and/or wireless networks conforming to a variety of protocols, including the Internet. As such, a computer readable medium according to an embodiment of the present invention may be created using a data signal encoded with such programs. Computer readable media encoded with the program code may be packaged with a compatible device or provided separately from other devices (e.g., via Internet download). Any such computer readable medium may reside on or within a single computer program product (e.g. a hard drive or an entire computer system), and may be present on or within different computer program products within a system or network.

The above description is illustrative and is not restrictive. Many variations of the invention will become apparent to those skilled in the art upon review of the disclosure. The scope of the invention should, therefore, be determined not with reference to the above description, but instead should be determined with reference to the pending claims along with their full scope or equivalents.

A recitation of "a", "an" or "the" is intended to mean "one or more" unless specifically indicated to the contrary.

All patents, patent applications, publications, and descriptions mentioned above are herein incorporated by reference in their entirety for all purposes. None is admitted to be prior art.

What is claimed is:

**1**. A method for requesting authorization of a transaction between a consumer and a merchant, the method comprising:

providing, to a server of the merchant by the consumer, a checkout request to initiate a transaction;

receiving, from the merchant server by an access device used by the consumer, a first code for displaying an application page containing a payment object directed to a server of a non-merchant entity;

receiving a selection of the payment object; and

sending, to a server of the non-merchant entity, a consumer message from the access device, wherein the consumer message includes:

account information of an account of the consumer to be used for the transaction; and

a transaction identifier corresponding to the transaction.

**2**. The method of claim **1**, wherein the payment object is a submit payment element.

**3**. The method of claim **2**, further comprising:

displaying an application page containing a plurality of payment mechanism options for the transaction, wherein a first subset of the payment mechanism options includes one or more first payment mechanisms; and

receiving a selection of one of the first payment mechanisms, wherein when a first payment mechanism is selected, a destination address of the payment object on the application page is the non-merchant server.

**4**. The method of claim **3**, wherein when a payment mechanism not in the first subset is selected, a destination address of a submit payment element on the application page is the merchant server.

**5**. The method of claim **2**, further comprising:

determining, via the first code, whether to change the destination of the submit payment element based on the selection of a payment mechanism.

**6**. The method of claim **1**, wherein the payment object is a payment mechanism option.

**7**. The method of claim **6**, further comprising:

when the payment mechanism option is activated, sending, from the access device to the non-merchant server, a transaction message including transaction information.

**8**. The method of claim **7**, wherein the checkout request includes one or more items to be purchased in the transaction, and wherein the transaction message includes the items and an amount of the transaction.

**9**. The method of claim **6**, wherein the payment mechanism option is directed to the non-merchant server via a link, the method further comprising:

using the link to retrieve code to display a submit payment element with the destination address directed to the non-merchant server.

**10**. The method of claim **9**, wherein the link is an IFrame.

**11**. The method of claim **1**, wherein the consumer is not required to enroll in a program or service or to have been previously enrolled in a program or service before sending the consumer message.

**12**. A computer program product comprising a non-transitory computer readable medium storing a plurality of instructions that when executed by one or more processors direct the one or more processors to perform an operation for conducting a transaction between a consumer and a merchant, the instructions comprising:

providing, to a server of the merchant by the consumer, a checkout request to initiate a transaction;

receiving, from the merchant server by an access device used by the consumer, a first code for displaying an application page containing a payment object directed to a server of a non-merchant entity;

receiving a selection of the payment object; and

sending, to a server of the non-merchant entity, a consumer message from the access device, wherein the consumer message includes:

account information of an account of the consumer to be used for the transaction; and

a transaction identifier corresponding to the transaction.

**13**. A system for conducting a transaction between a consumer and a merchant, the system comprising:

a server having an external interface, wherein the server is associated with the merchant;

one or more processors; and

one or more memory devices containing instructions for directing the one or more processors to perform steps comprising:

providing, to a server of the merchant by the consumer, a checkout request to initiate a transaction;

receiving, from the merchant server by an access device used by the consumer, a first code for displaying an application page containing a payment object directed to a server of a non-merchant entity;

receiving a selection of the payment object; and

sending, to a server of the non-merchant entity, a consumer message from the access device, wherein the consumer message includes:

account information of an account of the consumer to be used for the transaction; and

a transaction identifier corresponding to the transaction.

**14**. A method for conducting a transaction between a consumer and a merchant, the method comprising:

receiving, at a server of the merchant from an access device used by the consumer, a checkout request to initiate a transaction;

providing, from the merchant server to the access device, a first code for displaying an application page containing a payment object directed to a server of a non-merchant entity,

wherein after activation of the payment object a consumer message is sent from the access device to the non-merchant server,

wherein the consumer message includes:

account information of an account of the consumer to be used for the transaction; and

a transaction identifier corresponding to the transaction.

**15**. The method of claim **14**, wherein the payment object is a submit payment element.

**16**. The method of claim **15**, further comprising:

providing, from the merchant server to the access device, a second code for displaying an application page containing a plurality of payment mechanism options for the transaction, wherein a first subset of the payment mechanism options includes one or more first payment mechanisms,

wherein when one of the first payment mechanisms is selected, a destination address of the submit payment element on the application page is a server not operated by the merchant.

**17**. The method of claim **15**, wherein the first code determines whether to change the destination of the submit payment element based on the selection of a payment mechanism.

**18**. The method of claim **14**, wherein the payment object is a payment mechanism option.

**19**. The method of claim **18**, further comprising:

receiving, at the merchant server from the access device, a selection of one of the payment mechanism option; and

sending a link to the access device such that code is served from the non-merchant server to display a submit payment element with the destination address directed to the non-merchant server.

**20**. The method of claim **19**, wherein the link is an IFrame.

**21**. The method of claim **18**, wherein activation of the payment mechanism option sends, from the access device to the non-merchant server, a transaction message including transaction information.

**22**. The method of claim **21**, wherein the checkout request includes one or more items to be purchased in the transaction, and wherein the transaction message includes the items and an amount of the transaction.

**23**. The method of claim **14**, further comprising:

creating, at the merchant server, a transaction identifier corresponding to the transaction;

sending, from the merchant server to the access device, the transaction identifier; and

receiving, at the merchant server from the non-merchant server, a response message regarding the transaction, wherein the response message includes the transaction identifier.

**24**. The method of claim **23**, wherein the account information includes an account identifier, and wherein the response message includes a payment identifier associated with the account of the consumer, further comprising:

sending, from the merchant server, an authorization request using the payment identifier received from the non-merchant server,

wherein the payment identifier is not the account identifier, and wherein only the non-merchant server knows the association between the payment identifier and the account identifier.

**25**. A computer program product comprising a non-transitory computer readable medium storing a plurality of instructions that when executed by one or more processors direct the one or more processors to perform an operation for conducting a transaction between a consumer and a merchant, the instructions comprising:

receiving, at a server of the merchant from an access device used by the consumer, a checkout request to initiate a transaction;

providing, from the merchant server to the access device, a first code for displaying an application page containing a payment object directed to a server of a non-merchant entity,

wherein after activation of the payment object a consumer message is sent from the access device to the non-merchant server,

wherein the consumer message includes:

account information of an account of the consumer to be used for the transaction; and

a transaction identifier corresponding to the transaction.

**26**. A system for conducting a transaction between a consumer and a merchant, the system comprising:

a server having an external interface, wherein the server is associated with the merchant;

one or more processors; and

one or more memory devices containing instructions for directing the one or more processors to perform steps comprising:

receiving, at a server of the merchant from an access device used by the consumer, a checkout request to initiate a transaction;

providing, from the merchant server to the access device, a first code for displaying an application page containing a payment object directed to a server of a non-merchant entity,

wherein after activation of the payment object a consumer message is sent from the access device to the non-merchant server,

wherein the consumer message includes:

account information of an account of the consumer to be used for the transaction; and

a transaction identifier corresponding to the transaction.

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