said bill generator generating a message in response to a next due date corresponding to said bill data not being in correspondence with said minimum interval in said payor information for said payor identified by said payorID so that only one transfer of funds between said payor and said payee occurs during said minimum interval.

4. The system of claim **1**, said payor information further including a payor bankaccountID that corresponds to a government account so that said payor may transfer funds between said government account and said authorized payees for said payor.

5. The system of claim **1**, wherein said TCF message generator generates updated bill records corresponding to said generated EFT messages for effecting a transfer of funds, said updated bill records being stored in said payor information for said payor identified by said generated bill record; and

a payor control interface for presenting generated bill records and said updated bill records to at least one of said payors so that said payor may review an account of fund transfer activity.

6. The system of claim **5**, wherein said payor control interface receives a payor control message from said payors having a payorID and a reversal directive, said reversal directive corresponding to one of said updated bill records presented to said payor identified by said payorID in said received payor control message;

said bill generator generating a second bill record to indicate a transfer of funds corresponding to said reversal directive; and

said TCF message generator generating EFT messages corresponding to said second bill record.

7. The system of claim **6**, said payee information for each of said payees including a provisional period; and

said bill generator generating a message in response to said payor control message containing said reversal directive being received on a date not corresponding to said provisional period so that a reversal of funds between said payor and said payee is only initiated during said provisional period.

8. The system of claim **1**, further comprising:

a payor control interface for receiving payor control messages from said payors, said payor control messages including a payorID and one of a payment date and an obligation amount;

said bill generator modifying said generated bill records in response to said payor control messages, said bill generator replacing one of a payment date and an obligation amount in said generated bill record with one of said payment date and said obligation amount in said payor control message from said payor identified by said payorID.

9. The system of claim **1**, said system further comprising:

a payor control interface for receiving payor control messages from said payors, said payor control messages including a payorID, payeeID and control parameters; and

said system modifying said control parameters in said child payee information corresponding to said payorID and said payeeID in said payor control message.

10. A bill paying system comprising:

storage for payee information for each of a plurality of payees;

storage for payor information for each of a plurality of payors, said payor information for each said payor including child-payee information identifying said payees authorized to receive a transfer of funds from said payor and control parameters, said control parameters being established by said payors for controlling transfers of funds between said payor establishing said control parameters and more than one of said payees and for controlling multiple transfers between said payor establishing said control parameters and one of said payees authorized to receive a transfer of funds from said payor establishing said control parameters;

a bill generator for generating bill records from said child payee information of said payor information for at least one of said payors, said generated bill records corresponding to said control parameters established by said one of said payors;

a Transfer Communication Facilitator (TCF) message generator for generating at a time corresponding to said control parameters, Electronic Funds Transfer (EFT) messages corresponding to said generated bill records to effect said transfer of funds corresponding to said generated bill records;

an electronic communication interface for receiving Electronic Data Interchange (EDI) forms from said payees, said EDI forms including a payorID and bill data; and

said bill generator modifying a generated bill record of said payor information for a payor identified by said payorID within a received EDI form in accordance with said bill data received from one of said payees in response to said EDI form being received from one of said payees, whereby a generated bill record of said payor information for said one of said payors may be modified by one of said payees.

11. The system of claim **6**, said control parameters of said payor information for each of said payors includes:

a maximum payment amount for identifying a maximum amount transferred between each of said payors and each of said payees identified by said child payee information in said payor information for each of said payors; and

said bill generator generating a message in response to an obligation amount in said bill data received from one of said payees exceeding said maximum payment amount in said payor information for said payor identified by said payorID in said received EDI form.

12. The system of claim **10**, said control parameters of said payor information for each of said payors includes:

a minimum interval for identifying a minimum interval time between generation of said bill records for each of said payors and each of said payees identified by said child payee information in said payor information for each of said payors; and

said bill generator generating a message in response to a due date in said bill data not corresponding to said minimum interval in said payor information for said payor identified by said payorID in said received EDI form so that only one transfer of funds between said payor and said payee occurs during_said minimum interval.

13. A bill payment system comprising:

storage for payee information for each of a plurality of payees;

storage for payor information for each of a plurality of payors, said payor information for each of said payor including child payee information identifying at least one of said payees authorized to receive a transfer of funds from said payor;

a communication interface for receiving a bill data message from at least one of said payees, said bill data message including a payorID and at least one of an obligation amount and a due date;

a bill generator for generating a bill record from a bill data message received from one of said payees, payor information for said payor identified by said payorID in said received bill data message, and said payee information for said payee sending said bill data message, said generated bill record including an obligation amount and a payment date so that said generated bill record corresponds to a transfer of funds between said identified payor and said payee sending said bill data message to pay said obligation amount on said payment date; and

a Transfer Communication Facilitator (TCF) message generator for generating at a predetermined time Electronic Funds Transfer (EFT) messages corresponding to said generated bill record to effect said transfer of funds.

14. The system of claim **13**, further comprising:

a payor control interface for receiving payor control messages from said payors, said payor control messages including a payorID, a payeeID, and payor bill data;and

said bill generator modifying a generated bill record in accordance with said payor bill data in said received payor control message, said generated bill record corresponding to said payor identified by said payorID and said payee identified by said payeeID.

15. The system of claim **14**, said payor bill data including one of an obligation amount and a payor payment date; and

said bill generator modifying a generated bill record by replacing one of said obligation amount and said payment date in said generated bill record with one of said payor obligation amount and said payor payment date in said payor control message.

16. The system of claim **13**, said payor information for each of said payors includes:

a maximum payment amount for identifying a maximum amount to be transferred between each of said payors and each of said payees identified by said child payee information in said payor information for each of said payors; and

said bill generator generating a message in response to said obligation amount in said bill data message exceeding said maximum payment amount in said payor information for said payor identified by said payorID in said bill data message.

17. The system of claim **13**, said payor information for each of said payors includes:

a minimum interval for identifying a minimum interval time between generation of said bill records for each of said payors and each of said payees identified by said child payee information in said payor information for each of said payors; and

said bill generator generating a message in response to a payment date generated from said due date in said bill data message not corresponding to said minimum interval in said payor information for said one payor identified by said payorID so that only one transfer of funds between said payor and said payee occurs during said minimum interval.

18. The system of claim **13**, said payor information further including a payor bankaccountID that corresponds to a government account so that said payor may transfer funds between said government account and said authorized payees for said payor.

19. The system of claim **13**, wherein said TCF message generator generates updated bill records corresponding to said generated EFT messages for effecting a transfer of funds, said updated bill records being stored in said payor information for said payor identified by said generated bill record; and

a payor control interface for presenting said generated bill records and said updated bill records to at least one of said payors so that said payor may review an account of fund transfer activity.

20. The system of claim **19**, wherein said payor control interface receives a payor control message from said payors, said payor control message having a payorID and a reversal directive, said reversal directive corresponding to one of said updated bill records presented to said payor identified by said payorID in said received payor control message;

said bill generator generating a second bill record to indicate a transfer of funds corresponding to said reversal directive; and

said TCF message generator generating EFT messages corresponding to said second bill record.

21. The system of claim **20**, said payee information for each of said payees including a provisional period; and

said bill generator generating a message in response to said payor control message containing said reversal directive being received on a date not corresponding to said provisional period so that a reversal of funds between said payor and said payee is only initiated during said provisional period.

22. The system of claim **13**, further comprising:

said communication interface for receiving EDI forms from said payees receives EDI forms including a payorID and bill data; and

said bill generator modifying a generated bill record in accordance with said bill data in said received EDI form, said generated bill record corresponding to said payor identified by said payorID and said payee sending said EDI form.

23. The system of claim **22**, said bill data including one of an obligation amount and a due date; and

said bill generator modifying a generated bill record by modifying one of said obligation amount and said payment date in said generated bill record in correspondence with one of said obligation amount and said due date in said bill data.

24. The system of claim **13**, said system further comprising:

a payor control interface for receiving payor control messages from said payors, said payor control messages including a payorID, payeeID and control parameters; and

said system modifying said payor information corresponding to said payorID in said payor control message.

* * * * *

US005655008A

United States Patent [19]

Futch et al.

[11] Patent Number: 5,655,008

[45] Date of Patent: Aug. 5, 1997

[54] **SYSTEM AND METHOD FOR PERFORMING A VARIETY OF TRANSACTIONS HAVING DISTRIBUTED DECISION-MAKING CAPABILITY**

[75] Inventors: **Donald R. Futch**, Columbia; **Richard E. Greer**, Greenville, both of S.C.

[73] Assignee: **Dart, Inc.**, Columbia, S.C.

[21] Appl. No.: **487,070**

[22] Filed: **Jun. 7, 1995**

[51] **Int. Cl.**[6] **H04M 11/00**

[52] **U.S. Cl.** **379/91.01**; 395/217; 379/144

[58] **Field of Search** 379/91, 93, 94, 379/96–99, 114, 115, 144, 155, 90, 110, 201; 364/400, 401, 406, 408; 235/379–381; 348/3, 6, 7, 13; 902/1, 5, 24; 395/201, 215–217

[56] **References Cited**

U.S. PATENT DOCUMENTS

4,649,563	3/1987	Riskin .	
4,734,858	3/1988	Schlafly .	
4,799,156	1/1989	Shavit et al. .	
4,947,028	8/1990	Gorog .	
5,007,084	4/1991	Materna et al.	379/91
5,220,501	6/1993	Lawlor et al. .	
5,323,448	6/1994	Biggs	379/91
5,383,113	1/1995	Kight et al. .	
5,396,546	3/1995	Remillard	379/96
5,404,393	4/1995	Remillard	379/96
5,416,831	5/1995	Chewning, III et al.	379/96
5,475,740	12/1995	Biggs, Jr. et al.	379/91

OTHER PUBLICATIONS

A prior art brochure entitled "Introducing Simple Tran"; undated.

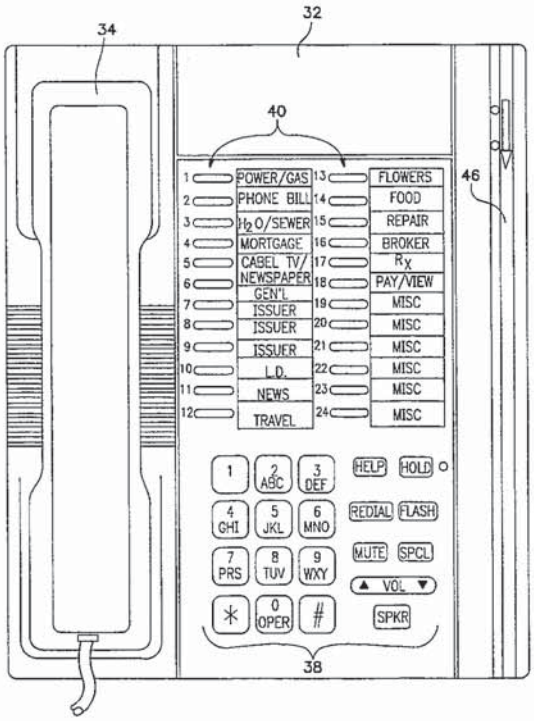
A prior art brochure entitled "Audio Response Capture" by Electronic Merchant Services of Columbia, SC; undated.

Primary Examiner—Wing F. Chan
Attorney, Agent, or Firm—Dority & Manning

[57] **ABSTRACT**

A system and method whereby a multiplicity of users may perform a variety of transactions, such as a product/service request, a bill payment request and long distance telephone service, through a system operator. The system includes a plurality of telephone instruments respectively having a telephone identifier and a wallet card swipe reader or the like for inputting a user identifier. A plurality of user actuators, such as individual buttons, are located on the telephone instrument to initiate a request for a particular transaction. A system processor in communication with the telephone instrument determines which type of transaction is being requested and determines whether the request is valid. Preferably, the validity check is completely performed at a gateway computer having a validity table in its memory corresponding to the particular telephone instrument. The gateway computer stores all transaction requests accrued over a period of time in its memory and forwards them to a central computer at a predetermined regular time. The central computer then correlates the transaction request with complete information in its database to carry out the transaction as requested.

22 Claims, 8 Drawing Sheets



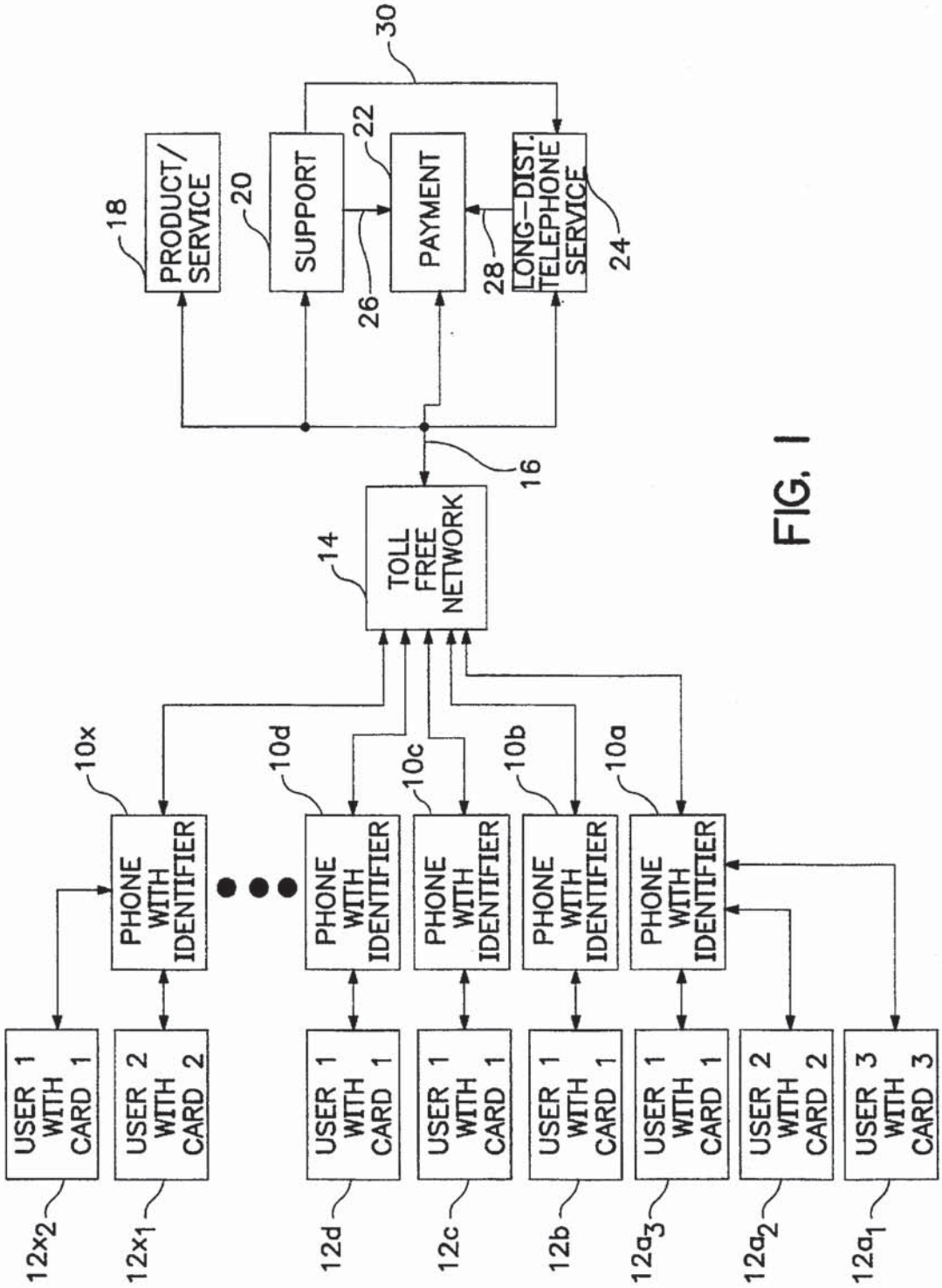

30
18
PRODUCT/ SERVICE
20
SUPPORT
22
PAYMENT
LONG-DIST. TELEPHONE SERVICE
24
26
28
16
14
TOLL FREE NETWORK
10x
10d
10c
10b
10a
PHONE WITH IDENTIFIER
USER 1 WITH CARD 1
USER 2 WITH CARD 2
USER 3 WITH CARD 3
12x2
12x1
12d
12c
12b
12a3
12a2
12a1

FIG. 1

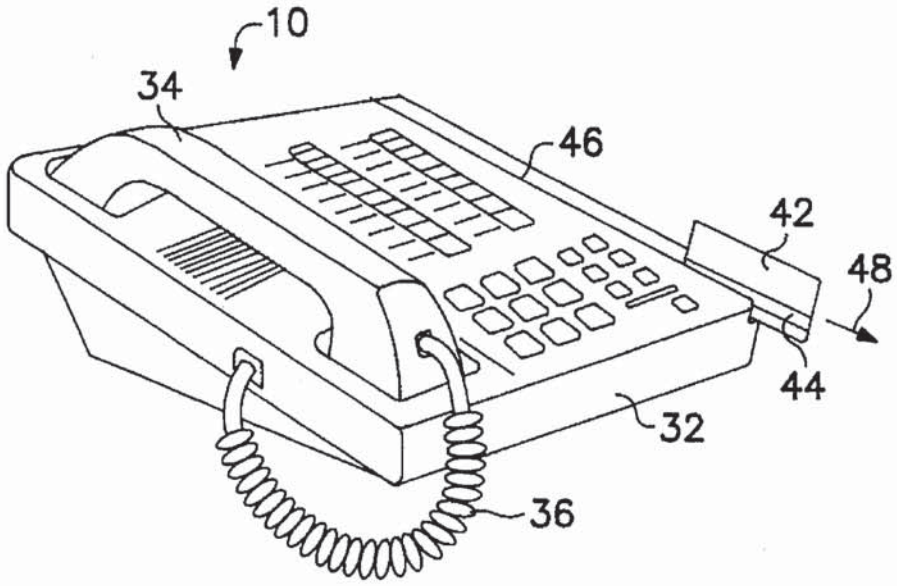


FIG. 2

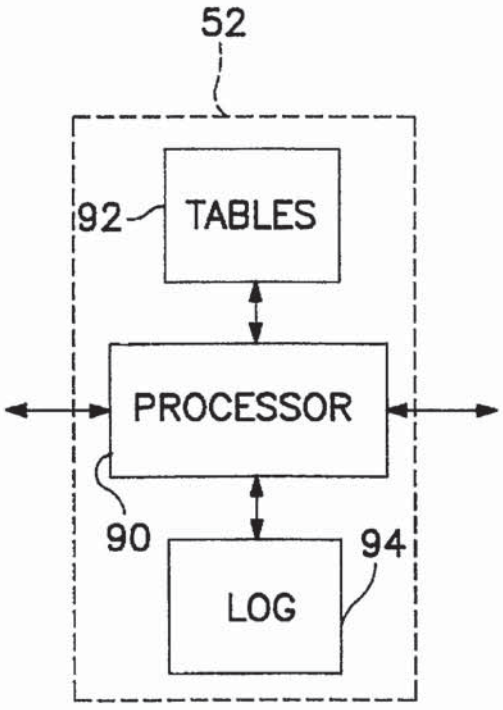


FIG. 5

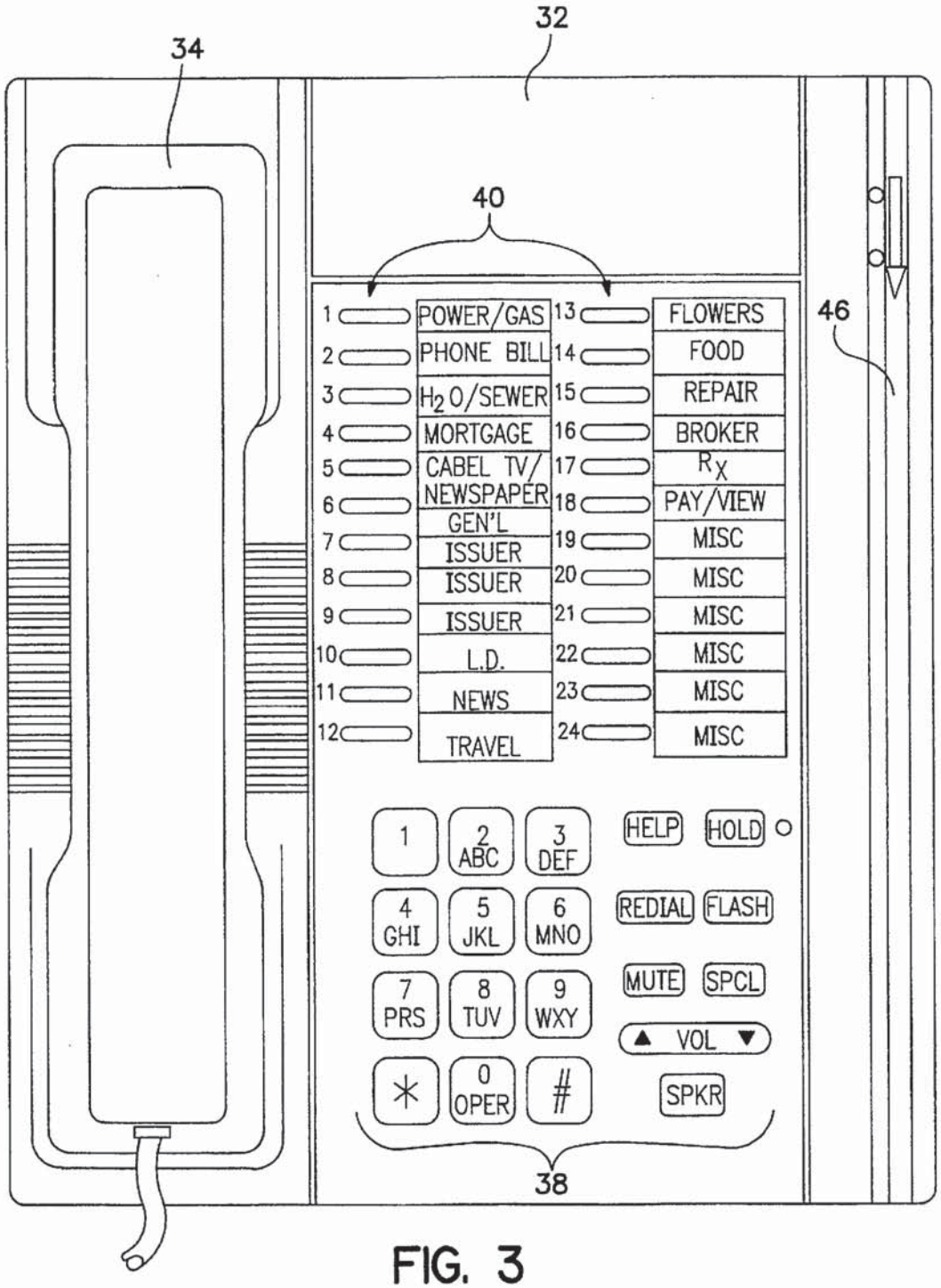

32
34
40
46
1 POWER/GAS
2 PHONE BILL
3 H_2O/SEWER
4 MORTGAGE
5 CABEL TV/ NEWSPAPER
6 GEN'L
7 ISSUER
8 ISSUER
9 ISSUER
10 L.D.
11 NEWS
12 TRAVEL
13 FLOWERS
14 FOOD
15 REPAIR
16 BROKER
17 R_X
18 PAY/VIEW
19 MISC
20 MISC
21 MISC
22 MISC
23 MISC
24 MISC
1
2 ABC
3 DEF
4 GHI
5 JKL
6 MNO
7 PRS
8 TUV
9 WXY
* 0 OPER #
HELP
HOLD
REDIAL
FLASH
MUTE
SPCL
VOL
SPKR
38

FIG. 3

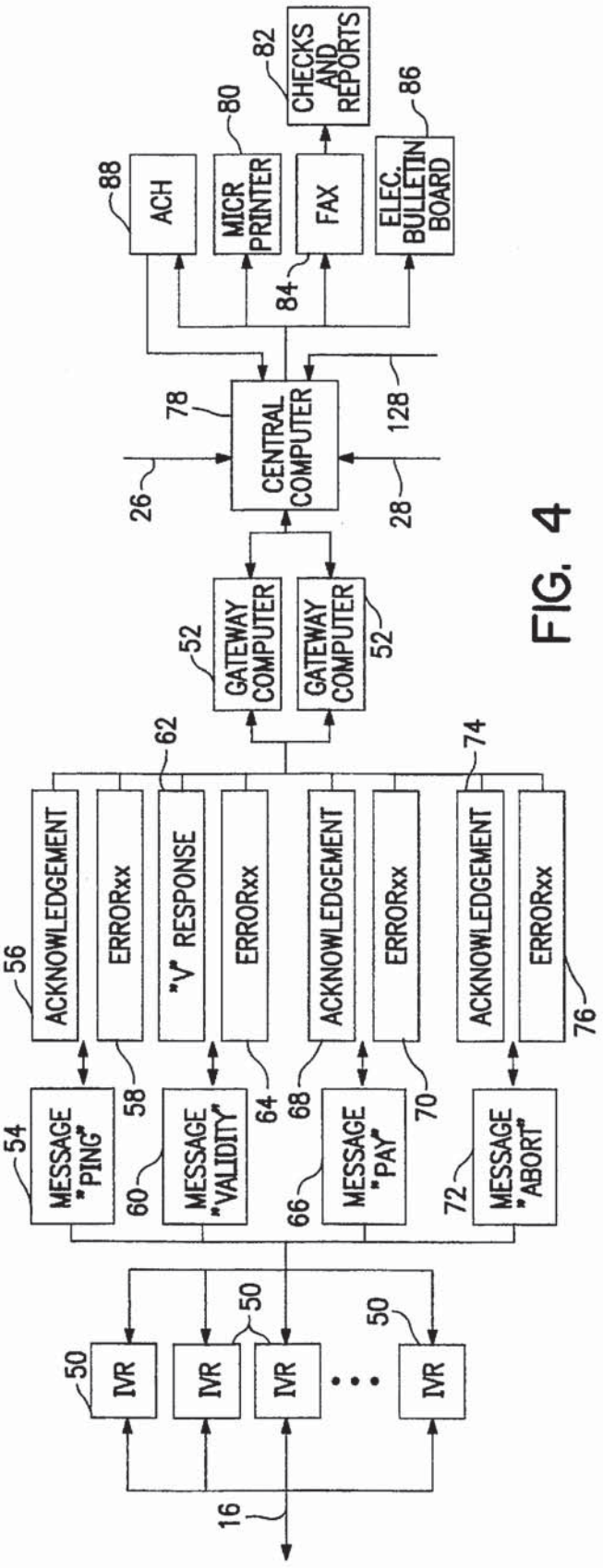

IVR
50
16
MESSAGE "PING"
54
ACKNOWLEDGEMENT
56
ERRORxx
58
MESSAGE "VALIDITY"
60
"V" RESPONSE
62
ERRORxx
64
MESSAGE "PAY"
66
ACKNOWLEDGEMENT
68
ERRORxx
70
MESSAGE "ABORT"
72
ACKNOWLEDGEMENT
74
ERRORxx
76
GATEWAY COMPUTER
52
CENTRAL COMPUTER
78
26
28
128
ACH
88
MICR PRINTER
80
FAX
84
ELEC. BULLETIN BOARD
86
CHECKS AND REPORTS
82

FIG. 4

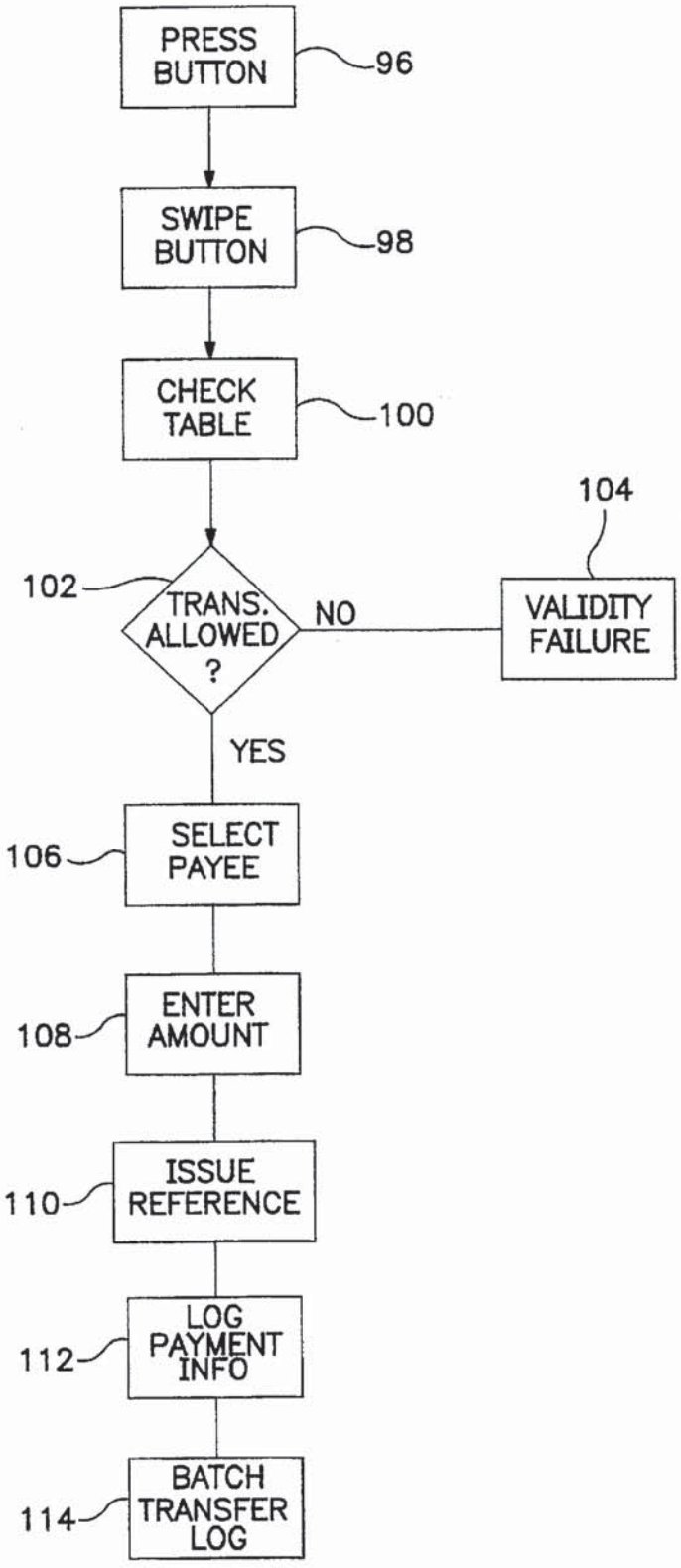

PRESS BUTTON
96
SWIPE BUTTON
98
CHECK TABLE
100
104
102
TRANS. ALLOWED ?
NO
VALIDITY FAILURE
YES
106
SELECT PAYEE
108
ENTER AMOUNT
110
ISSUE REFERENCE
112
LOG PAYMENT INFO
114
BATCH TRANSFER LOG

FIG. 5A

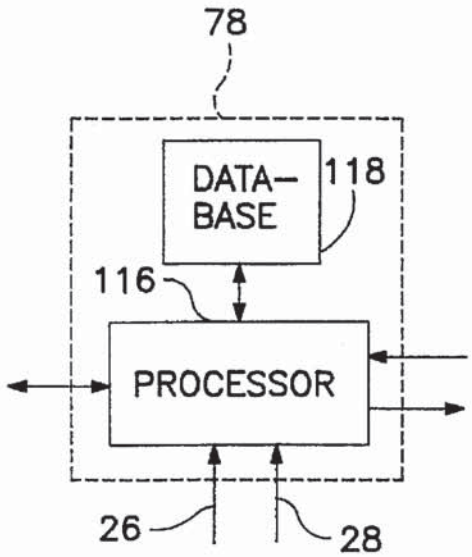

78
DATA-
BASE
118
116
PROCESSOR
26
28

FIG. 6

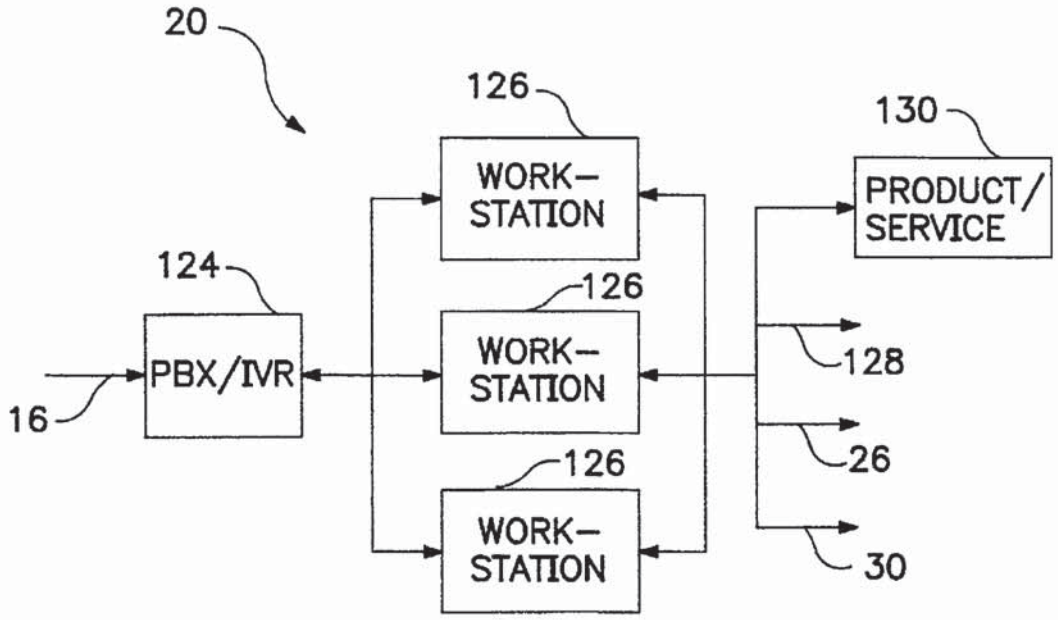
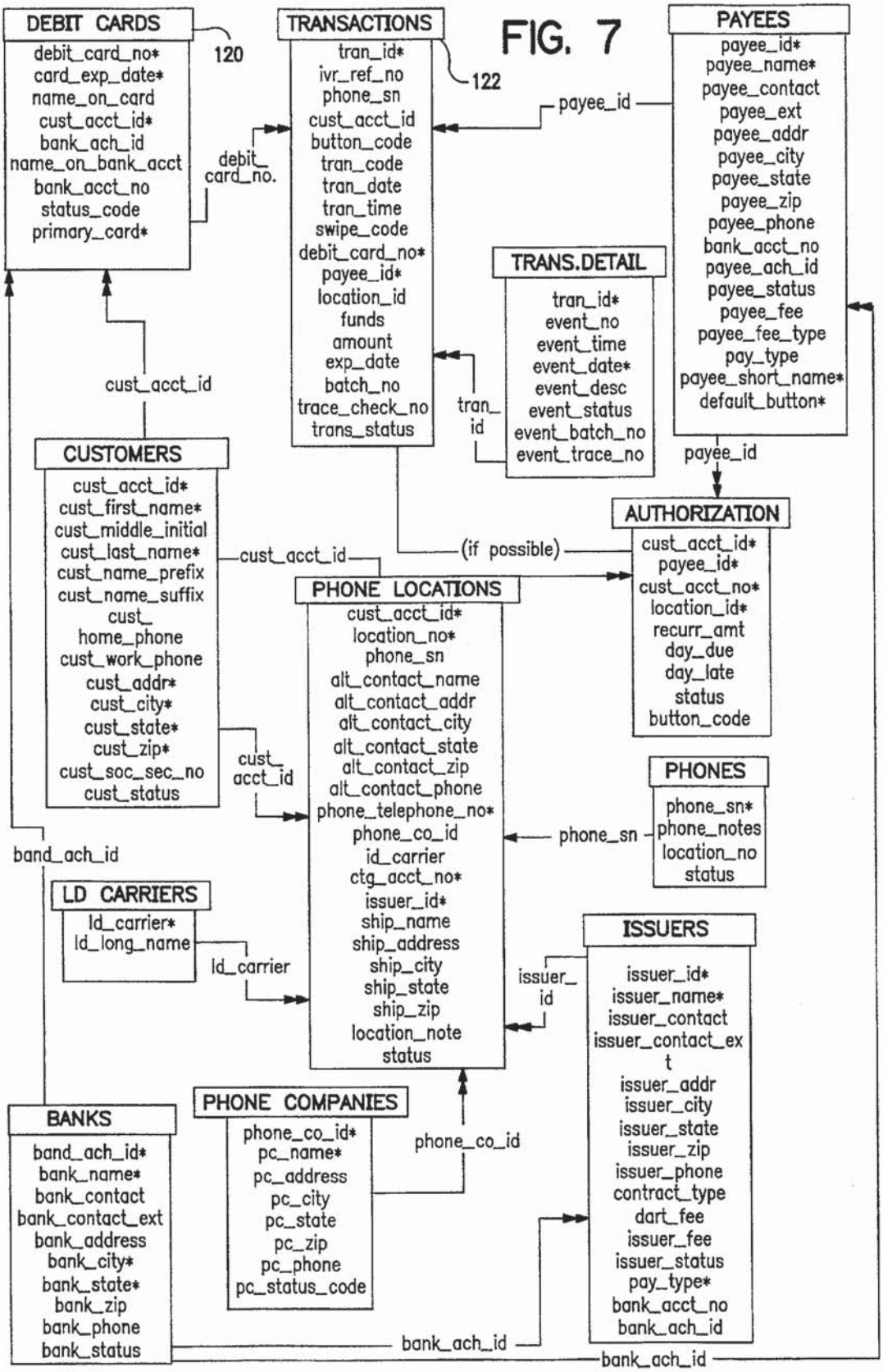

20
126
WORK-
STATION
130
PRODUCT/
SERVICE
124
126
PBX/IVR
WORK-
STATION
128
16
26
126
WORK-
STATION
30

FIG. 8

FIG. 7


DEBIT CARDS
debit_card_no*
card_exp_date*
name_on_card
cust_acct_id*
bank_ach_id
name_on_bank_acct
bank_acct_no
status_code
primary_card*
120
TRANSACTIONS
tran_id*
ivr_ref_no
phone_sn
cust_acct_id
button_code
tran_code
tran_date
tran_time
swipe_code
debit_card_no*
payee_id*
location_id
funds
amount
exp_date
batch_no
trace_check_no
trans_status
122
PAYEES
payee_id*
payee_name*
payee_contact
payee_ext
payee_addr
payee_city
payee_state
payee_zip
payee_phone
bank_acct_no
payee_ach_id
payee_status
payee_fee
payee_fee_type
pay_type
payee_short_name*
default_button*
TRANS.DETAIL
tran_id*
event_no
event_time
event_date*
event_desc
event_status
event_batch_no
event_trace_no
debit_
card_no.
payee_id
tran_
id
cust_acct_id
CUSTOMERS
cust_acct_id*
cust_first_name*
cust_middle_initial
cust_last_name*
cust_name_prefix
cust_name_suffix
cust_
home_phone
cust_work_phone
cust_addr*
cust_city*
cust_state*
cust_zip*
cust_soc_sec_no
cust_status
AUTHORIZATION
cust_acct_id*
payee_id*
cust_acct_no*
location_id*
recurr_amt
day_due
day_late
status
button_code
(if possible)
PHONE LOCATIONS
cust_acct_id*
location_no*
phone_sn
alt_contact_name
alt_contact_addr
alt_contact_city
alt_contact_state
alt_contact_zip
alt_contact_phone
phone_telephone_no*
phone_co_id
id_carrier
ctg_acct_no*
issuer_id*
ship_name
ship_address
ship_city
ship_state
ship_zip
location_note
status
PHONES
phone_sn*
phone_notes
location_no
status
phone_sn
band_ach_id
LD CARRIERS
ld_carrier*
ld_long_name
ld_carrier
ISSUERS
issuer_id*
issuer_name*
issuer_contact
issuer_contact_ex
t
issuer_addr
issuer_city
issuer_state
issuer_zip
issuer_phone
contract_type
dart_fee
issuer_fee
issuer_status
pay_type*
bank_acct_no
bank_ach_id
issuer_
id
PHONE COMPANIES
phone_co_id*
pc_name*
pc_address
pc_city
pc_state
pc_zip
pc_phone
pc_status_code
phone_co_id
BANKS
band_ach_id*
bank_name*
bank_contact
bank_contact_ext
bank_address
bank_city*
bank_state*
bank_zip
bank_phone
bank_status
bank_ach_id
bank_ach_id

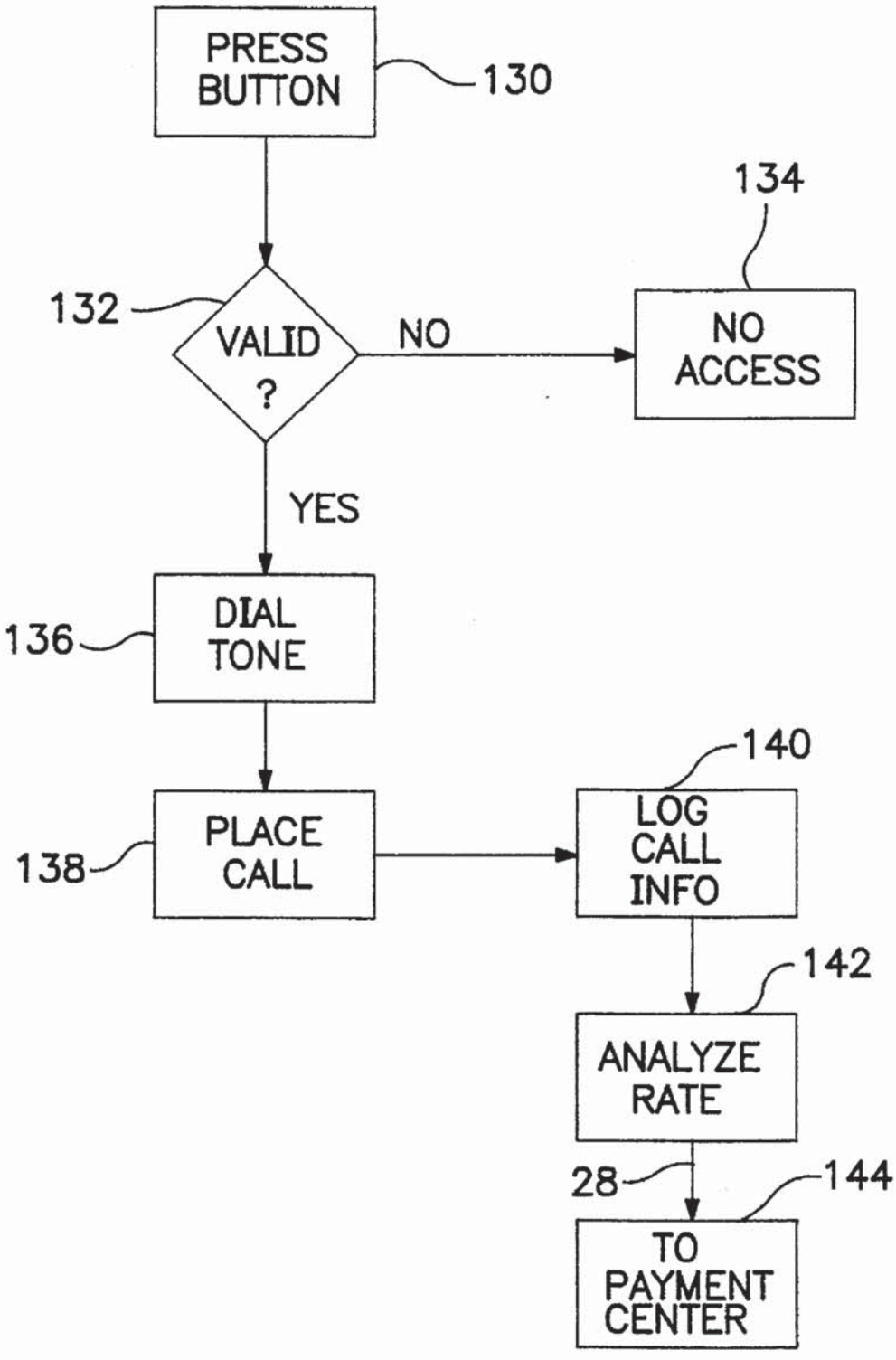

PRESS BUTTON
130
134
132
VALID ?
NO
NO ACCESS
YES
DIAL TONE
136
140
PLACE CALL
138
LOG CALL INFO
142
ANALYZE RATE
28
144
TO PAYMENT CENTER

FIG. 9

SYSTEM AND METHOD FOR PERFORMING A VARIETY OF TRANSACTIONS HAVING DISTRIBUTED DECISION-MAKING CAPABILITY

BACKGROUND OF THE INVENTION

The present invention relates to a computer-based system and method by which a multiplicity of users may perform a variety of transactions through a system operator. More particularly, the invention relates to such a system and method which includes distributed decision-making capability to enhance transaction speed and redundancy.

Various computer-based systems have been proposed to allow a multiplicity of users to perform selected transactions. For example, systems have been implemented whereby a system operator will, on behalf of a consumer, pay bills rendered to the consumer by a billing entity. The payment itself may take various forms, including a consolidated check or an electronic funds transfer. At least one such system, shown in U.S. Pat. No. 5,383,113 to Kight et al., effects electronic funds transfer utilizing the Federal Reserve automated check clearing house (ACH) system. At least one other such system, i.e., that shown in U.S. Pat. No. 5,220,501 to Lawlor et al., utilizes the bank automatic teller machine (ATM) network.

Other computer-based systems have been proposed which allow consumers to order a variety of goods and services. Such systems generally include a remote telecommunications device functionally connected to a computer facility. The consumer selects the desired goods or services on the telecommunications device, which transmits this information to the computer facility. The computer facility notifies the provider of the desired goods or services that an order has been made. Examples of systems by which a consumer may order various goods or services are shown in U.S. Pat. No. 4,947,028 to Gorog, U.S. Pat. No. 4,799,156 to Shavit et al., and U.S. Pat. No. 4,734,858 to Schlafly.

Many of the above systems are designed to be utilized with a personal computer. While personal computers are becoming more commonplace, most people still do not have a personal computer at their disposal. In fact, many individuals remain somewhat uneasy about using a personal computer.

Other systems utilize a "screen phone" device distributed by the system operator. While these devices may be somewhat easier to use than a personal computer, many consumers still find their use relatively difficult. As a result, such consumers are deterred from using the overall system.

In addition, prior art systems generally tend to access the entire database of consumer information when deciding whether a particular transaction is allowed. In other words, a central computer facility having detailed consumer account and demographic information is accessed in order to determine whether the consumer is permitted, for example, to pay a bill. Thus, the time required to make a validity decision regarding the transaction is significantly increased. In addition, a failure of the central computer will often result in the entire system being "down."

SUMMARY OF THE INVENTION

The present invention recognizes and addresses the foregoing disadvantages, and others, of prior art constructions and methods.

Accordingly, it is an object of the present invention to provide an improved computer-based system by which a multiplicity of users may perform a variety of transactions.

It is another object of the present invention to provide an improved system of the type described which performs a validity analysis of the requested transaction relatively quickly.

It is a further object of the present invention to provide an improved system of the type described which is relatively easy to use.

It is another object of the present invention to provide a system of the type described which incorporates a degree of redundancy to enhance fault tolerance.

It is another object of the present invention to provide an improved method by which a system operator may pay bills on behalf of consumers.

Some of these objects are achieved by a system for use by a multiplicity of users to perform a variety of transactions through a system operator. Such transactions include payment of bills rendered to the user by a third party, various requests for products or services, and closed-network long distance telephone service. The system automatically collects payment for the transactions from the user, such as by electronic funds transfer from the user's bank account.

The system comprises a plurality of telephone instruments respectively having an electronic telephone identifier. The telephone instruments further include means, such as a wallet card swipe reader, for inputting a user identifier. In addition, each of the telephone instruments has a plurality of user actuators thereon respectively indicative of a particular transaction. In exemplary constructions, the user actuators are respective buttons on the face of the telephone instrument.

When a particular user actuator is selected, system processor means in communication with a respective telephone instrument function to receive at least the telephone identifier therefrom. The system processor means are further able to determine which of the types of transactions is being requested based on which user actuator was selected by the user.

The system processor means preferably includes at least one gateway computer for receiving transaction requests from the telephone instruments. In presently preferred embodiments, a plurality of gateway computers are provided, functionally arranged in parallel. A central computer in communication with the gateway computers functions to forward a payment command to the payment means for completing the bill payment transaction. Preferably, the gateway computers include log means for storing information regarding each transaction received during a selected period and forwarding such information to the central computer in batch at a predetermined time.

Each of the gateway computers further includes table means for storing therein a plurality of tables corresponding to respective of the telephone instruments. Validity processor means of the gateway computers function to check whether requests for bill payment received from the telephone instruments are valid. The validity processor means preferably performs this validity check by receiving both the telephone identifier and the user identifier, and comparing the identifiers with data in a table corresponding to the particular telephone instrument.

In some exemplary constructions, communication between the telephone instruments and gateway computers is facilitated by a plurality of voice response units. The voice response units may function to return a reference number to the user indicating receipt of a valid request for bill payment by the system operator.

Other objects of the invention are achieved by a computer-based method of effecting payment of bills ren-

dered to consumers by third parties. The method comprises a step of providing a telephone instrument to respective of the consumers, each of the telephone instruments including means for communicating a telephone identifier and further including a wallet card swipe reader. A wallet card, having a user identifier magnetically encoded thereon, is also provided to respective of the consumers.

As an additional step, the method includes electronically receiving a request to pay a bill, the request including the telephone identifier and the user identifier. The telephone identifier and user identifier are then checked against a validity table to determine whether the request is valid. If the request is not valid, the transaction is denied.

If the request is valid, an amount to be paid to the third party is received from inputs entered on a keypad of the telephone instrument. The amount to be paid, along with the validity information, forms an abbreviated request bundle. The abbreviated request bundle is later correlated with a complete database containing sufficient information regarding the user and the third party to effect bill payment thereto as requested. Finally, the method involves paying the bill which had been rendered to the user by the third party.

According to a presently preferred methodology, the user is further provided a transaction identifier to reference receipt and acceptance of the request. Another presently preferred methodology involves the step of creating a log in a first computer which contains abbreviated request bundles accrued over a period of time. At a predetermined time, these abbreviated request bundles are forwarded from the first computer to a second computer for respective correlation with the computer database.

Other objects, features and aspects of the present invention are discussed in greater detail below.

BRIEF DESCRIPTION OF THE DRAWINGS

A full and enabling disclosure of the present invention, including the best mode thereof, to one of ordinary skill in the art, is set forth more particularly in the remainder of the specification, including reference to the accompanying drawings, in which:

FIG. **1** is a diagrammatic overview of a system constructed in accordance with the present invention;

FIG. **2** is a perspective view of a presently preferred telephone instrument for use with the system of FIG. **1**;

FIG. **3** is an enlarged plan view of the telephone instrument shown in FIG. **2**;

FIG. **4** is a diagrammatic representation of preferred payment means for use with the system of FIG. **1**;

FIG. **5** is a diagrammatic representation showing in greater detail the functional components of a gateway computers as shown in FIG. **4**;

FIG. **5A** is a flowchart illustrating a computer process by which the bill payment means of FIG. **4** may function to check transaction validity;

FIG. **6** is a diagrammatic representation showing in greater detail the functional components of a central computer as shown in FIG. **4**;

FIG. **7** is a diagrammatic representation of the manner in which database information is stored by the central computer of FIGS. **4** and **6**;

FIG. **8** is a diagrammatic representation of the support center for use with the system of FIG. **1**; and

FIG. **9** is a flowchart showing the operation of the means for providing long distance telephone service shown in FIG. **1**.

Repeat use of reference characters in the present specification and drawings is intended to represent same or analogous features or elements of the invention.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

It is to be understood by one of ordinary skill in the art that the present discussion is a description of exemplary embodiments only, and is not intended as limiting the broader aspects of the present invention, which broader aspects are embodied in the exemplary constructions.

A system according to the present invention for performing a variety of transactions is diagrammatically illustrated in FIG. **1**. As can be seen, the system includes an indeterminate multiplicity of telephone instruments **10** (respectively indicated by the reference numbers **10***a*–**10***d* and **10***x*) which are distributed to the public. As will be explained more fully below, each such telephone instrument has a unique serial number, or "identifier," which allows it to be electronically recognized by the system operator.

One or more authorized users **12** are associated with each of the telephone instruments **10**. For example, telephone instrument **10***a* has three authorized users, i.e., users $12a_1$, $12a_2$, and $12a_3$. Telephone instrument **10***b*, however, has only one authorized user **12***b* in the illustrated example. Like telephone instruments **10**, each user **12** also has a unique identifier which the system operator uses to determine whether a particular transaction is authorized.

In the exemplary construction illustrated in FIG. **1**, telephone instruments **10** communicate with means for performing various transactions via a toll free network **14**. Although details of these means will be discussed more fully below, each is shown generally in FIG. **1** for purposes of overview. First such means **18** are provided for requesting various products or services on behalf of users **12**. Another such means, i.e., support center **20**, allow new users to be entered into the system as well as also requesting various products or services on behalf of the consumer. Payment means **22** allow the system to pay bills on behalf of users **12**.

In addition to the above, long distance means **22** are provided to allow long distance telephone calls to be made by users **12**. Preferably, long distance means **22** provide this long distance telephone service through a "closed network." As used herein, the term "closed network" means that only telephone instruments **10** known to the system are authorized to make long distance calls.

For reasons which will be explained below, support center **20** and long distance means **24** are capable of communicating with payment means **22**, as diagrammatically illustrated at **26** and **28**. Similarly, support center **20** communicates with long distance means **24**, as indicated at **30**.

FIGS. **2** and **3** illustrate a presently preferred embodiment of telephone instrument **10**. As can be seen, instrument **10** resembles a typical touchtone telephone in many respects. For example, instrument **10** includes a base unit **32** and a handset **34** interconnected by a coiled telephone cord **36**. Instrument **10** also includes a numbered keypad and various function keys, as indicated generally at **38**, which may be found on a typical telephone.

Unlike a typical telephone, however, telephone instrument **10** includes a variety of user actuators respectively corresponding to a desired transaction. In presently preferred embodiments, the user actuators are configured as respective buttons, e.g. buttons labeled **1**–**24** in the illustrated example (FIG. **3**). Upon being pressed a single time, these buttons automatically initiate communication with

other parts of the system so that a desired transaction is requested. Indicia located adjacent the buttons **40** indicate the specific type of transaction.

A number of the buttons are preferably reserved for one-touch access to bill payment. In the illustrated embodiment, botton**1** through button**6** are bill payment buttons arranged as follows:

Botton**1**—power or gas bill

Button**2**—phone bill

Button**3**—water or sewer bill

Button**4**—mortgage or rent

Button**5**—cable T.V. or newspaper

Button**6**—user's general payment list

The means by the present invention effects bill payment will be explained in greater detail below.

Often, an issuer of telephone instruments **10** will be a business entity other than the system operator. For example, a business with which a consumer has a special relationship, e.g., a bank, power company, newspaper, etc., may issue the telephone instruments **10** to its customers as a promotion. In this case, button**7** through button**9** may be reserved for use by the issuer.

As an example, a bank issuer may desire that its customers have one-touch access to interest rates or checking account information. In the case of a newspaper, issuer buttons could be used for product purchases, information processing, classified sales and the like. If a power company is the issuer, these buttons could be used to access outage reporting, meter reading, or for informational services on energy conservation and the like.

Button**10** may be utilized to directly access long distance means **24**. In other words, a user desiring to make a long distance call through the closed network of the system would press button**10**. When long distance means **24** provides a return dial tone, the number to be called is dialed via the keypad at **38**.

Button**11** through button**18** are utilized to provide one-touch access to various goods or services. In the illustrated embodiment, these goods or services include:

Button**12**—travel agency

Button**13**—florist

Button**14**—home delivery of food

Button**15**—home repair

Button**16**—discount brokerage

Button**17**—discount pharmacy

Button**18**—pay per view cable television

As noted above, some of these goods or services may be provided by direct access between the user and the provider. These providers may be equipped with appropriate software to recognize the particular user based on the telephone or user identifiers in the manner discussed below. Payment for these goods or services, however, would generally be arranged separately between the user and the provider. Other goods or services may be arranged through the support center **20**. In this case, payment for the goods or services would preferably be accomplished through payment means **22**.

As shown, button**19** through button**24** are labeled as miscellaneous buttons. These buttons may be used to access additional goods or services. Alternatively, these buttons may be used as speed dial buttons as are frequently provided on typical telephones.

Telephone instrument **10** also includes a wallet card reader device, preferably of the type satisfying ISO standards 78XX. Such card readers are capable of detecting an alphanumeric code impressed onto a magnetic stripe of a wallet card. In this case, users are each provided a system debit card **42** having a user identifier encoded on magnetic stripe **44**. The system thus receives the user identifier when card **42** is swiped at the appropriate time through the reader slot **46** of telephone instrument **10** (as shown by arrow **48**).

Referring now to FIG. **4**, the operation of payment means **22** will be described in more detail. As shown, payment means **22** include a plurality of integrated voice response (IVR) units **50** which generate voice messages for communication with the user. Preferably, IVR units **50** are functionally arranged in parallel as shown to give the system redundancy should one unit fail. Additionally, each of IVR units **50** will generally be limited in the maximum amount of calls which it may handle at a given time. A parallel architecture allows the call to be "bounced" to another IVR unit **50** where it can be serviced.

One or more gateway computers **52** are further provided to communicate with IVR units **50** over an interconnecting local area network (LAN). Preferably, bill payment means **22** will include a plurality of gateway computers **52** functionally arranged in parallel as shown. In presently preferred embodiments, gateway computers **52** may each be a HP9000 model E35.

In use, IVR units **50** and gateway computers **52** exchange a number of computer messages to facilitate processing of a transaction request. For example, as indicated at **54**, IVR unit **50** may issue a simple "ping" message when a transaction request is first received from one of telephone instruments **10**. The "ping" message asks whether one of gateway computers **52** is available to handle the transaction. An available one of gateway computers will respond by issuing an acknowledgement, as indicated at **56**. If gateway computers **52** are unavailable, the requesting IVR unit **50** will receive an error, as indicated at **58**. The error number, indicated as "XX," will prompt unit **50** to provide a certain voice message to the user.

After a successful "ping," IVR unit **50** will request whether the transaction is valid, as indicated at **60**. If gateway computer **52** responds that the transaction is valid, a "V" response will be received, as indicated at **62**. If the transaction is not valid, gateway computer **52** will issue an error message as indicated at **64**.

If successful communication is established between one of IVR units **50** and one of gateway computers **52**, and the transaction is indicated as being valid, the respective IVR unit **50** will send a "pay" message to the respective gateway computer **52**, as indicated at **66**. The "pay" message informs the gateway computer **52** that a payment is to be made, and the amount of such payment. Gateway computer **52** then issues an acknowledgement, as indicated at **68**, that the payment has been accepted. Otherwise, gateway computer **52** issues an error message, as indicated at **70**.

If the transaction is interrupted or some other event is detected where such may be appropriate, IVR unit **50** sends an "ABORT" message to gateway computer **52**, as indicated at **72**. If the "ABORT" message is properly received by gateway computer **52**, an acknowledgement is provided, as indicated at **74**. Otherwise, an error is generated, as indicated at **76**.

After the transaction has been validated and the payment information has been gathered, gateway computers **52** communicate with a central computer **78**. From the information provided by gateway computers **52**, central computer **78** functions to identify the user and the desired payee. Based on stored information, payment is effected to the payee by one of numerous methods. In presently preferred

embodiments, central computer **78** may be a HP9000 model E55. For redundancy, several such central computers may be provided.

One form of payment which may be made to the payee is a lump-sum check drawn on the system operator's bank account. Such a check may be produced by a laser printer **80** having appropriate software giving it the capability to imprint MICR codes. Information regarding the customer accounts to be credited by the check could be provided to the payee in a number of ways. For example, central computer **78** may automatically send an appropriate report **82** via fax modem **84**. In the alternative, payment information may be provided by electronic bulletin board **86** through an online service or the Internet if the payee is suitably equipped.

As indicated at **88**, payment may also be effected through the ACH if appropriate arrangements have been made with the payee. In many cases, the system operator will not be a bank. Due to Federal Reserve regulations, however, only banks may have direct access to the ACH. Thus, the system operator making payments through the ACH will affiliate with a gatekeeper bank to provide ACH access. The ACH will transfer funds directly from the account of the system operator into that of the payee. A report may be sent to the payee by one of the methods discussed above to apprise the payee of accounts to be credited with the payment.

Alternatively, if the payee has made suitable arrangements with its own bank, it may not be necessary to issue a separate report to the payee of the accounts to be credited. Specifically, the requisite account information can be included in the ACH transfer to the payee's bank.

The ACH also allows the system operator to collect payment for bills paid on behalf of various users. Such funds are electronically transferred from the user's bank account to the bank account of the system operator via the ACH, preferably before a payment is issued to the billing entity. Access to the user's bank account is provided by the ACH prenote procedure. Information for the ACH prenote is gathered from data given by the user in an application completed to become part of the system.

A significant advantage of the present invention is illustrated by the above discussion. Specifically, the system is organized to allow a decision regarding the validity of a particular transaction to be made at gateway computers **52** instead of central computer **78**. While the decision-making capability of the system is distributed in this manner, detailed information regarding the identity of the users and their respective bank accounts and the like is maintained at central computer **78**. Thus, decision-making capability is distributed without the risk of a security breach. The technique by which the present invention achieves these results will now be described.

Referring to FIG. **5**, the functional components of each gateway computer **52** is illustrated in more detail. As can be seen, gateway computer **52** includes a processor **90** in communication with table storage means **92** and log means **94**. Table storage means contains a plurality of "tables" having a restricted amount of information regarding each of telephone instruments **10**. At stated above, this information is sufficient to allow processor **90** to determine the validity of the desired transaction without compromising security of the system.

As an example, consider the following table which may correspond to one of telephone instruments **10**.

TABLE

A.	650114999
B.	2
C.	0000000050788363_0000000003456791
D.	11_2 0000001_0000001
E.	12_2 0000001_0000001
F.	21_2 0000002_0000001
G.	31_2 0000003_0000001
H.	32_2 0000003_0000001
I.	41_4 0000005_0000001 0000008_0000002
J.	51_2 0000004_0000001
K.	52_2 0000006_0000001
L.	61_8 0000001_0000002_0000003_0000006_0000007_0000008_ 0000010_0000013

For convenience, each table entry has been denominated by one of the letters A through L.

The entry indicated by letter A gives the unique identifier of the telephone instrument to which the table corresponds. In other words, this telephone instrument has an identifier of 650114999. Entry B indicates the number of cards **42** which are authorized to be utilized with the corresponding telephone instrument **10**. In this case, the particular telephone instrument has two (2) authorized cards. Entry C gives the user identifier encoded on each of these two cards. The respective user identifiers are separated by an underscore character as shown. The user identifiers may respectively correspond to an individual bank account from which funds are to be drawn for covering a requested bill payment transaction.

Entries D through L contain information corresponding to the specific bill payment transactions permitted on this telephone instrument **10**. For example, consider entry D, which corresponds to the botton**1** of FIG. **3**. It will be recalled that this button allows the payment of a bill rendered by either a power or gas utility.

As can be seen, entry D contains the listing "11_2" on its first line. The first "1" of this listing simply indicates that it corresponds to botton**1**. The second "1" refers to a number which the user may enter in the telephone keypad to pay a power bill after being prompted by IVR unit **50**. The "2" following the underscore indicates the number of fields which follow. The first such field, i.e., 0000001, corresponds to a particular payee. The second field gives the service location for which payment is to be made, e.g., primary residence in this case.

The listing of line E, i.e., $12\__2$, indicates that button **1** may also be utilized to pay a gas bill. Thus, the following fields respectively indicate the payee and the location for which payment is to be made. It may be noticed that the payee is indicated in entries D and E by the same number. This is because, in the exemplary case shown, the payee is a utility offering both electric and gas services. It should be understood that, in many cases, the payees for electric and gas will be different.

It should also be appreciated that many users will have multiple payees and/or locations for each category of bills to

be paid. For example, a user may have a vacation home in addition to a primary residence. Such a situation is shown by entry I, where the user is authorized to pay mortgage/rent at two locations. In this case, two different mortgagees are to be paid for the primary and vacation residences, and are given by the respective payee numbers "0000005" and "0000008." As will be apparent from the discussion below, these and other field numbers in the Table allow gateway computers **52** to direct IVR units **50** such that the name of the payee and location can be inserted into the voice prompt provided to the user.

Entry L corresponds to button**6**, the general payments button on telephone instrument **10**. The general payments list is constructed by support center **20** based on user request. In this case, a total of eight (8) payees are present in the user's general payments list. In other words, the user may pay any one of these eight payees after button**6** is pressed. A detailed listing of multiple table entries and explanations therefor is attached hereto as Appendix A.

Although some steps of the payment process have been discussed above, a flowchart summary is shown in FIG. **5**A for convenience. First, the user presses a selected one of the transaction buttons on telephone instrument **10**, as indicated at **96**. The user is then prompted to swipe card **42**, as indicated at **98**. The instrument identifier and user identifier are then provided to gateway computer **52**. Gateway computer **52** uses this information to perform a table check, as indicated at **100**. Based on the results of the table check, a decision may be made as to whether the transaction is allowed, as indicated at **102**. If the transaction is not allowed, a validity failure results, as indicated at **104**.

If the transaction is allowed, the user is prompted to select a payee from within the group of payees for the button pressed, as indicated at **106**. Next, as indicated at **108**, the user is prompted to enter an amount to be paid. The user is then issued a reference number, as indicated at **110**, to confirm the occurrence of the transaction.

As indicated at **112**, the transaction amount and payee (as shown in the table) is stored in log **94**. Because the information in log **94** is sufficient to indicate transaction validity, but insufficient to actually effect payment, it may be referred to as an "abbreviated request bundle." All abbreviated request bundles accrued over a period of time are stored in log **94** in this manner. At a predetermined time, they will be transferred to central computer **78**, as indicated at **114**, which may then effect payment as described.

It can be seen that the present system performs all of the functions needed to validate and capture a transaction without the assistance of central computer **78**. The amount of information in each of the tables is carefully selected so that these functions can occur, but further so that insufficient information will be available in the tables to threaten security. In other words, the information contained in the tables would be useless to an unauthorized person who might gain access through deception.

In addition, the methodology described herein allows the transaction to occur, from the standpoint of the user, at a lesser time than may otherwise be the case. For example, the present system eliminates the need to access voluminous demographic data on the user, the user's bank account and the payee. This architecture also allows transactions to be gathered even if central computer **78** is experiencing a malfunction. Thus, the user will not be inconvenienced.

As an illustration of the transaction as seen by the user, consider the following series of messages generated by IVR unit **50**. These messages correspond to an actuation of button**1**, for the payment of a power or gas bill:

BUTTON1 POWER/GAS

Message No.	IVR Message
01	1. To pay the power company for electric or electric and gas press 1, to pay the gas company press 2, for other payment options press 3, to exit press 0.
11	2. (IF 0 is pressed) Goodbye.
	2.5 (IF 3 is pressed) Go to message 10.
02	3. Please swipe your home banking debit card (allow manual entry if card unable to be read).
(IVR checks customer table, payee table, and location name table (local or remote) for validity information and variable information)	
03	4. (Validity failure) We're sorry, your phone is not activated or your debit card is not authorized. Please hang up and press the support center button.
11	5. Goodbye.
	5.1 (If gateway returns 3 payees) To pay Payee Co. 1 press 1, To pay Payee Co. 2 press 2, To pay Payee Co. 3 press 3.
	5.2 (If gateway returns 3 locations for the selected payee) To pay Primary Residence press 1, To pay Second home press 2, To pay Rental property press 3.
04	6. Please enter the amount you want to pay, in dollars and cents with no decimal, followed by the pound key.
05	7. You have entered _____.
06	8. If correct press 1. If incorrect press 0. (If 0 is pressed, loop back to msg.4).
07	9. _____ (info from payee table) power/gas company has been paid $_____ from your account.
06	10. If correct press 1. If incorrect press 0. (If 0 is pressed, loop back to msg. 4)
08	11. Your reference number is _____. To repeat press 1 (If 1 pressed loop back to Msg. 08). To continue press 2.
Script continues to prompt for and verify the amount. The name of the selected company is played along with the amount, and the reference number is played with a repeat option. If there are multiple locations #5.2 above is repeated for each remaining location, adding, "Or continue, press 0" at the end. After locations are selected or rejected, if there are multiple payees, #5.1 is repeated, again with, "Or to continue, press 0" at the end. After this the caller may select the menu of all payment types.	
09	12. Press 1 for more bill pay services. Press 0 to exit.
11	13. (If 0 pressed) Goodbye.
10	14. (If 1 pressed) For Power or gas press 1, for telephone press 2, for water or sewer press 3, for mortgage or rent press 4, for Cable TV or newspaper press 5, for general payments press 6.
(NOTE: If previous transaction had a good card swipe - go to enter amount you want to pay after validity table, location table and payee table information is retrieved for that button #.)	

A recitation of dialogue for other bill payment buttons is attached hereto as Appendix B.

FIG. **6** illustrates the primary functional components of central computer **78**. As can be seen, central computer **78** includes a main processor **116** in communication with a database **118**. As described above, database **118** contains the detailed information necessary to effect bill payment on behalf of the user as well as other functions performed by the system.

In an exemplary embodiment, the information is stored in database **118** using Informix program. As shown in FIG. **7**, this program stores the information using "fields" which have therein a plurality of "keys." Further, the fields are functionally interconnected by common keys. For example, field **120**, labeled "debit cards," has nine keys. The common

key between field **120** and field **122**, labeled "transactions," is "debit_card_no."

A presently preferred embodiment of support center **20** is illustrated in greater detail in FIG. **8**. As shown, support center **20** includes a public branch exchange ("PBX") having an IVR, as indicated at **124**. PBX unit **124** routes a help request to one of a plurality of workstation computers **126** interconnected on a local area network (LAN). In presently preferred embodiments, computers **126** may be Pentium-based computers having a 100 MHz clock speed and including "Windows for Workgroups" software.

The telephone identifier provided to PBX **124** is then sent to central computer **26**, as indicated at **128**. Central computer **78** provides the workstation computer **126** with customer information for display as the call is delivered. The attendant of each workstation computer **126** may then see the customer information on the display. As a result, the attendant will be in a position to assist the user.

Among the functions performed at support center **20** is the creation and updating of the database **118** and the tables stored by gateway computers **52**. Additionally, the support center **20** may process selected product/service transactions, as indicated at **130**. In this case, payment for the product or service is preferably made through payment means **22** instead of independent payment by the user. Thus, as described above, support center **20** communicates with payment means **22** by line **26**.

Support center **20** also communicates with long distance means **24**, as indicated at line **30**. This communication provides notice to the closed network that a particular one of telephone instruments **10** is allowed access to the system.

As previously noted, long distance means **24** provides long distance telephone service through a closed network. Referring to FIG. **9**, the closed network is first accessed by pressing the appropriate button on telephone instrument **10**, as indicated at **130**. A computer within long distance means **24** then receives the unique identifier provided by telephone instrument **10**. Based on this identifier, the computer determines whether instrument **10** is part of the closed network, as indicated in **132**. If the telephone instrument is not part of the closed network, access to the network is denied, as indicated at **134**.

If, on the other hand, telephone instrument **10** is part of the closed network, long distance means **24** returns a dial tone, as indicated at **136**. The user then places a desired call using telephone instrument **10**, as indicated at **138**.

As the call is transpiring, various information regarding the destination and length of the call is recorded, as indicated at **140**. Before the call is to be billed, its rate is analyzed based on a predetermined criteria, as indicated at **142**. In presently preferred embodiments, the predetermined criteria is selected to be lower than at least the largest four long distance carriers. Thus, the amount charged to the user will always be lower than at least these largest four long distance carriers.

After the rate is determined, a charge for the various calls is forwarded to payment means **22**, as indicated at **144**. The telephone calls may then appear on a consolidated statement from the system operator along with bills paid by payment means **22** and products or services ordered on behalf of the user by support center **20**.

While preferred embodiments of the invention and presently preferred methods of practicing same have been shown and described, modifications and variations thereto may be practiced by those of ordinary skill in the art without departing from the spirit and scope of the present invention, which is more particularly set forth in the appended claims. In addition, it should be understood that aspects of the various embodiments may be interchanged both in whole or in part. Furthermore, those of ordinary skill in the art will appreciate that the foregoing description is by way of example only, and is not intended to be limitative of the invention so further described in such appended claims.

APPENDIX A

```
650114999
2
0000000050788363_0000000003456791
11_2
0000001_0000001
12_2
0000001_0000001
21_2
0000002_0000001
31_2
0000003_0000001
32_2
0000003_0000001
41_4
0000005_0000001
0000008_0000002
51_2
0000004_0000001
52_2
0000006_0000001
61_8
0000001_0000002_0000003_0000006_0000007_0000008_0000010_0000013
#
650114888
1
0000000044488363
11_4
0000001_0000001
0000001_0000002
12_2
0000001_0000001
21_2
```

APPENDIX A-continued

0000002_0000001
31_2
0000003_0000001
32_2
0000003_0000001
41_4
0000009_0000001
0000007_0000002
51_2
0000004_0000001
52_2
0000005_0000001
61_8
0000001_0000002_0000003_0000004
0000005_0000010_0000014_0000021
#
ELECTRONIC PAYEE TABLE
0001 SCE&G
0002 Southern Bell
0003 City of Columbia, SC
0004 CVI of Columbia, SC
0005 State Newspaper
.
.
.
0010 Midland Mortgage
0011 Fleet Mortgage
LOCATION TABLE
0001 Primary Residence
0002 2nd Home
0003 Rental Property 1
0004 Rental Property 2
0005 Parent
0006 Child
0007 In-law
0008 Business
0009 Vacation Home
TELEPAY (DART) HOME BANKING

VALIDITY TABLE:
*note 1 (field separator = _(underscore character))
*note 2 (button number = (11 to 61) 11 = power bill payment
12 = gas bill payment
21 = telephone bill payment
31 = water bill payment
32 = sewer bill payment
41 = Mortgage/rent payment
51 = Cable TV bill payment
52 = Newspaper bill payment
61 = General bill payment
*General bill payment will return the presence or absence of the payee chosen
TABLE:
PHONE SERIAL - (9 digits exact) ex. 650114999_
NUM. OF DEBIT CARDS ALLOWED THIS PHONE (2 digits max.) ex 01_
DEBIT CARD SWIPE account # - (19 digits max.) ex. 0788363_
BUTTON CODE 11_(POWER)
NUMBER OF FIELDS FOR THE ABOVE BUTTON CODE (MAX = 18 ie 3 companies with 3 locations each) ex. 6_
PAYEE CODE 1 ex. 0000001_
LOCATION CODE 1 ex. 0000001_
PAYEE CODE 1 ex. 0000001_
LOCATION CODE 2 ex. 0000002_
PAYEE CODE 1 ex. 0000001_
LOCATION CODE 3 ex. 0000003_
BUTTON CODE 12 (GAS)
NUMBER OF FIELDS FOR THE ABOVE BUTTON CODE (MAX = 18 ie 3 companies with 3 locations each) ex. 6_
PAYEE CODE 1 ex. 0000001_
LOCATION CODE 1 ex. 0000001_
PAYEE CODE 1 ex. 0000001_
LOCATION CODE 2 ex. 0000002_
PAYEE CODE 1 ex. 0000001_
LOCATION CODE 3 ex. 0000003_
BUTTON CODE 21 (TELEPHONE)
NUMBER OF FIELDS FOR THE ABOVE BUTTON CODE (MAX = 18 ie 3 companies with 3 locations each) ex. 6_
PAYEE CODE 1 ex. 0000002_
LOCATION CODE 1 ex. 0000001_
PAYEE CODE 1 ex. 0000002_

APPENDIX A-continued

LOCATION CODE 2 ex. 0000002_
PAYEE CODE 1 ex. 0000002_
LOCATION CODE 3 ex. 0000003_
BUTTON CODE 31 (WATER)
NUMBER OF FIELDS FOR THE ABOVE BUTTON CODE (MAX = 18 ie 3 companies with 3 locations each) ex. 6_
PAYEE CODE 1 ex. 0000003_
LOCATION CODE 1 ex. 0000001_
PAYEE CODE 1 ex. 0000003_
LOCATION CODE 2 ex. 0000002_
PAYEE CODE 1 ex. 0000003_
LOCATION CODE 3 ex. 0000003_
BUTTON CODE 32 (SEWER)
NUMBER OF FIELDS FOR THE ABOVE BUTTON CODE (MAX = 18 ie 3 companies with 3 locations each) ex. 6_
PAYEE CODE 1 ex. 0000003_
LOCATION CODE 1 ex. 0000001_
PAYEE CODE 1 ex. 0000003_
LOCATION CODE 2 ex. 0000002_
PAYEE CODE 1 ex. 0000003_
LOCATION CODE 3 ex. 0000003_
BUTTON CODE 41 (Mortgage/rent)
NUMBER OF FIELDS FOR THE ABOVE BUTTON CODE (MAX = 18 ie 3 companies with 3 locations each) ex. 4_
PAYEE CODE 1 ex. 0000010_
LOCATION CODE 1 ex. 0000001_
PAYEE CODE 1 ex. 0000012_
LOCATION CODE 2 ex. 0000001_
BUTTON CODE 51 (CABLE TV)
NUMBER OF FIELDS FOR THE ABOVE BUTTON CODE (MAX = 18 ie 3 companies with 3 locations each) ex. 6_
PAYEE CODE 1 ex. 0000004_
LOCATION CODE 1 ex. 0000001_
PAYEE CODE 1 ex. 0000004_
LOCATION CODE 2 ex. 0000002_
PAYEE CODE 1 ex. 0000004_
LOCATION CODE 3 ex. 0000003_
BUTTON CODE 52 (NEWSPAPER)
NUMBER OF FIELDS FOR THE ABOVE BUTTON CODE (MAX = 18 ie 3 companies with 3 locations each) ex. 6_
PAYEE CODE 1 ex. 0000003_
LOCATION CODE 1 ex. 0000001_
PAYEE CODE 1 ex. 0000003_
LOCATION CODE 2 ex. 0000002_
PAYEE CODE 1 ex. 0000003_
LOCATION CODE 3 ex. 0000003_
BUTTON CODE 61
NUMBER OF FIELDS FOR THE ABOVE BUTTON CODE (MAX = UNLIMITED UP TO ELECTRONIC PAYEE TABLE) ex. 6_
PAYEE CODE 1 ex 0000005_
.
.
.
PAYEE CODE (N-1)*

*The IVR will check the payee code entered to see if it is listed under button 61 in the customers validity table. If it is not listed then the IVR will tell the customer that this is the 1st time he is paying this company and to please input the customer account number to be included in the transaction record captured for this payment transaction.

SAMPLE VALIDITY TABLE ENTRY
PHONE SERIAL NUMBER = 650114999
DEBIT CARD ACCT # = 0000000050788363
BUTTON CODE 11
NUMBER OF ENTRY FIELDS = 2
ELECTRONIC PAYEE TABLE ENTRY FOR 1ST POWER CO. = 0000001
(SCE&G from electronic payee table)
LOCATION TABLE ENTRY FOR 1st LOCATION. = 0000001
(Primary residence from location table)
BUTTON CODE 12
NUMBER OF ENTRY FIELDS = 2
ELECTRONIC PAYEE TABLE ENTRY FOR 1ST GAS CO. = 0000001
(SCE&G from electronic payee table)
LOCATION TABLE ENTRY FOR 1st LOCATION. = 0000001
(Primary residence from location table)
BUTTON CODE 21
NUMBER OF ENTRY FIELDS = 2
ELEC. PAYEE TABLE ENTRY FOR 1ST TELEPHONE CO. = 0000002
(Southern Bell from electronic payee table)
LOCATION TABLE ENTRY FOR 1st LOCATION. = 0000001

APPENDIX A-continued

(Primary residence from location table)
BUTTON CODE 31
NUMBER OF ENTRY FIELDS = 2
ELECTRONIC PAYEE TABLE ENTRY FOR 1ST WATER CO. = 0000003
(City of Columbia from electronic payee table)
LOCATION TABLE ENTRY FOR 1st LOCATION. = 0000001
(Primary residence from location table)
BUTTON CODE 32
NUMBER OF ENTRY FIELDS = 2
ELECTRONIC PAYEE TABLE ENTRY FOR 1ST SEWER CO. = 0000003
(City of Columbia from electronic payee table)
LOCATION TABLE ENTRY FOR 1st LOCATION. = 0000001
(Primary residence from location table)
BUTTON CODE 41
NUMBER OF ENTRY FIELDS = 4
ELECTRONIC PAYEE TABLE ENTRY FOR 1ST MORTGAGE/RENT
COMPANY = 0000010 (Midland Mort. from Payee table)
LOCATION TABLE ENTRY FOR 1st LOCATION. = 0000001
(Primary residence from location table)
ELECTRONIC PAYEE TABLE ENTRY FOR 2nd MORTGAGE/RENT
COMPANY = 0000012 (Fleet Mortgage from Payee table)
LOCATION TABLE ENTRY FOR 1st LOCATION. = 0000002
(Rental Property from location table)
BUTTON CODE 51
NUMBER OF ENTRY FIELDS = 2
ELECTRONIC PAYEE TABLE ENTRY FOR 1ST CABLE TV = 0000004
(CVI of Columbia, S.C. from payee table)
LOCATION TABLE ENTRY FOR 1st LOCATION. = 0000001
(Primary residence from location table)
BUTTON CODE 52
NUMBER OF ENTRY FIELDS = 2
ELECTRONIC PAYEE TABLE ENTRY FOR 1ST NEWSPAPER = 0000005
(STATE of Columbia, S.C. from payee table)
LOCATION TABLE ENTRY FOR 1st LOCATION. = 0000001
(Primary residence from location table)
BUTTON CODE 61
NUMBER OF ENTRIES THAT THIS CUSTOMER HAS ACCOUNT
NUMBERS ON FILE AT DART = 8
PAYEE TABLE ENTRY 1 = 0000001
PAYEE TABLE ENTRY 2 = 0000002
PAYEE TABLE ENTRY 3 = 0000003
PAYEE TABLE ENTRY 4 = 0000004
PAYEE TABLE ENTRY 5 = 0000005
PAYEE TABLE ENTRY 6 = 0000010
PAYEE TABLE ENTRY 7 = 0000011
PAYEE TABLE ENTRY 8 = 0000012
END-OF-TABLE = #

APPENDIX B

BUTTON#1 POWER/GAS

01 1. To pay the power company for electric or electric and gas press 1, to pay the gas company press 2, for other payment options press 3, to exit press 0.
11 2. (IF 0 is pressed) Goodbye. 2.5 (IF 3 is pressed) Go to message 10.
02 3. Please swipe your DART home banking debit card. (allow manual entry if card unable to be read)

(IVR checks customer table, payee table, and location name table (local or remote) for validity information and variable information).

03 4. (Validity failure) We're sorry, your phone is not activated or your debit card is not authorized. Please hang up and press the DART Home Banking helpdesk button.
11 5. Goodbye. 5.1 (If ECCG returns 3 payees) To pay Payee Co. 1 press 1, To pay Payee Co. 2 press 2, To pay Payee Co. 3 press 3. 5.2 (IF ECCG returns 3 locations for the selected payee) To pay Primary Residence press 1, To pay Second home press 2, To pay Rental property press 3.
04 6. Please enter the amount you want to pay, in dollars and cents with no decimal, followed by the pound key.
05 7. You have entered _____
06 8. If correct press 1. If incorrect press 0. (If 0 is pressed, loop back to msg. 4).
07 9. _____(info from payee table) power/gas company has been paid S _____from your account.
06 10. If correct press 1. If incorrect press 0. (If 0 is pressed, loop back to msg. 4)
08 11. Your reference number is _____. To repeat press 1 (If 1 pressed loop back to Msg. 08). To continue press 2.

(Script continues to prompt for and verify the amount. The name of the selected company is played along with the amount, and the reference number is played with a repeat option. If there are multiple locations #5.2 above is repeated for each remaining location, adding, "Or continue, press 0" at the end. After locations are selected or rejected, if there are multiple payees, #5.1 is repeated, again with, "Or to continue, press 0" at the end. After this the caller may select the menu of all payment types.

09 12. Press 1 for more bill pay services. Press 0 to exit.
11 13. (If 0 pressed) Goodbye.
10 14. (If 1 pressed) For Power or gas press 1, for telephone press 2, for water or sewer press 3, for mortgage or rent press 4, for Cable TV or newspaper press 5, for other general payments press 6.

(NOTE: If previous transaction had a good card swipe—go to enter amount you want to pay after validity table, location table, and payee table information is retrieved for that button #.)

BUTTON #2 TELEPHONE

01 1. To pay your telephone bill press 1, for other payment options press 2, or press 0 to exit.
11 2. (IF 0 is pressed) Goodbye. 2.5 (IF 2 is pressed) go to message 10.
02 3. Please swipe your DART home banking debit card. (allow manual entry if card unable to be read)
03 4. (Validity failure) We're sorry, your phone is not activated or your debit card is not authorized. Please hang up and press the DART home banking helpdesk button.
11 5. Goodbye. 5.1 (If ECCG returns 3 payees) To pay Payee Co. 1 press 1, To pay Payee Co. 2 press 2, To pay Payee Co. 3 press 3. 5.2 (IF ECCG returns 3 locations for the selected payee) To pay Primary Residence press 1, To pay Second home press 2, To pay Rental property press 3.
04 6. Please enter the amount you want to pay, no decimal, followed by the pound key.
05 7. You have entered _____
06 8. If correct press 1. If incorrect press 0. (If 0 is pressed, loop back to msg. 4).
07 9. _____(info from payee table) telephone company has been paid S _____from your account.
06 10. If correct press 1. If incorrect press 0. (If 0 is pressed, loop back to msg. 4)
08 11. Your reference number is _____. To repeat press 1 (If 1 pressed loop back to Msg. 08). To continue press 2.

(Script continues to prompt for and verify the amount. The name of the selected company is played along with the amount, and the reference number is played with a repeat option. If there are multiple locations #5.2 above is repeated for each remaining location, adding, "Or continue, press 0" at the end. After locations are selected or rejected, if there are multiple payees, #5.1 is repealed, again with, "Or to continue, press 0" at the end. After this the caller may select the menu of all payment types.

09 12. Press 1 for more bill pay services. Press 0 to exit.
11 13. (If 0 pressed) Goodbye.
10 14. (If 1 pressed) For Power or gas press 1, for telephone press 2, for water or sewer press 3, for mortgage or rent press 4, for Cable TV or newspaper press 5, for other general payments press 6.

(NOTE: If previous transaction had a good card swipe—go to enter amount you want to pay after validity table, location table, and payee table information is retrieved for that button #.)

BUTTON #3 WATER/SEWER

01 1. To pay your water or your water and sewer bill press 1, to pay your sewer bill Press 2, for other payment options press 3, or press 0 to exit.
11 2. (IF 0 is pressed) Goodbye. 2.5 (IF 3 is pressed) go to message 10.
02 3. Please swipe your DART home banking debit card. (allow manual entry if card unable to be read)

(IVR checks customer table, payee table, and location name table (local or remote) for validity information and variable information).

03 4. (Validity failure) We're sorry, your phone is not activated or your debit card is not authorized. Please hang up and press the DART home banking helpdesk button.
11 5. Goodbye. 5.1 (If ECCG returns 3 payees) To pay Payee Co. 1 press 1, To pay Payee Co. 2 press 2, To pay Payee Co. 3 press 3. 5.2 (IF ECCG returns 3 locations for the selected payee) To pay Primary Residence press 1, To pay Second home press 2, To pay Rental property press 3.
04 6. Please enter the amount you want to pay, no decimal, followed by the pound key.
05 7. You have entered _____
06 8. If correct press 1. If incorrect press 0. (If 0 is pressed, loop back to msg. 4).
07 9. _____(info from payee table) water/sewer company has been paid S _____from your account.
06 10. If correct press 1. If incorrect press 0. (If 0 is pressed, loop back to msg. 4)
08 11. Your reference number is _____. To repeat press 1 (If 1 pressed loop back to Msg. 08). To continue press 2.

(Script continues to prompt for and verify the amount. The name of the selected company is played along with the amount, and the reference number is played with a repeat option. If there are multiple locations #5.2 above is repeated for each remaining location, adding, "Or continue, press 0" at the end. After locations are selected or rejected, if there are multiple payees, #5.1 is repeated, again with, "Or to continue, press 0" at the end. After this the caller may select the menu of all payment types.

09 12. Press 1 for more bill pay services. Press 0 to exit.
11 13. (If 0 pressed) Goodbye.
10 14. (If 1 pressed) For Power or gas press 1, for telephone press 2, for water or sewer press 3, for mortgage or rent press 4, for Cable TV or newspaper press 5, for other general payments press 6.

(NOTE: If previous transaction had a good card swipe—go to enter amount you want to pay after validity table, location table, and payee table information is retrieved that button #.)

TELEPAY (DART) HOME BANKING

BUTTON #4 MORTGAGE or RENT

01 1. If you would like to pay your mortgage or rent press 1, for other payment options, press 2 or press 0 to exit.
11 2. (IF 0 is pressed) Goodbye. 2.5 If 2 pressed, go to message 10.
02 3. Please swipe your DART home banking debit card. (allow manual entry if card unable to be read)

(IVR checks customer table, payee table, and location name table (local or remote) for validity information and variable information).

03 4. (Validity failure) We're sorry, your phone is not activated or your debit card is not authorized. Please hang up and press the DART home banking helpdesk button.
11 5. Goodbye. 5.1 (If ECCG returns 3 payees) To pay Payee Co. 1 press 1, To pay Payee Co. 2 press 2, To pay Payee Co. 3 press 3. 5.2 (IF ECCG returns 3 locations for the selected payee) To pay Primary Residence press 1, To pay Second home press 2, To pay Rental property press 3.
04 6. Please enter the amount you want to pay, no decimal, followed by the pound key.
05 7. You have entered _____
06 8. If correct press 1. If incorrect press 0. (If 0 is pressed, loop back to msg. 4).
07 9. _____(info from payee table) mortgage or rental company has been paid S _____from your account.
06 10. If correct press 1. If incorrect press 0. (If 0 is pressed, loop back to msg. 4)

08 11. Your reference number is _____. To repeat press 1 (If 1 pressed loop back to Msg. 08). To continue press 2.

(Script continues to prompt for and verify the amount. The name of the selected company is played along with the amount, and the reference number is played with a repeat option. If there are multiple locations #5.2 above is repeated for each remaining location, adding, "Or continue, press 0" at the end. After locations are selected or rejected, if there are multiple payees, #5.1 is repeated, again with, "Or to continue, press 0" at the end. After this the caller may select the menu of all payment types.

09 12. Press 1 for more bill pay services. Press 0 to exit.
11 13. (If 0 pressed) Goodbye.
10 14. (If 1 pressed) For Power or gas press 1, for telephone press 2, for water or sewer press 3, for mortgage or rent press 4, for Cable TV or newspaper press 5, for other general payments press 6.

(NOTE: If previous transaction had a good card swipe—go to enter amount you want to pay after validity table, location table, and payee table information is retrieved for that button #.)

TELEPAY (DART) HOME BANKING

BUTTON #5 Cable TV/Newspaper

01 1. If you would like to pay your cable TV, bill press 1, to pay your Newspaper bill, Press 2, or press 0 to exit.
2. (IF 0 is pressed) Goodbye. 2.5 If 2 pressed, go to message 10.
02 3. Please swipe your DART home banking debit card. (allow manual entry if card unable to be read)

(IVR checks customer table, payee table, and location name table (local or remote) for validity information and variable information).

03 4. (Validity failure) We're sorry, your phone is not activated or your debit card is not authorized. Please hang up and press the DART home banking helpdesk button.
11 5. Goodbye. 5.1 (If ECCG returns 3 payees) To pay Payee Co. 1 press 1, To pay Payee Co. 2 press 2, To pay Payee Co. 3 press 3. 5.2 (IF ECCG returns 3 locations for the selected payee) To pay Primary Residence press 1, To pay Second home press 2, To pay Rental property press 3.
04 6. Please enter the amount you want to pay, no decimal, followed by the pound key.
05 7. You have entered _____
06 8. If correct press 1. If incorrect press 0. (If 0 is pressed, loop back to msg. 4).
07 9. _____(info from payee table) cable TV/Newspaper company has been paid S _____from your account.
06 10. If correct press 1. If incorrect press 0. (If 0 is pressed, loop back to msg. 4)
08 11. Your reference number is _____. To repeat press 1 (If 1 pressed loop back to Msg. 08). To continue press 2.

(Script continues to prompt and verify the amount. The name of the selected company is played along with the amount and the reference number is played with a repeat option. If there are multiple locations #5.2 above is repeated for each remaining location, adding, "Or continue, press 0" at the end. After locations are selected or rejected, if there are multiple payees, #5.1 is repeated, again with, "Or to continue, press 0" at the end. After this the caller may select the menu of all payment types.

09 12. Press 1 for more bill pay services. Press 2 to exit.
11 13. (If 2 pressed) Goodbye.
10 14. (If 1 pressed) For Power or gas press 1, for telephone press 2, for water or sewer press 3, for mortgage or rent press 4, for Cable TV or newspaper press 5, for other general payments press 6.

(NOTE: If previous transaction had a good card swipe—go to enter amount you want to pay after validity table, location table, and payee table information is retrieved/or that button #.)

TELEPAY (DART) HOME BANKING

BUTTON #6 GENERAL PAYMENTS

23 1. You have chosen to make a payment to a company listed in the general payments guide. Press 1 to continue, press 2 for other payment options, or press 0 to exit.
11 2. (IF 0 is pressed) Goodbye. 2.1 If 1 pressed, go to message 10. 2.2 Please enter the company code.
05 3. You have entered.
15 4. If correct press 1. To change press 2 (If 2 pressed, loop back to 2.1)
02 5. Please swipe your DART home banking debit card. (allow manual entry if card unable to be read)

(IVR checks validity table, payee table, and location name table (local or remote) for validity information, variable information, and if 1st time paid).

03 4. (Validity failure) We're sorry, your phone is not activated or your debit card is not authorized. Please hang up and press the DART home banking helpdesk button.
11 7. Goodbye.
(IF 1st time customer has paid this payee ask for 7.6 information and confirm. Indicated by payee number not being in validity table). 7.6 Please enter your account number for this company, followed by the pound sign. 7.7 You entered _____(correct press 1, reenter press 2)
04 8. Please enter the amount you want to pay, no decimal, followed by the pound key.
05 9. You have entered _____
06 10. If correct press 1. If incorrect press 0. (If 0 is pressed, loop back to msg. 4).
07 11. _____(info from payee table) company will be paid S _____from your account.
06 12. If correct press 1. If incorrect press 0. (If 0 is pressed, loop back to msg. 4)
13. Your reference number is _____. To repeat press 1 (If 1 pressed loop back to Msg. 08). To continue press 2. 13.1 Press 1 to pay another company listed in the general payments guide, Press 2 for other payment options or Press 0 to exit.
11 14. (If 0 pressed) Goodbye.
10 16. (If 2 pressed) For Power or gas press 1, for telephone press 2, for water or sewer press 3, for mortgage or rent press 4, for Cable TV or newspaper press 5, for other general payments press 6.

(NOTE: If previous transaction had a good card swipe—go to enter amount you want to pay after validity table, location table, and payee table information is retrieved for that button #.)

What is claimed is:

1. A system for use by a multiplicity of users to perform a variety of transactions through a system operator and effect

collection of payment for said transactions by said system operator, said system comprising:

a plurality of telephone instruments respectively having a telephone identifier, said telephone instruments further including means for inputting a user identifier;

each of said telephone instruments further having a plurality of user actuators thereon respectively indicative of a particular transaction, said transactions including bill payment, product/service requests and closed network long distance telephone service;

system processor means in communication with said respective of said telephone instruments upon actuation of a selected user actuator by said user, said system processor means operative to receive at least said telephone identifier from said telephone instrument;

said system processor means being further able to determine which type of said transactions is being requested based on actuation of said selected user actuator;

payment means for effecting payment of bills rendered by third parties to said user on behalf of said user;

product/service means for effecting requests of products/services on behalf of said user;

long distance means for effecting long distance telephone calls by said user from said telephone instrument through a closed network;

collection means for collecting payment for said transactions based on receipt of at least said telephone identifier from said telephone instrument; and

wherein said system processor includes:

(a) at least one gateway computer having table means for storing therein a plurality of tables respectively corresponding to one of maid telephone instruments;

(b) said gateway computer further having validity processor means for checking whether a request for bill payment from one of said telephone instruments is valid, said validity processor means operative to check said request for bill payment by receiving both of said telephone identifier and said user identifier and comparing said identifiers with data in a corresponding table;

(c) a central computer in communication with said at least one gateway computer and operative to forward a payment command to said payment means, said central computer having a complete database containing sufficient information regarding said user and said third party to effect bill payment thereto as requested.

2. A system as set forth in claim **1**, wherein said long distance means includes:

means for logging information regarding calls made from a respective of said telephone instruments;

means for dynamically analyzing said calls made from a respective of said telephone instruments and determining a rate according to a predetermined criteria; and

means in communication with said collection means for effecting payment for said calls from said user to said system operator.

3. A system as set forth in claim **1**, wherein said means of said telephone instrument for inputting a user identifier is a wallet card swipe reader.

4. A system as set forth in claim **1**, wherein said system includes means for returning to said user a reference number indicating receipt of a valid request for bill payment by said system operator.

5. A system as set forth in claim **1**, wherein said at least one gateway computer includes a plurality of said gateway computers functionally arranged in parallel to receive transaction requests from said telephone instruments.

6. A system as set forth in claim **5**, including a plurality of integrated voice response units functionally connected between said telephone instruments and said gateway computers to facilitate response units being functionally arranged in parallel with one another.

7. A system as set forth in claim **1**, wherein said gateway computer further includes log means for storing information regarding each said transaction received during a selected period and forwarding said information to said central computer in batch at a predetermined time.

8. A system as set forth in claim **1**, wherein said collection means includes means for electronically transferring funds from a bank account of said user to a bank account of said system operator.

9. A system as set forth in claim **1**, wherein said payment means includes:

means for electronically transferring funds from a bank account of said system operator to a bank account of said third party; and

means for producing a check drawn on said bank account of said system operator to said third party.

10. A system for use by a multiplicity of users to request payment by a system operator of bills rendered by a third party to said users, said system comprising:

a plurality of telecommunication instruments respectively having an instrument identifier, said telecommunication instruments further including means for inputting a user identifier;

at least one gateway computer having table means for storing therein a plurality of tables respectively corresponding to one of said telephone instruments;

said gateway computer further having gateway processor means for validity checking requests for bill payment from said telecommunication devices, said gateway processor means operative to receive both of said telecommunication identifier and said user identifier and comparing said identifiers with data in a corresponding table;

a central computer in operative communication with said gateway computer, said central computer having a complete database containing sufficient information regarding said user and a payee to effect bill payment thereto as requested;

payment means in communication with said central computer and operative upon receipt of a payment command therefrom for effecting payment to said third parties of said bills; and

collection means for collecting payment for said transactions.

11. A system as set forth in claim **10**, wherein said collection means includes means for electronically transferring funds from a bank account of said user to a bank account of said system operator.

12. A system as set forth in claim **11**, wherein said means of said telecommunication instrument for inputting a user identifier is a wallet card swipe reader.

13. A system as set forth in claim **12**, wherein respective of said telecommunications instruments are telephone instruments.

14. A system as set forth in claim **13**, wherein said system includes means responsive to said gateway computer for returning to said user by voice a reference number indicating receipt and acceptance by said system operator of a request for bill payment.

15. A system as set forth in claim 10, wherein said at least one gateway computer includes a plurality of said gateway computers functionally arranged in parallel to receive transaction requests from said telephone instruments.

16. A system as set forth in claim 15, including a plurality of integrated voice response units functionally connected between said telecommunications instruments and said gateway computers to facilitate communication therebetween, said integrated voice response units being functionally arranged in parallel with one another.

17. A system as set forth in claim 10, wherein gateway computer further includes log means for storing information regarding a plurality of said requests received during a selected period as abbreviated request bundles and forwarding said abbreviated request bundles to said central computer in batch at a predetermined time.

18. A system as set forth in claim 12, wherein said payment means includes:

first means for electronically transferring funds from a bank account of said system operator to a bank account of said third party; and

second means for producing a check drawn on said bank account of said system operator to said third party.

19. A system as set forth in claim 18, wherein said first means includes supplemental means for notifying said third party of an electronic funds transfer to facilitate proper crediting of an account of said user.

20. A computer-based method of effecting payment of bills rendered to consumers by third parties on behalf of said consumers, said method comprising the steps of:

(a) providing a telephone instrument to respective of said consumers, said telephone instrument including means for communicating a telephone identifier and further including a wallet card swipe reader;

(b) providing a wallet card to respective of said consumers, said wallet card having a user identifier magnetically encoded thereon;

(c) electronically receiving a request to pay a bill, said request including said telephone identifier and said user identifier;

(d) checking said telephone identifier and said user identifier against a validity table to determine whether said request is valid;

(e) if said request is not valid, denying said request;

(f) if said request is valid, receiving an amount to be paid to said third party from inputs entered on a keypad of said telephone instrument and forming an abbreviated request bundle;

(g) correlating said abbreviated request bundle with a complete database containing sufficient information regarding said user and said third party to effect bill payment thereto as requested; and

(h) paying said bill rendered to said user by said third party on said user's behalf.

21. A method as set forth in claim 20, including the steps of:

(i) creating in a first computer a log containing a plurality of said abbreviated request bundles accrued from a plurality of said telephone instruments over a selected period; and

(j) at a predetermined time, forwarding said plurality of said abbreviated request bundles from said first computer to a second computer for respective correlation with said complete database.

22. A method as set forth in claim 20, further comprising the step of providing to said user a transaction identifier to reference receipt and acceptance of said request.

* * * * *

US005860073A

United States Patent [19]

Ferrel et al.

[11] **Patent Number: 5,860,073**

[45] **Date of Patent: Jan. 12, 1999**

[54] **STYLE SHEETS FOR PUBLISHING SYSTEM**

[75] Inventors: **Patrick J. Ferrel**, Seattle; **Matthew W. Gertz**; **Robert F. Meyer**, both of Redmond; **Stephen J. Millet**, Seattle; **Kevin M. Schofield**, Bellevue; **John P. Shewchuk**; **Walter W. Smith**, both of Seattle, all of Wash.

[73] Assignee: **Microsoft Corporation**, Redmond, Wash.

[21] Appl. No.: **503,452**

[22] Filed: **Jul. 17, 1995**

[51] **Int. Cl.**[6] **G06F 15/00**

[52] **U.S. Cl.** **707/522**; 707/513; 707/516; 707/526

[58] **Field of Search** 395/774, 776–778, 395/779, 784, 788; 707/522, 526, 513, 516

[56] **References Cited**

U.S. PATENT DOCUMENTS

4,710,885	12/1987	Litteken	395/774
4,723,210	2/1988	Barker et al.	395/776
4,739,477	4/1988	Barker et al.	395/611
4,969,093	11/1990	Barker et al.	395/800
5,033,008	7/1991	Barker et al.	395/785
5,129,052	7/1992	Barker et al.	395/776
5,133,051	7/1992	Handley	395/776
5,181,162	1/1993	Smith et al.	395/792
5,339,392	8/1994	Risberg et al.	395/333
5,347,632	9/1994	Filepp et al.	395/200.32
5,491,785	2/1996	Robson et al.	395/507
5,557,722	9/1996	De Rose et al.	395/774
5,621,875	4/1997	Mason et al.	395/793
5,630,103	5/1997	Smith et al.	395/500
5,644,776	7/1997	De Rose et al.	395/761

OTHER PUBLICATIONS

Lie, "Cascading HTML style sheets—a proposal", http://www.w3.org/People/howcome/p/cascade.html, 10 Oct., 1994.

Gifford, "Polychannel systems for mass digital communication", *Comm. of ACM*, v.33, n. 2, p. 141(11), Feb. 1990.

Jackson, "The Published Word", *PC User*, n. 137, p. 32(4), Jul. 18, 1990.

Journalist User's Guide: Your Personalized Newspaper for Compuserve®, PED Software Corp., pp. 1–111, Jan. 1994.

Hüser et al., "The Individualized Electronic Newspaper: An Application Challenging Hypertext Technology", GMD Report No. GMD–664, Jul. 1992.

Sterahn et al., "Positioning HTML Elements with Cascading Style Sheets", http://www.w3.org/pub/WWW/TR/WD–positioning, Jan. 31, 1997.

Lie et al., "Cascading Style Sheets, level 1", http://www.w3.org/pub/WWW/TR/REC–CSS1, Dec. 17, 1996.

Hughes, "Thinking about style sheets", http:www.w3.org/Style/mail/kh–2–May–95.html, May 2, 1995.

Duncan, Rey, "Power Programming: An HTML Primer, " PC Magazine, Jun. 13, 1995, pp. 261–270.

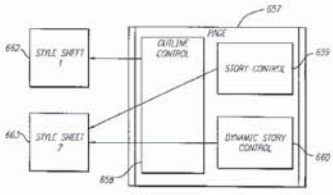
Microsoft ®Word, "About Styles" Chp. 9, pp. 178–183 and Document Templates Chp. 10, pp. 205–224, User's Guide, 1993–1994, Microsoft Corporation.

Primary Examiner—Joseph R. Burwell
Attorney, Agent, or Firm—Banner & Witcoff Ltd.

[57] **ABSTRACT**

The use of style sheets in an electronic publishing system is described. A style sheet is a collection of formatting information, such as font and tabs in a textual document. The style sheets described herein are applied to individual display regions (controls) on a page. Unlike previous systems, the display regions in this system do not contain any text at the time the style sheet is applied. Rather, the text, or other media such as graphics, is poured into the display region when the title is rendered on the customer's computer.

35 Claims, 20 Drawing Sheets



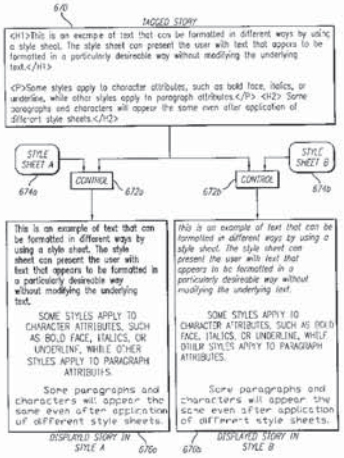
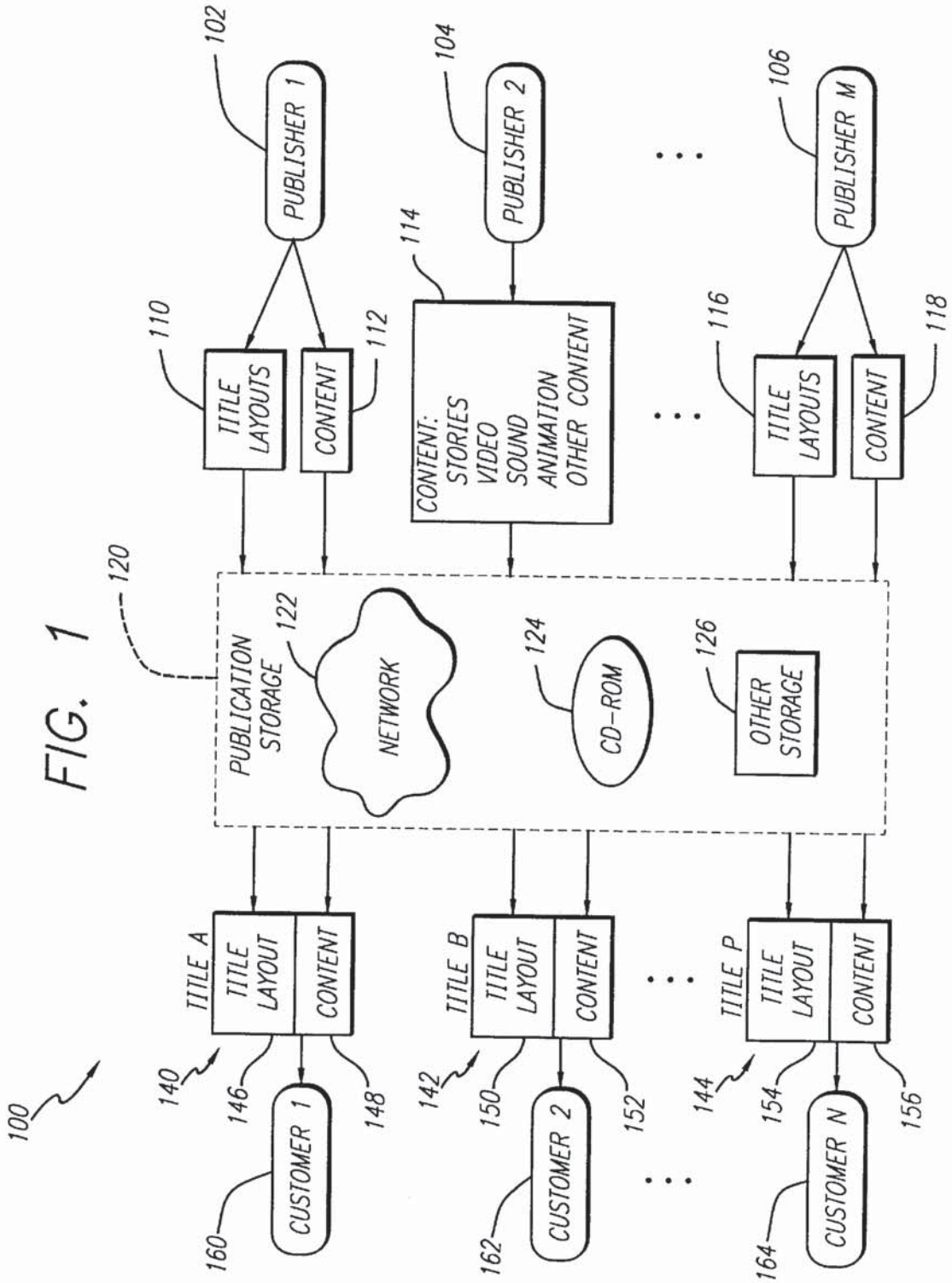


FIG. 1


100
102
PUBLISHER 1
104
PUBLISHER 2
106
PUBLISHER M
110
TITLE LAYOUTS
112
CONTENT
114
CONTENT: STORIES VIDEO SOUND ANIMATION OTHER CONTENT
116
TITLE LAYOUTS
118
CONTENT
120
PUBLICATION STORAGE
122
NETWORK
124
CD-ROM
126
OTHER STORAGE
TITLE A
TITLE LAYOUT
CONTENT
TITLE B
TITLE LAYOUT
CONTENT
TITLE P
TITLE LAYOUT
CONTENT
140
142
144
146
148
150
152
154
156
CUSTOMER 1
CUSTOMER 2
CUSTOMER N
160
162
164

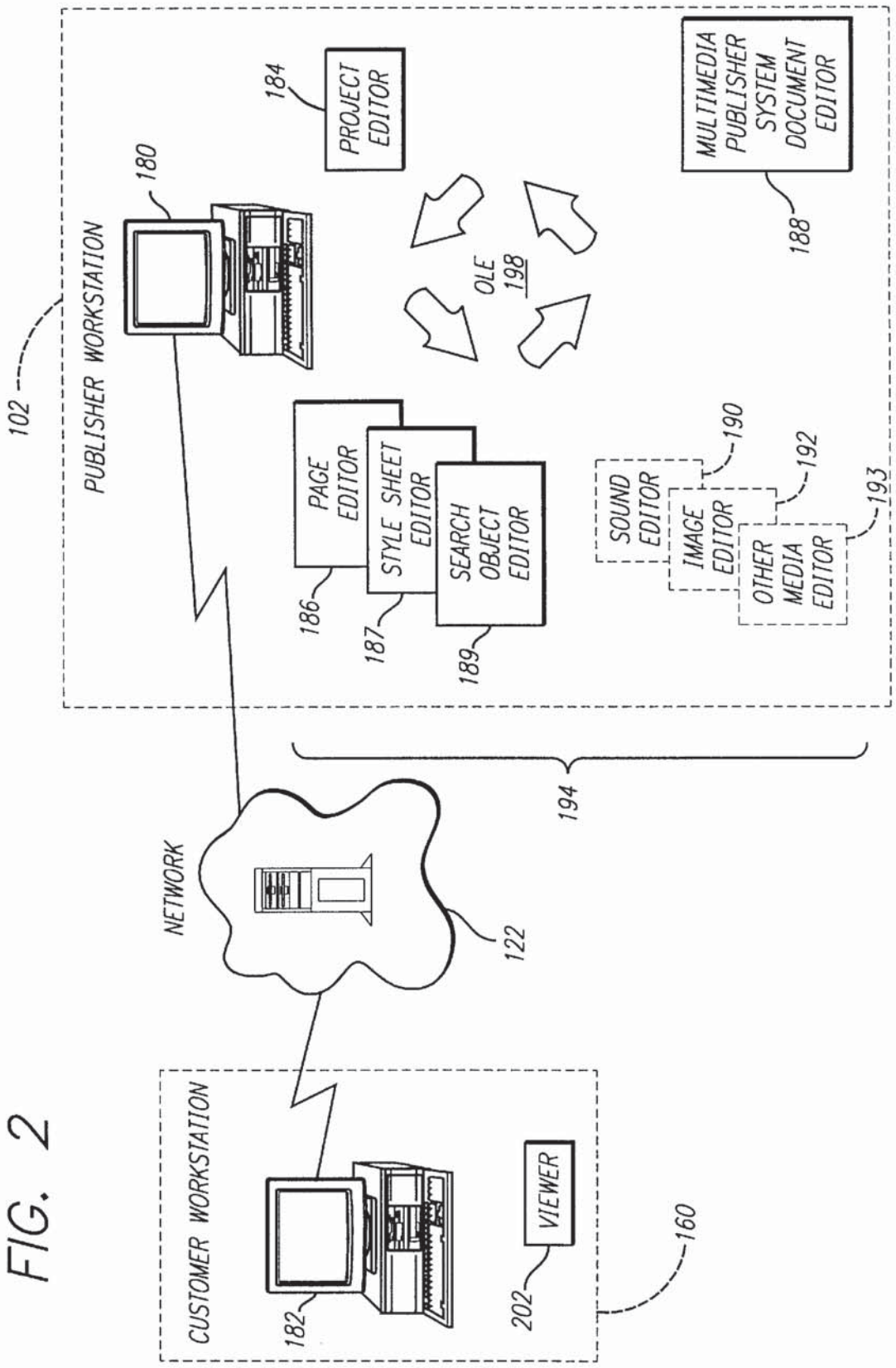

102
PUBLISHER WORKSTATION
180
184
PROJECT EDITOR
MULTIMEDIA PUBLISHER SYSTEM DOCUMENT EDITOR
188
OLE 198
PAGE EDITOR
STYLE SHEET EDITOR
SEARCH OBJECT EDITOR
186
187
189
SOUND EDITOR
IMAGE EDITOR
OTHER MEDIA EDITOR
190
192
193
194
NETWORK
122
CUSTOMER WORKSTATION
182
VIEWER
202
160

FIG. 2

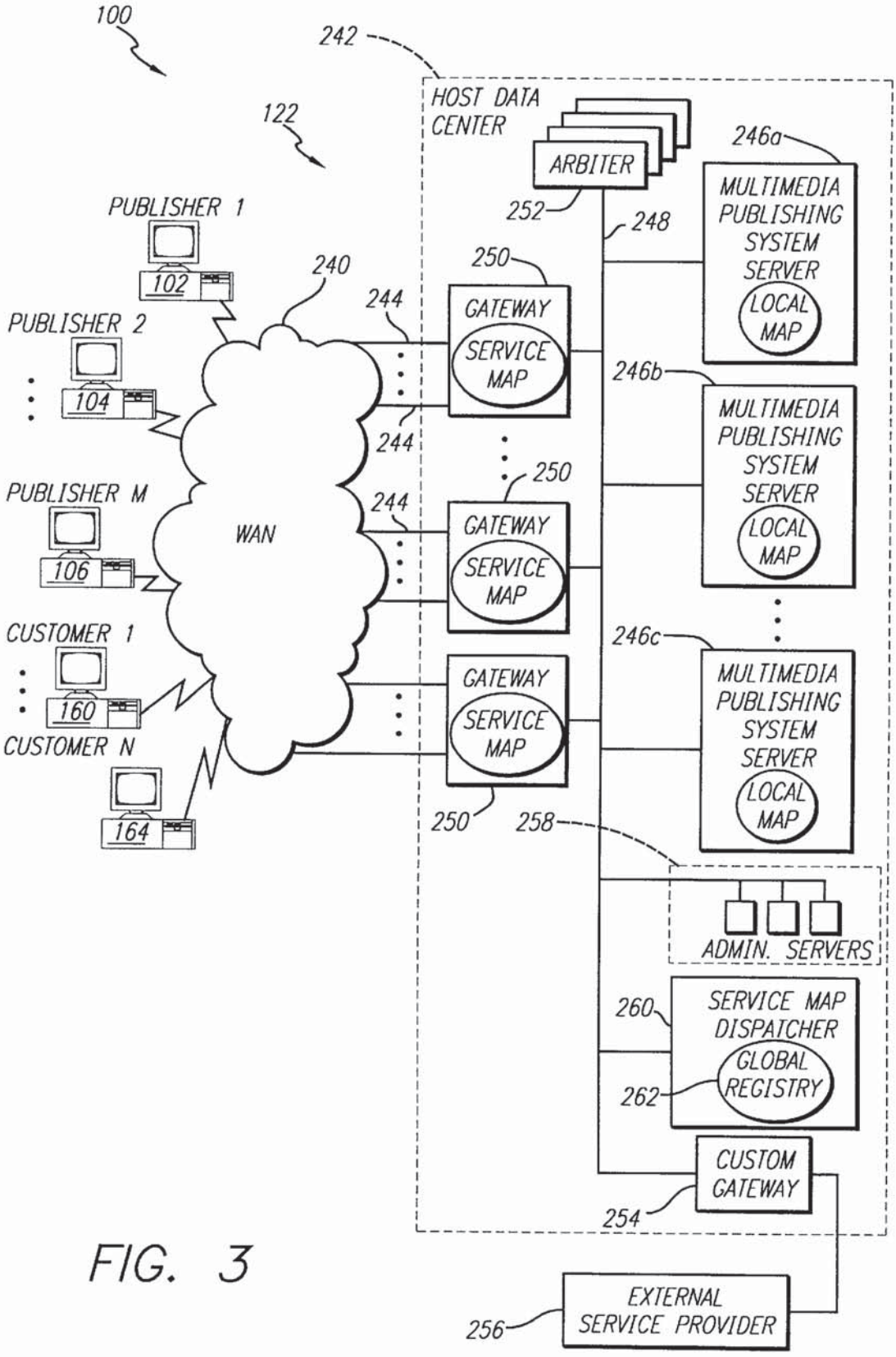

100
242
HOST DATA CENTER
122
ARBITER
252
246a
MULTIMEDIA PUBLISHING SYSTEM SERVER
LOCAL MAP
248
PUBLISHER 1
102
240
250
GATEWAY
SERVICE MAP
244
PUBLISHER 2
104
246b
MULTIMEDIA PUBLISHING SYSTEM SERVER
LOCAL MAP
PUBLISHER M
106
WAN
CUSTOMER 1
160
246c
MULTIMEDIA PUBLISHING SYSTEM SERVER
LOCAL MAP
CUSTOMER N
164
258
ADMIN. SERVERS
260
SERVICE MAP DISPATCHER
GLOBAL REGISTRY
262
CUSTOM GATEWAY
254
EXTERNAL SERVICE PROVIDER
256

FIG. 3

FIG. 4

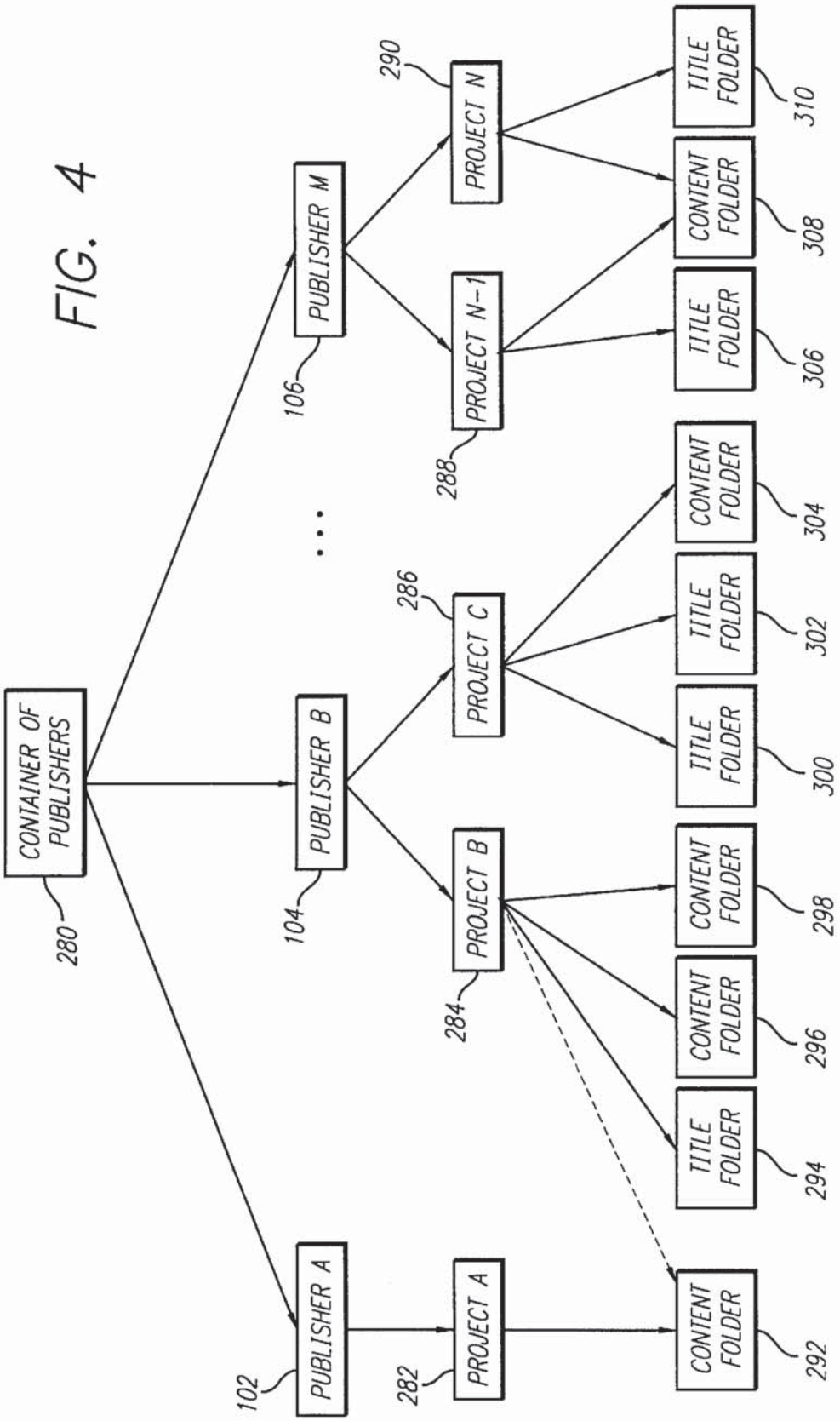

CONTAINER OF PUBLISHERS
280
PUBLISHER A
102
PUBLISHER B
104
PUBLISHER M
106
PROJECT A
282
PROJECT B
284
PROJECT C
286
PROJECT N-1
288
PROJECT N
290
CONTENT FOLDER
292
TITLE FOLDER
294
CONTENT FOLDER
296
TITLE FOLDER
298
CONTENT FOLDER
300
TITLE FOLDER
302
CONTENT FOLDER
304
TITLE FOLDER
306
CONTENT FOLDER
308
TITLE FOLDER
310

FIG. 5

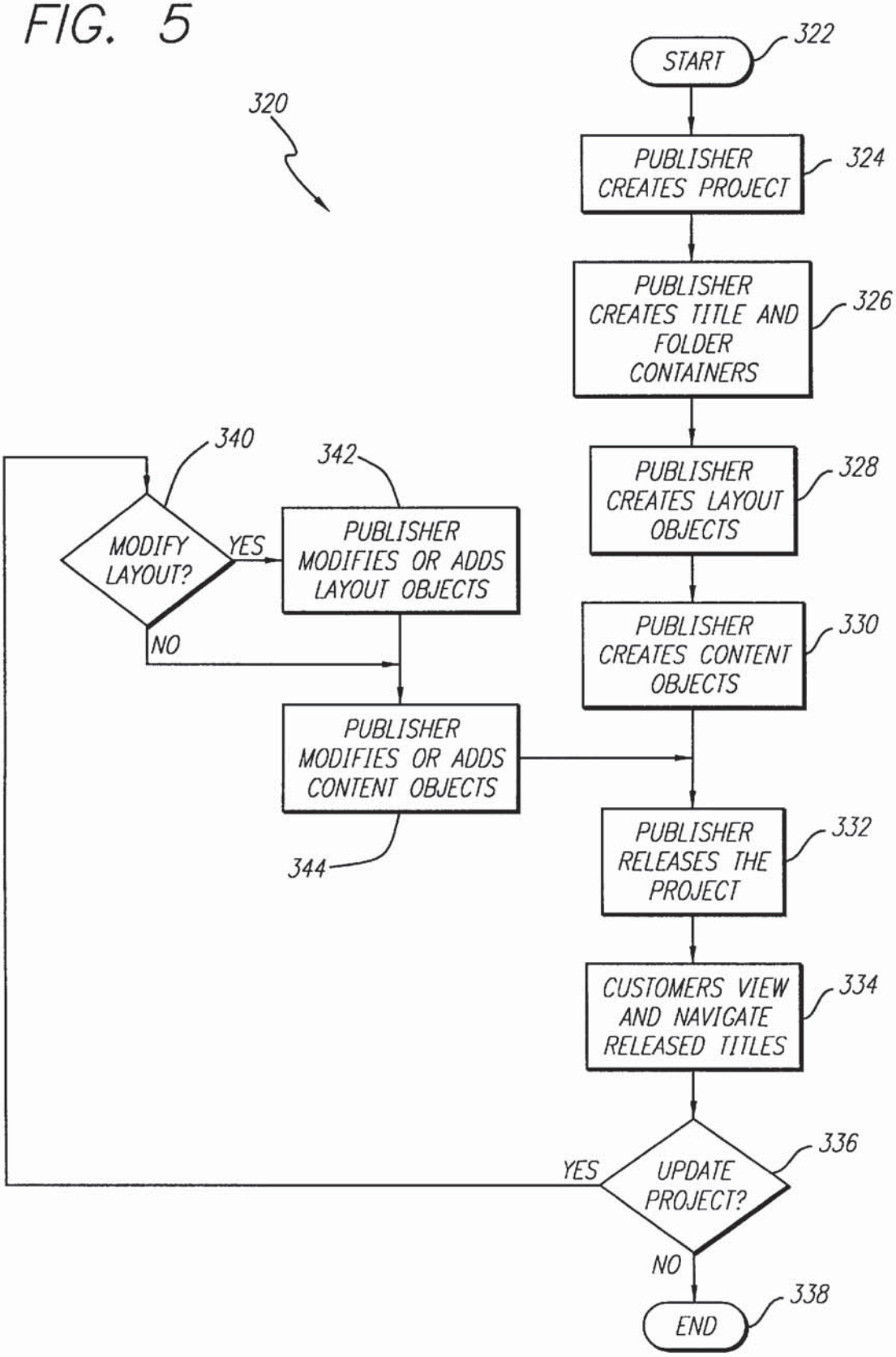

320
START
322
PUBLISHER CREATES PROJECT
324
PUBLISHER CREATES TITLE AND FOLDER CONTAINERS
326
PUBLISHER CREATES LAYOUT OBJECTS
328
PUBLISHER CREATES CONTENT OBJECTS
330
PUBLISHER RELEASES THE PROJECT
332
CUSTOMERS VIEW AND NAVIGATE RELEASED TITLES
334
UPDATE PROJECT?
336
YES
NO
END
338
MODIFY LAYOUT?
340
YES
NO
PUBLISHER MODIFIES OR ADDS LAYOUT OBJECTS
342
PUBLISHER MODIFIES OR ADDS CONTENT OBJECTS
344

FIG. 6

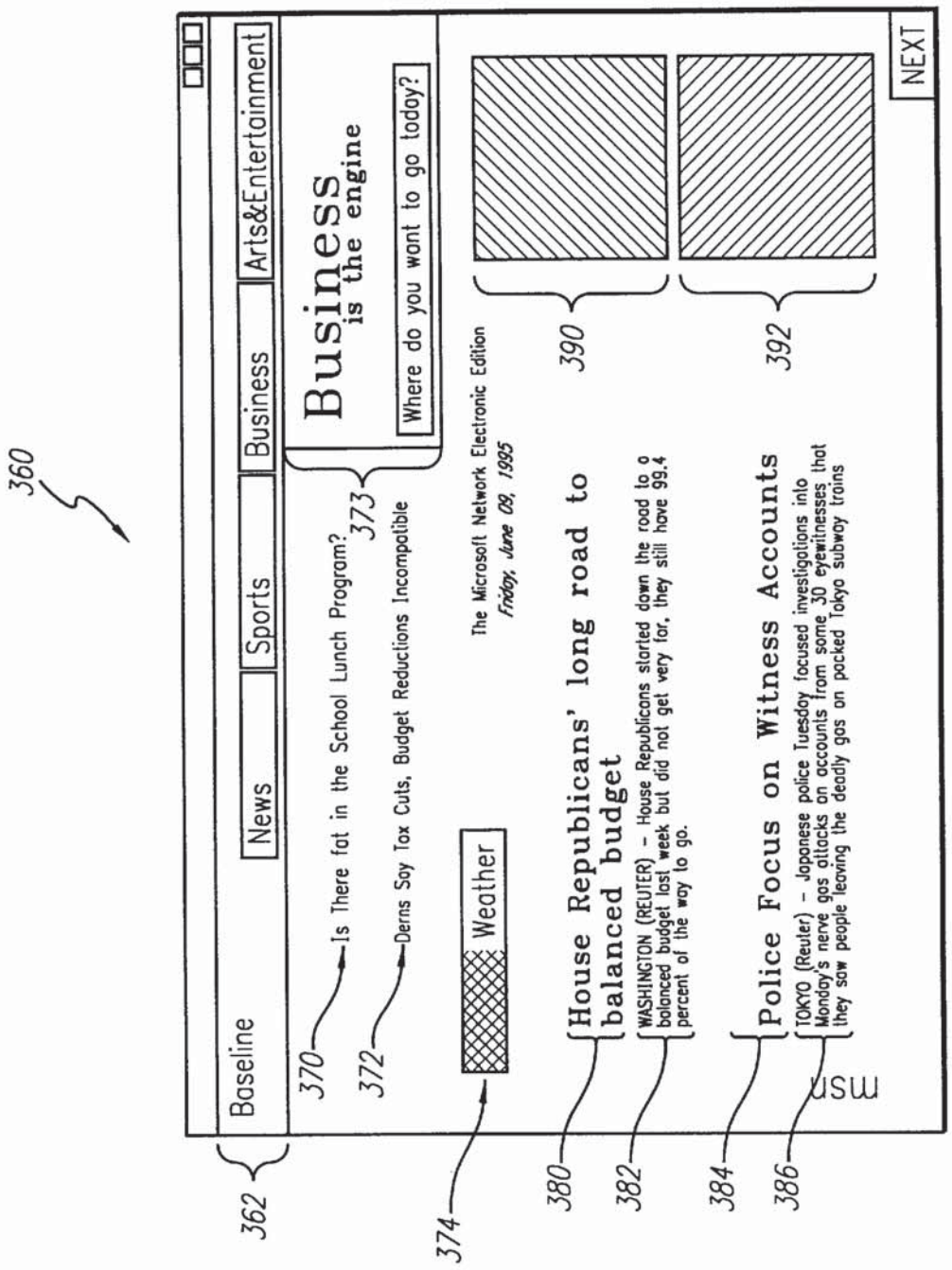

360
Baseline
News
Sports
Business
Arts&Entertainment
362
Business
is the engine
Where do you want to go today?
373
370
Is There fat in the School Lunch Program?
372
Derns Soy Tax Cuts, Budget Reductions Incompatible
Weather
374
The Microsoft Network Electronic Edition
Friday, June 09, 1995
House Republicans' long road to balanced budget
380
WASHINGTON (REUTER) - House Republicans started down the road to a balanced budget last week but did not get very far, they still have 99.4 percent of the way to go.
382
390
Police Focus on Witness Accounts
384
TOKYO (Reuter) - Japanese police Tuesday focused investigations into Monday's nerve gas attacks on accounts from some 30 eyewitnesses that they saw people leaving the deadly gas on packed Tokyo subway trains
386
392
msn
NEXT

FIG. 7

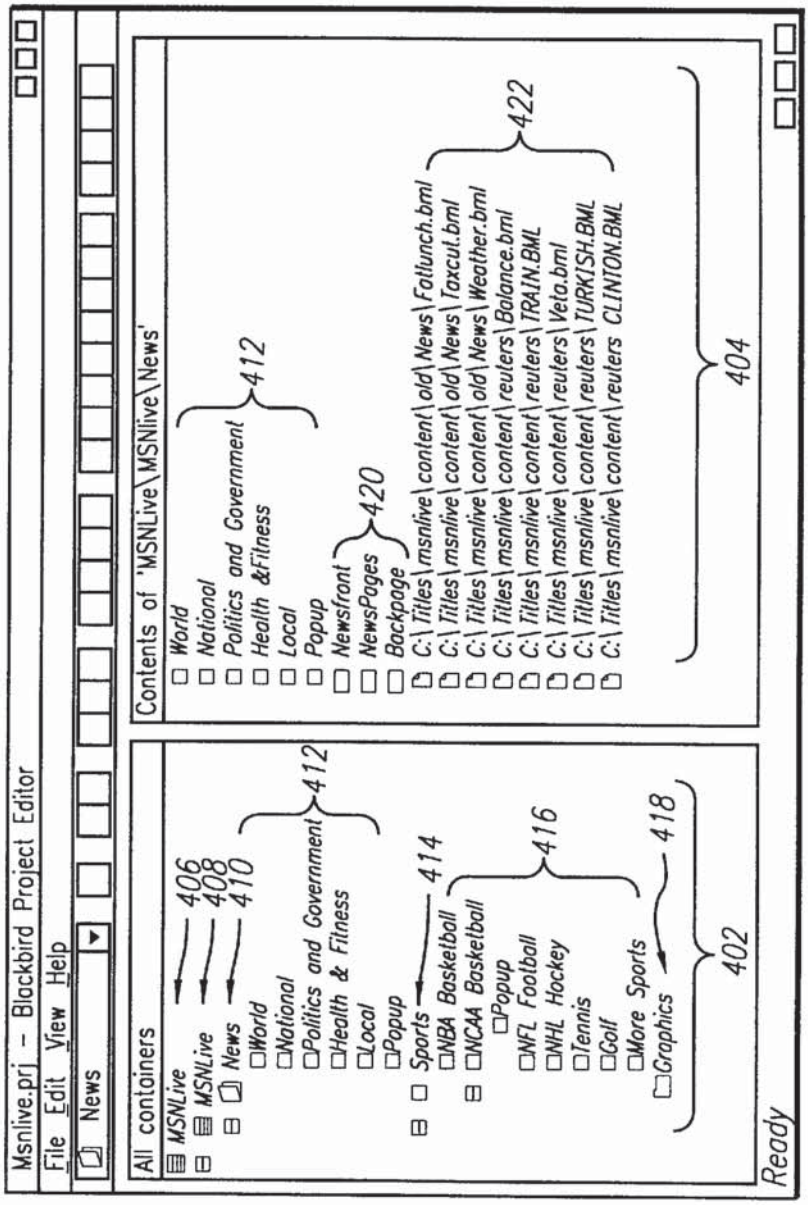

400
Msnlive.prj - Blackbird Project Editor
File Edit View Help
News
All containers
MSNLive
MSNLive
News
World
National
Politics and Government
Health & Fitness
Local
Popup
Sports
NBA Basketball
NCAA Basketball
Popup
NFL Football
NHL Hockey
Tennis
Golf
More Sports
Graphics
406
408
410
412
414
416
418
402
Contents of 'MSNLive\MSNlive\News'
World
National
Politics and Government
Health &Fitness
Local
Popup
Newsfront
NewsPages
Backpage
C:\Titles\msnlive\content\old\News\Fatlunch.bml
C:\Titles\msnlive\content\old\News\Taxcut.bml
C:\Titles\msnlive\content\old\News\Weather.bml
C:\Titles\msnlive\content\reuters\Balance.bml
C:\Titles\msnlive\content\reuters\TRAIN.BML
C:\Titles\msnlive\content\reuters\Veto.bml
C:\Titles\msnlive\content\reuters\TURKISH.BML
C:\Titles\msnlive\content\reuters CLINTON.BML
412
420
422
404
Ready

FIG. 8

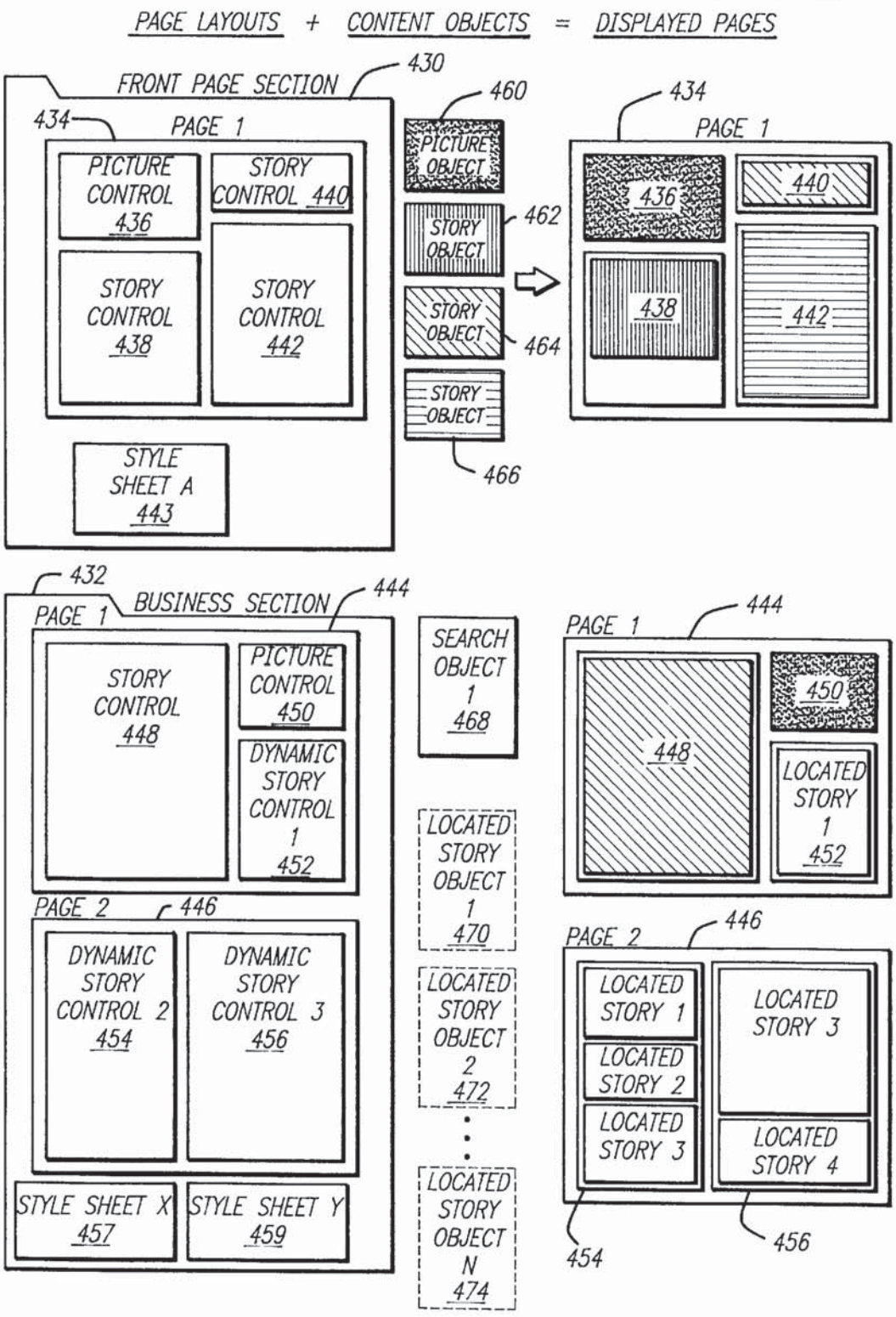

PAGE LAYOUTS + CONTENT OBJECTS = DISPLAYED PAGES
FRONT PAGE SECTION
430
434
PAGE 1
PICTURE CONTROL 436
STORY CONTROL 440
STORY CONTROL 438
STORY CONTROL 442
STYLE SHEET A 443
460
PICTURE OBJECT
462
STORY OBJECT
STORY OBJECT
464
STORY OBJECT
466
434
PAGE 1
436
440
438
442
432
BUSINESS SECTION
444
PAGE 1
STORY CONTROL 448
PICTURE CONTROL 450
DYNAMIC STORY CONTROL 1 452
PAGE 2
446
DYNAMIC STORY CONTROL 2 454
DYNAMIC STORY CONTROL 3 456
STYLE SHEET X 457
STYLE SHEET Y 459
SEARCH OBJECT 1 468
LOCATED STORY OBJECT 1 470
LOCATED STORY OBJECT 2 472
LOCATED STORY OBJECT N 474
444
PAGE 1
448
450
LOCATED STORY 1 452
446
PAGE 2
LOCATED STORY 1
LOCATED STORY 2
LOCATED STORY 3
LOCATED STORY 3
LOCATED STORY 4
454
456

FIG. 9

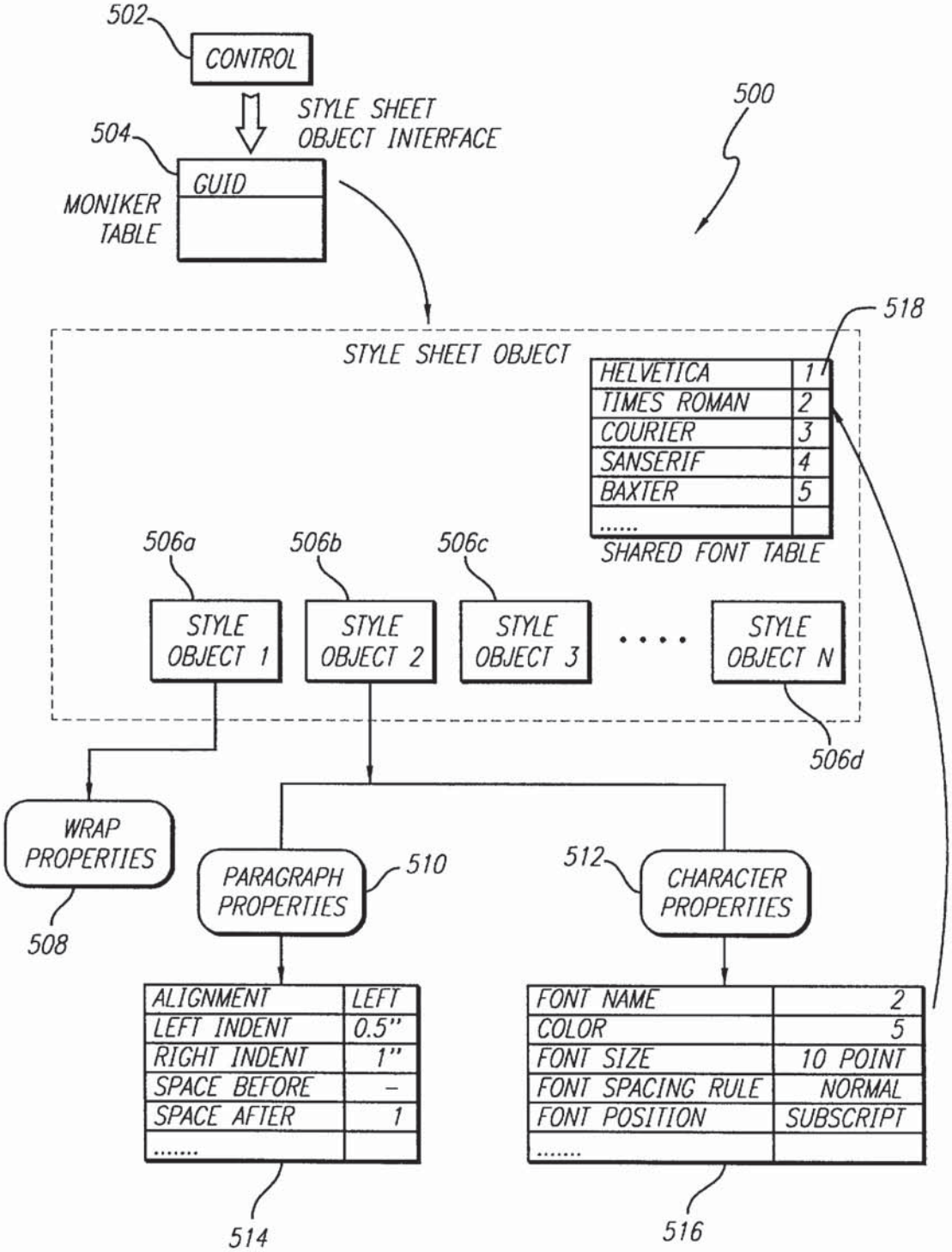

502
CONTROL
STYLE SHEET OBJECT INTERFACE
500
504
GUID
MONIKER TABLE
STYLE SHEET OBJECT
518
HELVETICA 1
TIMES ROMAN 2
COURIER 3
SANSERIF 4
BAXTER 5
.....
SHARED FONT TABLE
506a
506b
506c
STYLE OBJECT 1
STYLE OBJECT 2
STYLE OBJECT 3
STYLE OBJECT N
506d
WRAP PROPERTIES
508
PARAGRAPH PROPERTIES
510
512
CHARACTER PROPERTIES
ALIGNMENT LEFT
LEFT INDENT 0.5"
RIGHT INDENT 1"
SPACE BEFORE –
SPACE AFTER 1
.....
514
FONT NAME 2
COLOR 5
FONT SIZE 10 POINT
FONT SPACING RULE NORMAL
FONT POSITION SUBSCRIPT
.....
516

FIG. 10

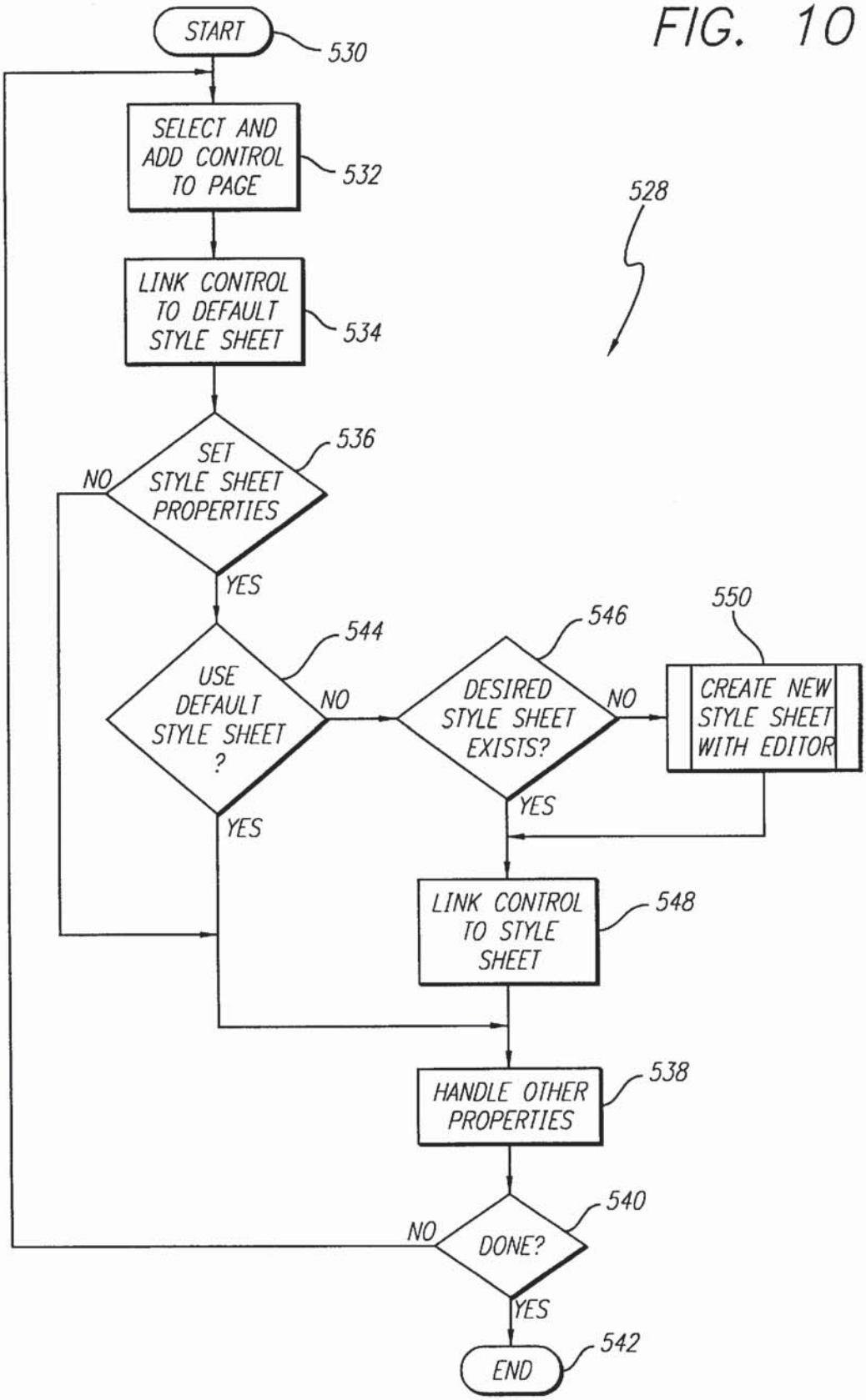
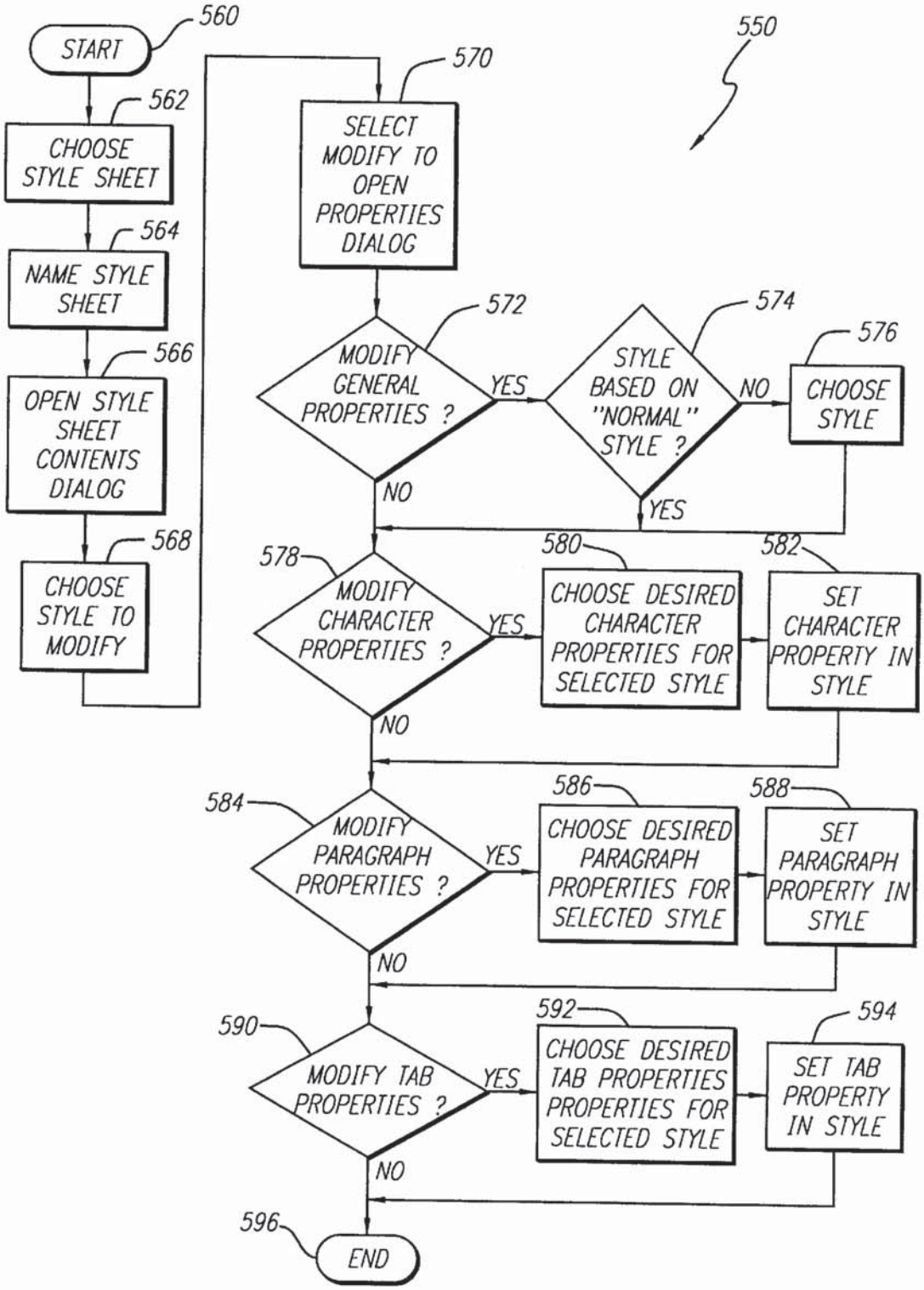

START
530
SELECT AND ADD CONTROL TO PAGE
532
528
LINK CONTROL TO DEFAULT STYLE SHEET
534
SET STYLE SHEET PROPERTIES
536
NO
YES
USE DEFAULT STYLE SHEET ?
544
NO
DESIRED STYLE SHEET EXISTS?
546
NO
CREATE NEW STYLE SHEET WITH EDITOR
550
YES
YES
LINK CONTROL TO STYLE SHEET
548
HANDLE OTHER PROPERTIES
538
DONE?
540
NO
YES
END
542

FIG. 11


550
560
START
562
CHOOSE STYLE SHEET
564
NAME STYLE SHEET
566
OPEN STYLE SHEET CONTENTS DIALOG
568
CHOOSE STYLE TO MODIFY
570
SELECT MODIFY TO OPEN PROPERTIES DIALOG
572
MODIFY GENERAL PROPERTIES ?
YES
574
STYLE BASED ON "NORMAL" STYLE ?
NO
576
CHOOSE STYLE
NO
YES
578
MODIFY CHARACTER PROPERTIES ?
YES
580
CHOOSE DESIRED CHARACTER PROPERTIES FOR SELECTED STYLE
582
SET CHARACTER PROPERTY IN STYLE
NO
584
MODIFY PARAGRAPH PROPERTIES ?
YES
586
CHOOSE DESIRED PARAGRAPH PROPERTIES FOR SELECTED STYLE
588
SET PARAGRAPH PROPERTY IN STYLE
NO
590
MODIFY TAB PROPERTIES ?
YES
592
CHOOSE DESIRED TAB PROPERTIES PROPERTIES FOR SELECTED STYLE
594
SET TAB PROPERTY IN STYLE
NO
596
END

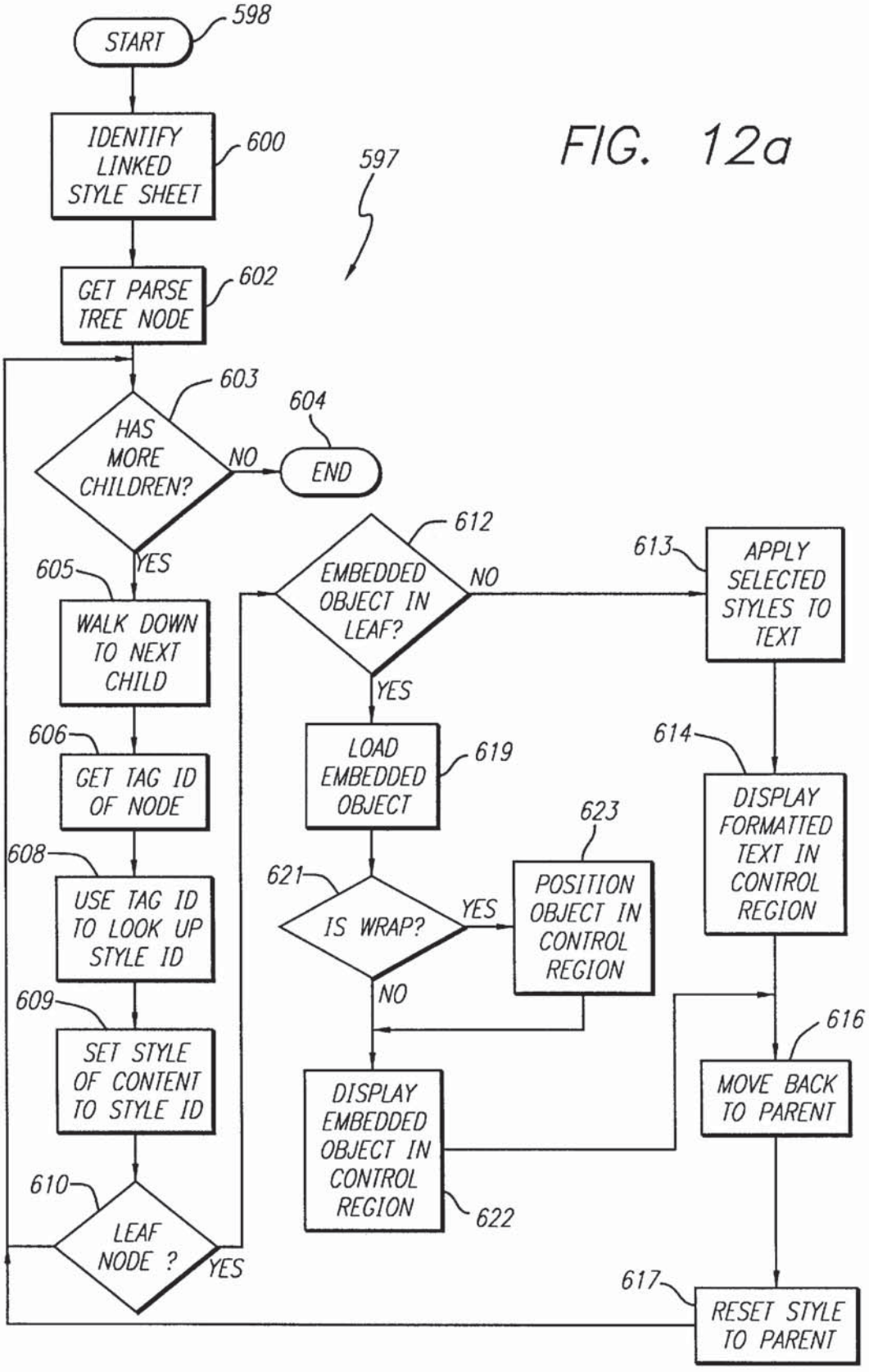

598
START
IDENTIFY LINKED STYLE SHEET
600
597
GET PARSE TREE NODE
602
603
HAS MORE CHILDREN?
NO
604
END
YES
605
WALK DOWN TO NEXT CHILD
606
GET TAG ID OF NODE
608
USE TAG ID TO LOOK UP STYLE ID
609
SET STYLE OF CONTENT TO STYLE ID
610
LEAF NODE ?
YES
612
EMBEDDED OBJECT IN LEAF?
NO
YES
LOAD EMBEDDED OBJECT
619
621
IS WRAP?
YES
623
POSITION OBJECT IN CONTROL REGION
NO
DISPLAY EMBEDDED OBJECT IN CONTROL REGION
622
613
APPLY SELECTED STYLES TO TEXT
614
DISPLAY FORMATTED TEXT IN CONTROL REGION
616
MOVE BACK TO PARENT
617
RESET STYLE TO PARENT

FIG. 12a

FIG. 12b

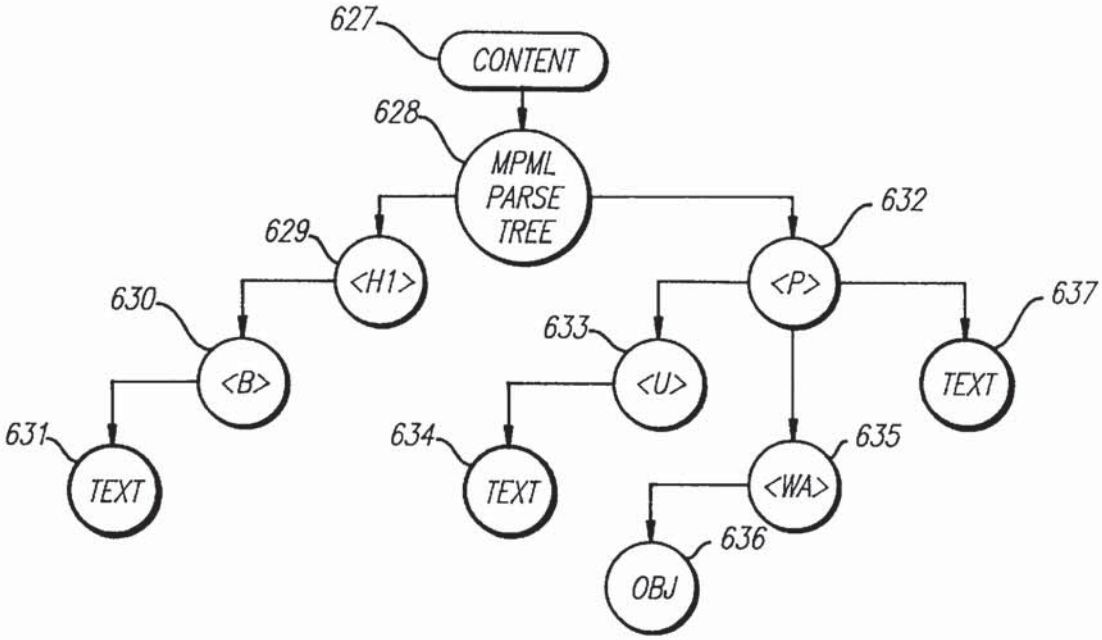


FIG. 16

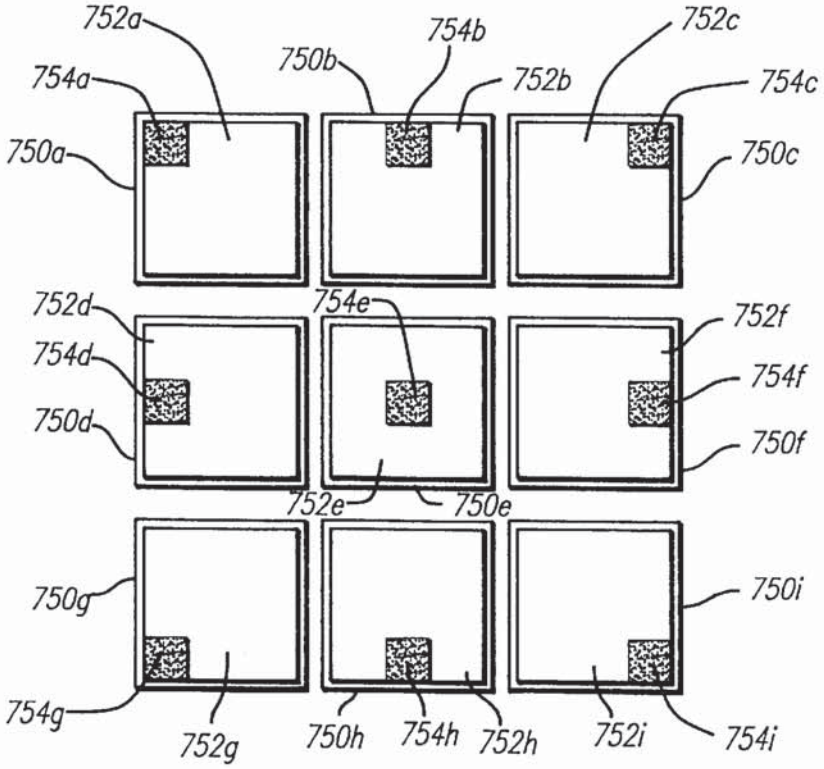


FIG. 12c

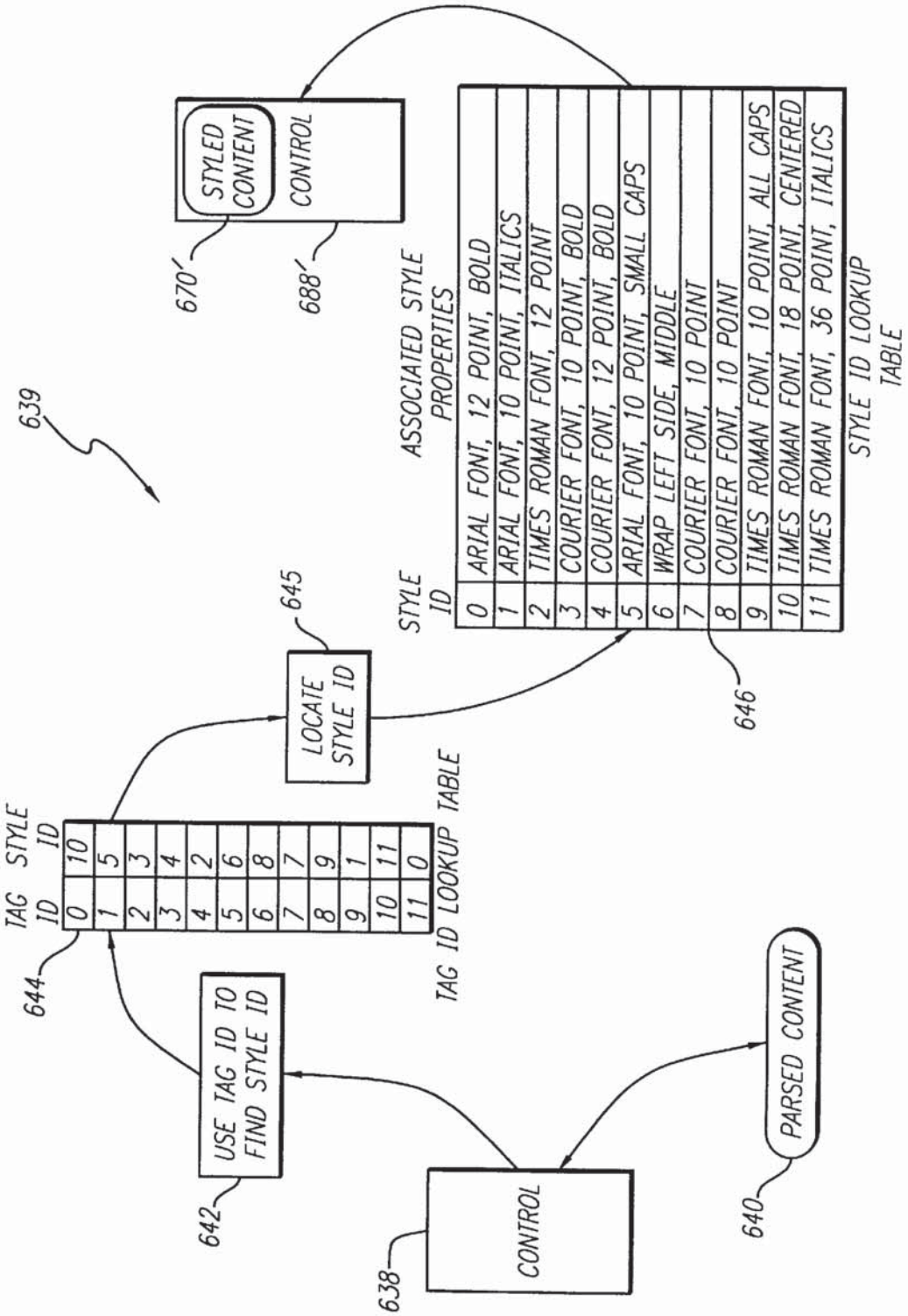

639
670'
STYLED CONTENT
CONTROL
688'
ASSOCIATED STYLE PROPERTIES
STYLE ID
0 ARIAL FONT, 12 POINT, BOLD
1 ARIAL FONT, 10 POINT, ITALICS
2 TIMES ROMAN FONT, 12 POINT
3 COURIER FONT, 10 POINT, BOLD
4 COURIER FONT, 12 POINT, BOLD
5 ARIAL FONT, 10 POINT, SMALL CAPS
6 WRAP LEFT SIDE, MIDDLE
7 COURIER FONT, 10 POINT
8 COURIER FONT, 10 POINT
9 TIMES ROMAN FONT, 10 POINT, ALL CAPS
10 TIMES ROMAN FONT, 18 POINT, CENTERED
11 TIMES ROMAN FONT, 36 POINT, ITALICS
STYLE ID LOOKUP TABLE
646
645
LOCATE STYLE ID
TAG ID
STYLE ID
0 10
1 5
2 3
3 4
4 2
5 6
6 8
7 7
8 9
9 1
10 11
11 0
TAG ID LOOKUP TABLE
644
USE TAG ID TO FIND STYLE ID
642
CONTROL
638
PARSED CONTENT
640

FIG. 13a

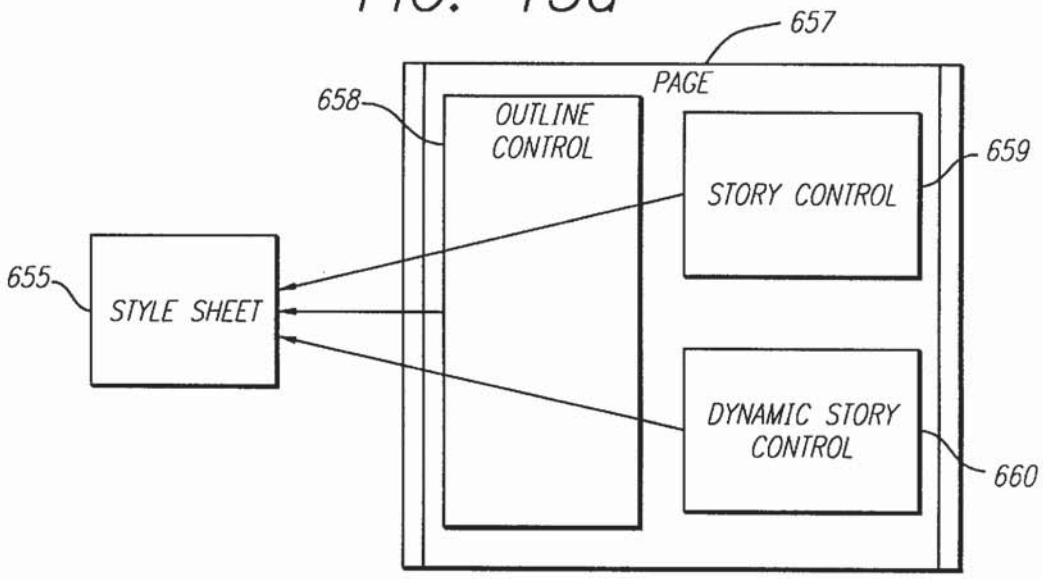


FIG. 13b

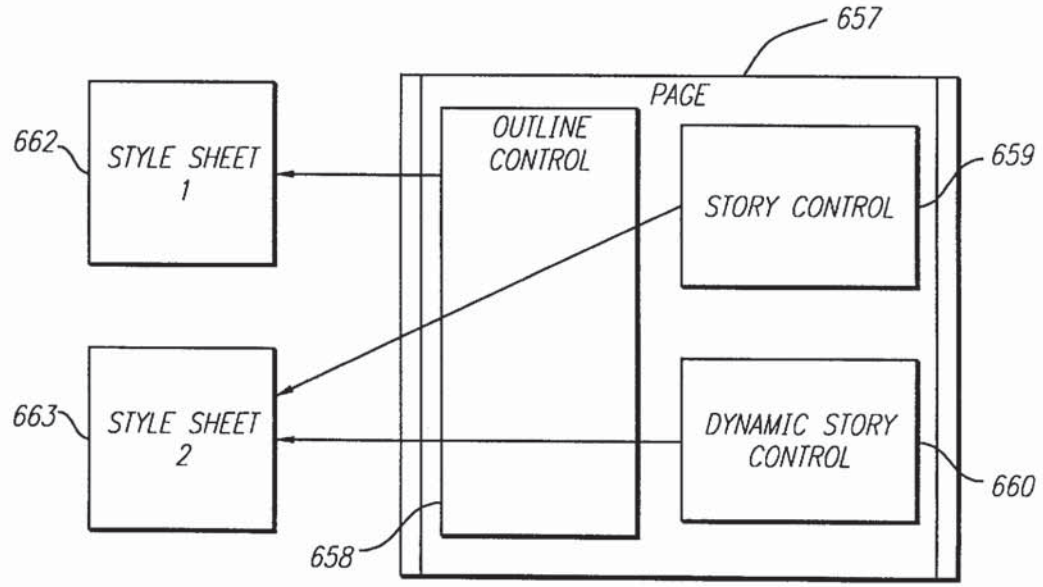


FIG. 14

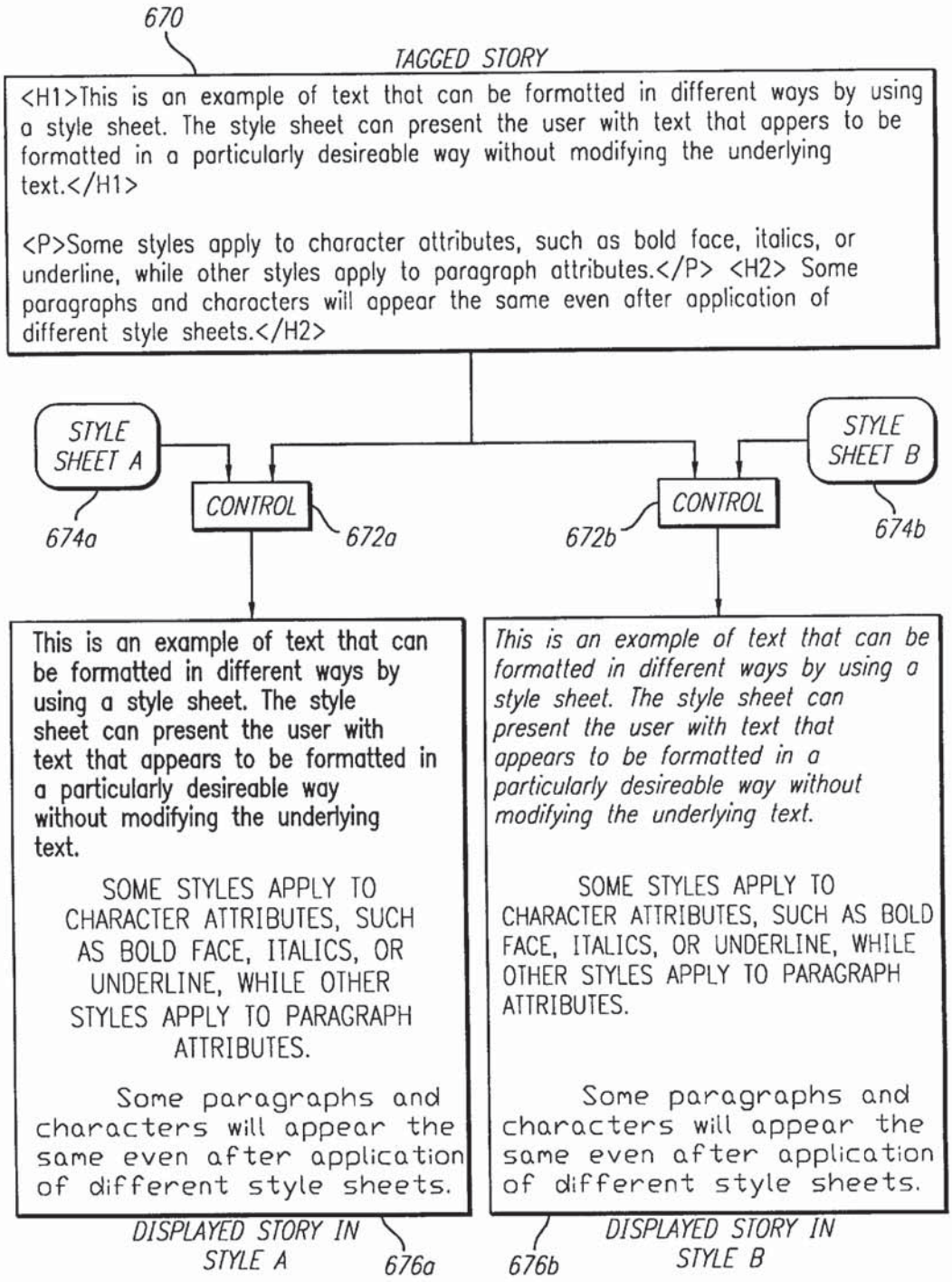

670
TAGGED STORY
<H1>This is an example of text that can be formatted in different ways by using a style sheet. The style sheet can present the user with text that appers to be formatted in a particularly desireable way without modifying the underlying text.</H1>
<P>Some styles apply to character attributes, such as bold face, italics, or underline, while other styles apply to paragraph attributes.</P> <H2> Some paragraphs and characters will appear the same even after application of different style sheets.</H2>
STYLE SHEET A
674a
CONTROL
672a
CONTROL
672b
STYLE SHEET B
674b
This is an example of text that can be formatted in different ways by using a style sheet. The style sheet can present the user with text that appears to be formatted in a particularly desireable way without modifying the underlying text.
SOME STYLES APPLY TO CHARACTER ATTRIBUTES, SUCH AS BOLD FACE, ITALICS, OR UNDERLINE, WHILE OTHER STYLES APPLY TO PARAGRAPH ATTRIBUTES.
Some paragraphs and characters will appear the same even after application of different style sheets.
DISPLAYED STORY IN STYLE A
676a
This is an example of text that can be formatted in different ways by using a style sheet. The style sheet can present the user with text that appears to be formatted in a particularly desireable way without modifying the underlying text.
SOME STYLES APPLY TO CHARACTER ATTRIBUTES, SUCH AS BOLD FACE, ITALICS, OR UNDERLINE, WHILE OTHER STYLES APPLY TO PARAGRAPH ATTRIBUTES.
Some paragraphs and characters will appear the same even after application of different style sheets.
676b
DISPLAYED STORY IN STYLE B

FIG. 15

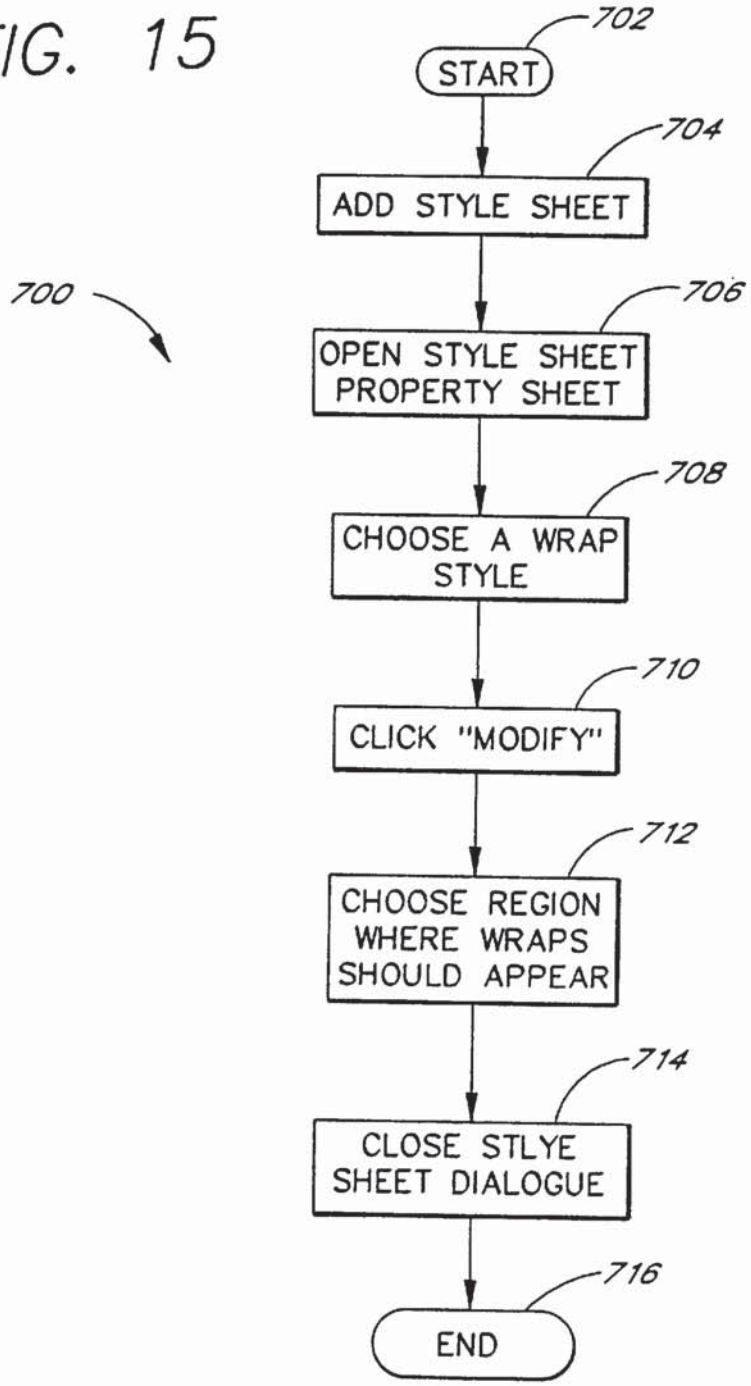

700
702
START
704
ADD STYLE SHEET
706
OPEN STYLE SHEET PROPERTY SHEET
708
CHOOSE A WRAP STYLE
710
CLICK "MODIFY"
712
CHOOSE REGION WHERE WRAPS SHOULD APPEAR
714
CLOSE STLYE SHEET DIALOGUE
716
END

FIG. 17

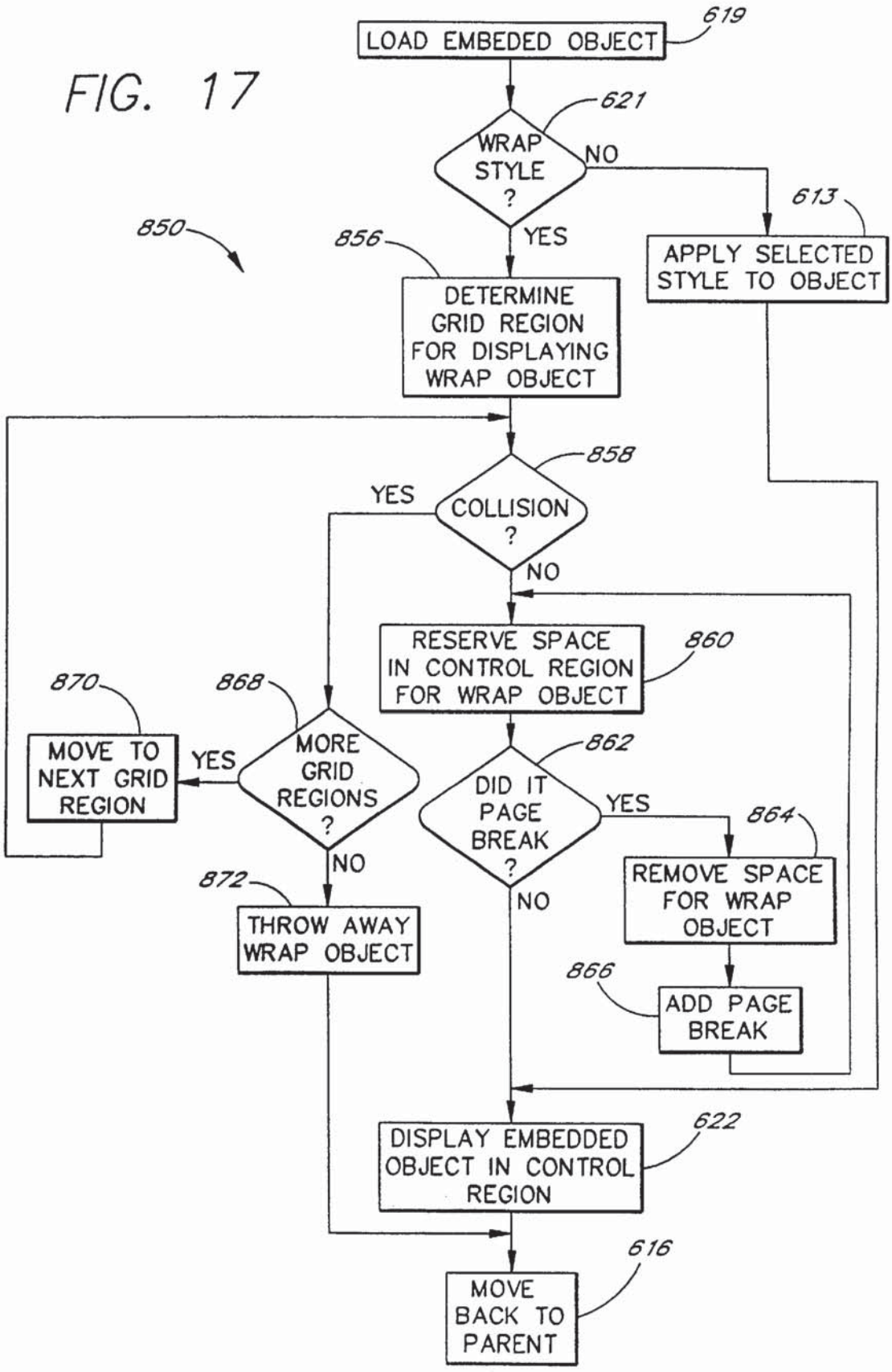

LOAD EMBEDED OBJECT
619
WRAP STYLE ?
621
NO
YES
613
APPLY SELECTED STYLE TO OBJECT
850
856
DETERMINE GRID REGION FOR DISPLAYING WRAP OBJECT
858
COLLISION ?
YES
NO
RESERVE SPACE IN CONTROL REGION FOR WRAP OBJECT
860
870
868
MOVE TO NEXT GRID REGION
YES
MORE GRID REGIONS ?
862
DID IT PAGE BREAK ?
YES
864
REMOVE SPACE FOR WRAP OBJECT
NO
872
THROW AWAY WRAP OBJECT
866
ADD PAGE BREAK
DISPLAY EMBEDDED OBJECT IN CONTROL REGION
622
616
MOVE BACK TO PARENT

FIG. 18

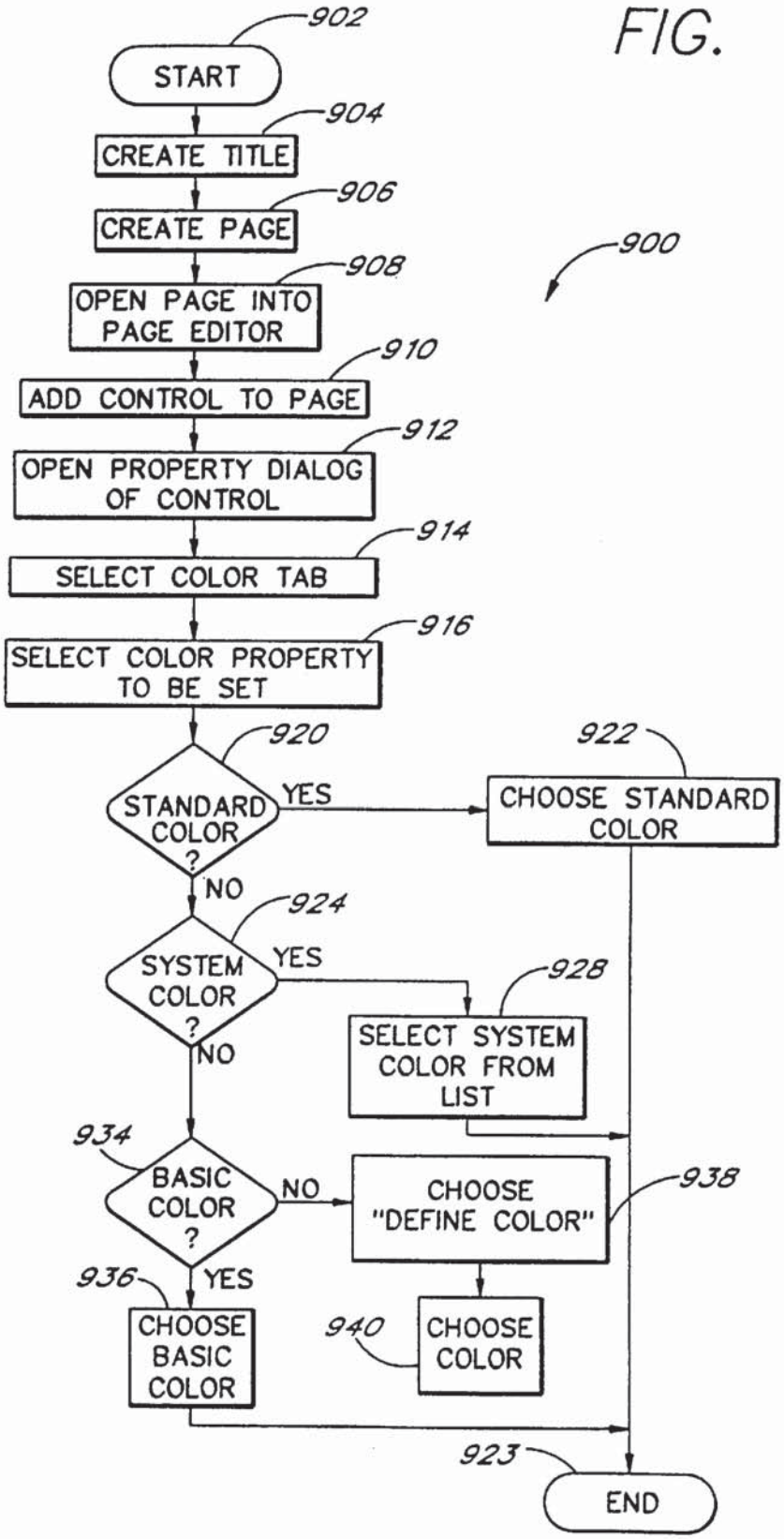
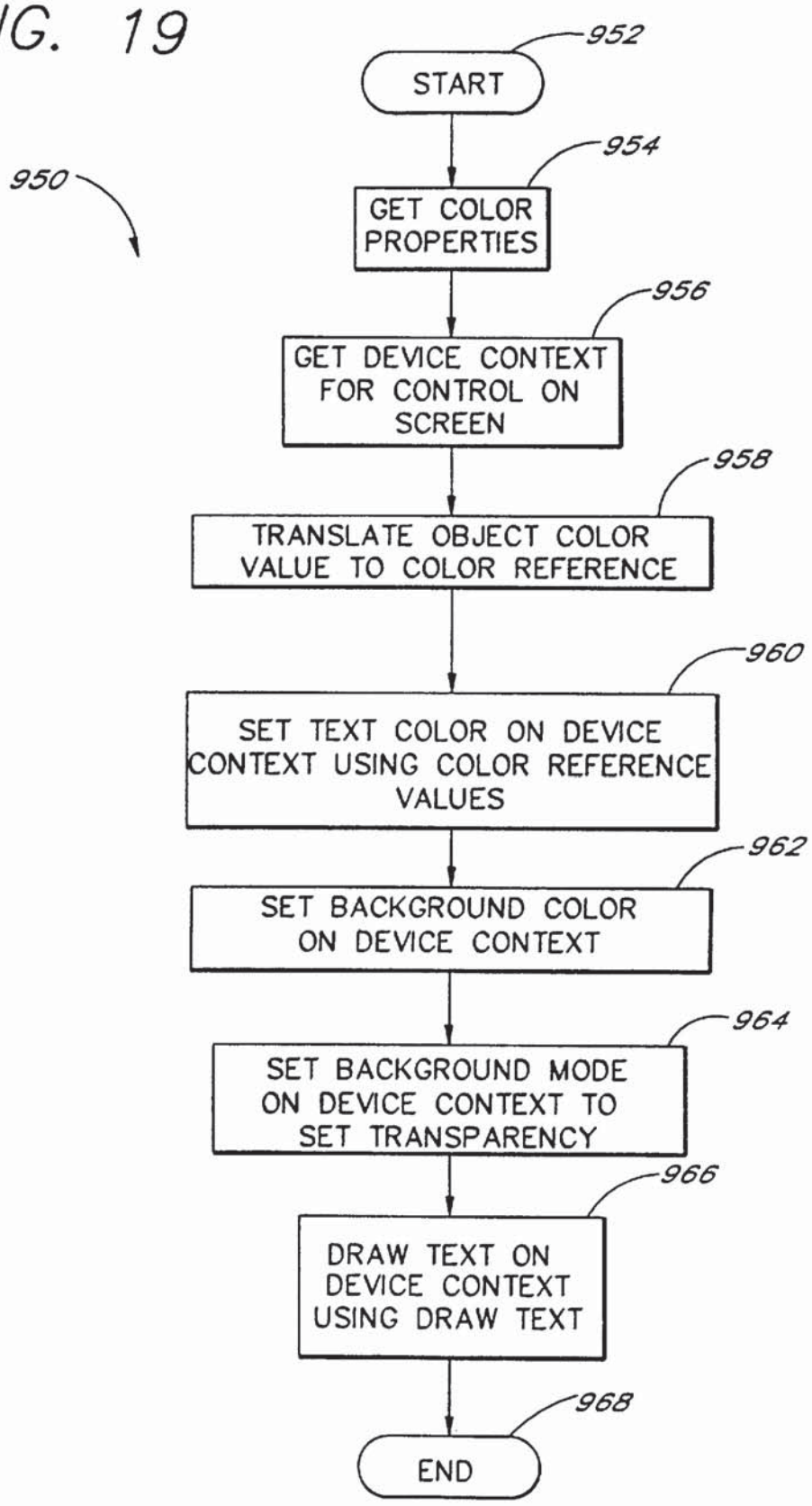

902
START
904
CREATE TITLE
906
CREATE PAGE
908
OPEN PAGE INTO PAGE EDITOR
900
910
ADD CONTROL TO PAGE
912
OPEN PROPERTY DIALOG OF CONTROL
914
SELECT COLOR TAB
916
SELECT COLOR PROPERTY TO BE SET
920
STANDARD COLOR ?
YES
922
CHOOSE STANDARD COLOR
NO
924
SYSTEM COLOR ?
YES
928
SELECT SYSTEM COLOR FROM LIST
NO
934
BASIC COLOR ?
NO
CHOOSE "DEFINE COLOR"
938
936
YES
CHOOSE BASIC COLOR
940
CHOOSE COLOR
923
END

FIG. 19


950
952
START
954
GET COLOR PROPERTIES
956
GET DEVICE CONTEXT FOR CONTROL ON SCREEN
958
TRANSLATE OBJECT COLOR VALUE TO COLOR REFERENCE
960
SET TEXT COLOR ON DEVICE CONTEXT USING COLOR REFERENCE VALUES
962
SET BACKGROUND COLOR ON DEVICE CONTEXT
964
SET BACKGROUND MODE ON DEVICE CONTEXT TO SET TRANSPARENCY
966
DRAW TEXT ON DEVICE CONTEXT USING DRAW TEXT
968
END

STYLE SHEETS FOR PUBLISHING SYSTEM

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to electronic publishing systems and, more specifically, to using style sheets in an on-line publishing system.

2. Description of the Related Technology

Many different systems exist for publishing documents on a computer system. These systems are used to, for example, create newsletters or brochures to promote a particular company. In addition, publications can be used to disseminate information to a variety of customers. A number of programs exist for allowing a user to design complicated layouts for a particular application. Well-known programs such as Microsoft Publisher®, Ventura Publisher®, PageMaker®, and PrintShop® help a user to produce attractive newsletters and brochures.

These publication systems let the user define particular regions of every page for a specific purpose. For example, the user can place a graphic frame that runs along the top of the page to hold a particular image. Such an image may include the title of the newsletter or another related aspect of the newsletter. In a similar way, the user may define other areas of the first page to include one or more text frames for holding text-based information such as the words from particular story. The user designs the text frame to have certain properties, such as height, width, background color, foreground color and other such properties so that the text becomes attractively formatted for the customer. In addition, the user can format the text information within the text frame to have desired font and paragraph characteristics. For example, the user can highlight the characters within the text frame and define that font to be, for example, bold-faced. The user can also choose to only apply a character format to specific words or paragraphs within a text frame.

After defining an initial text frame in these publishing systems, the user can define additional text frames on the same page. For example, one text frame may hold the title of a story whereas the next text frame holds the name of the author and the text of the story. Although this layout is straightforward to prepare, it is also very difficult to modify once it has been produced.

Some word processing programs such as Microsoft Word® and WordPerfect® have incorporated some publishing features into their software. One feature that has been incorporated into the Microsoft Word wordprocessor is the use of style sheets to mark regions of documents with specific character or paragraph properties.

A style sheet, as used in Microsoft Word, is a compilation of character and paragraph styles, with each style containing properties for formatting marked text. These style sheets are associated with a particular document to define how marked characters and paragraphs are displayed to the user. However, current word processing software only allows one style sheet to be applied to any document or to multiple documents. There is no provision for applying more than one style sheet to different sections of the same document. Thus, all text in a document that is marked with a particular style will be formatted with the same character or paragraph properties defined by that style.

Microsoft Word also allows for limited customization of the colors that are used for displaying text in a document. The author of a document may choose any of the standard 16 colors for a piece of text, or may set the color to "Auto". Setting the colors to "Auto" in Word will cause the selected text to be displayed in the standard "Window Text" system color. The system colors are designated by the Microsoft Windows® user in the control panel. However, the user is not able to set any other part of the Word document to default to system colors other than "Window Text".

Another category of publication systems include software for electronically publishing stories across on-line networks such as CompuServe, America On-Line, or the Internet. Most of these systems create and display stories that are formatted in a Standard Generalized Markup Language (SGML) or Hypertext Markup Language (HTML). Both the HTML and SGML are standards for tagging text in documents to be displayed in an on-line network. Documents that are formatted in HTML or SGML can be viewed by several widely distributed browsers such as Mosaic and NetScape for the Internet. These browser programs read SGML and HTML tagged documents and display them with proper formatting.

Several programs exist for producing documents that are tagged in either the SGML and HTML format. Programs such as Interleaf's WorldView 2 allow a user to create an SGML document with, for instance, bold-face text and hyperlinks to other documents. Once a document has been saved in an SGML format, it can be read by either the Mosaic or NetScape browser. Unfortunately, all of the formatting commands for text or graphics in an SGML or HTML document are embedded within the document. The Mosaic or NetScape browsers do not reformat these tagged documents, but rather only display the commands embedded in the SGML or HTML documents to a user. For this reason, the designers that produce the SGML and HTML documents must add formatting commands to every new document. In addition, there is little flexibility to change the document's formatting once the tagged document has been produced. Therefore, the process of creating documents for display using SGML or HTML is very inefficient for the document designer.

Other commercially available software programs for producing on-line publications are available in the marketplace. One type of electronic publisher that generates its own specific format of text while retaining the specific layout of the document is the Adobe Acrobat™ software package. Acrobat™ reads and stores documents in a specialized format known as the Portable Document Format (PDF) for use on the Internet. Other electronic publishing programs are produced by Interleaf, Inc. (Waltham, Mass.), Farallon Computing (Alameda, Calif.) and Common Ground Software (Belmont, Calif.).

Another on-line information system is described in U.S. Pat. No. 5,347,632 by Filepp et al. This patent discusses an interactive computer system network which enables a user to display news information and perform transactional services through a personal computer. However, in the Filepp system the news information is integrated into the display regions.

The invention described in U.S. Pat. No. 5,347,632 includes procedures for formulating objects that have been specially structured to include display data, control data and program instructions. Unfortunately, this system does not provide a separation of the content being displayed from the design. Therefore, the same design layout cannot be shared among disparate pieces of content.

The content displayed in this system is therefore difficult to modify because new design layouts must be transmitted to the users across slow communications lines for every piece of information viewed on the computer monitor. If the content of the information was separated from the design layout, the design layout objects could reside locally on the user's computer and be available whenever required by a

specific piece of content. Similarly, it is difficult to update the character and paragraph styles of the objects in this system because the content of the information is not separated from the design layout. These disadvantages are overcome by the present invention.

SUMMARY OF THE INVENTION

A style sheet is a collection of formatting information, such as fonts and tabs in a textual document, that can be manipulated and applied as a single unit. Presently known style sheets, such as those used in Microsoft Word, are associated with particular documents. In contrast, style sheets of the present invention are applied to individual display regions (controls) on pages within titles (e.g., the Wall Street Journal is an example of a title). The display regions in a page do not contain any text at the time the style sheet is applied. Rather, the text is poured into the region when the title is displayed (also termed rendered) on the customer's computer.

More than one display region, on the same page or on different pages within a title, may use the same style sheet. A title may also contain more than one style sheet, and the publisher is free to associate each display region on the page with any particular style sheet in the title. Additionally, style sheets can be shared between titles. Important benefits derived from this invention include efficient delivery and personalization of the published title.

One embodiment of the present invention is a method of styling content, comprising the steps of creating a first style sheet container storing a plurality of styles, creating a second style sheet container storing a plurality of styles, creating a content container storing content and a plurality of tags, each tag identifying a portion of the content, linking the content container with the first and second style sheet containers, linking each tagged content portion to a selected one of the styles, applying each selected style to each tagged content portion, and displaying the styled content.

Another aspect of the present invention is a viewer for viewing titles, comprising a content object, a style sheet stored separately from the content, a first control linking to the style sheet and displaying styled content, a second control linking to the style sheet and displaying styled content.

Yet another aspect of the present invention is a method of publishing and viewing titles in an electronic publication system including a storage, comprising the steps of creating a content object, creating a style sheet object independent of the content object, linking the style sheet object to a control object, linking the content object to the control object, storing the objects in the storage, retrieving the objects from the storage, applying the linked style sheet to the content, and displaying the styled content with the control.

Still another aspect of the present invention is an electronic publication system, comprising a publication storage, a content editor generating one or more documents containing content, a project editor generating a title layout, wherein the content documents are linked to the title layout in a title, wherein the title layout includes the setting of system colors, and wherein the title is released to the publication storage as separately stored title layout and content documents, and a viewer retrieving the separately stored title layout and content documents from the publication storage, wherein the viewer renders the title layout and content documents as a displayable title, and wherein the system colors set in the title layout are associated with colors set external to the viewer.

Another embodiment of the present invention is a method of styling content in an electronic publishing system, comprising defining a control region, linking the control region to a style sheet object, wherein the style sheet object includes a plurality of styles, associating the control region with content, and displaying a portion of the content, wherein the displayed content portion is styled with at least one of the styles.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a block diagram of the basic system configuration of the multimedia publishing system (MPS), which is the presently preferred underlying architecture for the present invention.

FIG. **2** is a diagram of the major system components of the MPS shown in FIG. **1**.

FIG. **3** is a diagram of an exemplary on-line system, for publication storage and distribution.

FIG. **4** is block diagram of a hierarchy of containers or folders for a plurality of publishers using the system of FIGS. **1** and **2**.

FIG. **5** is an overview flow diagram of the MPS processes performed using the system of FIGS. **1** and **2**.

FIG. **6** is an exemplary screen display of one page of a title as displayed by the viewer of FIG. **2**.

FIG. **7** is an exemplary screen display of the parts of the content and layout for the title displayed in FIG. **6**.

FIG. **8** is a block diagram of the interaction of page layouts, controls, style sheet and content objects at the viewer of FIG. **2**.

FIG. **9** is a diagram illustrating the internal structure of a style sheet object such as shown in FIG. **8**.

FIG. **10** is a flow diagram of the process used to add style sheets to a control region of a page which is a process in the flow diagram shown in FIG. **5**.

FIG. **11** is a flow diagram of the process used to create new style sheets with an editor as illustrated in FIG. **10**.

FIG. **12***a* is a flow diagram of the process performed by the viewer as shown in FIGS. **2** and **5** to gather style information from tagged content and format the content based on a style sheet.

FIG. **12***b* is a diagram illustrating an exemplary Multimedia Publishing Markup Language (MPML) parse tree.

FIG. **12***c* is a diagram of the process that a control uses to retrieve style properties from a style sheet.

FIG. **13***a* is a diagram of multiple controls on a page referencing one style sheet.

FIG. **13***b* is a diagram of multiple controls on a page referencing two different style sheets.

FIG. **14** is a block diagram illustrating the process of displaying the same tagged story by applying two different style sheets.

FIG. **15** is a flow diagram of the wrap edit process performed by the designer to include a wrap style in a style sheet using the style sheet editor shown in FIG. **2**.

FIG. **16** is a diagram of various positions for an embedded object that a designer can set by choosing wrap styles in a style sheet as shown in the flow diagram of FIG. **15**.

FIG. **17** is a flow diagram of the wrap process of applying a wrap style to an embedded object in the viewer shown in FIG. **2**.

FIG. **18** is a flow diagram of the process used by the designer to assign colors to elements in the control.

FIG. **19** is a flow diagram of the process used by the viewer to render colors according to instructions set by the designer.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Reference is now made to the drawings wherein like numerals refer to like parts throughout. For convenience, the following description will be organized into the following seven principle sections: Acronyms, Advantages of the Multimedia Publication System, Multimedia Publishing System Overview, Style Sheet Overview, Style Sheet Object, Applying Style Sheets to Content, Displaying the Styled Content, Assigning Colors in a Control and Summary.

The discussion in the first three sections is general background of the preferred Multimedia Publication System (MPS). The remaining sections focus on the preferred implementation of style sheets within the MPS.

I. ACRONYMS

The following list of acronyms is provided as a reference in reading the remaining sections.

AVI—Advanced Video Imaging.
BBS—Bulletin Board System.
MPML—Multimedia Publishing Markup Language
CF—Component Forms
COS—Caching Object Store
DBM—Database Management System
DLL—Dynamic-link Library
GUID—Globally Unique Identifier
HTML—HyperText Markup Language
ICP—Independent Content Provider
IP—Information Provider
LAN—Local Area Network
MP—Multimedia Publishing
MPC—Microsoft Network Procedure Call
MPS—Multimedia Publishing System
MFC—Microsoft Foundation Class
MSN—Microsoft Network
OCX—OLE Control
OFS—Object File System
OLE—Object Linking and Embedding
PDA—Personal Digital Assistant
RGB—Red, Green, Blue
RPC—Remote Procedure Call
RTF—Rich Text Format
SGML—Standard Generalized Markup Language
VBA—Visual Basic for Applications
WAN—Wide Area Network
WWW—World-Wide Web

II. ADVANTAGES OF THE MULTIMEDIA PUBLICATION SYSTEM

The present invention can perhaps provide the most benefit by using an on-line network. Therefore, this and the following sections present background information on a preferred on-line publication system which is a foundation upon which the present invention can reside.

To enable a new generation of on-line, multimedia applications, an end-to-end system has been invented for developing and using applications and services. The system, called the Multimedia Publishing System (MPS or MP system), preferably uses the Microsoft Network. As an open, turnkey system, MPS includes components for design, authoring, distribution, viewing, search, personalization, and billing of on-line services and multimedia applications. The MP system allows content providers to offer rich, interactive multimedia applications and services, providing users a compelling and exciting on-line experience. The MP system provides the key to overcoming the previously described hurdles facing the on-line industry.

The Microsoft Network removes the primary barriers to on-line service use. These barriers include cost, difficult user interfaces and lack of inertia. Access to The Microsoft Network is provided by Windows 95, the most recent version of the Microsoft Windows operating system thereby making it accessible to millions of customers. The Microsoft Network is designed to make accessing electronic information easy and inexpensive for any user of Windows 95.

In the MP system, Independent Content Providers (ICPs), also known as publishers, supply the system with stories, publications, newspapers, sounds, graphics movies and much more. The MP system is designed to take projects (e.g. stories, publications, etc) produced by the publishers and make them accessible to millions of users on the Microsoft Network. Thus, the basic components of the MP system are a project designer component, a public distribution site, and a viewer component. These components of the MP system are described in detail below.

One unique concept that permeates the MP system is the clean separation of content and design. In this context, content is defined as the actual data that is to be displayed to the user. The design of a project is how that information gets displayed to the user (e.g., its format on the computer screen). An illustrative example would be an electronic newspaper, wherein the content is the text and graphics of the stories, while the design is the layout and style of that data. The design of the electronic newspaper is what makes it look like a newspaper on a computer monitor, whereas the content is the data that makes up the designed screens.

In the MP system, the content and the design are stored as separate objects in the public distribution site so that many different pieces of content can be viewed with the same appearance. An object can be defined as a discrete data item or data structure which can be stored in persistent storage or in memory. The object may include computer instructions for manipulating data. Once a designer, using the project designer component at the publisher site, has created a particular page layout that is attractive, many pieces of content can be viewed from within that layout because of the separation of content from design in the MP system. The system keeps track of links between a piece of content and its associated page layout, but does not actually format the data in the content with a particular style.

As will be discussed in more detail below, the designer creates projects with design and content information for a particular publisher. Continuing the example from above, a project could correspond to an entity that owned a series of newspapers and other media businesses. Within each project, one or more titles would correspond to the actual newspaper. Each title has one or more sections, and can be thought of as similar to the sections in a standard, printed daily newspaper or other periodical such as a magazine.

Within each section are pages that define the information that is displayed to a single screen on the customer's computer visual display. When viewing a particular title, the customer will normally look at only one page of information at a time. On each page are controls which contain instructions for gathering, formatting and displaying the linked content onto the page. When a customer looks at information on a page that is provided by a publisher, the customer is

really looking at content that has been formatted within pre-defined control regions on the page.

One important facet of this invention is the concept of viewing the same content objects in many different ways. As discussed above, content objects are viewed after being formatted by a particular linked control. The control knows how to format a particular piece of content by looking at the style that has been defined for that content by the designer and then comparing that style to a linked style sheet. Because each control on a page can have a different associated style sheet, different controls on the same page can each display the same linked content in varying formats. In one control, the title might be displayed using a 14 point font and bold emphasis, whereas the same piece of content in a different control on the page can be displayed in a 12 point font and italic emphasis. The ability of each control on a page to have its own associated style sheet is a powerful tool for the designer to use to format attractive content on a page.

Unlike prior publishing systems, content (such as text or graphics) in the MP system is never reformatted into the marked style. The content is only displayed to the user in the chosen style. Therefore, should the designer choose to change a particular style, only the style sheet property of that style needs to be altered. The next time that the content is displayed using the altered style sheet, the content will be displayed with the properties of the new style.

A further advantage of the MPS is that it provides the designer with the flexibility to allow customers to choose their own color schemes. Designers can choose a specific color for controls and other displayed objects, or can specify one of the system colors the end-user has customized in the Windows® Control panel. This flexibility allows the designer to give the customer the ability to adjust the color of various chosen title elements. Thus the customer can choose a combination of colors which suit their individual needs. Customers with vision deficiencies which do not allow them to view certain colors or combinations of colors will be able to display titles in specific color combinations. The system also allows the designer to assign permanent colors to controls and objects when a particular "look and feel" is important to a title. Other advantages and benefits of the MP system are discussed in detail below.

To provide more detail on the advantages of the MP system, the following section presents an overview of the Multimedia Publishing system.

III. MULTIMEDIA PUBLISHING SYSTEM OVERVIEW

This section presents an overview of the configuration and major components of the preferred Multimedia Publication System. Beginning with a description of the important concept of separating design and content, this section continues by discussing the major components and configuration of the MP system. In addition, a description of the container hierarchy is discussed in conjunction with FIGS. **1–4**.

The objects utilized by the MP System include a project; title; content folder and, optionally, subfolder; section and, optionally, subsection; window; page; control; style sheet; and various content objects (such as stories, images, audio, so forth). These objects will be explained in more detail below in reference to FIGS. **1–7**. It is important to realize that these objects need to be stored in a non-volatile computer memory such as a hard disk drive.

The natural way of storing related and ordered objects is in a data structure, such as an acyclic graph. The presently preferred way of storing the MP system objects is called a caching object store (COS). The concept of a COS and how it operates to organize objects within an OLE environment is known in the art. See, for example, *Inside OLE* 2 by Kraig Brockschmidt (Microsoft Press). In the presently preferred MPS, each title corresponds to a COS. There is least one COS at the publisher workstation and in each MPS server at the publication storage and distribution center (FIG. **2**). Each customer workstation also has a COS so that the customer can store and retrieve MP system objects when assembling content into controls on pages.

A title may be broadly defined to encompass a publication (e.g., newspaper), service (e.g., stock quotations) or application (e.g., multimedia encyclopedia). When a title is viewed, the viewer opens a title file which represents the title. This title file is a COS file. Typically in the on-line scenario, this would be a skeleton title. A skeleton title is a COS file which contains only a root moniker and no actual objects. A moniker is an object used in the implementation of the COS and contains identification and status information about COS objects.

A superCOS is a COS file which contains more than one COS. For example a superCOS at the customer workstation is used to cache objects which have been remotely retrieved from the host data center. As long as these cached objects are not out of date or flushed, the viewer will be able to quickly provide that object the next time it is requested rather than retrieving it from the data center again. This gives the MP system a tremendous speed advantage over other on-line systems.

A top level system flow diagram is presented in conjunction with FIG. **5** and exemplary Viewer screen displays that could be seen during the processes of the system flow diagram are described in conjunction with FIGS. **6** and **7**. An example of the rendering process that relies on style sheets and content retrieval is presented in conjunction with FIG. **8**.

A. Separation of Design and Content in the Multimedia Publishing System

As discussed above, the MPS architecture maintains a clean separation between design information and the content to which that design will be applied. A publisher's collection of page layouts is in the form of one or more titles. A title is a collection of page layouts, in a particular sequence which relates to the order in which pages will be viewed. The page layouts describe how the client area of a window will appear when a page is rendered. Rendering refers to the creation of a bitmap of a display screen in memory prior to displaying the screen. A complete page layout is created by placing controls on a blank page layout, where each control delineates an area where some piece of content should be displayed. Settings on each control determine the proper place to look for the content to be displayed in that control.

The content takes the form of discrete objects, each of which compose one unit of information, e.g., a story or a picture. These content objects are of well-known and public data formats, and may be created using any tool that supports these data formats. Content objects generally do not have formatting information encoded within them.

When the publisher has created the title (with its page layouts) and the content objects, the title and content are published together to the public distribution point. Consumers download the title and content objects to their personal computer, where the MPS viewer software uses the page