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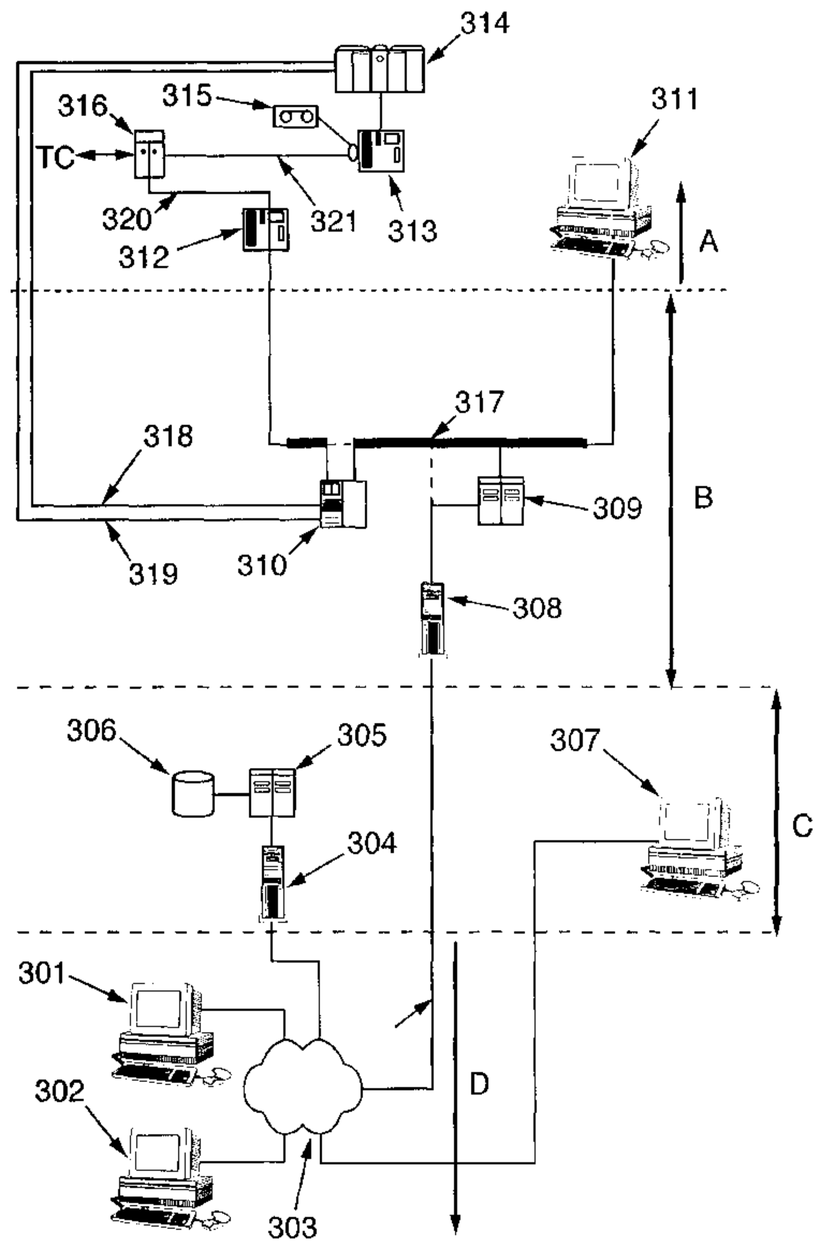
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(54) Titre : INTERFACE ORDINATEUR VERS SYSTEME DE REPONSE VOCALE INTERACTIF
(54) Title: COMPUTER INTERFACE TO TELEPHONE INTERACTIVE VOICE RESPONSE SYSTEM



(57) Abrégé/Abstract:
Gaming systems for remote interaction with a patron on a secondary interactive communications network such as the internet and interactive television are provided. Interactive voices response telephone systems provide a set of voice-like control messages and multi-frequency tonal command messages to complete a patron transaction in conjunction with a main data processing and management facility. A gaming gateway obtains data messages equivalent to said control messages and interacts with said patron by real time data to assemble a fully detailed gaming transaction for submission through interactive voice response telephone systems.

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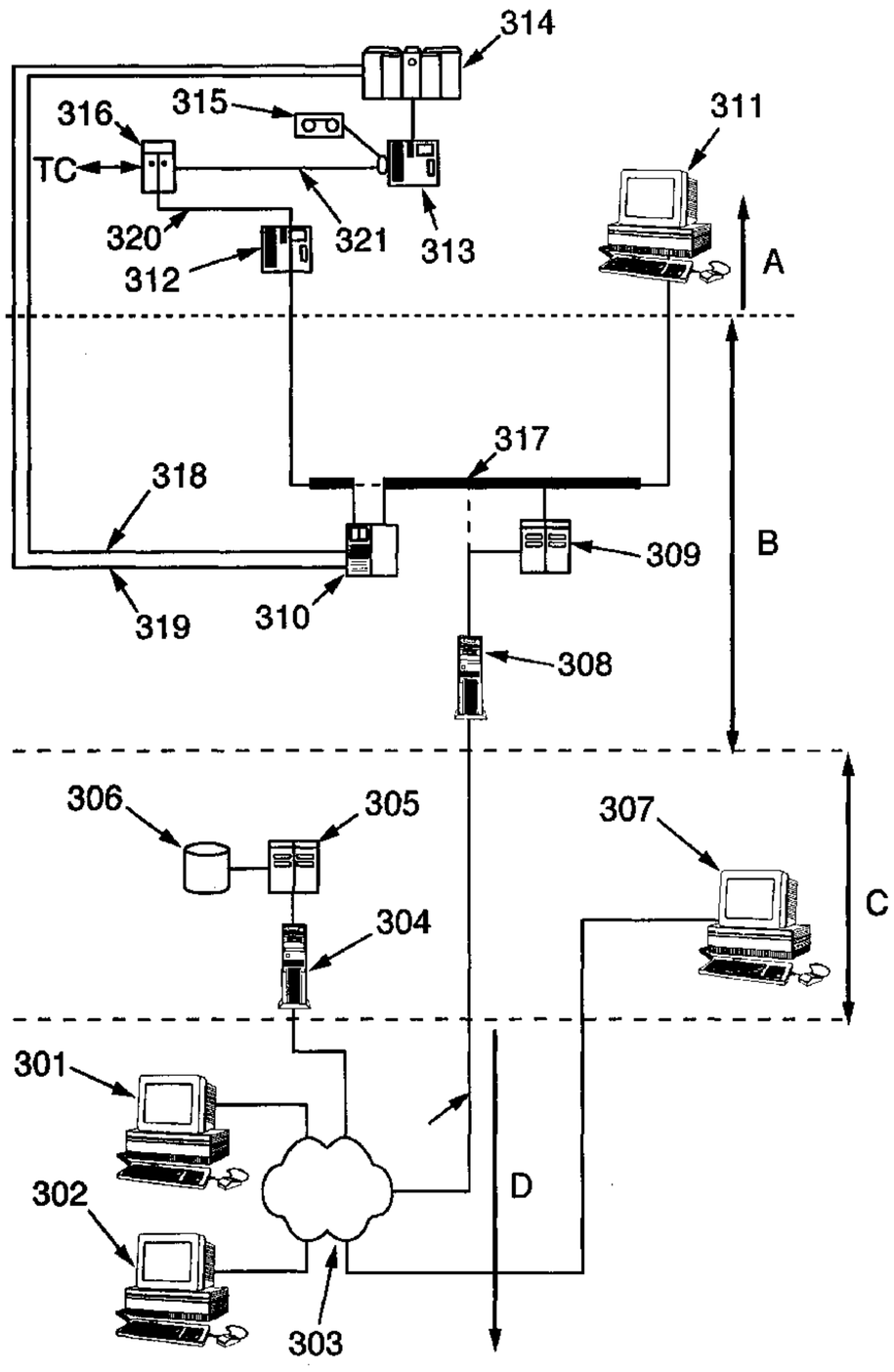
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(54) Title: COMPUTER INTERFACE TO TELEPHONE INTERACTIVE VOICE RESPONSE SYSTEM



(57) Abstract: Gaming systems for remote interaction with a patron on a secondary interactive communications network such as the internet and interactive television are provided. Interactive voices response telephone systems provide a set of voice-like control messages and multi-frequency tonal command messages to complete a patron transaction in conjunction with a main data processing and management facility. A gaming gateway obtains data messages equivalent to said control messages and interacts with said patron by real time data to assemble a fully detailed gaming transaction for submission through interactive voice response telephone systems.

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COMPUTER INTERFACE

TO TELEPHONE INTERACTIVE VOICE RESPONSE SYSTEM

BACKGROUND OF THE INVENTION

I. FIELD OF THE INVENTION

The present invention relates generally to telephone interactive voice response (herein IVR) systems. Particularly, the present invention relates additions to IVR systems and use of resulting signals to convert computer commands to tones, particularly multi-frequency tones such as MF and DTMF tones, and consumer interaction for gaming, namely wagering and lotteries.

II. DESCRIPTION OF THE PRIOR ART

Interactive voice response gaming systems operate by the consumer first calling a telephone number for the system and call opens a telephone connection with the system. The system replies with a menu of options that is presented to the consumer as an outgoing message of fixed audio pattern in voice form. The consumer then has the option of replying by means of a choice of numbers on the telephone's keypad that is to select the option the consumer desires. When the consumer depresses a number, the telephone transmits a message tone, most commonly a DTMF tone, to the system for processing.

When the system receives an appropriate incoming message as a DTMF tone, it uses the tone's frequencies to determine what number the consumer depressed and, therefore, what option the consumer desires. Further options or results are then presented in the same form until the transaction is completed at which point the call is terminated.

Interactive response systems such as these can be used, for example, in racetrack betting where the consumer calls the track's wagering system to purchase a bet. The wagering system presents the options available for wagers. The consumer depresses the keypad number associated with that particular option. The wagering system then presents the horses

and types of bets available. The consumer again responds with a number for his/her selection.

The drawback to the interactive voice response system is that the feedback to the consumer is limited to fixed voice messages from the system and numeric responses from the consumer. This type of system can be cryptic and hard for a consumer to understand without using it multiple times. It is also slow, equipment intensive, cumbersome, difficult to adapt and isolated from other sources of valuable information which the consumer may need or want to have associated with the large number of choices being made.

In order to improve on speed and information presentation using computers it is currently necessary to replace very expensive legacy equipment including legacy IVR systems and purchase of additional expensive equipment. This would also involve substantial changes in business processes and proven business activities based upon such legacy technology.

Early attempts at providing a solution for IVR communicating to users computers have not been based upon existing legacy systems but rather to address point to point communications with the user and requiring compatible modems with voice switches.

Others required that racing and other data be broadcast and then manipulated and displayed on a user terminal again requiring new equipment and multiple systems. Alternatively, such attempts required the addition of new dedicated data equipment and special systems, configurations and designs to operate same in conjunction with legacy systems.

The objective of this new system is to put into place the technical architecture which will allow Patrons the capability to build wagers and other complete transactions on a number of appliances including the PC, television and wireless screen phones using legacy equipment with full access to other sources of information and then purchase or transact using legacy systems.

III. OBJECTS OF THE INVENTION

There is a resulting unforeseen need for a system that can display graphical interfaces to the consumer while also interfacing with existing interactive voice response systems including associated recorders and processes for audit and dispute resolution purposes, .in a high

speed and broadly available manner, particularly where large numbers of options are available.

It is an object of the invention to maximize utility of legacy tested systems with little or no intervention by interfacing directly at high speed.

It is a further object of the invention to provide the user with a greatly expanded amount of contemporaneous information in conjunction with use of such legacy systems and a wider variety of choices within existing approved regimes and auditing procedures.

The objective of the invention system is to put into place the technical architecture which will allow Patrons the capability to build wagers and other complete transactions on a number of appliances including the PC, television and wireless screen phones using legacy equipment with full access to other sources of information and then purchase or transact using legacy systems.

SUMMARY OF THE INVENTION

The invention provides a gaming system for remote interaction with a patron on a secondary interactive communications network such as the internet and interactive television including

a first interactive voice response telephone system providing a set of voice-like control messages and capacity to receive multi-frequency tonal command messages to complete a patron transaction in conjunction with a main data processing and management facility and

a gaming gateway with means to access real time data directly from said main data facility, means to obtain data messages equivalent to said control messages and to provide said data messages to said patron on a user communications terminal, means to access real time data provided by said patron on said user communications terminal, and means to interact with said patron real time data to assemble a fully detailed current gaming transaction,

a second interactive voice response telephone system including means to interact

with said gaming gateway and said first interactive voice response system by means of a standard telephonic connection,

means to cause opening of a said telephonic connection between the said first and said second of said interactive voice response systems, and,

means to submit said completed transaction from said gaming gateway to said data management facility by way of said command and control messages.

In other embodiments, the present invention provides for tonal command messages to and from a telephone system to complete a patron transaction by means of standard telephonic connections and telephone calls.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 shows a flowchart of a process for interfacing a computer/PDA to an IVR system.

FIG. 2 shows a diagram of a PC to IVR racetrack wagering system of the present invention showing information flow.

FIG. 3 shows another embodiment of a PC to IVR racetrack wagering system of the present invention showing information flow.

FIG. 4 shows the tonal addition to a typical outgoing voice-like message of the preferred embodiment.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Prior art telephone wagering systems allow patrons to telephone into the racetrack and then using the telephone keypad to respond to a menu of voice prompts, thereby building and placing the wager.

The preferred embodiment system creates a set of pages on a user terminal such as a PC, TV or screen phone which is operationally equivalent to the IVR outgoing voice message menu and then the system uses the information from the data submitted by the patron to create telephone tones which are then used to execute the transaction into the existing IVR.

Unlike prior art systems the preferred embodiment does not download the data, manipulate it and then create a display within the client terminal. Instead a page is downloaded from a website and displayed on a user terminal.

FIG. 2 illustrates the preferred embodiment of a personal computer (PC) noted as 301 and 302 to legacy IVR 313 system of the present invention in connection with racetrack wagering

User computers (PCs) 301 and 302 access a racetrack information web server 305 over the Internet 303 in a known manner. A firewall 304 at the web server's site is used for security purposes.

Alternatively, any internet capable device can be used such as Personal Digital Assistants, cellular or PCS telephones that are Wireless Access Protocol (WAP) enabled.

A Totalizator or Tote is a special type of wagering computer which is suited to deal with pari-mutuel wagering. Web Tote 306 contains the main database of real time race information, track information, jockey information, horse information, advertisements, web pages, wagering information and all other information required to make a wager which information is available to the user at PC 301 through servers 305 and 306 and firewall 304 on the internet or web 303.

The racetrack information web server 305 operates continuously and provides the current data from the web tote 306 and also the contractual provisions for the use of the wagering system on server 305 or alternatively web sever 309. Upon request web tote 305 will then redirect the patron's browser on PC 301 to a secure site Telephone Account Betting TAB web server 309 operated by a racetrack and requiring, preferably, X509 certificates or equivalent.

A PC 307 can be used, also through the internet, to provide maintenance and support on the racetrack information server 306. This includes adding web pages and updating web pages and deleting web pages.

Remote Maintenance and support may be provided by using standard remote control software.

After the patron downloads web pages from the TAB web server 309 and the patron makes his/her selections of bets/races/tracks/ through the firewall 308.

The Wagering Gateway server 310 is located in a secured environment represented by area B in Figure 2 and is connected to a separate secure local area network LAN 317 depicted in dashed and solid line representation.

The Wagering Gateway 310 is connected to the existing racetrack main computer database, maintained on Tote 314, at line 318 preferably via two dedicated data ports for all current information such as Track/Race Odds and Pool data and transaction details.

The Wagering Gateway 310 is also connected to the existing Tote 314 via other lines 319, preferably a third dedicated data ports, for Patron validation and account balance information.

TAB Web Server 309 is also located in the secure environment A and is connected to the separate secure LAN 317. This LAN 317 may, alternatively, be physically connected to the internet via the Racetrack's secure environment firewall 308, not shown.

At the racetrack, the Manual Entry and Tote IVR Tone Insertion system 311 of the preferred embodiment is located in the Racetrack's call center and is used for two purposes. Firstly, in accordance with the invention it generates the required multi-frequency tones which act as control messages for addition to the outgoing Voice Messages used in the racetrack IVR 313. Preferably these are separate from and prior to said voice messages in time sequence. Preferably these control messages are fixed waveform audio tones.

Analog IVR 312 can then detect certain specified of the said Tote IVR 313 control messages quickly and simply.

Secondly call center staff may enter and change the available simulcast Tracks and Race information for the daily racing schedule.

Approved patrons who are registered and have set up an account within the Racetrack's Telephone Account Betting (TAB) system by other means can purchase wagers in the known manner by a telephone call, TC in Figures 2 and 3, to the Racetrack's Interactive Voice Response (IVR) system 313through a typical PBX telephone system 316 and then IVR 313. During the telephone call TC, the Patrons make entries via their telephone keypad by following the voice prompt menu. Currently Patrons can also, but only separately, obtain up-to-the-minute odds, pools, schedules, entries, results and racing information from the Racetrack's web server 305 on PCs 301, 302 or equivalent devices.

Figure 4 depicts elapsed time C versus amplitude D of the outgoing control messages at IVR 313. Figure 4 shows the typical fixed waveform multi-frequency tonal control message of the preferred embodiment with tonal initial portions A and legacy voice-like second portion B. Upon telephonic connection between analog IVR 312 and tote IVR 313, analog IVR 312 will quickly recognize tonal portion A while ignoring the second portion B. Correspondingly, tote IVR 313 will be responsive to telephonic input almost immediately upon commencement of the delivery of the outgoing audio control message often even during the said initial portion A.

Preferably the telephonic connection between analog IVR 312 and IVR 313 occurs through the medium of existing telephone PBX-type system 316 on lines 320 and 321 to further advantage the use of priorities available for phone line and other usage in such systems as shown in Figure 2.

Alternatively, as shown in Figure 3 analog IVR 312 and IVR 313 may connect using a dedicated telephonic line directly between them 220. Thus, PBX system would continue to use telephone lines 321.

The system of the preferred embodiment interfaces analog IVR 312 into the existing Racetrack Tote 314and Tote IVR 313 systems.

Analog IVR 312 then converts said tonal control messages to computer messages for high speed processing between the wagering gateway 310 and the user PC 301 through Lan 317 and tab web server 309.

Analog IVR 312 may then receive computer messages from the wagering gateway 310 and convert same to tonal command responses which are thence provided to tote IVR 313 by telephonic connection lines 320 and 321.

Thus, action and response between tote IVR 313 and the analog IVR 312 of the preferred embodiment is greatly speeded up by ignoring voice-like messages and utilizing use of available IVR response times without waiting.

The Patron at PC 301 will initially connect to the current Racetrack website, for instance, at server 305 which will have an additional button added "To Access TAB Account". This button will then display a lead in page in the frame to the right. Alternatively, this may be provided directly from server 309. Once the patron accepts the terms and conditions he/she is redirected

to the TAB Web Server 309 physically at the Racetrack. Access to the TAB Web Server 309 preferably requires i. authentication of the Patron's PC digital Identification certificate and ii. The Patrons PC browser must have at least a 128 bit Secure Socket Layer (SSL) support for communications to be established.

The following basic steps detail how the Patron and system of the preferred embodiment interact after authentication and a secure communications link is established between the patron at PC 301 and the wagering gateway 310 through server 309 and are illustrated in the flowchart of FIG. 1 where numbers correspond to the steps taken:

A) Patron enters an account number and Personal Identification Number

B) wagering gateway 310 and tote 314 interact to validate the account number and pin as at:

B1 which provides access or

B2 which refuses access

C) wagering gateway 310 and tote 314 interact to return current account balance to the patron

D) Interacting with the wagering gateway 310 Patron selects to place a wager

E) A page of currently available tracks for wagering into the Tote IVR 313 is displayed

F) Patron selects which track.

G) A page of current races and wager types is displayed.

H) Patron selects race and wager type.

I) Patron is asked for a wager amount.

J) The specific requested wager type page is displayed with the runners and odds.

K) The Patron selects the runners and presses the "SUBMIT" button.

L) The wager request is submitted by the wagering gateway 310 to the Tote 314 for validation by means of IVRs 312 and 313.

M) The wager is validated by interaction between the gateway 310 and the Tote 314 directly.

N) The validated wager is purchased.

O) Accounts are updated.

P) The Patron's PC 301 is redirected to an error page or presents a wager confirmation or cancel page

Physical Layout

The physical layout of the systems will be divided into four areas as shown in Figure 2:

A. Existing at the Racetrack which also shows the analog IVR 312 of the preferred embodiment.

B. New in the racetrack's secure facility, (I.S. Machine Room)

C. Off site 3rd parties

D. Patrons terminal

Racetrack's physical legacy systems include:

1. the Tote system 314 provided for all Racetrack wagering activities and account management.

2. the Tote IVR system 313 connects to the Tote 314 via dedicated data ports using a digital IVR Protocol.

3. the Tote IVR system 313 connects to the Racetrack's PBX 316 via internal telephonic lines 321 and may preferably have certain hunting groups assigned within the Racetrack's PBX 316.

4. the Tote IVR Tape Recorder 315 is connected to the internal lines for recording all Patron keypad DTMF message activity.

The preferred embodiment adds several new systems to the Racetrack's technical configuration, namely: The analog IVR system 312 which communicates to the Tote 314 via the Tote IVR 313 thereby still allowing the tape-recording 315 of all message activity and use of legacy proven equipment and processes. The analog IVR system 312 is also connected on separate secure LAN 317 to the Wagering Gateway 310.

Patrons System

The Patron's PC user terminals include internet browsers available. In the preferred embodiment, the browser is required to have 128-bit Secure Socket Layer (SSL) support. The

Racetrack will decide and authorize the issuance of a digital Identification client certificate to the Patron's PC browser. This certificate is downloaded by the Patron into their PC from the Trusted third party web site, using a password issued by the Racetracks call center.

Protocols

Serial Data Protocols from the Tote system 314 will be used to obtain current race information. This line 318 is connected to the Wagering Gateway system 310.

The Interactive Voice Response Protocol on dedicated line 319 will be used to:

- validate patron account and PIN number
- obtain current patron account balance before and after each wager

This protocol is also used by the existing Tote IVR system 313 for the current Telephone Account Betting (TAB).

Certificates and Secure Socket Layer Security

The TAB Web Server 309 will have a Server Digital Certificate and will be used with a client side digital ID certificate with 128 bit SSL communications.

Lead Page Processing

The existing Racetrack site provided by web server 305 will be modified to include a button "To Access TAB Account". Alternatively, portions of this can be on a web server 309.

Prior to entering the site's secure pages to access the user's account and build the wager, the user terminal lead page displays;

i.) The race track's terms and conditions for the use of the site plus legal notices.

ii.) A statement about the users browser requirements to communicate with the secure site's pages.

iii.) An acceptance box for the user to acknowledge and accept the race track's provisions in order to enter the secure portion of the site.

iv.) Hyperlinks to obtain browser additions to meet the browser requirements.

TAB Web Server

The Tab Web Server 309 will receive the patron's queries and send back the results as pages. The system will follow the same basic sequence as the current TAB system. The TAB Web server 309 will communicate over a propriety protocol with the Wagering Gateway 310 for race information, development of a wagering ticket and placement of the wager.

Wagering Gateway

The Wagering Gateway 310 includes four types of modules which communicate with the dedicated digital IVR ports on tote 314 by lines 318 and 319 to provide user account balances and user authenticity and with analog IVR 312 and LAN 317 for processing data.

IVR Server

This analog IVR system 312 provides the telephone call setup and analog tone signaling call via the Tote IVR 313 to the Tote 314 for submitting and confirming wagers. It receives control messages and sends command messages corresponding to completed wager transactions or tickets. The system preferably supports from many analog lines into the Tote IVR 313. Once the IVR 312 has one or more valid connections to the Tote IVR 313 it will poll the Wagering Gateway 310 for a Patron wager.

The system preferably has an active status window and will log Patron transactions to log files.

Administration Manual Entry

The manual entry system 311 is preferably located in the call center and connected to the wagering LAN 317. The system 311 is to be used to manually enter the Track and Race information into the Wagering Gateway prior to the daily racing schedule. Also, the system is to allow for late scratches and runner changes.

Tone Insertion into IVR Prompts

The manual entry system 311 generates fixed waveform or tonal, preferably MF tonal, messages to be recorded in conjunction with selected speech prompts and loaded into the Tote IVR 313. These prompts are then used to provide prompts to individual telephone callers and the wagering system of the preferred embodiment alike.

It will be understood by those skilled in the art that the foregoing represents merely sample embodiments of the invention and that modifications and alternative implementations are possible without departing from the scope of the present invention.

I claim:

1) A gaming system for remote interaction with a patron over a secondary interactive communications network including a first interactive voice response telephone system providing a set of voice-like control messages and capacity to receive multi-frequency tonal command messages to complete a patron transaction in conjunction with a main data processing and management facility comprising:

a) a gaming gateway including,

i) means to access real time data directly from said main data facility,

ii) means to obtain data messages equivalent to said control messages and to provide said data messages to said patron on a user communications terminal,

iii) means to access real time data provided by said patron on said user communications terminal,

iv) means to interact with said patron real time data to assemble a fully detailed current gaming transaction,

b) a second interactive voice response telephone system including means to interact with said gaming gateway and said first interactive voice response system by means of a standard telephonic connection,

c) means to cause opening of a said telephonic connection between the said first and said second of said interactive voice response systems, and,

d) means to submit said completed transaction from said gaming gateway to said data management facility by way of said command and control messages.

2) A gaming system as claimed in claim 1 further comprising:

a) means to provide said control messages with substantially fixed early portions,

b) wherein said means to submit comprises means to recognize said early portions of said control messages.

3) A gaming system as claimed in claim 2 wherein said means to recognize includes means to ignore the remainder of said control messages after said early portions.

4) A gaming system as claimed in claim 3 wherein said means to submit further comprises means to deliver said command messages through said second interactive voice response system to said first interactive voice response system.

5) A gaming system as claimed in claim 4 wherein said early portions comprise multi-frequency tones.

6) A gaming system as claimed in claim 5 wherein said early portions comprise multi-frequency tones of a type which does not interfere with said capacity to receive.

7) A gaming system as claimed in claim 6 wherein said command messages are dual-tone multi-frequency tones.

8) A gaming system for remote interaction with a patron over a secondary interactive

communications network including a first interactive voice response system providing a set of voice-like control messages and capacity to receive multi-frequency tonal command messages to and from a telephone system to complete a patron transaction in conjunction with a main data processing and management facility comprising:

a) a gaming gateway including,

i) means to access real time data directly from said main data facility,

ii) means to obtain data messages equivalent to said control messages and to provide said data messages to said patron on a user communications terminal,

iii) means to access real time data provided by said patron on said user communications terminal,

iv) means to interact with said patron real time data to assemble a fully detailed current gaming transaction,

b) a second interactive voice response system including means to interact with said gaming gateway and said first interactive voice response system by means of standard telephonic connections,

c) means to cause opening of said telephonic connections between the said first and said second of said interactive voice response systems, and,

d) means to submit said completed transaction from said gaming gateway to said data management facility by way of said command and control messages.

9) A gaming system as claimed in claim 8 further comprising:

a) means to provide said control messages with substantially fixed early portions,

b) wherein said means to submit comprises means to recognize said early portions of said control messages.

10) A gaming system as claimed in claim 9 wherein said means to recognize includes means to ignore the remainder of said control messages after said early portions.

11) A gaming system as claimed in claim 10 wherein said means to submit further comprises means to deliver said command messages through said second interactive voice response system to said first interactive voice response system.

12) A gaming system as claimed in claim 11 wherein said early portions comprise multi-frequency tones.

13) A gaming system as claimed in claim 12 wherein said early portions comprise multi-frequency tones of a type which does not interfere with said capacity to receive.

14) A gaming system as claimed in claim 13 wherein said command messages are dual-tone multi-frequency tones.

15) A gaming system for remote interaction with a patron over a secondary interactive communications network including a first interactive voice response system providing a set of voice-like control messages and capacity to receive multi-frequency tonal command messages to and from a telephone system to complete a patron transaction in conjunction with a main data processing and management facility comprising:

a) a gaming gateway including,

i) means to access real time data directly from said main data facility,

ii) means to obtain data messages equivalent to said control messages and to provide said data messages to said patron on a user communications terminal,

iii) means to access real time data provided by said patron on said user communications terminal,

iv) means to interact with said patron real time data to assemble a fully detailed current gaming transaction,

b) a second interactive voice response system including means to interact with said gaming gateway and said first interactive voice response system by means of a standard telephone connection,

c) means to cause opening of said telephone connection between the said first and said second of said interactive voice response systems,

d) means to submit said completed transaction from said gaming gateway to said data management facility by way of said command and control messages, and,

e) means to terminate said telephone connection and means to interact with said patron to present the results of said transaction at said user terminal.

16) A gaming system as claimed in claim 8 further comprising:

a) means to provide said control messages with substantially fixed early portions,

b) wherein said means to submit comprises means to recognize said early portions of said control messages.

17) A gaming system as claimed in claim 9 wherein said means to recognize includes means to ignore the remainder of said control messages after said early portions.

18) A gaming system as claimed in claim 10 wherein said means to submit further comprises means to deliver said command messages through said second interactive voice response system to said first interactive voice response system.

19) A gaming system as claimed in claim 11 wherein said early portions comprise multi-frequency tones.

20) A gaming system as claimed in claim 12 wherein said early portions comprise multi-frequency tones of a type which does not interfere with said capacity to receive.

21) A gaming system as claimed in claim 13 wherein said command messages are dual-tone multi-frequency tones.

22) A data system for remote interaction with a patron over a secondary interactive communications network including a first interactive voice response telephone system providing a set of voice-like control messages and capacity to receive multi-frequency tonal command messages to complete a patron transaction in conjunction with a main data processing and management facility comprising:

a) a gateway including,

i) means to access real time data directly from said main data facility,

ii) means to obtain data messages equivalent to said control messages and to provide said data messages to said patron on a user communications terminal,

iii) means to access real time data provided by said patron on said user communications terminal,

iv) means to interact with said patron real time data to assemble a fully detailed current transaction,

b) a second interactive voice response telephone system including means to interact with said gateway and said first interactive voice response system by means of a standard telephonic connection,

c) means to cause opening of a said telephonic connection between the said first and said second of said interactive voice response systems, and,

d) means to submit said completed transaction from said gateway to said data management facility by way of said command and control messages.

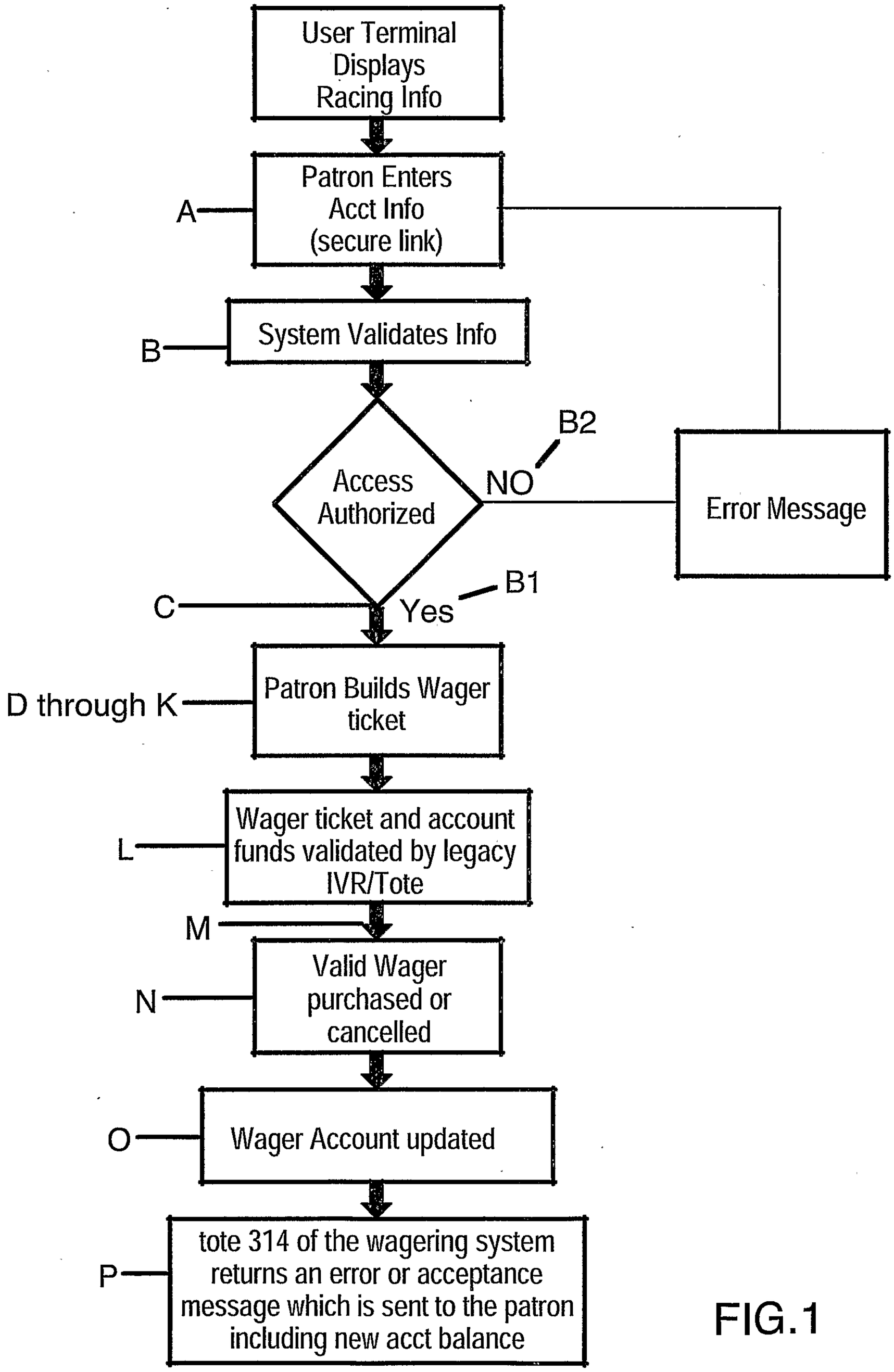

User Terminal Displays Racing Info
Patron Enters Acct Info (secure link)
A
System Validates Info
B
Access Authorized
B2
NO
Error Message
Yes
B1
C
Patron Builds Wager ticket
D through K
Wager ticket and account funds validated by legacy IVR/Tote
L
M
Valid Wager purchased or cancelled
N
Wager Account updated
O
tote 314 of the wagering system returns an error or acceptance message which is sent to the patron including new acct balance
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FIG.1

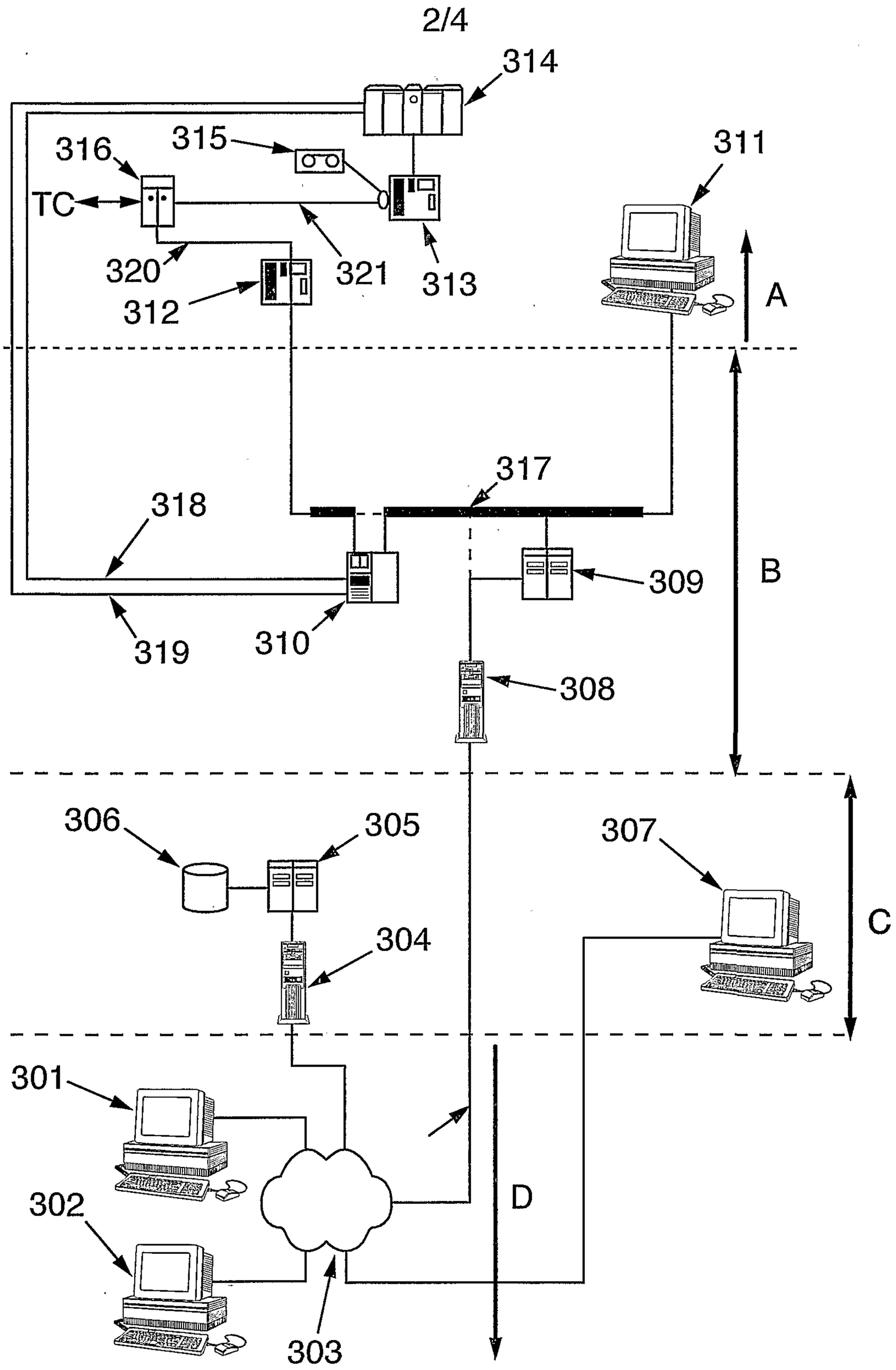

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FIG.2

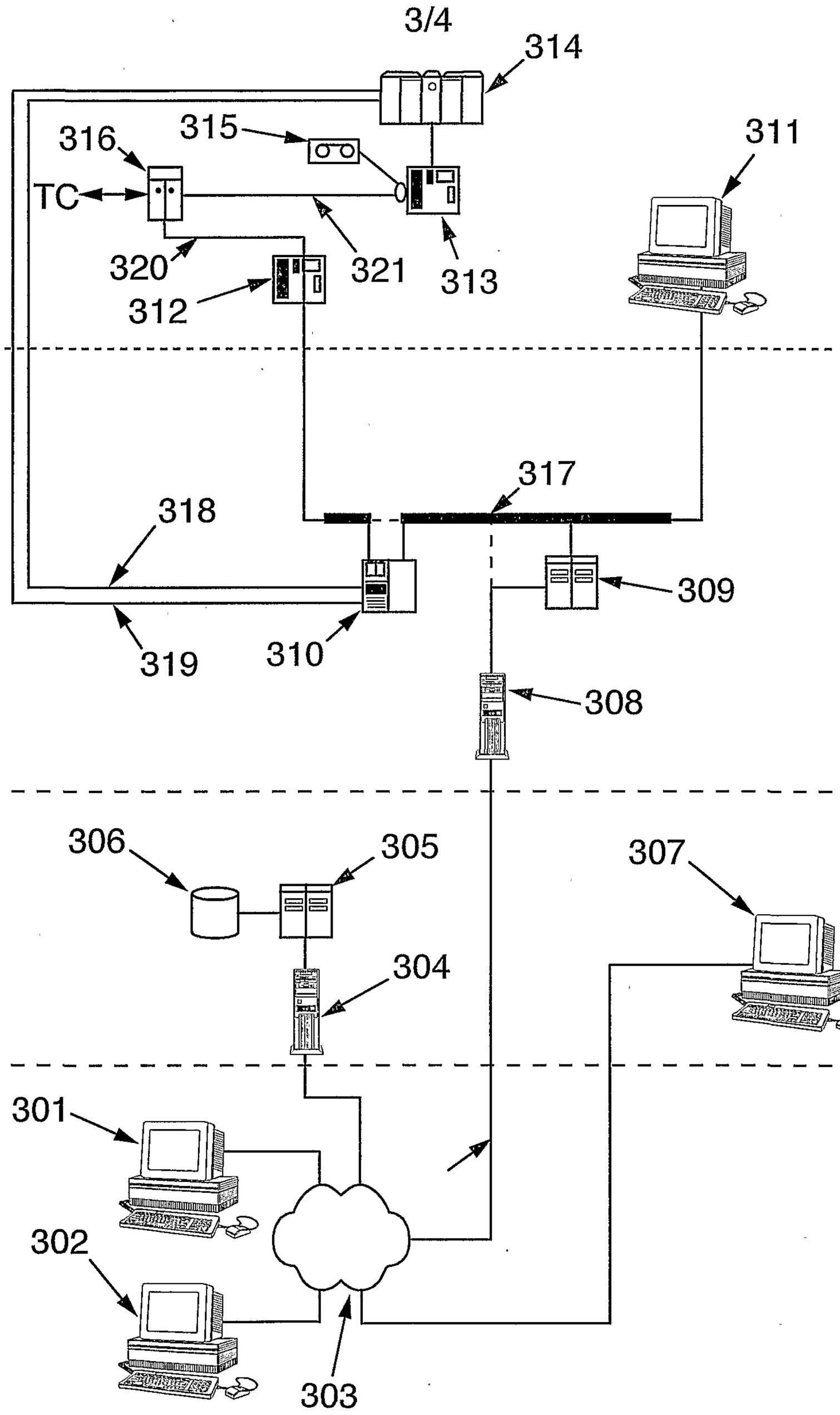

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FIG.3

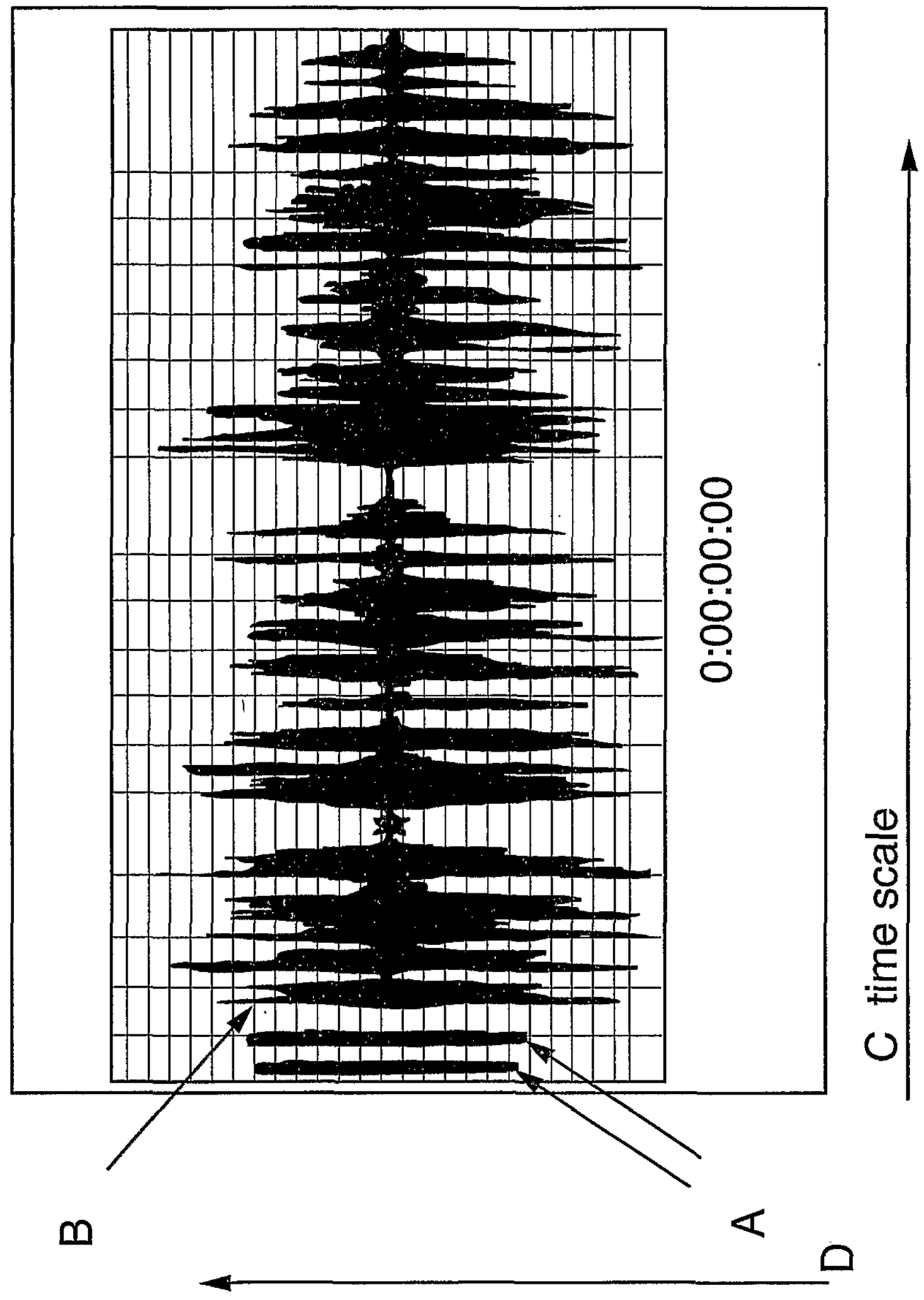
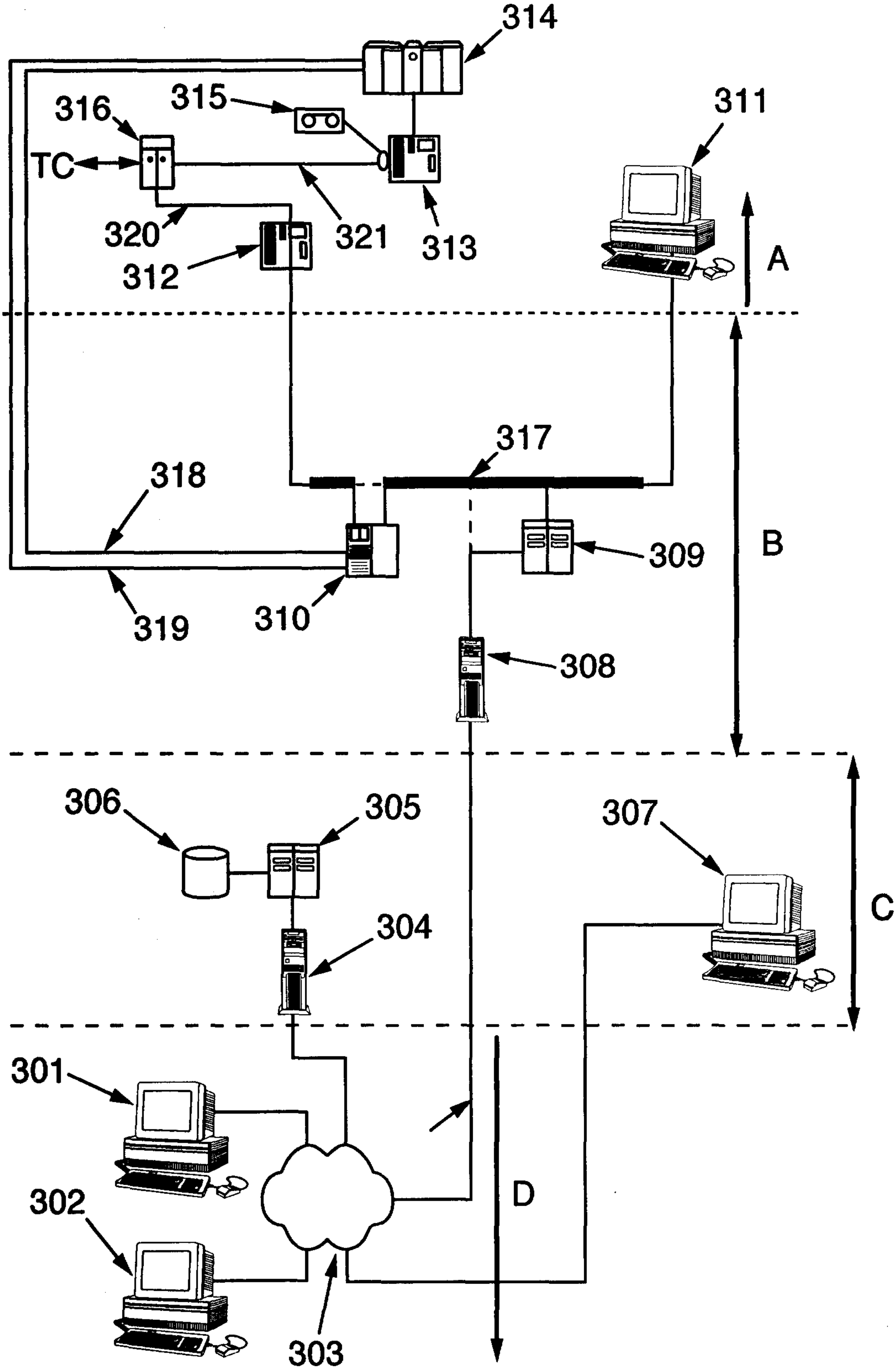


FIG.4


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