

reconfiguration sequence terminates with the last  
active node in the enhanced range passing the token  
5 to the ID of a node in the basic range.

3. A LAN as defined in claim 2 wherein:  
the execution of the basic reconfiguration  
sequence commences upon the expiration of a  
predetermined time period established by the ID of  
5 an active node in the basic range.

4. A LAN as defined in claim 3 wherein:  
all active enhanced nodes have IDs in the  
enhanced range; and  
the execution of the enhanced  
5 reconfiguration sequence commences upon the  
expiration of a predetermined time period  
established by the ID of an active enhanced node in  
the enhanced range.

5. A LAN as defined in claim 4 wherein:  
the predetermined time period established  
by the ID of an active enhanced node in the enhanced  
range is greater than the predetermined time period  
5 established by the ID of an active node in the basic  
range.

6. A LAN as defined in claim 2 wherein:  
all active enhanced nodes have IDs in the  
enhanced range; and  
the execution of the enhanced  
5 reconfiguration sequence commences upon the  
expiration of a predetermined time period  
established by the ID of an active enhanced node in  
the enhanced range.

7. A LAN as defined in claim 6 wherein:  
the execution of the enhanced  
reconfiguration sequence commences with one active  
enhanced node in the enhanced range which has the ID  
5 that results in the expiration of predetermined time  
period; and

said one active enhanced node includes means for responding to a token pass to a predetermined ID of a node in the basic range to complete the token loop.

8. A LAN as defined in claims 2 wherein: at least one active enhanced node has an ID in the basic range; and the execution of the enhanced reconfiguration sequence begins upon receipt of a token by an active enhanced node in the basic range of addresses.

9. A LAN as defined in claim 8 wherein: the execution of the basic reconfiguration sequence commences upon the expiration of a predetermined time period established by the ID of an active node in the basic range.

10. A LAN as defined in claim 2 wherein: the token pass from the last active enhanced node in the enhanced range to the ID of a node in the basic range allows the basic reconfiguration sequence to be completed through the remaining active nodes in the basic range.

11. A LAN as defined in claim 1 wherein: each enhanced node has at least one enhanced operational capability which all basic nodes do not have but which appears to basic nodes as basic LAN operational activity.

12. A LAN as defined in claim 1 wherein: said reconfiguration means is distributed among all of the nodes.

13. A LAN as defined in claim 12 wherein: said reconfiguration means which executes the enhanced reconfiguration sequence is present only at the enhanced nodes.

14. A LAN as defined in claim 13 wherein: the reconfiguration means of each basic

node transmits and responds to standard tokens  
(ITTs) during execution of the basic reconfiguration  
5 sequence; and

the reconfiguration means of each enhanced  
node transmits one of either extended tokens (XITTs)  
or enhanced tokens (XTOKs) and responds to standard  
tokens, extended tokens or enhanced tokens during  
10 execution of the enhanced reconfiguration sequence.

15. A LAN as defined in claim 14 wherein:

the reconfiguration means of each basic  
node also responds to extended tokens during  
execution of the reconfiguration sequences.

16. A LAN as defined in claim 15 wherein:

communications between basic nodes and  
from basic nodes to enhanced nodes occur in  
accordance with a basic communication protocol; and  
5 communications between enhanced nodes and  
from enhanced nodes to basic nodes occur in  
accordance with an enhanced communication protocol,  
the enhanced protocol includes a first signalling  
scheme which is recognizable only by enhanced nodes  
10 and a second signalling scheme which is recognizable  
by both enhanced and basic nodes.

17. A LAN as defined in claim 16 wherein:

each extended token contains signal  
elements which are recognizable in the basic and  
enhanced protocols and which contain additional  
5 signal elements which are transparent in the basic  
protocol but which convey information in the  
enhanced protocol.

18. A LAN as defined in claim 16 wherein:

each enhanced token contains signal  
elements which are recognizable only in the  
enhanced protocol and which are transparent in the  
5 basic protocol.

19. A LAN as defined in claims 1 or 15  
wherein:

the execution of both the basic and  
enhanced reconfiguration sequences involves  
5 transmitting a token to an ID which is incremented  
relative to the ID of the node transmitting the  
token and recording the incremented ID as the next  
ID (NID) in the token loop upon sensing network  
activity created by the successful receipt and use  
10 of the token by the next active node.

20. A LAN as defined in claim 19 wherein:

the recorded incremented ID is that of the  
next active node in the reconfigured token loop.

21. A LAN as defined in claim 20 wherein:

after the token loop has been initially  
established, the basic and enhanced reconfiguration  
sequences are selectively executed upon a previously  
5 active node becoming inactive by any single node  
transmitting a token to an incremented IDs above the  
NID when the node at the previous NID becomes  
inactive and recording the new incremented NID upon  
sensing network activity associated with the  
10 successful receipt of the token at the next active  
node at the new NID.

22. A LAN as defined in claim 20 wherein:

the basic and enhanced reconfiguration  
sequences are executed at all of the nodes to  
establish a new token loop when a previously  
5 inactive node becomes active.

23. A LAN as defined in claim 1 wherein:

communications between enhanced nodes and  
from enhanced nodes to basic nodes occur in  
accordance with an enhanced communication protocol,  
5 the enhanced protocol includes a first signalling  
scheme which is recognizable only by enhanced nodes

and a second signalling scheme which is recognizable by both enhanced and basic nodes;

communications in both protocols involve  
10 transmitting frames of data, each data frame having an address field; and

the address field in the basic frames has a size limitation which limits the maximum number of permissible nodes in the basic range.

24. A LAN as defined in claim 23 wherein:

the address field in the enhanced frames has a size limitation which limits the maximum number of nodes in the enhanced range to a number  
5 substantially greater than the maximum number of permissible nodes in the basic range.

25. A LAN as defined in claim 1 wherein:

at least one enhanced node with an ID in the enhanced range includes means for responding to a token addressed to a predetermined ID in the basic  
5 range in the token loop, said one enhanced node normally responding to data packet frame transmissions addressed to it at its ID in the extended range.

26. A LAN as defined in claim 25 wherein:

the predetermined ID in the basic range to which the one enhanced node responds to tokens is available to designate broadcast data frames to all  
5 the nodes.

27. A LAN as defined in claim 26 wherein:

the predetermined ID in the basic range to which the one enhanced node responds to tokens is employed to designate broadcast data frames to all  
5 the nodes.

## AMENDED CLAIMS

[received by the International Bureau  
on 21 May 1990 (21.05.90);  
original claims 1,6,7,11,21,26 and 27 amended;  
other claims unchanged (7 pages)]

1. A directed token local area network (LAN),  
comprising:

5 a plurality of at least three nodes, each  
node having a unique address or ID, at least one of  
the nodes being a basic node, all basic nodes having  
IDs which fall within a basic range of permissible  
IDs, at least one of the nodes being an enhanced  
10 node, each enhanced node having an ID which falls  
within an enhanced range of permissible IDs or the  
basic range, all of the IDs in the enhanced range  
being greater than those permitted in the basic  
range, at least one of the enhanced nodes having an  
ID in the enhanced range; and

15 reconfiguration means associated with all  
of the nodes and operative for passing tokens to  
locate the next active node and automatically  
establish all of the active nodes in a token loop  
according to the IDs of the nodes to enable all of  
20 the active nodes to receive tokens during normal LAN  
operation, said reconfiguration means executing a  
standard reconfiguration sequence for locating and  
establishing the active nodes in the basic range of  
IDs in a basic segment of the token loop, said  
25 reconfiguration means also executing an enhanced  
reconfiguration sequence for locating and  
establishing the active nodes in the enhanced range  
of IDs in the other enhanced segment of the token  
loop, and the execution of the enhanced  
30 reconfiguration sequence commences with the first  
enhanced node to receive the token in conjunction  
with execution of the basic reconfiguration  
sequence.

- 66 -

2. A LAN as defined in claim 1 wherein:  
the execution of the enhanced  
reconfiguration sequence terminates with the last  
active node in the enhanced range passing the token  
to the ID of a node in the basic range.

3. A LAN as defined in claim 2 wherein:  
the execution of the basic reconfiguration  
sequence commences upon the expiration of a  
predetermined time period established by the ID of  
an active node in the basic range.

4. A LAN as defined in claim 3 wherein:  
all active enhanced nodes have IDs in the  
enhanced range; and  
the execution of the enhanced  
reconfiguration sequence commences upon the  
expiration of a predetermined time period  
established by the ID of an active enhanced node in  
the enhanced range.

5. A LAN as defined in claim 4 wherein:  
the predetermined time period established  
by the ID of an active enhanced node in the enhanced  
range is greater than the predetermined time period  
established by the ID of an active node in the basic  
range.

6. A LAN as defined in claim 2 wherein:  
all active enhanced nodes have IDs in the  
enhanced range; and  
the execution of the enhanced  
reconfiguration sequence commences upon the  
expiration of a predetermined time period  
established by the ID of an active enhanced node in  
the enhanced range.

7. A LAN as defined in claim 6 wherein:  
the execution of the enhanced  
reconfiguration sequence commences with one active

- 67 -

enhanced node in the enhanced range which has the ID that results in the expiration of predetermined time period; and

5           said one active enhanced node includes means for responding to a token pass to a predetermined ID of a node in the basic range to complete the token loop.

8.    A LAN as defined in claims 2 wherein:  
          at least one active enhanced node has an  
10    ID in the basic range; and  
          the execution of the enhanced reconfiguration sequence begins upon receipt of a token by an active enhanced node in the basic range of addresses.

15           9.    A LAN as defined in claim 8 wherein:  
          the execution of the basic reconfiguration sequence commences upon the expiration of a predetermined time period established by the ID of an active node in the basic range.

20           10.   A LAN as defined in claim 2 wherein:  
          the token pass from the last active enhanced node in the enhanced range to the ID of a node in the basic range allows the basic reconfiguration sequence to be completed through the  
25    remaining active nodes in the basic range.

          11.   A LAN as defined in claim 1 wherein:  
          each enhanced node has at least one enhanced operational capability which all basic nodes do not have but which appears to basic nodes  
30    as basic LAN operational activity.

          12.   A LAN as defined in claim 1 wherein:  
          said reconfiguration means is distributed among all of the nodes.

          13.   A LAN as defined in claim 12 wherein:  
35    said reconfiguration means which executes



- 68 -

the enhanced reconfiguration sequence is present only at the enhanced nodes.

14. A LAN as defined in claim 13 wherein:  
the reconfiguration means of each basic  
5 node transmits and responds to standard tokens  
(ITTs) during execution of the basic reconfiguration  
sequence; and

the reconfiguration means of each enhanced  
node transmits one of either extended tokens (XITPs)  
10 or enhanced tokens (XTOKs) and responds to standard  
tokens, extended tokens or enhanced tokens during  
execution of the enhanced reconfiguration sequence.

15. A LAN as defined in claim 14 wherein:  
the reconfiguration means of each basic  
15 node also responds to extended tokens during  
execution of the reconfiguration sequences.

16. A LAN as defined in claim 15 wherein:  
communications between basic nodes and  
from basic nodes to enhanced nodes occur in  
20 accordance with a basic communication protocol; and  
communications between enhanced nodes and  
from enhanced nodes to basic nodes occur in  
accordance with an enhanced communication protocol,  
the enhanced protocol includes a first signalling  
25 scheme which is recognizable only by enhanced nodes  
and a second signalling scheme which is recognizable  
by both enhanced and basic nodes.

17. A LAN as defined in claim 16 wherein:  
each extended token contains signal  
30 elements which are recognizable in the basic and  
enhanced protocols and which contain additional  
signal elements which are transparent in the basic  
protocol but which convey information in the  
enhanced protocol.

- 69 -

18. A LAN as defined in claim 16 wherein:  
each enhanced token contains signal  
elements which are recognizable only in the  
enhanced protocol and which are transparent in the  
5 basic protocol.

19. A LAN as defined in claims 1 or 15  
wherein:

the execution of both the basic and  
enhanced reconfiguration sequences involves  
10 transmitting a token to an ID which is incremented  
relative to the ID of the node transmitting the  
token and recording the incremented ID as the next  
ID (NID) in the token loop upon sensing network  
activity created by the successful receipt and use  
15 of the token by the next active node.

20. A LAN as defined in claim 19 wherein:  
the recorded incremented ID is that of the  
next active node in the reconfigured token loop.

21. A LAN as defined in claim 20 wherein:  
20 after the token loop has been initially  
established, the basic and enhanced reconfiguration  
sequences are selectively executed upon a previously  
active node becoming inactive by any single node  
transmitting a token to an incremented IDs above the  
25 NID when the node at the previous NID becomes  
inactive and recording the new incremented NID upon  
sensing network activity associated with the  
successful receipt of the token at the next active  
node at the new NID.

22. A LAN as defined in claim 20 wherein:  
30 the basic and enhanced reconfiguration  
sequences are executed at all of the nodes to  
establish a new token loop when a previously  
inactive node becomes active.

- 70 -

23. A LAN as defined in claim 1 wherein:  
communications between enhanced nodes and  
from enhanced nodes to basic nodes occur in  
accordance with an enhanced communication protocol,  
5 the enhanced protocol includes a first signalling  
scheme which is recognizeable only by enhanced nodes  
and a second signalling scheme which is recognizable  
by both enhanced and basic nodes;

communications in both protocols involve  
10 transmitting frames of data, each data frame having  
an address field; and

the address field in the basic frames has a  
size limitation which limits the maximum number of  
permissible nodes in the basic range.

15 24. A LAN as defined in claim 23 wherein:

the address field in the enhanced frames  
has a size limitation which limits the maximum  
number of nodes in the enhanced range to a number  
substantially greater than the maximum number of  
20 permissible nodes in the basic range.

25 25. A LAN as defined in claim 1 wherein:

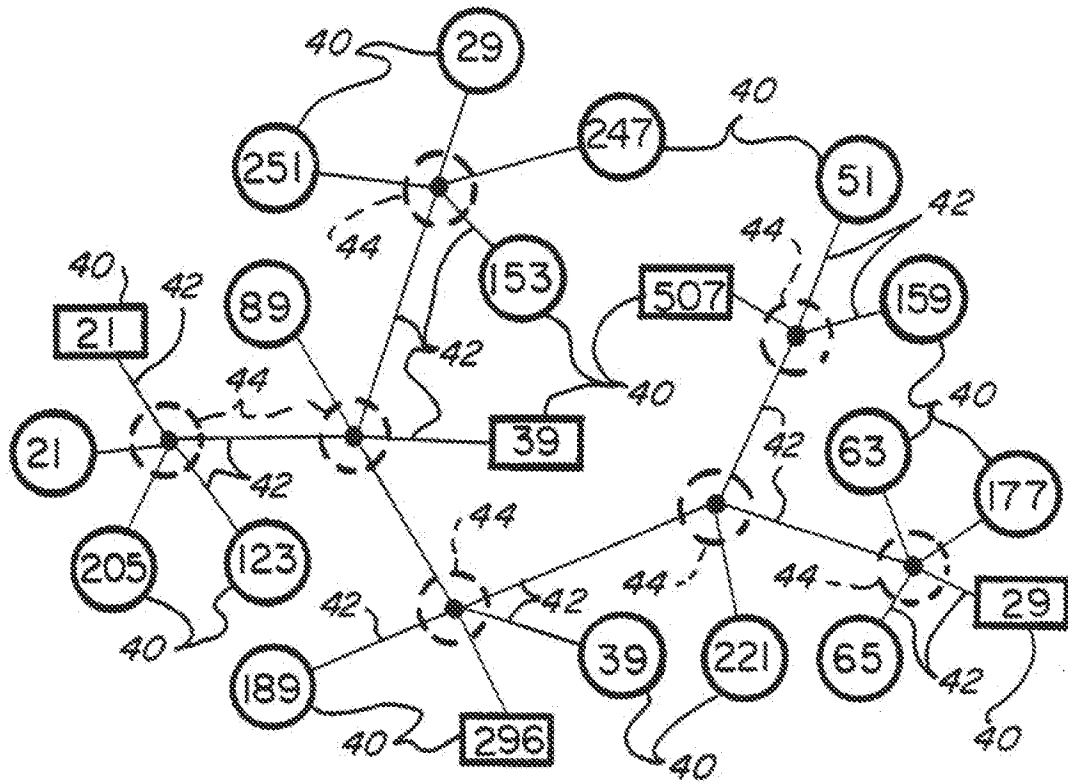
at least one enhanced node with an ID in  
the enhanced range includes means for responding to  
a token addressed to a predetermined ID in the basic  
range in the token loop, said one enhanced node  
normally responding to data packet frame  
transmissions addressed to it at its ID in the  
extended range.

30 26. A LAN as defined in claim 25 wherein:

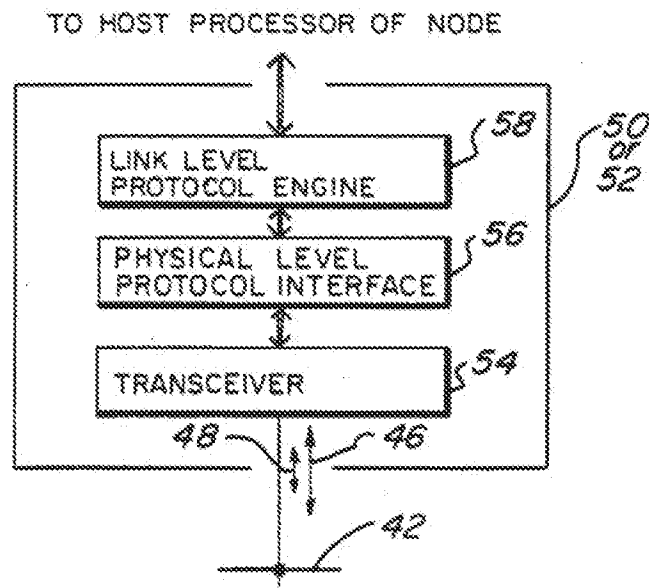
the predetermined ID in the basic range to  
which the one enhanced node responds to tokens is  
available to designate broadcast data frames to all  
the nodes.

27. A LAN as defined in claim 26 wherein:  
the predetermined ID in the basic range to  
which the one enhanced node responds to tokens is  
employed to designate broadcast data frames to all  
the nodes.

5



Fig\_1



Fig\_3

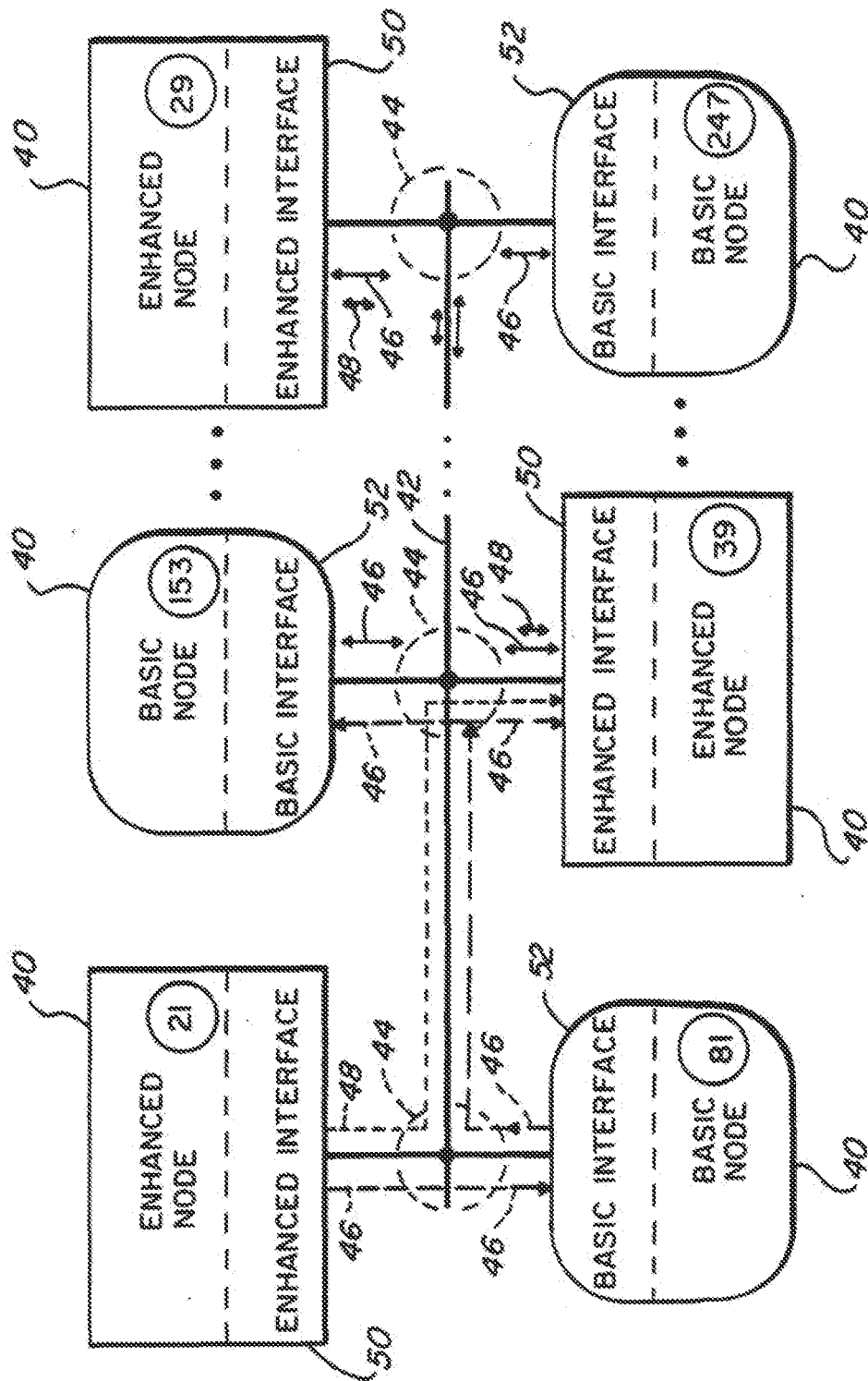


Fig - 2

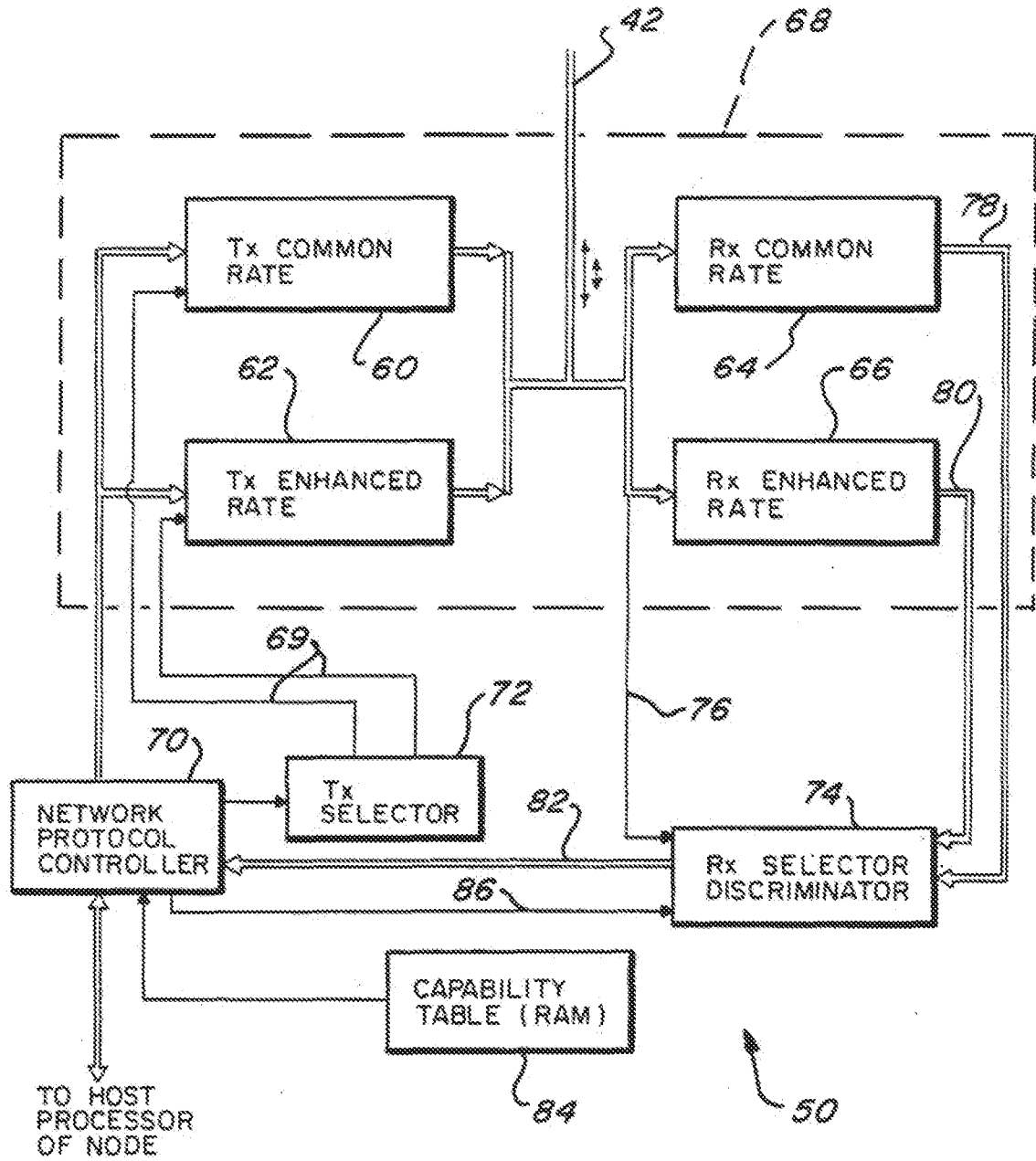
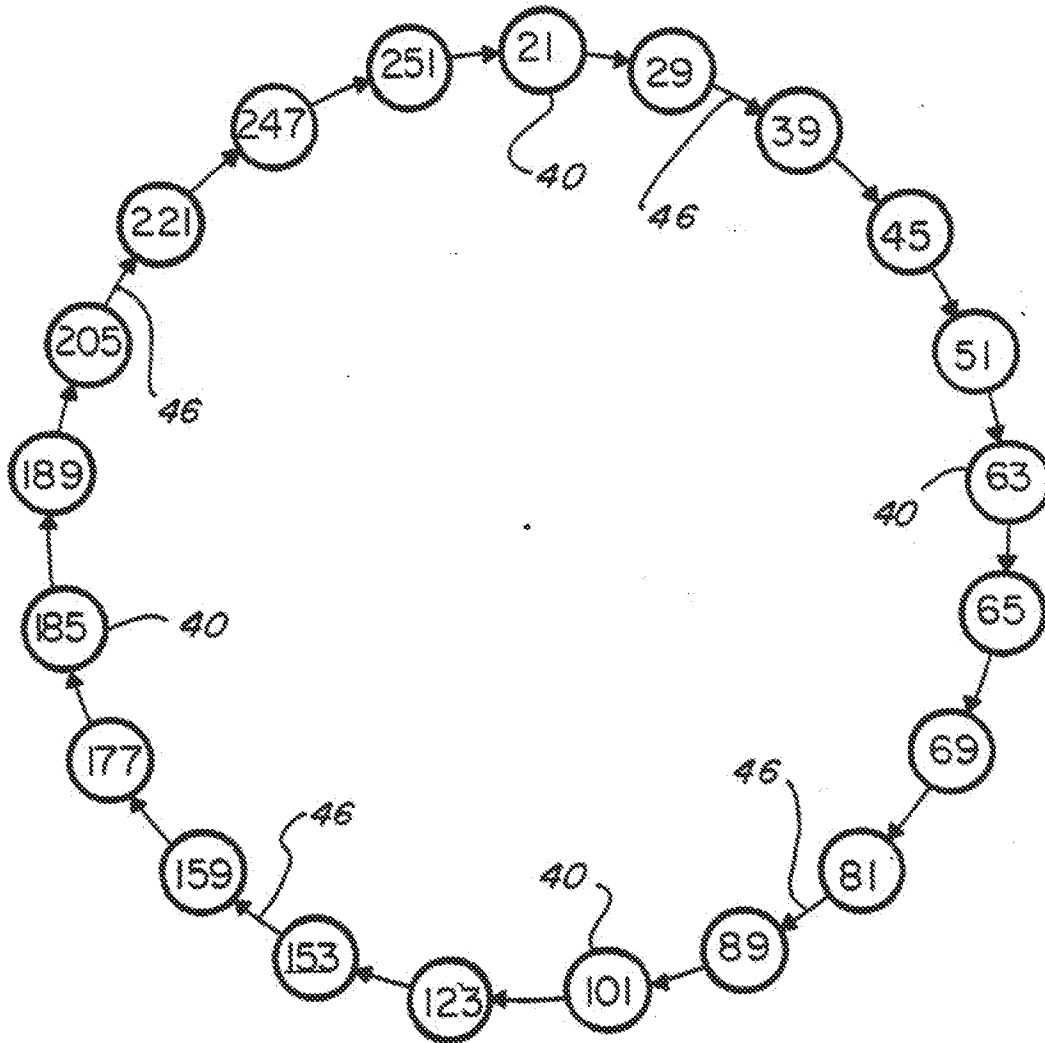


Fig-4

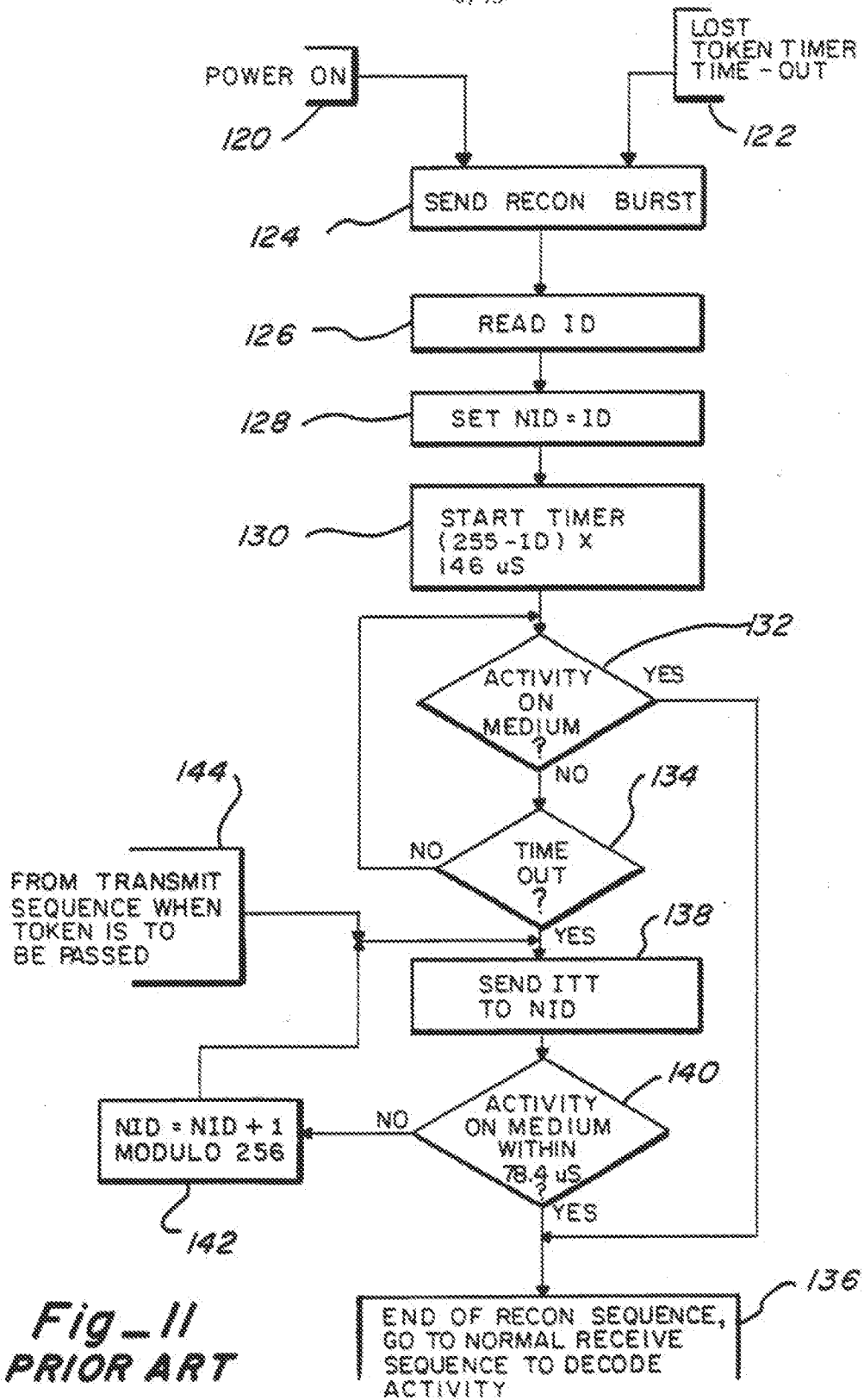






**Fig - 10**  
PRIOR ART

6/13



**Fig-11**  
**PRIOR ART**

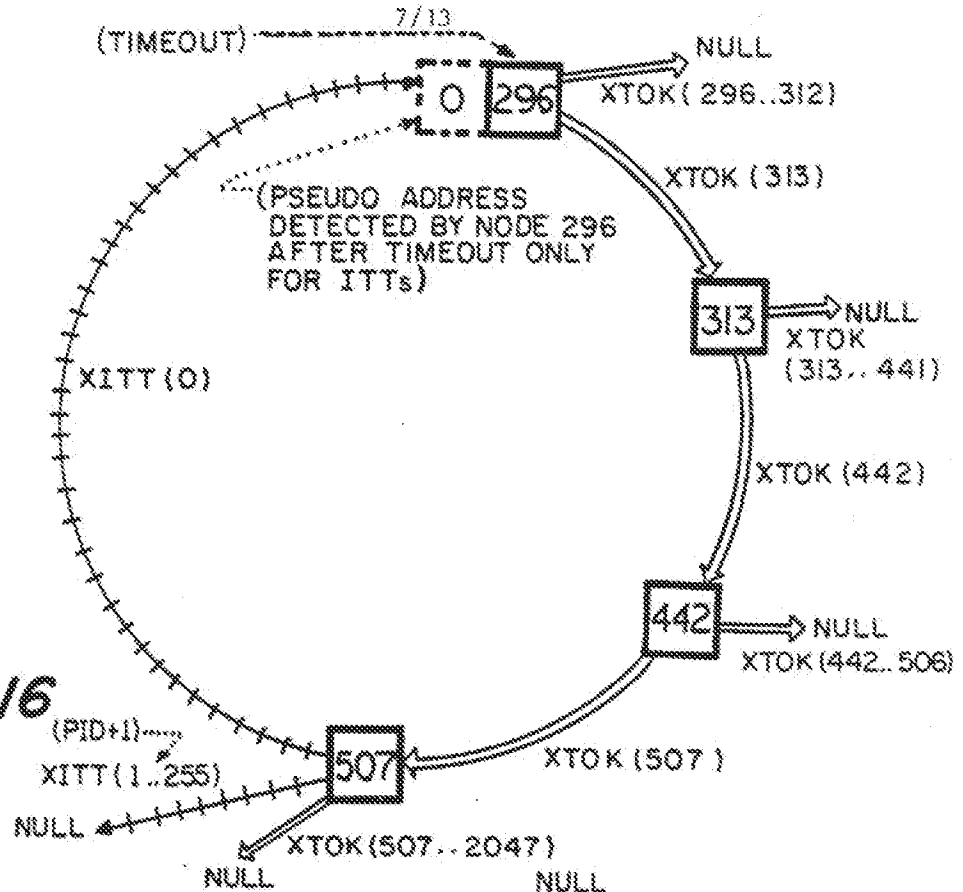


Fig - 16

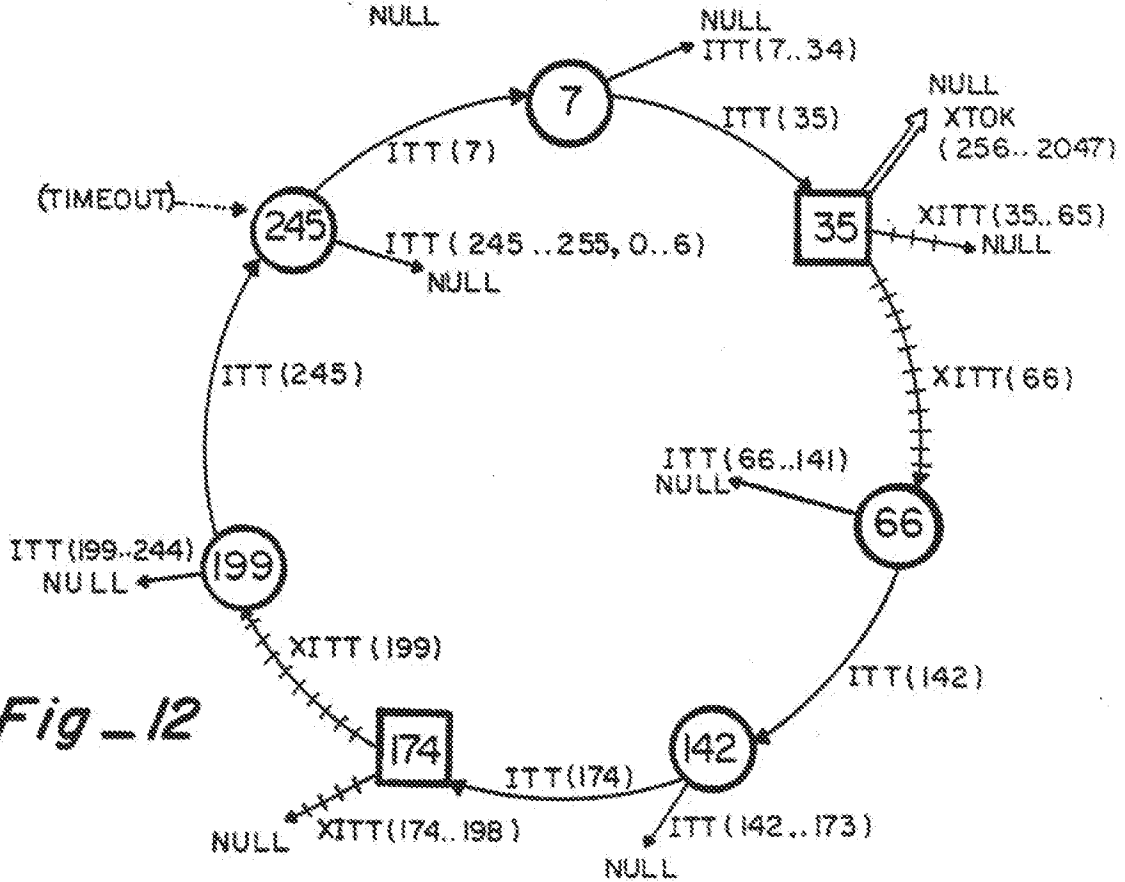


Fig - 12

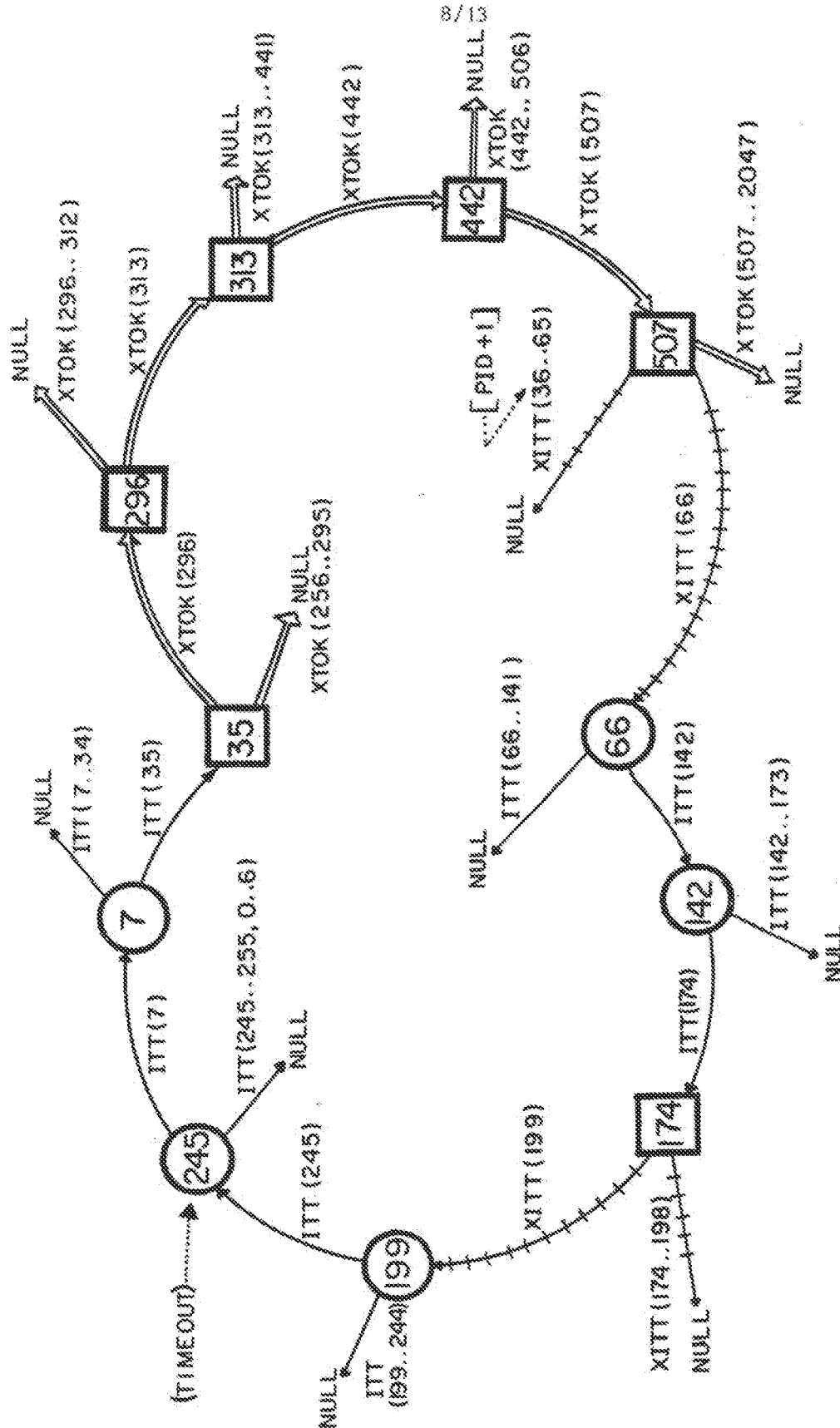


Fig-13

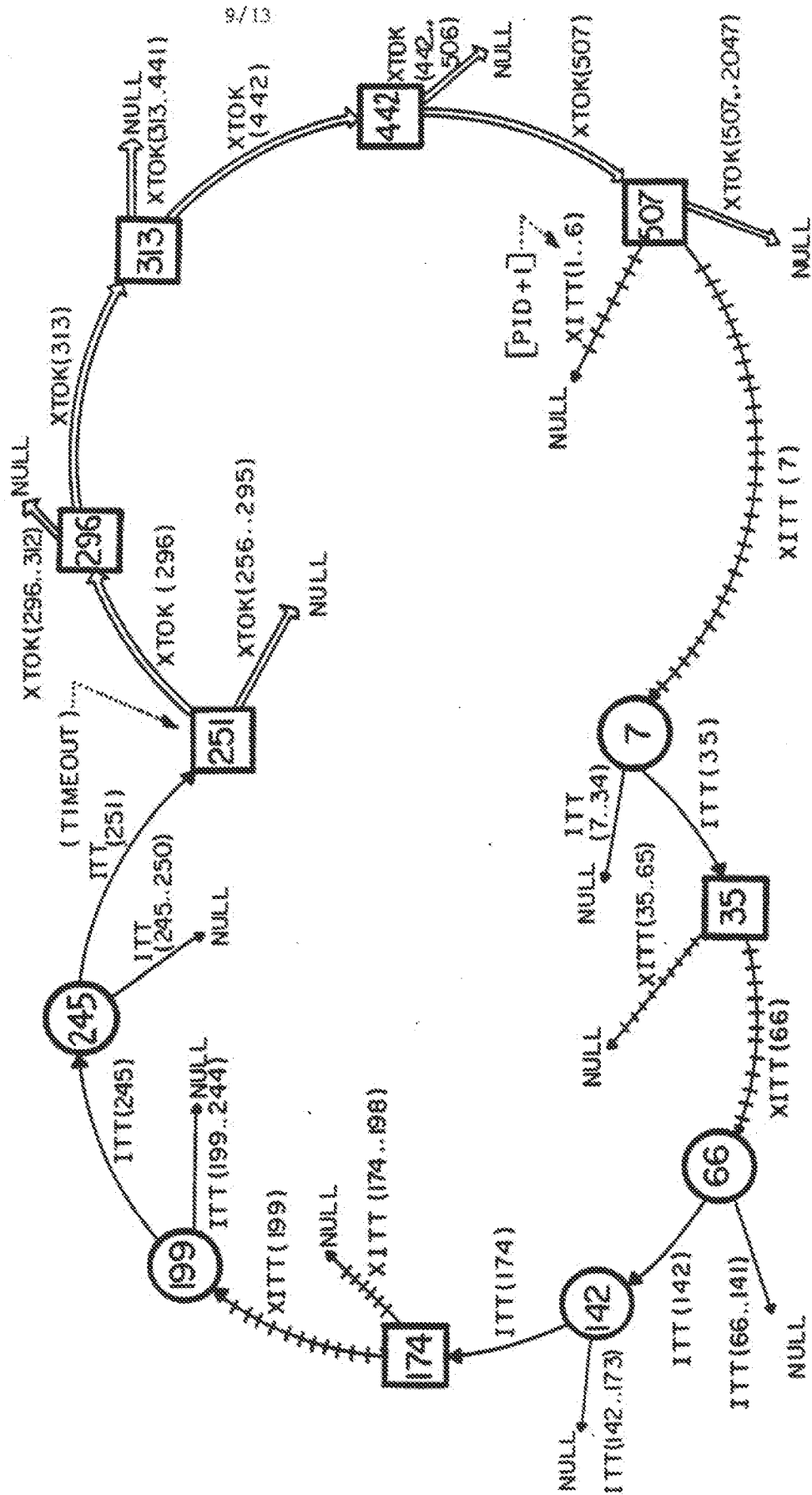


Fig - 14

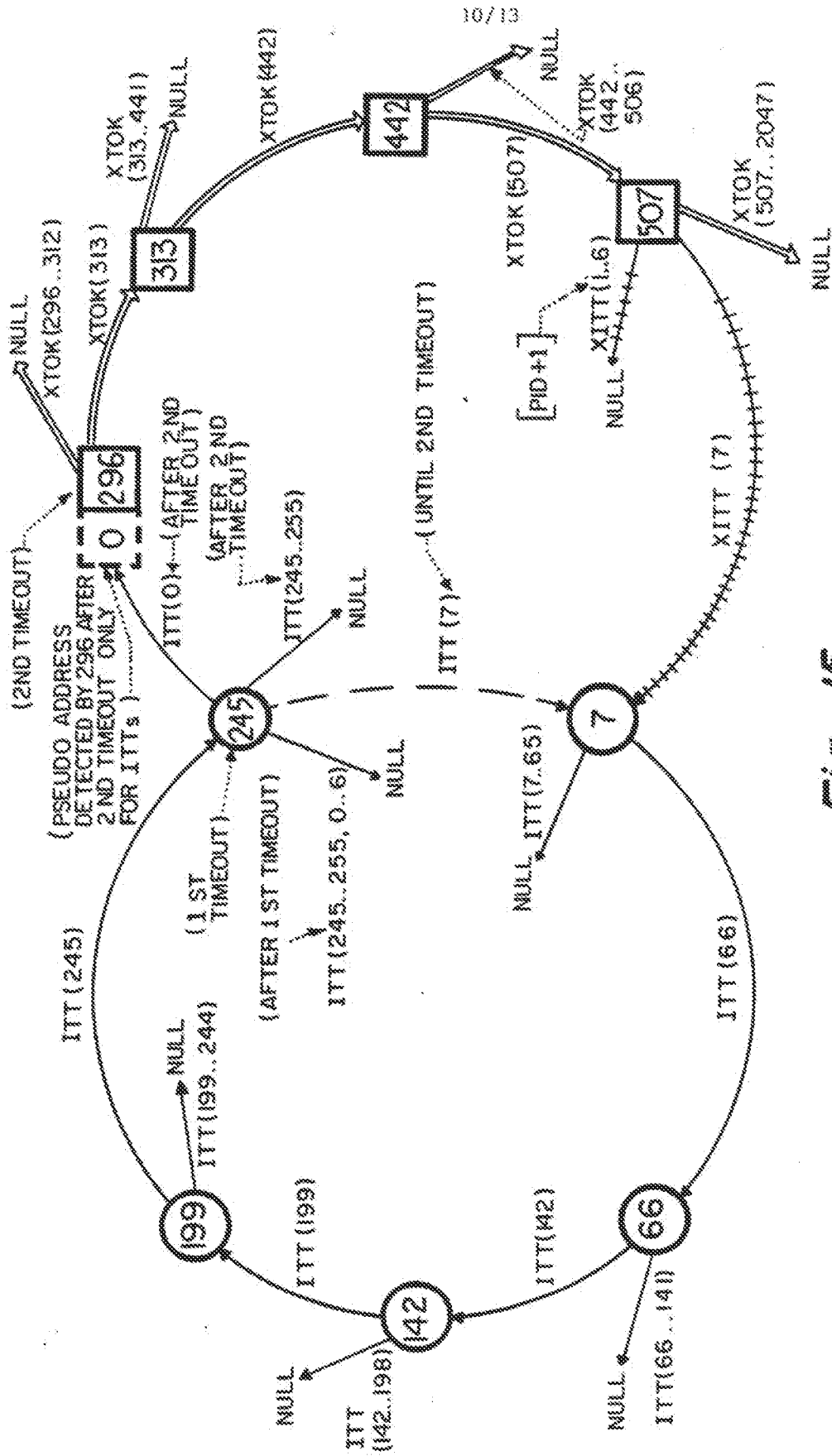


Fig-15

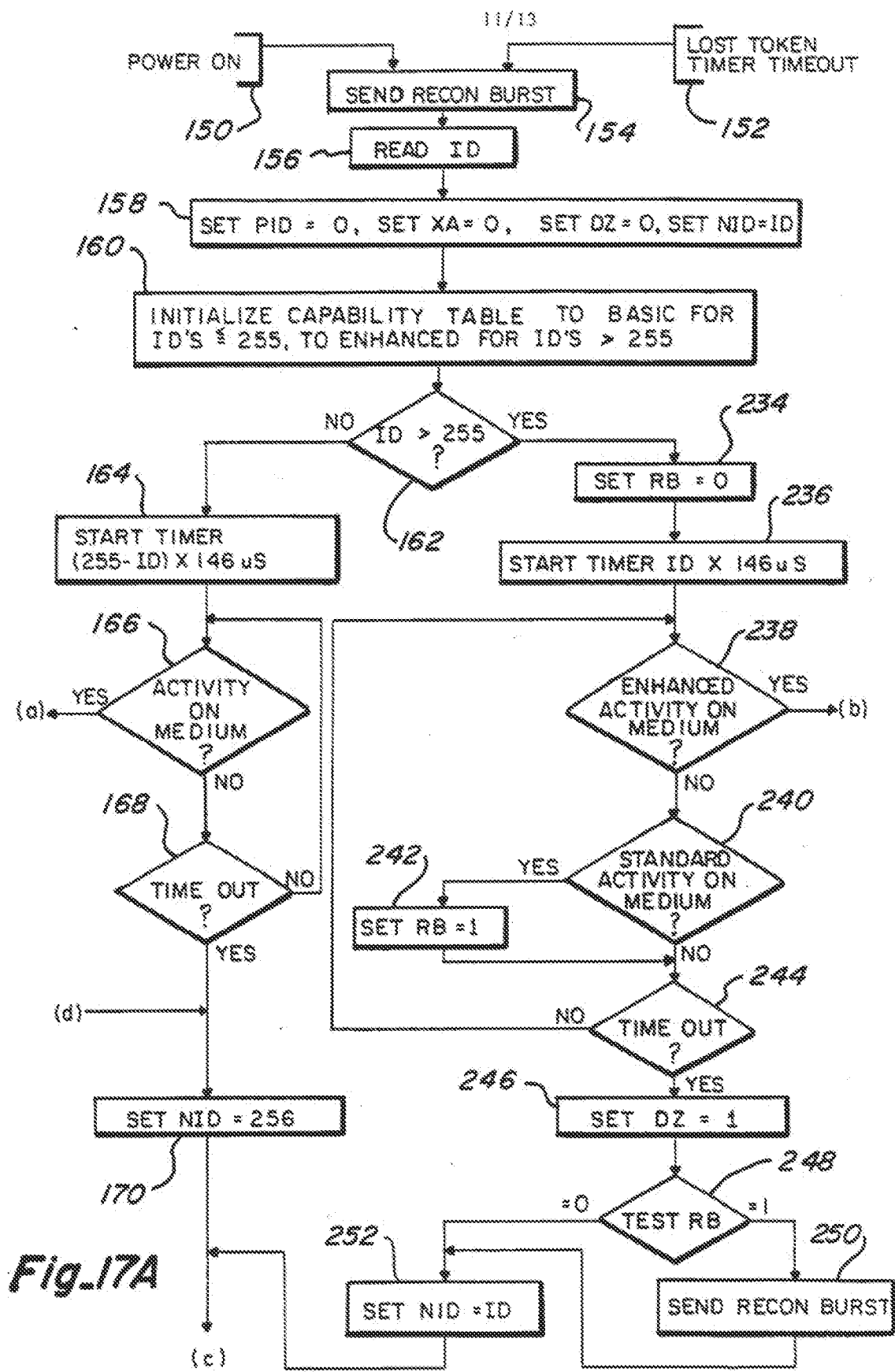


Fig. 17A

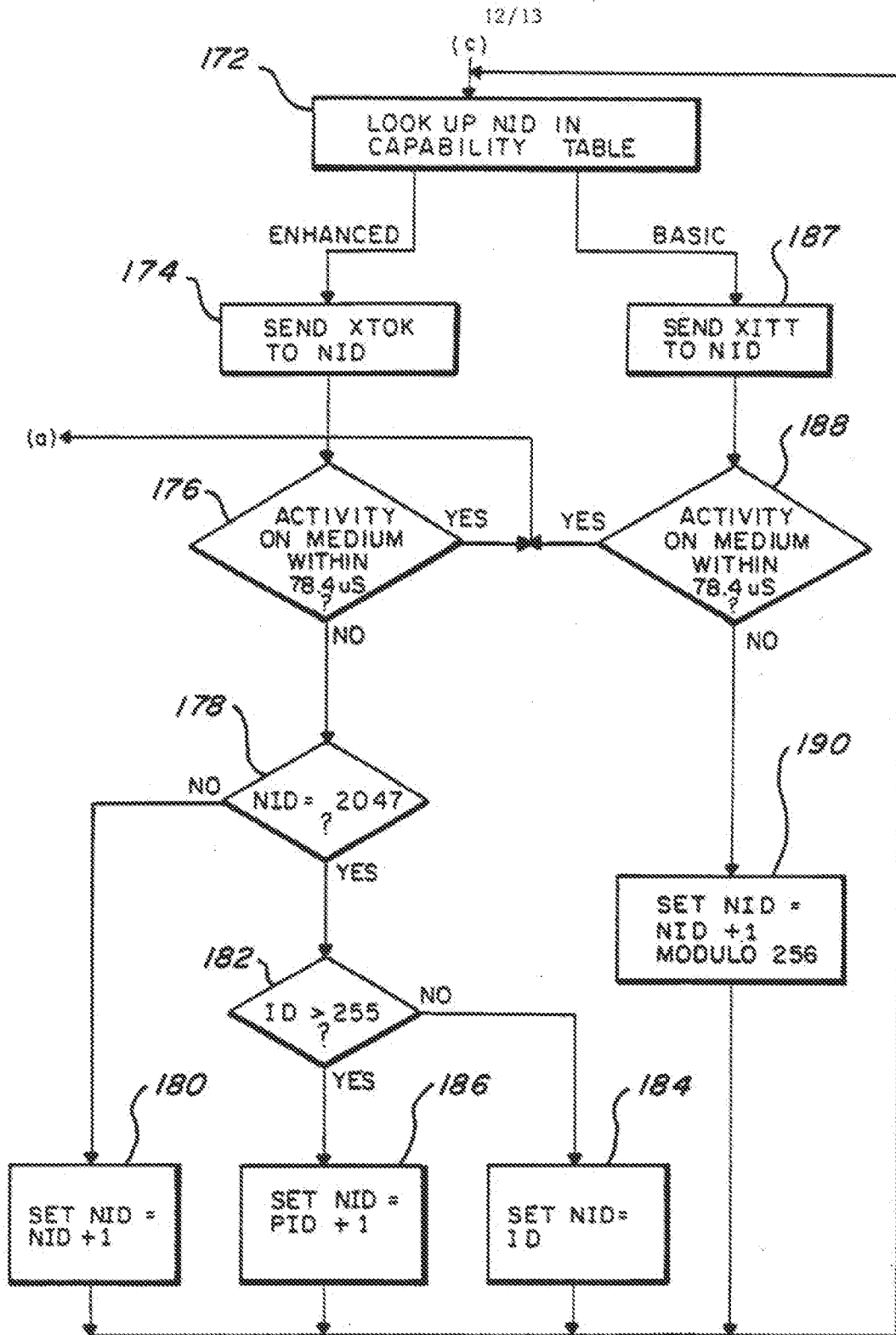


Fig - 17B



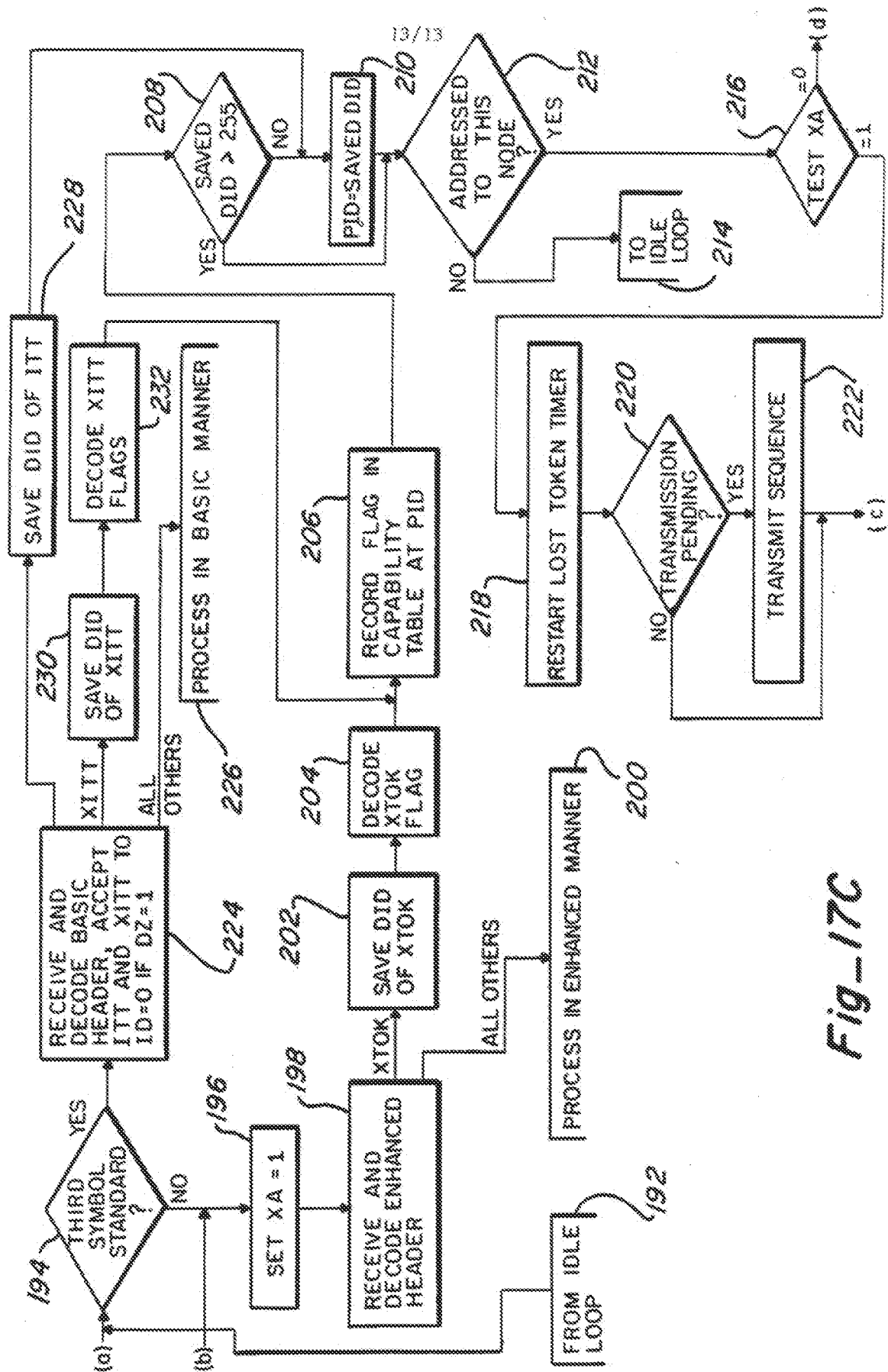


Fig. 17C

# INTERNATIONAL SEARCH REPORT

International Application No. **PCT/US89/05781**

<b>I. CLASSIFICATION OF SUBJECT MATTER</b> (If several classification symbols apply, indicate all) <sup>6</sup>		
According to International Patent Classification (IPC) or to both National Classification and IPC		
IPC <sup>7</sup> <b>H04J 3/00</b> <b>U.S. Cl. 370/85.4, 85.15</b>		
<b>II. FIELDS SEARCHED</b>		
Minimum Documentation Searched <sup>7</sup>		
Classification System	Classification Symbols	
U.S. Cl.	370/85.4, 85/5, 85.6, 85.15, 84	
Documentation Searched other than Minimum Documentation to the extent that such Documents are included in the Fields Searched <sup>8</sup>		
<b>III. DOCUMENTS CONSIDERED TO BE RELEVANT</b> <sup>9</sup>		
Category <sup>9</sup>	Citation of Document, <sup>11</sup> with indication, where appropriate, of the relevant passages <sup>12</sup>	Relevant to Claim No. <sup>13</sup>
A	US,A, 4,701,908 Ikeda 20 October 1987 (See entire patent)	1 - 27
A	US,A, 4,792,944 Takahashi et al. 20 December 1988 (See entire patent)	1 - 27
A	US,A, 4,602,365 White et al. 22 July 1986 (See entire patent)	1 - 27
A	US,A, 4,649, 535 Ulug 10 March 1987 (See entire patent)	1 - 27
<p><sup>10</sup> Special categories of cited documents:</p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> <p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.</p> <p>"Z" document member of the same patent family</p>		
<b>IV. CERTIFICATION</b>		
Date of the Actual Completion of the International Search	Date of Mailing of this International Search Report	
28 February 1990	<b>21 MAR 1990</b>	
International Searching Authority	Signature of Authorized Officer	
ISA/US	<i>Min Jung</i> Min Jung	

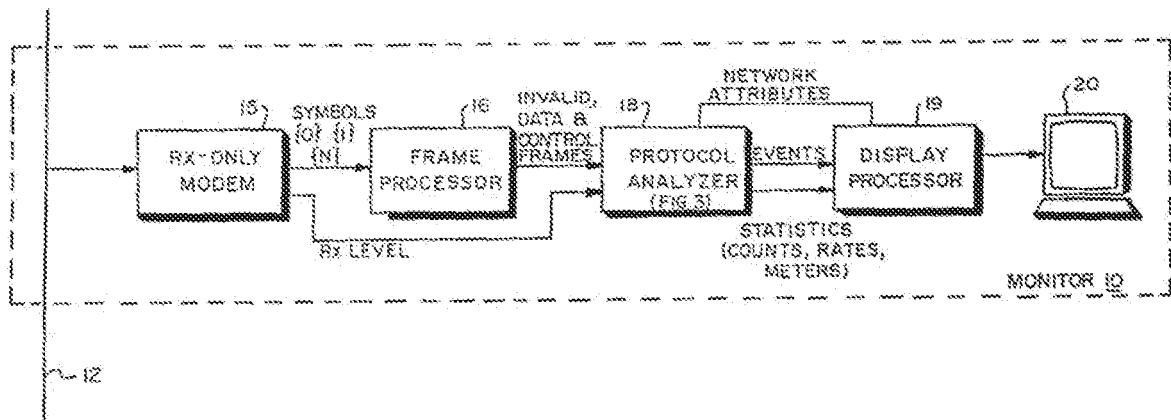
Form PCT/ISA210 (second sheet) (Rev.11-87)



## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification <sup>5</sup> :  H04L 12/26	A1	(11) International Publication Number: <b>WO 90/14725</b>  (43) International Publication Date: 29 November 1990 (29.11.90)
<p>(21) International Application Number: PCT/US90/02895</p> <p>(22) International Filing Date: 18 May 1990 (18.05.90)</p> <p>(30) Priority data: 354,343                      19 May 1989 (19.05.89)                      US</p> <p>(71) Applicant: CONCORD COMMUNICATIONS, INC. [US/US]; 753 Forest Street, Marlboro, MA 01752 (US).</p> <p>(72) Inventor: DOUGLAS, Robert, H. ; 13850 North Coral Gables, Phoenix, AZ 85023 (US).</p> <p>(81) Designated States: AT (European patent), BE (European patent), CH (European patent), DE (European patent)*, DK (European patent), ES (European patent), FR (European patent), GB (European patent), IT (European patent), JP, LU (European patent), NL (European patent), SE (European patent).</p>	<p><b>Published</b></p> <p><i>With international search report.</i></p> <p><i>Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i></p>	

(54) Title: A PASSIVE NETWORK MONITOR



## (57) Abstract

The invention is a network monitor (10) that passively detects sequences of control frame transmissions. Detected control frame sequences are compared to a model of the expected exchange of control frames. The monitor concludes that a malfunction has occurred when the detected control frame sequences do not match the frame sequences indicated by model. The monitor is quite useful with a network that uses a token passing protocol, since it can determine whether a particular station (11) is working improperly by tracking whether the token is passed in the order proscribed by the expected token-passing sequence in the model. The monitor can detect and diagnose many types of network malfunctions. The monitor also observes and maintains statistics on network data traffic and configuration information, in real time. Since the monitor independently tracks which station has the token, statistics are developed on how much traffic is passing to and from bridges (14).

\* See back of page

### DESIGNATIONS OF "DE"

Until further notice, any designation of "DE" in any international application whose international filing date is prior to October 3, 1990, shall have effect in the territory of the Federal Republic of Germany with the exception of the territory of the former German Democratic Republic.

#### FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AT	Austria	ES	Spain	MC	Monaco
AU	Australia	FI	Finland	MG	Madagascar
BB	Barbados	FR	France	ML	Mali
BE	Belgium	GA	Gabon	MR	Mauritania
BF	Burkina Faso	GB	United Kingdom	MW	Malawi
BG	Bulgaria	GR	Greece	NL	Netherlands
BJ	Benin	HU	Hungary	NO	Norway
BR	Brazil	IT	Italy	RO	Romania
CA	Canada	JP	Japan	SD	Sudan
CF	Central African Republic	KP	Democratic People's Republic of Korea	SE	Sweden
CG	Congo	KR	Republic of Korea	SN	Senegal
CH	Switzerland	LI	Liechtenstein	SU	Soviet Union
CM	Cameroon	LR	Sierra Leone	TD	Chad
DE	Germany, Federal Republic of	LU	Luxembourg	TG	Togo
DK	Denmark			US	United States of America

-/-

A PASSIVE NETWORK MONITOR

FIELD OF THE INVENTION

This invention relates generally to electronic communications and more specifically to a passive malfunction and performance monitor for a broadcast communication network.

BACKGROUND OF THE INVENTION

Data communication networks allow information exchange and sharing of computer resources, and thus enable an organization to take advantage of its total computing capabilities. It is increasingly common for computer resources to be arranged into local area networks (LANs), especially when data transfer is required among several resources, or stations, located at various places within a building or cluster of buildings.

Because organizations often either use computer equipment made by a number of different manufacturers, or desire to exchange information with other organizations that use different equipment, it became quite apparent in the late 1970's that a way to support high-speed data communication between different types of computers would be needed.

This prompted the Institute of Electrical and Electronic Engineers (IEEE) to begin its Project 802. The IEEE quickly reached two conclusions. First, because of diversity in design, getting different computers to communicate is a complex problem. It requires architecture decisions not only at low levels, such as agreeing upon suitable modulation schemes, but also at higher levels. Second, no single architecture is ideal for all applications.

The IEEE thus developed a LAN reference model having three "layers". A first layer, called the physical layer, is

-2-

concerned with the nature of the transmission medium. A second layer, called the media access control (MAC) layer, is concerned with the details of signalling along the physical layer. Messages are exchanged, among many stations, in groups of elemental symbols. The basic message is called a frame at the MAC layer, with allowable frame types include both control frames and data frames. Data frames contain the information which is to be exchanged over the broadcast network, while control frames are used to issue instructions to each station, primarily to insure that no two stations attempt to transmit at the same time. A third layer, the logical link control (LLC) layer, is concerned with establishing, maintaining, and terminating logical links between stations.

The IEEE also concluded that no single MAC-layer architecture would be ideal for all situations. Performance can be sacrificed for lower cost in some applications, such as the typical office, but in other environments, such as the typical factory, users will spend more money to obtain a network which is more robust. The IEEE 802.4 Token-Passing Bus Access Method was developed for these critical environments.

Even though the 802.4 standard specifies a fairly robust communication environment, failures still occur due to equipment malfunction, network mis-operation, or programming errors. There is a need to identify which station is the source of such failures, particularly since a single malfunctioning station may prevent use of the network by other stations. The failure source often needs to be located quickly, especially when the profitability of the organization is critically dependent upon the operation of the LAN, such as is often the case in a manufacturing environment.

The failure identification problem is further exacerbated by the presence of equipment manufactured by multiple, independent companies. Although all such LAN equipment

operates in accordance with a standard protocol, it is often difficult to consistently obtain diagnostic information about each station in such a situation. This can be especially true if several vendors have chosen to implement the standard protocol in different ways, or require conflicting diagnostic procedures.

It is also necessary to understand the utilization of the LAN in order to locate and correct performance bottlenecks. Such bottlenecks often occur due to load imbalances, and especially those caused by heavy traffic to and from certain stations, called bridges. Bridges serve as gateways for messages from one network to another, and thus are often a bottleneck. As a result, network managers often seek answers to questions such as (1) To what degree does each station utilize the medium? (2) Should the network be broken into multiple, interconnected networks for load balancing? and (3) How much of the traffic is being routed through bridges?

Certain diagnostic tools, called monitors, are presently available to help identify and isolate network failures as well as performance bottlenecks. Monitors are generally of two types, with each type having distinct disadvantages.

With the first type of monitor, diagnostic and performance information is collected in some form by each station. This information is then transmitted to a central location and combined with information from other stations.

There are several drawbacks to this approach. First, the information is physically difficult to collect from each station. If the LAN itself is used to transmit the information, certain types of LAN failures will also prevent collection of diagnostic data, and thus prevent proper diagnosis of the trouble. On the other hand, if a secondary path is used to collect information, expensive and cumbersome hardware must be added. Finally, the types of data which each

station can collect may often be limited by performance constraints. In the absence of a previously standardized or agreed-upon set of parameters to be maintained, the management information collected from equipment manufactured by different suppliers may not be compatible, and in the worst case, may even lead to conflicting conclusions about equipment malfunctions.

In fact, this is presently such a problem that several industry organizations are proposing management standards, which will specify which information must be maintained by each station, as well as how the information should be exchanged.

A second type of monitor attaches directly to the LAN and detects and stores data packet traces, much in the same manner as a logic analyzer. These monitors are sometimes capable of recording the number and type of frames transmitted by each station. However, they also have several disadvantages.

First, since these monitors do not automatically determine which station is the source of errors, they require an operator who is knowledgeable about the network protocol, at least enough to recognize that certain frame types should not occur in certain situations. The operator must typically program the monitor with a data sequence to be triggered on, and then must manually review the traces occurring after the trigger to determine the source of a problem. Thus, these monitors do not report problems in real-time, generally require programming to detect errors, and do not give automatic indication of the source of a problem.

Second, these monitors cannot automatically identify which frames are transmitted by stations that accesses the network through a bridge. This is because the source addresses of such frames are not that of the bridge itself, but rather that of an originating station located on the other side of the bridge. The bridge merely forwards these frames to the local area



network, without modifying address fields in the frame.

Thus, there is an unmet need for a data communications network monitoring device which reliably and quickly identifies faults, without requiring a high level of operator expertise. The monitor should not require the use of station resources, and should not use the network itself to transmit diagnostic information. The monitor should avoid the need for requiring stations to observe agreed-upon management protocols. It should also measure network utilization not only by the directly attached stations, but also by stations connected to the network through bridges.

SUMMARY OF THE INVENTION

Briefly, a network monitor constructed in accordance with the invention diagnoses whether one or more stations in a broadcast communications network are malfunctioning. This is accomplished by passively detecting sequences of control frame transmissions. Detected control frame sequences are compared, in real time, to a model of the expected exchange of control frames. The monitor concludes that a malfunction has occurred when the detected control frame sequences do not match the frame sequences indicated by model. Observed malfunctions are then reported.

The monitor is quite useful with a network that uses a token passing protocol. In this configuration, it can determine whether a particular station is working improperly by detecting sequences of token-passing control frames, and then track whether the token is passed in the order proscribed by the model.

The monitor can also infer that a cable is broken, a station has dropped from the network, a particular station's receiver or transmitter is operating marginally or has failed, a slot time value is incorrectly set, or that other types of malfunctions have occurred, and when appropriate, localizes these to a particular station.

Because the monitor collects information concerning the sequence of control frames, it also can report other information concerning the network. For example, it observes and maintains statistics on network data traffic and configuration information, in real time. Traffic monitoring is accomplished by examining the source or destination address field of detected data frames, and counting the various types of data frames for each source and destination station.

Since the monitor independently tracks which station has the token, statistics are easily developed on how much traffic

is passing to and from bridges, as well as to and from each station located behind a bridge. In this fashion, a bridge that has become overloaded can be readily identified.

Because the monitor is passive, it does not require the network to be completely operational in order to report malfunctions, the use of station resources, or a previously agreed-upon management protocol.

Unlike prior approaches which counted types of frames, or triggered upon detection of a single instance of a frame sequence, the monitor continuously tracks all network traffic, and reports appropriate messages in real time. The monitor thus has the distinct advantage of being readily usable by an operator having little or no personal expertise in the operation of the network protocol, since its output does not solely consist of traces. Rather, the monitor reports events which do not match the expected network behavior, without the need for intervention of an experienced network operator to program it.

BRIEF DESCRIPTION OF THE DRAWINGS

The above and further advantages of the invention may be better understood by referring to the following description in conjunction with the accompanying drawings, in which:

Fig. 1 is a block diagram of a broadband data communications network that makes use of a passive monitor in accordance with the invention;

Fig. 2 is a detailed block diagram of the passive monitor;

Fig. 3 is a detailed block diagram of a protocol analyzer portion of the passive monitor;

Figs. 4A through 4C show control frame formats specified by the IEEE 802.4 token-passing bus protocol; and

Figs. 5A through 5D are flow charts of the process used by the passive monitor to characterize the network.

DETAILED DESCRIPTION OF ILLUSTRATIVE EMBODIMENTS

Turning to the drawings more particularly, there is shown in Fig. 1 a passive monitor 10 constructed in accordance with the invention. Passive monitor 10 detects sequences of control frames passed between a number of stations 11a, 11b, ... and 11n (collectively, stations 11) over a broadcast media 12. The passive monitor 10, stations 11, and broadcast media 12 form a data communication network, and in the particular embodiment shown, a local area network (LAN) 13.

The stations 11 connected to LAN 13 use a Media Access Control (MAC) protocol to determine which station has the right to transmit. The specific protocol used in the preferred embodiment is defined by IEEE Standard 802.4, a token-passing bus protocol. Details of the 802.4 Standard are available in Token Passing Bus Access Method in Physical Layer Specifications, ANSI/IEEE Std 802.4-1985 (New York: Institute of Electrical and Electronic Engineers, 1985), which is incorporated herein by reference. However, the invention can be adapted to operate with other MAC protocols, and for that matter, with any layered protocol that uses control frames.

In accordance with the 802.4 Standard, a token is a special control frame which represents the right to transmit. Under ordinary operating conditions, a station 11 receiving a token is thus given the right to transmit. Only the station having the token may transmit at any given instant in time. When a particular station 11 has finished transmission, it passes the token to another station in accordance with the 802.4 protocol. The token passes among stations 11 in a prescribed sequences -- thus the stations 11 are said to be arranged in a "ring", and the token is said to move around the ring.

Also, in accordance with the 802.4 Standard, a head-end

remodulator 11k is connected to the LAN 13 when the broadcast media 12 is broadband. The head-end remodulator 11k acts as a radio-frequency repeater.

The LAN 13 may also include a bridge 14. The bridge 14 is a device which enables stations connected to the LAN 13 to also communicate with devices connected to other networks, such as the LAN 13b formed by stations 11x, 11y, ... 11z and another broadcast media 12b.

In operation, briefly, the passive monitor 10 listens to transmitted control and data frame traffic on the LAN 13. Monitor 10 is truly passive in that it does not initiate communications over the LAN 13, but merely receives and interprets control and data frame traffic. Passive monitor 10 detects sequences of control frames exchanged between stations 11. That is, rather than simply watch control and data frame traffic to or from a specific station 11, passive monitor 10 tracks traffic to and from each station 11 connected to the LAN 13. It thus develops a current state for the entire network. For example, among other things, passive monitor 10 keeps track of which station 11 last received a valid token-passing frame, and thus which station 11 currently has a valid right to transmit.

Passive monitor 10 also has stored a model of the expected behavior of frame traffic on the LAN 13, and in particular, a model of the MAC-layer protocol specified by 802.4. Passive monitor 10 can thus make inferences concerning whether the network is operating properly. For example, the passive monitor 10 can accurately determine which station should have the right to transmit, by traversing the model of expected frame traffic, and comparing the model with what is actually observed.

There are several advantages to this approach. Since the stations 11 themselves need not maintain any particular data

-11-

concerning the operation of LAN 13, a protocol for exchange of management information is not needed. Each station 11 need only conform to the basic network communication protocol used for the LAN 13. Furthermore, the network being monitored need not be completely functional for successful operation of monitor 10. In addition, the monitor 10 not only diagnoses whether a station has malfunctioned, but also compiles complete message traffic statistics, without using network resources.

To appreciate how this is accomplished, consider the detailed block diagram of passive monitor 10 in Fig. 2. Passive monitor 10 includes a receive-only modem 15, a frame processor 16, a protocol analyzer 18, a operator interface 19, and a display 20.

The modem 15 is similar to modems found in the receivers of stations 11 connected to the LAN 13. Operating in accordance with the 802.4 Standard, modem 15 outputs a series of demodulated symbols. The possible symbol types are {0} and {1}, as in conventional binary data signalling, and a non-data symbol {n}, used in the 802.4 Standard to delineate the fields defined for both data and control frames. Modem 15 also outputs an indication of the strength of the radio frequency signal receive-level on the media 12.

The frame processor 16 is similar to those found in the receivers of stations 11 connected to the LAN 13. Frame processor 16 converts the series of symbols from the modem 15 into frames, in accordance with the 802.4 protocol. The frame processor 16 thus performs the functions of the MAC layer, and outputs data and control frames to the protocol analyzer 18.

Frame processor 16 detects erroneous symbol sequences, frame control fields, frame checksums and the like, also in accordance with 802.4, to determine if each received frame is valid. The output of frame processor 16 thus includes

information concerning invalid frames as well as valid data and valid control frames. Frame processor 16 also recognizes certain symbol sequences such as silence.

Protocol analyzer 18 is preferably implemented as a computer containing appropriate software to interpret the output of the frame processor 16. Given the data rates possible over a LAN 13 using the 802.4 protocol, the computer is preferably a high-speed processor constructed from a bit-slice or reduced-instruction set computer (RISC) technology. The operation of the protocol analyzer 18 on the frame information output by frame processor 16 is at the heart of this invention.

Protocol analyzer 18 collects several types of information, including statistics, events, and network attributes. Generally speaking, statistics are taken on any phenomena of note, such as a noise burst, a repeated frame, receipt of a non-valid frame, a token-pass, a station leaving or entering the ring, a contention for the token, and the like. Statistics are kept for each station presently in the ring. The occurrence of these phenomena are preferably recorded by incrementing a counter, and thus are referred to as "counts". Counts are also quantities regarding that traffic load on the LAN 13, such as the number of frames originated by each station 11, or the number of bytes of data sent by each.

Other types of statistics include "rates", which are simply the average value of a counts per unit time, and "meters", which are phenomena that have units such as time or power. Thus, the observed token-rotation-time and receive-level are meters.

An event is an occurrence of interest, such as an unexpected frame sequence, or the observation that one of the stations 11 has improperly dropped from the ring.

A more complete understanding of the statistics and events



of interest is evident after reading the later discussion of Figs. 5A through 5D.

Protocol analyzer 18 maintains counts and events separately for all stations 11 on the LAN 13, including devices such as bridge 14.

Network attributes are information regarding the present configuration of the LAN 13, including the number of stations 11 currently in the ring, the logical ordering of stations in the ring, which station previously had and presently has the token, the expected token-passing sequence, and the like.

The output of protocol analyzer 18 is processed by the display processor 19, for presentation to the display 20. The display processor 19 and display 20 may simply present the number of counts, or log the occurrence of an event, but can also generate alarms messages when a count exceeds a predetermined threshold amount or upon certain events, or present graphical display of information. Display processor 19 and display 20 are preferably embodied as a general purpose computer.

Fig. 3 is a detailed block diagram of the protocol analyzer 18, which includes an input memory 31, a computer 32, a program memory 33, and a data memory 34. The data memory 34 is further logically divided into separate blocks of data, grouped as a event memory 36, a statistics memory 37 and a network attributes memory 38.

The input memory 31 receives frames, whether valid or invalid, from the frame processor 16. The input memory 31 is typically a first in first out (FIFO) memory, and is to normalize the frame input rate to computer 32.

The computer 32 operates as an inference-processor, to analyze the sequence of data, control, and invalid frames received from the input memory 31. As previously mentioned, the computer 32 analyzes frames by comparing frame sequences

with an internal model of the expected frame sequences to detect protocol violations, and hence station malfunctions. The protocol model is not just of the expected behavior of one station, but a model of the expected behavior of the entire network. The model thus contains information concerning the expected exchange of frame sequence for the entire network.

The internal model of the protocol is preferably stored in the sequence of instructions stored in the program memory 33. Alternatively, computer 32 and program memory 33 can be organized as an expert system, using an inference engine and knowledge base, with the knowledge base containing a set of if-then-production rules that represent the network protocol, and the inference engine suited for traversing the knowledge base to indicated conclusions based upon what traffic has actually been observed on the LAN 13.

Regardless of the implementation details of protocol analyzer 18, the result of the operation of computer 32 is to store events, statistics, and attributes data, in the respective one of the event memory 36, statistics memory 37, or attributes memory 38. The event memory 36, statistics memory 37, and attributes memory 38 are preferable dual-port random access memories (RAMs), so that both the computer 32 and the operator interface 19 (FIG. 1) may access them simultaneously.

To better understand the sequence of operations performed by computer 32, it is important to first understand the various frame formats defined by the 802.4 Standard, as shown in Figs. 4A through 4C. All valid frames include a number of sub-fields, with each sub-field being one or more octets (i.e., groups of eight symbols). As shown in Fig. 4A, the sub-fields include, in order, a PREAMBLE field, used to synchronize receiver modems, an SD field used as a start delimiter, an FC field used as a frame control field, DA and SA fields used as destination address and source address fields, respectively, a

-15-

DATA\_UNIT field of zero or more octets used as a data transfer mechanism, an FCS field used as a frame check sequence, and an ED field used as an end delimiter.

The protocol analyzer 18 is particularly concerned with analyzing the FC field of each frame. The possible FC fields in accordance with the 802.4 protocol are shown in Figs. 4B and 4C, with the control frame FC fields indicated in Fig. 4B, and the data frame FC fields shown in Fig. 4C.

The 802.4 Standard defines control frames including a claim\_token (CLM), solicit\_successor\_1 (SS1), solicit\_successor\_2 (SS2), who\_follows (WHO), resolve\_contention (RSV), token (TOK), and set\_successor (SET) frames. The purpose of each of these frames is set forth in the Standard, especially in Section 5.1 Basic Operation.

Since the Standard has been incorporated by reference, and which will not be repeated here at length. Briefly, however, the token frame represents the right to transmit. It is normally passed from station to station, in descending numerical order of station address. When a station hears a token addressed to itself, it assumes that it now has the right to transmit. When a station completes transmission, it sends a token frame to the next lowest address station in the ring. If the sending station does not hear traffic after attempting to pass the token to its successor twice, it uses who\_follows to determine the address of the next station in the ring. Any responding station uses the set\_successor frame to tell the original station who the new successor station is.

Solicit\_successor\_1 frames are periodically sent by each station, after finishing transmission, to determine if any new stations wish to be added to the ring between the present station and its successor station.

If no response is heard to a who\_follows, a solicit\_successor\_2 frame is sent, which asks any station to

respond.

Resolve\_contention frames are used to settle the situation where more than one station attempts to respond to a who\_follows, solicit\_successor\_1, or solicit\_successor\_2.

Fig. 4C shows the FC fields for various data frames. Of interest here are the request\_with\_no\_response (DR) (or normal data), request\_with\_response (RR), and response (IR) frames formats.

As previously described, the passive monitor 10 detects and isolates operational faults to a failing station by passively observing the control frame transmissions on the bus, comparing the operation of the protocol on the bus with that expected, and inferring that a fault has occurred and which station is causing the fault. Detailed flow charts of how this is accomplished are shown in Figs. 5A through 5C. By way of summary, protocol analyzer 18 concludes several things based upon its observation of frame sequences. For example, if the last thing detected by frame processor 16 was

(A) no frame (refer to Fig. 5A for more detail),  
the broadcast media cable 12 is broken or the head-end has failed if periodic silence is not heard;

a cable or head end failure may have occurred if no frames are heard; or

(B) a non-valid frame (refer to Fig. 5B for detail),  
a station's transmitter is failing, if it sends invalid frames as indicated by the modem 15;

a station's transmitter is failing or transmitting at an incorrect power level, or the cable system path to the station is failing or incorrectly attenuated, if the received signal level measured is outside a predetermined range; or

collisions may be occurring if invalid frames are

detected and contention for control of the right to transmit is possible;

(C) a data frame (refer to Fig. 5B for detail),

a station's receiver is failing if it does not correctly responded to response requests, such as when RR frames immediately follow another RR frame; or

a station is failing if an IR frame is not preceded by an RR frame;

(D) a non-token control frame (refer to Fig. 5C for detail),

a station may be failing if it sends SET frames not following a WHO frame, indicating frequent network re-entry;

a station may be failing if its address is in the DATA\_UNIT field of a WHO frame issued by the current token-holder;

a station may be failing if it is sending WHO frames with an SA field equal to the current token-holder's successor in the ring

a station is failing if it is sending an SS1 frame with an SA field greater than its DA field;

a station is failing if it is sending an SS2 frame with an SA field less than or equal to its DA field; or

or (E) a token-control frame (refer to Fig. 5D for detail),

a station may have failed if it improperly drops from the ring membership, which is determined by comparing the expected token pass sequence with the observed token-pass sequence;

a station's slot time value is incorrectly set, if the measured silence period after between an SS1 or SS2 frame and

the next TOK frame is outside the correct range;

a station's receiver is failing, if token passes to it from its predecessor are repeated; or

the network is either congested or there is at least one failing station, if the time taken to pass the token around the ring exceeds an appropriate pre-defined value.

Turning now to Figs. 5A through 5D more particularly, the operation of the protocol analyzer 18 to determine if one or more of the above-listed events have occurred will now be understood.

In Fig. 5A, after a start step 100, an initialize step 102 resets appropriate internal variables, such as the contents of the network attributes memory 38, including a record of the current token-holder, records describing the current state of the ring such as the expected successor for each station, and the like. The next step, 104, is used as an entry state A from other steps in the program, whenever a new frame is expected.

The next step 106 is to determine if the frame processor 16 is presently hearing silence. If silence is detected, control passes to step 108 which loops back to step 106 unless silence has been received for longer than the predetermined amount of time (ie., there is a silence time-out). If a silence time-out has occurred, control passes to step 110 where it is determined whether the last frame received was an SS2. If the answer is yes, it can be assumed that the network validly entered a state where only one station is active, and that is reported as an event, in step 112. However, if SS2 was not the last received frame in step 110, a dead bus event is reported, in step 113. In either event, control passes to step 144 which waits for the next non-silence indication from the modem 15, and then returns to A (step 104).

If something other than silence is heard in step 106, it

is assumed that a frame sequence has begun, and control passes to step 115 where a start delimiter is looked for. Upon receipt of a start delimiter, a frame is being received and control passes to B (step 150) in Fig. 4B.

However, if silence is then heard again, a noise burst must have occurred. This is counted in step 117, and then control passes back to A.

Otherwise, if silence is not heard again in step 117, control passes to step 118. The noise burst must be continuing, and step 118 determines if a predetermined noise burst time-out period has expired. If not, control returns to step 115. If the time-out period has expired, a cable break event, that is, an indication that there may be a disruption of the media 12, is reported in step 119, and silence is again waited for in step 120 before returning to A.

The initial steps executed upon indication of receipt of a frame are shown in Fig. 5B. From B, control passes to step 151, where it is determined if the frame was valid. If an invalid frame was received, control passes to step 155.

In step 155, it is first determined if the non-valid frame was possibly caused by contention for control of the LAN 13, i.e., two or more stations have collided by trying to transmit at the same time. Contention is possible if the last frame received was an SS1, SS2, WHO, CLM, or RSV. Contention is not possible if any other frame type was most recently received. (SET frames are ignored in this determination). If this is true, a probable collision is counted in step 156. If this is not true, a noise count is made in step 157. Step 157 may keep separate noise counters for different types of invalid frames. Control returns to A from either step 156 or 157.

If the frame was a valid frame in step 151, control passes to step 152, where the receive-level is checked. If this is outside pre-defined limits, a receive-level outside limits

event is reported in step 153, and control returns to A.

In step 154 a determination is made of what type of valid frame was heard. If it was a data frame control passes to step 158; if a non-token control frame, to C (step 200 in Fig. 5C); and if a token frame, to D (step 250 in Fig. D).

Upon receipt of a valid data frame, control passes to step 158. The next test is to determine if the previous frame was a token. If so, the current token-holder is set to the previous token frame's destination address in step 159. Thus, the protocol analyzer 18 does not assume that a token pass has taken place until it actually observes a data frame issued by the destination station indicated by the last token.

Thus, unlike other possible monitor schemes, the analyzer 18 does not require the SA of the data frame to be that of the token-holder. This allows proper recording of traffic statistics from bridges.

Control then passes to step 160 where the MAC action portion of the FC field is examined to determine the type of data frame. If it is a DT, or normal data frame, control passes to step 168. However, if it is a response (IR) or request\_with\_response (RR) frame, control passes to steps 164 or 161, respectively.

In step 161, if an RR frame was last heard, step 162 counts a repeat RR. This may indicate that the receiver of the RR frame is failing. If this is not the case, control passes to step 168.

In step 164, if an IR is not preceded by an RR frame, step 165 reports an unexpected frame for the stations indicated by the source address (SA) and destination address (DA) fields of the current frame, along with the detected unexpected frame type.

From either step 162 or 165 control returns to A.

In step 168, the SA field of the current frame is compared



to the current token-holder address. If these are equal, the frame originated from a station on the LAN 13, and station-type counts are taken in step 169. However, if these are not equal, it is concluded in step 170 that the frame originated from a bridge connected to the LAN 13, and thus the SA is actually the address of a station whose frames are being forwarded by the bridge 14.

Thus, unlike prior monitors, the token-holder is recorded in such a way that the possible existence of a bridge 14 is accounted for. By keeping track of the token-holder in the manner described herein, the protocol analyzer 18 can conclude that all frame transmitted after a token-pass to the bridge 14 are from stations 11 connected to the bridge, until the protocol analyzer 18 sees another token-pass, by the bridge. This allows protocol analyzer 18 to keep bridge traffic statistics and other bridge management data.

In Fig. 5C, the process for handling a non-token control frame is shown. From C, step 200, if the non-token control frame is a CLM, RSV, SET, WHO, SS1, or SS2, control passes to steps 202, 204, 206, 210, 218, or 224, respectively.

For a CLM frame, in step 202 the token-holder is set equal to the SA field, a claim is counted in step 203, and control returns to A.

For an RSV Frame, in step 204 the token-holder is set equal to the SA field, a resolve is counted in step 205, and control returns to A.

For a SET Frame, in step 206, it is first determined if a WHO frame was previously received. If so, nothing is wrong with the transmitting station, and control passes to A. If not, however, there appears to be an instance of the ring changing its configuration, and in step 207, a count is recorded. The count occurs whenever a station enters the ring or voluntarily leaves it. If an SS1 or SS2 has followed the

previous TOK, the station is entering, otherwise, it is leaving.

Step 210 is the first step which handles WHO frames. The idea here is to determine if it is the token-holder's transmitter or the successor's receiver which is failing. If the SA field of the WHO frame equals the token-holder, then in step 211 it is concluded that the station indicated by the DATA\_UNIT (DU) field must be failing, since the token-holder is asking which station follows it.

A typical sequence of frames to arrive at step 211 is as follows, such as when the station to which the token should be passed has a failing receiver:

```
TOK A B                (B's receiver bad)
nothing
TOK A B
nothing
WHO A X B              (X is any station)
                        (first parameter is SA,
SET C A C              second parameter is DA,
TOK A C                third is DU, for WHO and SET)
```

In this scenario, station A tries to pass the token to station B, and B's receiver is failing or has failed entirely. After hearing no acknowledgement for the predetermined time-out period, A tries again. Upon the second failure, A originates a WHO B, asking any station to respond. Station C responds, and then A passes the token to C. Thus in this scenario, the SA of the WHO frame is the same as the current token-holder.

However, if the SA field in the WHO frame equals the token-holder's expected successor station, as indicated by the present model of the expected token-passing sequence kept in the configuration memory 38, the WHO is counted against the

station indicated by the SA, which must have a failing transmitter.

As an example of how this might occur, when A has the token, but its transmitter is bad, consider the control frame sequence:

```
TOK C A                (A's transmitter bad)
data frames
...
TOK A B    **
nothing
TOK A B    **          (monitor still thinks C
nothing          is token-holder)
WHO A X B
```

(\*\* These TOK frames are interpreted as invalid since A's Tx is bad)

Since station A's transmitter is bad, the attempted token pass from A to B are never recognized by B or the monitor. The monitor thus thinks that C is still the token-holder. The monitor does know that A is C's successor, however, and thus charges the error to A, concluding that A's transmitter must be malfunctioning.

In step 218, if the SA of the WHO frame does not equal the token-holder's successor address, the monitor has lost track of the current network state, and reports an unexpected frame.

Upon receipt of an SS1 frame, it is determined in step 218 if the SA field equals the token-holder. If so, and SA is less than DA, in step 221 it is known that a slot-time delay will be observed, and so a timer is started. However, if the answer in step 218 is no, an unexpected frame event is reported, since SS1 frames should only be sent by stations having SA less than

DA, i.e., stations not at the end of the ring.

The process, from step 224, for SS2 frames is similar. However, in step 225, the SA field is expected to be greater than the DA field. If SA is not greater, or equal to the token-holder, the frame is checked to see if it is a solicit-any, in step 229. If so, this is counted in step 230. This occurrence normally indicates that a sole station on the LAN 13 is attempting to solicit communications.

Control returns to A from each of the non-token frame commands sequences in Fig. 5C.

Fig. 5D contains the sequence of steps executed for a token frame. From D, step 250, step 252 determines if SA equals the previous token frame SA. If so, the step 252 counts a repeat token, and control returns to A.

If not, step 254 determines if SA equals the previous token's DA field. If so, this is expected. If not, the monitor has either lost track of the network's token-pass state or is initializing. Step 255 determines if the SA address equals the successor to the previous token frame's DA field. If this is false, there is an unexpected frame event. This would happen, for example, if the monitor missed one token pass. However, if the answer in step 355 is yes, the monitor is truly lost, and counts, in step 257, that it must have missed at least one token pass. Control returns to A in either event.

Step 260 is executed if the token frame was in an expected sequence. Here, the DA field of the present token is checked against the expected token-passing sequence in the stored ring configuration to determine the expected successor. If these are not equal, then a station has either left or been added to the ring, and a ring change event is reported in step 261. This is also the appropriate place to update the ring configuration in the attributes memory 38.

Next, in step 264, it is determined if an SS1 or SS2 was the previous frame. If so, a clock of the previous slot time interval is read in step 265.

In step 268, if the DA is less than the SA, which is the usual case as the token passes from station to station in descending order of address, control passes to step 270, where the ring size counter is incremented. However, if this is not the case, the ring has rotated, i.e., a fly-back of the token from the lowest to the highest address station has occurred, and the token rotation time can be reported in step 269. Control passes to step A in either event.

The foregoing description has been limited to a specific embodiment of this invention. It will be apparent, however, that variations and modifications may be made to the invention, with the attainment of some or all of the advantages of the invention. For example, the invention can be adapted to work with other token bus protocols, other token-passing protocols, and even other protocols which exchange control frames. Therefore, it is the object of the appended claims to cover all such variations and modifications as come within the true spirit and scope of the invention.

CLAIMS

1. A method for passively monitoring an operating data communications network, the network including a plurality of stations, the stations communicating by exchanging data and control messages in accordance with a protocol, the method for monitoring comprising the steps of:

storing information which represents an expected exchange of control messages between any two stations in the network;

passively detecting sequences of control messages actually transmitted over the network, and thus maintaining a current state for the network;

determining if unexpected actual message sequences have occurred, by comparing the detected actual message sequences with the stored expected exchange of control messages; and

determining if a particular station is malfunctioning, by examining the unexpected actual message sequences.

2. A method for passively monitoring a operating data communications network, the network including a plurality of stations, the stations communicating by exchanging data and control frames in accordance with a protocol, the control frames having source and destination address fields, at least one type of control frame including a token-passing control frame used to control which station has the right to transmit at particular time, the method comprising the steps of:

storing information which represents an expected exchange of control frames between any two stations in the network;

passively detecting actual sequences of control frames actually transmitted over the network;

comparing the detected control frame sequences with the

stored expected exchange of control frames, to determine if unexpected actual control frame sequences have occurred;

maintaining the identity of the present token-holder, the token-holder identity updated only after the comparing step determines that an unexpected token-passing control frame sequence has not occurred.

3. A method as in claim 2 wherein the control frames include claim-token and resolve-contention frames, and the step of maintaining the token-holder identity further comprises the steps of:

after detecting a claim-token control frame, setting the token-holder record equal to the source address field in the claim-token frame; and

after detecting a resolve-contention control frame, setting the token-holder equal to the source address field in the resolve-contention frame.

4. A method as in claim 2 wherein the step of detecting also detects data frames, and the step of maintaining the token-holder identity further comprises the step of:

after detecting a data frame, if the immediate preceding frame transmitted over the network was a token-passing frame, setting the token-holder record equal to the destination address of the immediate preceding token-passing frame.

5. A method as in claim 2 wherein the control frames include a who-follows control frame having a data-unit field, further comprising the steps of:

maintaining a record of an expected token-passing sequence, and hence a record of an expected-successor for each value of the token-holder record, the expected token-passing sequence record updated after each time the token-holder record

is updated; and

wherein the step of determining if a particular station is malfunctioning further comprises the steps of:

after detecting a who-follows control frame,

(i) if the token-holder record equals the source address field of the who-follows control frame, determining that the station indicated by the who-follows data-unit field may be malfunctioning; and

(ii) otherwise, if the source address field of the who-follows control frame equals the expected-successor record associated with the current token-holder record, determining that the station indicated by the source address may be malfunctioning.

6. A method as in claim 2 wherein the step of determining if a particular station is malfunctioning further comprises:

comparing the source address field of a token-passing frame to the token-holder, in order to determine an expected token-passing sequence.

7. A method as in claim 2 wherein the data frames include a request frame and a request-with-response frame, and the step of determining if a particular station is malfunctioning further comprises:

determining if a response frame is preceded by a request-with-response frame.

8. A method as in claim 2 wherein the data frames includes a request-with-response frame, and the step of determining if a particular station is malfunctioning further comprises:

determining if a request-with-response frame is preceded by a request-with-response frame.



9. A method as in claim 2 further comprising the step of maintaining a record of an expected token-passing sequence, and hence a record of an expected-successor and an expected-predecessor for each value of the token-holder record, the expected token-passing sequence updated after each time the token-holder record is updated.

10. A method as in claim 9 additionally comprising the step of:

determining if a ring change event has occurred, by comparing the destination address field of token-passing frames to the expected-successor of the current token-holder record.

11. A method as in claim 9 wherein the step of determining if a particular station is malfunctioning further comprises:

determining if a solicit-successor-first-type control frame is detected having a source address less than its destination address.

12. A method as in claim 9 wherein the step of determining if a particular station is malfunctioning further comprises:

determining if a solicit-successor-second-type control frame is detected having a source address greater than or equal to its destination address.

13. A method as in claim 2 wherein the step of determining if a particular station is malfunctioning further comprises:

determining if token-passing control frames having the same source address are repeated immediately after each other.

14. A method as in claim 2 wherein the step of determining if a particular station is malfunctioning further comprises:

determining an observed slot-time, by measuring the time

elapsed between a solicit-successor-first-type control frame or solicit-successor-second-type control and the next following token-passing control frame.

15. A method as in claim 2 additionally comprising the step of:

determining an observed token-rotation time, by measuring the time elapsed between occurrences of token-passing control frames having a destination address field less than the source address field.

16. A method as in claim 2, wherein the control frames include a who-follows frame and a set-successor frame, additionally comprising the step of:

determining if a station is frequently re-entering the network, by counting the number of set-successor frames not following a who-follows frame.

17. A method as in claim 2 wherein a malfunction is not reported if the source address field of a data frame does not equal the token-holder, to allow tracking of frames forwarded to the network by a bridge.

18. An monitor for passively observing the operation of a data communications network, the network including a plurality of stations, the stations communicating by exchanging data and control frames in accordance with a protocol, the monitor comprising:

receive modem means for receiving symbols representing signal levels being transmitted on the network;

frame processor means, for interpreting series of symbols, for determining if a series of symbols represents a data frame, a control frame, or an invalid frame in accordance

with the protocol, and for outputting actual received frames;  
and

a protocol analyzer, including:

memory means for storing information that represents an expected exchange of control frames between any two stations in the network;

means for determining if an unexpected sequence of frames sequences have been received, by comparing a sequence of the actual received frames with the stored expected exchange of control frames; and

means for outputting an indication of unexpected frame sequences as events.

19. Apparatus as in claim 18 wherein the protocol is a token-passing protocol, control frames include a token-passing frame, and control frames have a source address and a destination address, and the protocol analyzer additionally comprises:

means for maintaining a record of the expected token-holder, and the expected-token passing sequence such that there is an expected successor and expected predecessor for each expected token-holder; and

means for outputting an indication of an unexpected frame

if two token-passing frames immediately follow each other with identical source addresses;

if the source address of a token-passing frame is not equal to the destination address of the last received token-passing frame; or

if the destination address of a token-passing frame is different from the expected successor of the current token-holder.

20. Apparatus as in claim 18 wherein control frame types include solicit-successor, who-follows, resolve-contention, and set-successor frames, the means for outputting an indication of an unexpected frame additionally outputs the indication

if a request-with-response frame follows a request-with response frame;

if a response frame does not follow a request-with-response frame;

if the source address of a who-follows frame does not equal the expected token-holder; or

if the source address of a who-follows frame equals the expected successor of the expected token-holder.

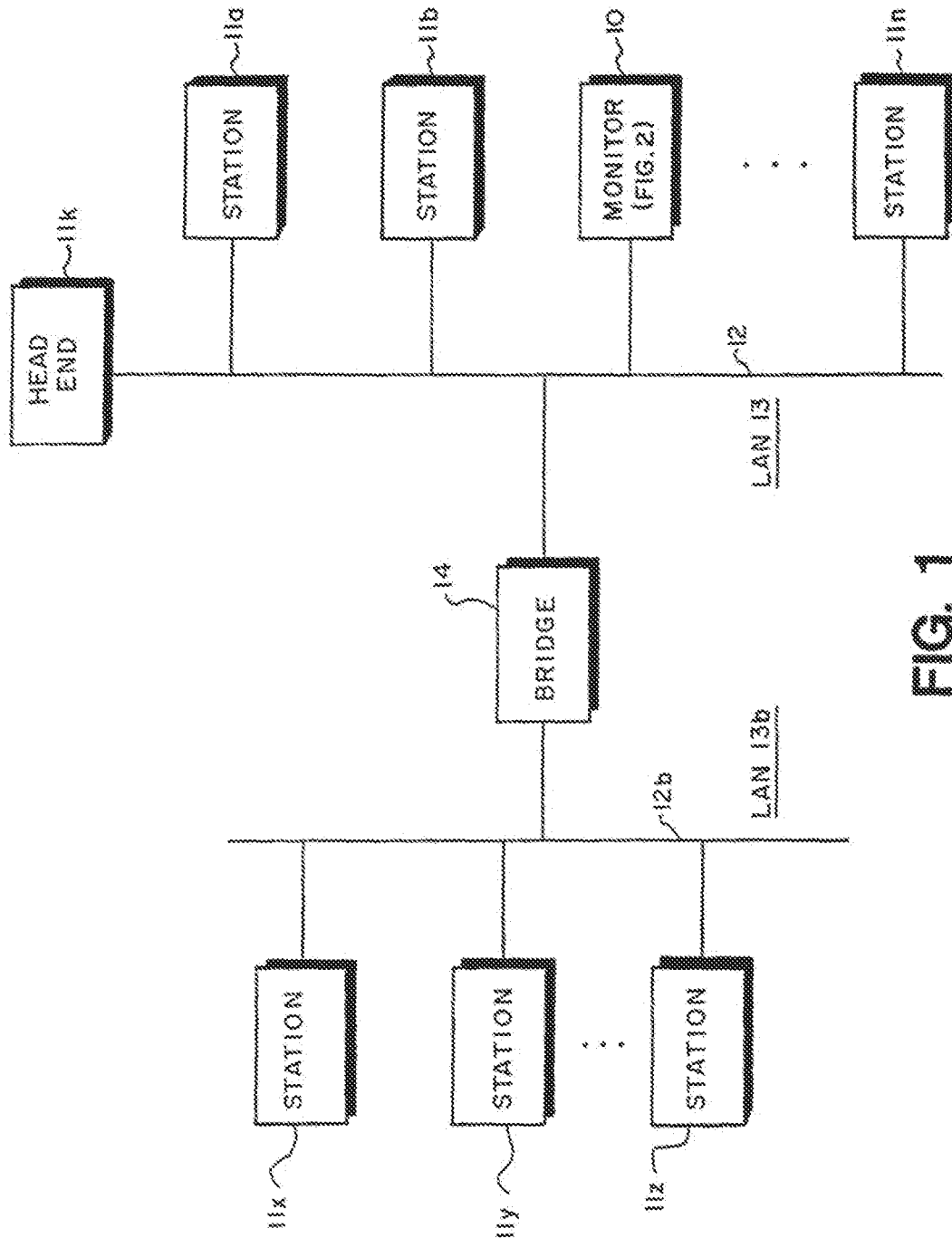


FIG. 1

SUBSTITUTE SHEET

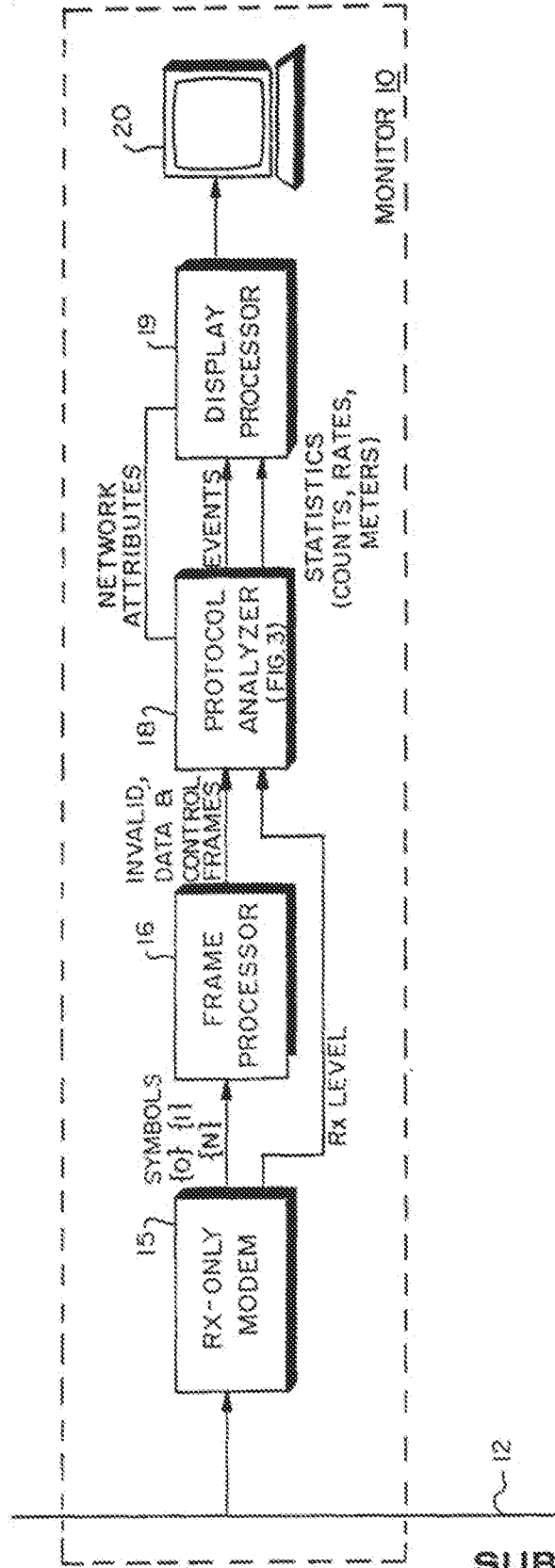


FIG. 2

SUBSTITUTE SHEET

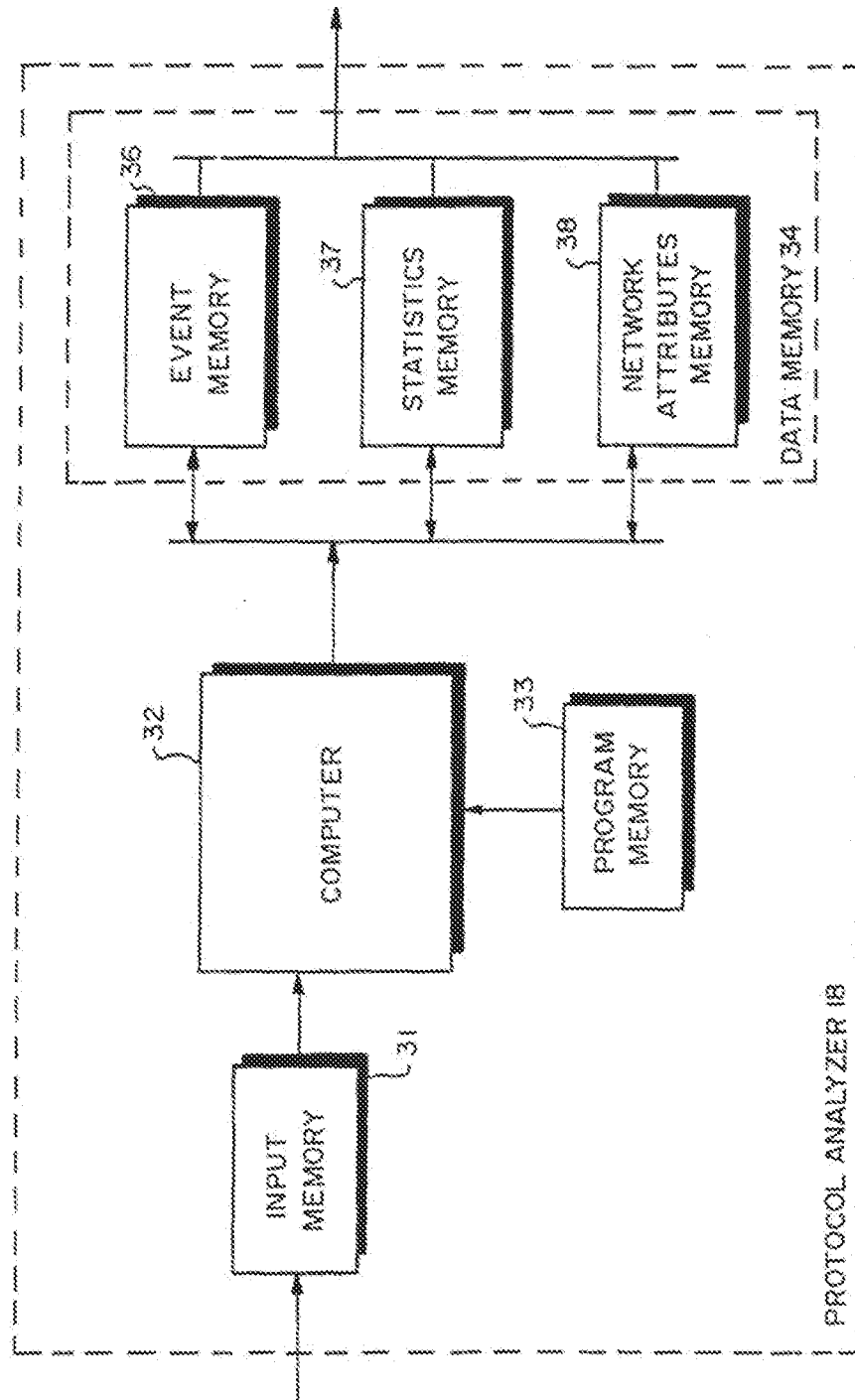
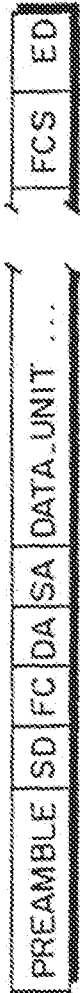


FIG. 3

SUBSTITUTE SHEET



where  
 PREAMBLE = pattern sent to set receiver's modem clock and level (1 or more octets)  
 SD = start delimiter (1 octet)  
 FC = frame control (1 octet)  
 DA = destination address (2 or 6 octets)  
 SA = source address (2 or 6 octets)  
 DATA\_UNIT = information (0 or more octets) (PDU)  
 FCS = frame check sequence (4 octets)  
 ED = end delimiter (1 octet)

FIG. 4A



1 2 3 4 5 6 7 8 ← bit positions

where  
 CCCCCC = type of MAC\_control frame as follows:

CCCCCC	← bit positions	
3 4 5 6 7 8		
0 0 0 0 0 0		claim_token
0 0 0 0 0 1		solicit_successor_1 (has 1 response window) (SS1)
0 0 0 0 1 0		solicit_successor_2 (has 2 response windows) (SS2)
0 0 0 0 1 1		who_follows (has 3 response windows) (WHO)
0 0 0 1 0 0		resolve_contention (has 4 response windows) (REV)
0 0 1 0 0 0		token (TOK)
0 0 1 1 0 0		set_successor (SET)

FIG. 4B

SUBSTITUTE SHEET



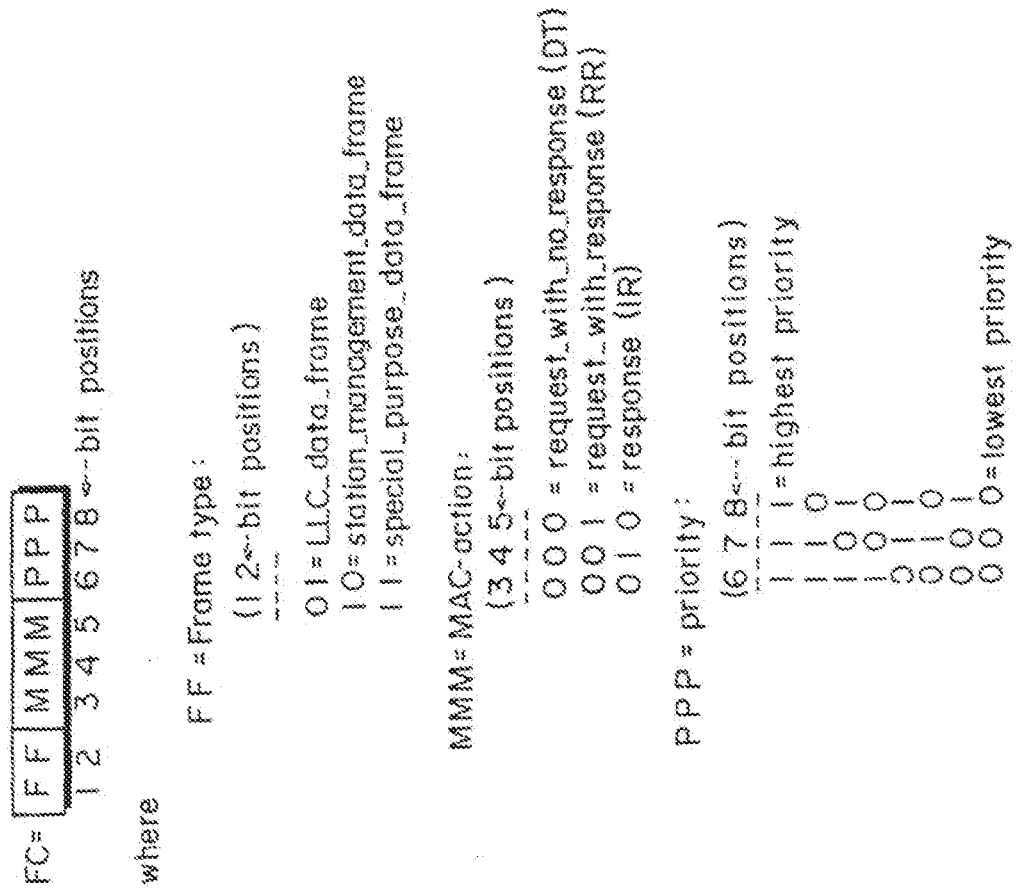
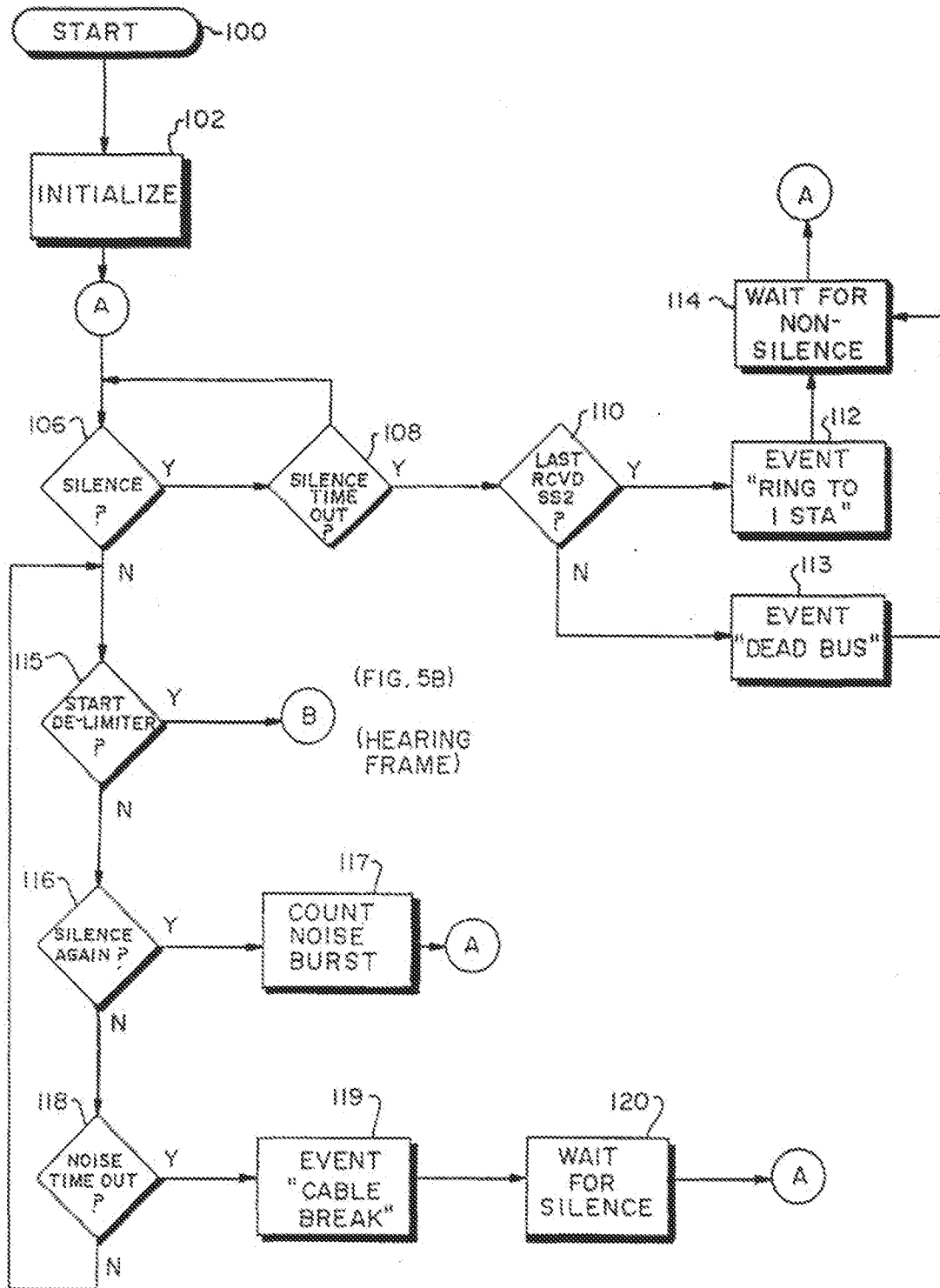


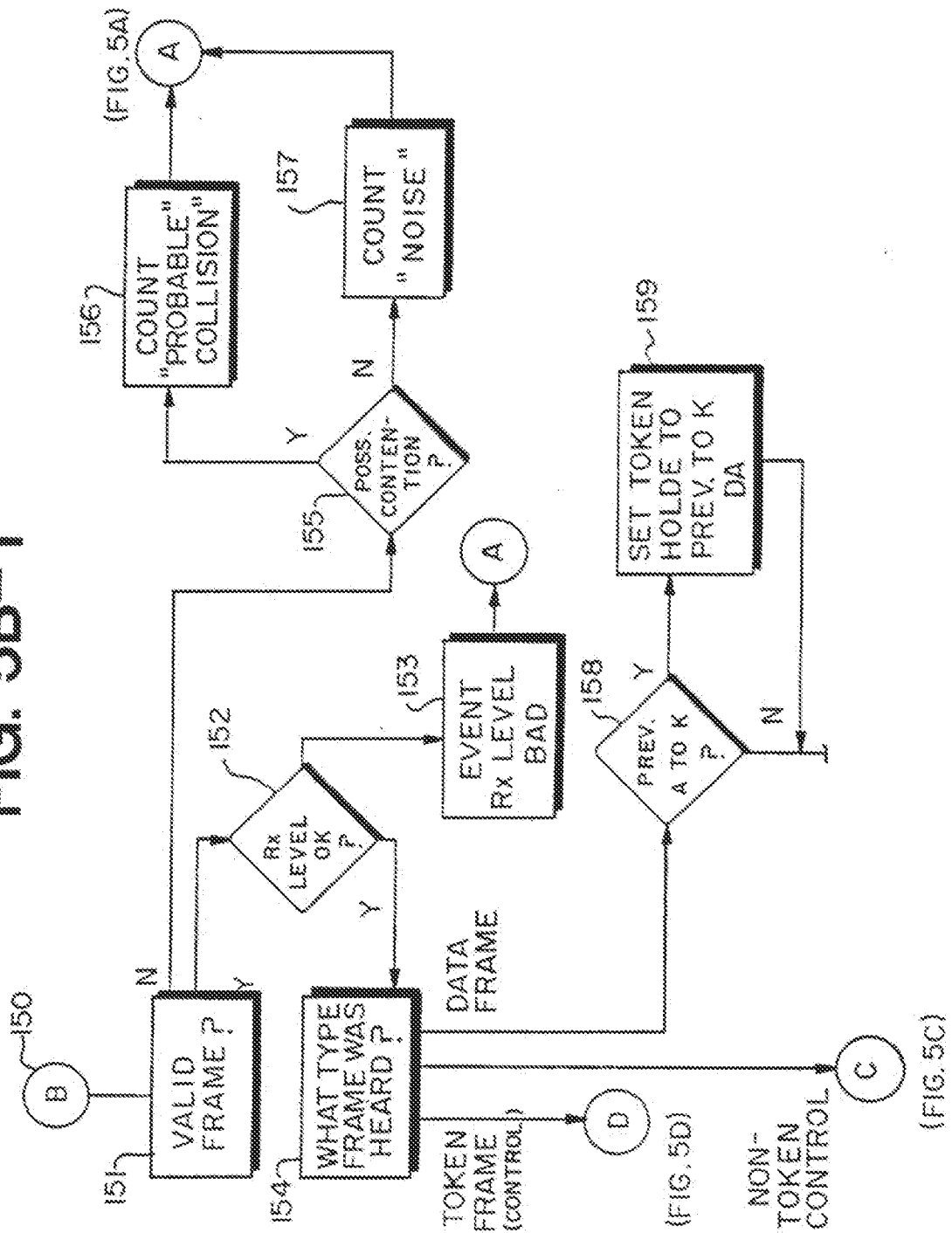
FIG. 4C

SUBSTITUTE SHEET



**FIG. 5A**  
**SUBSTITUTE SHEET**

FIG. 5B-1



SUBSTITUTE SHEET

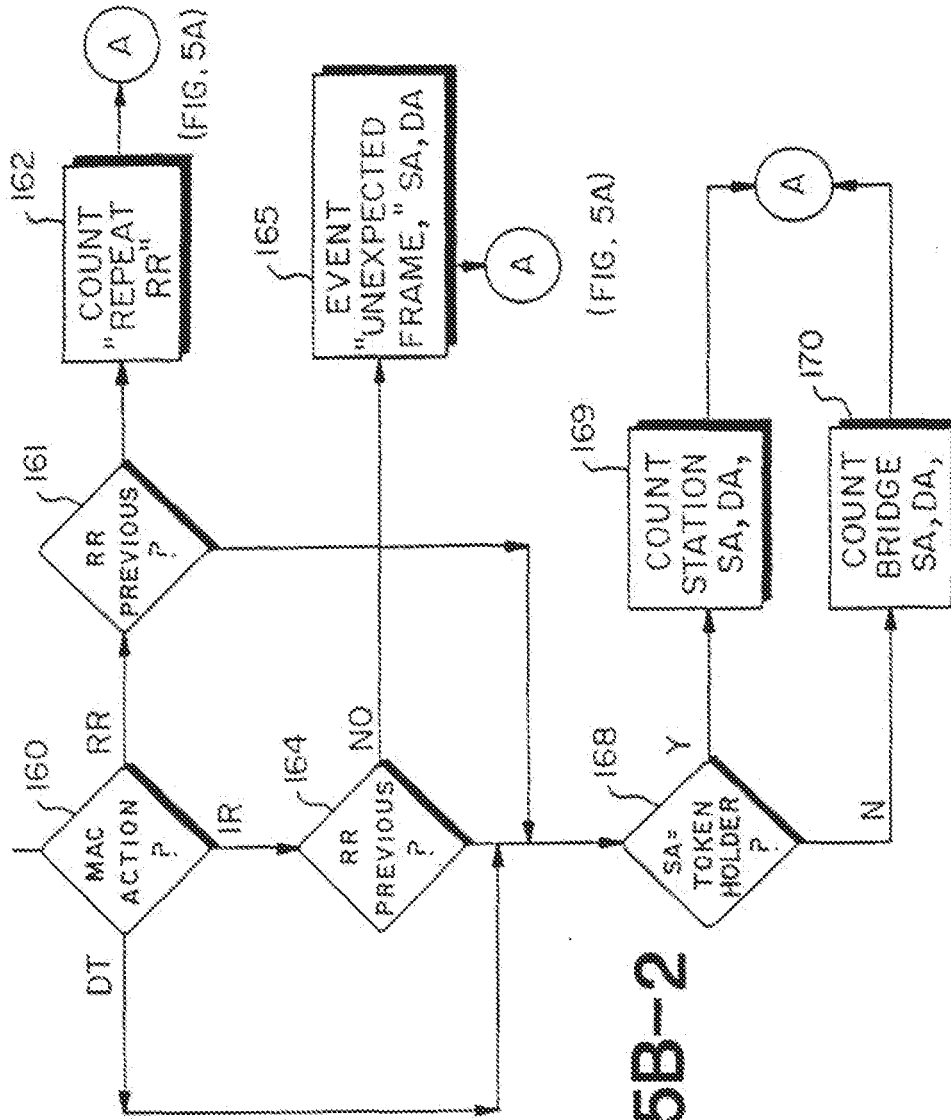


FIG. 5B-2

SUBSTITUTE SHEET

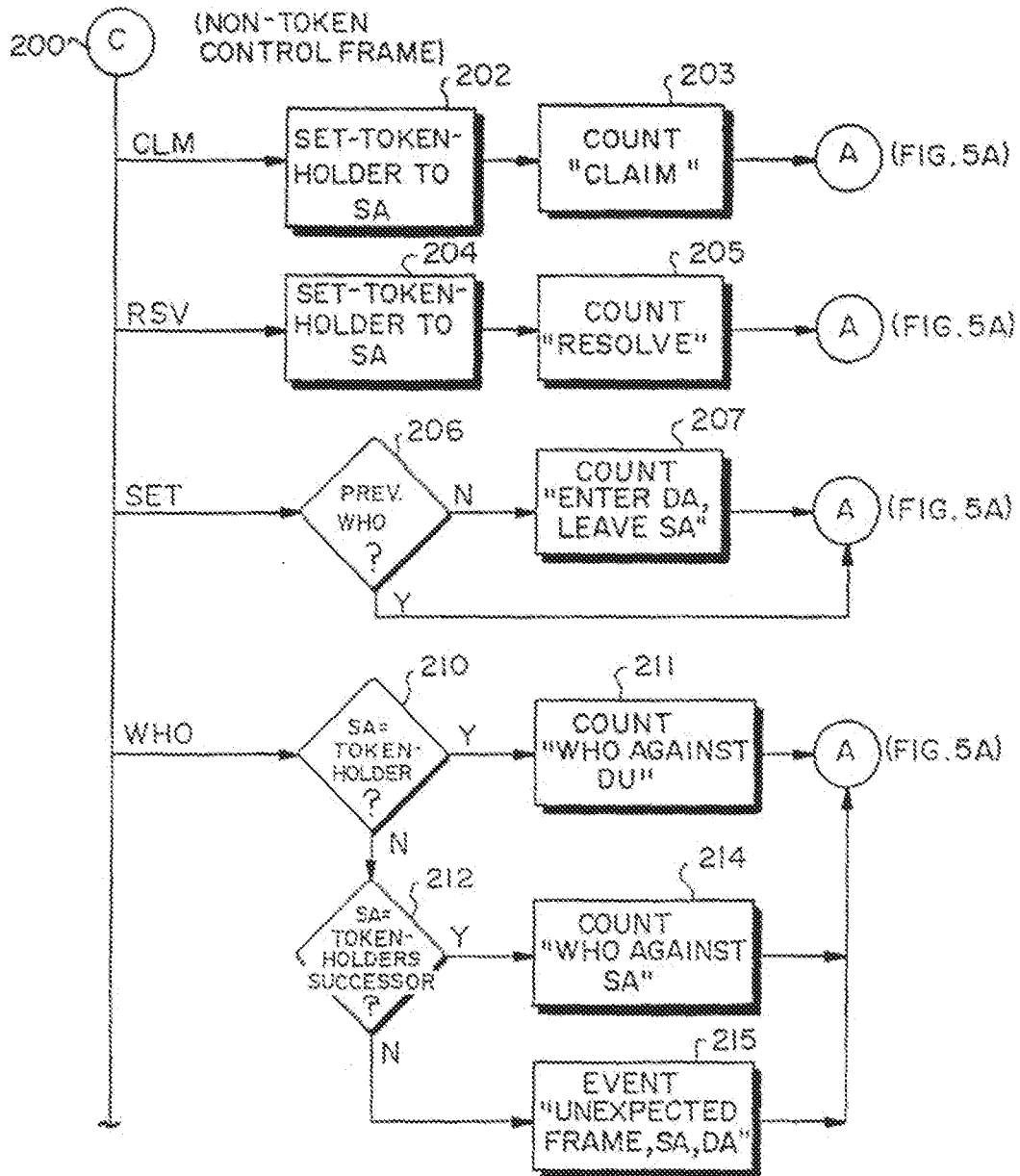


FIG. 5C-1

SUBSTITUTE SHEET

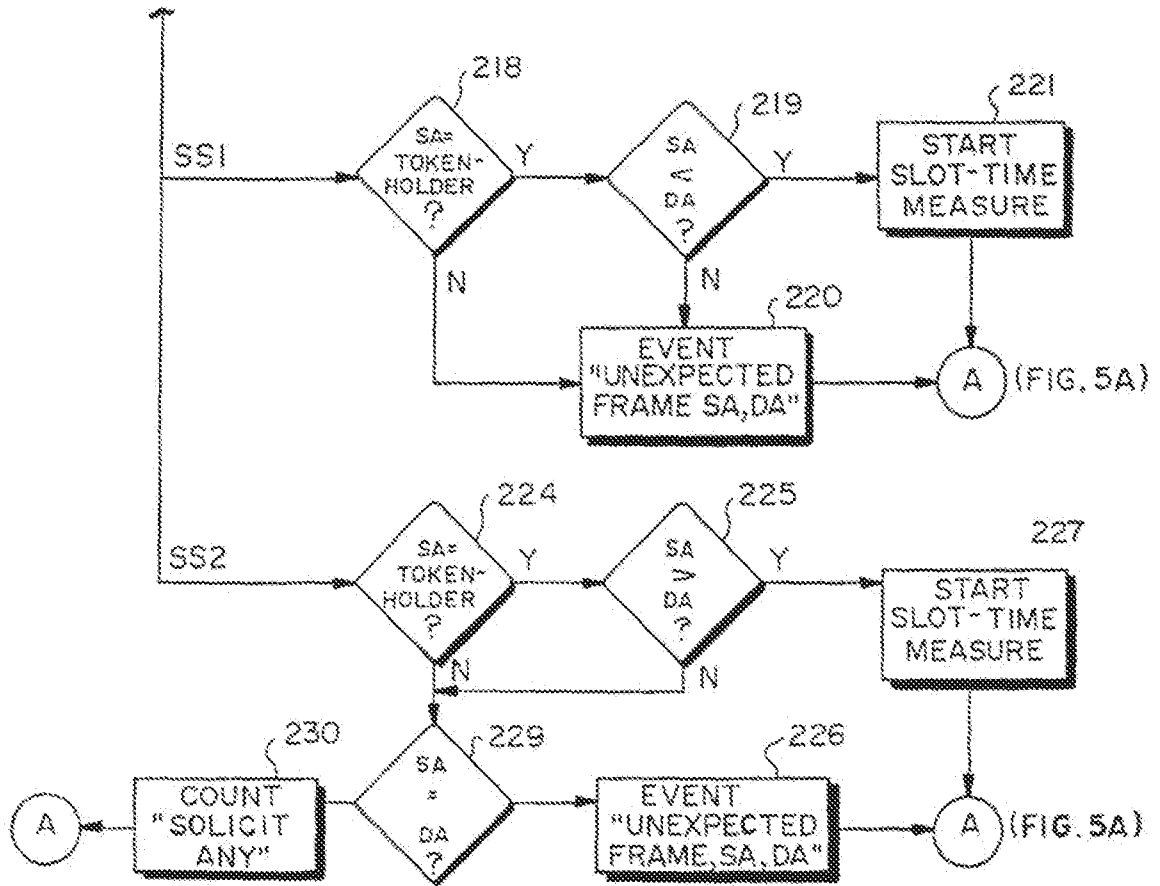
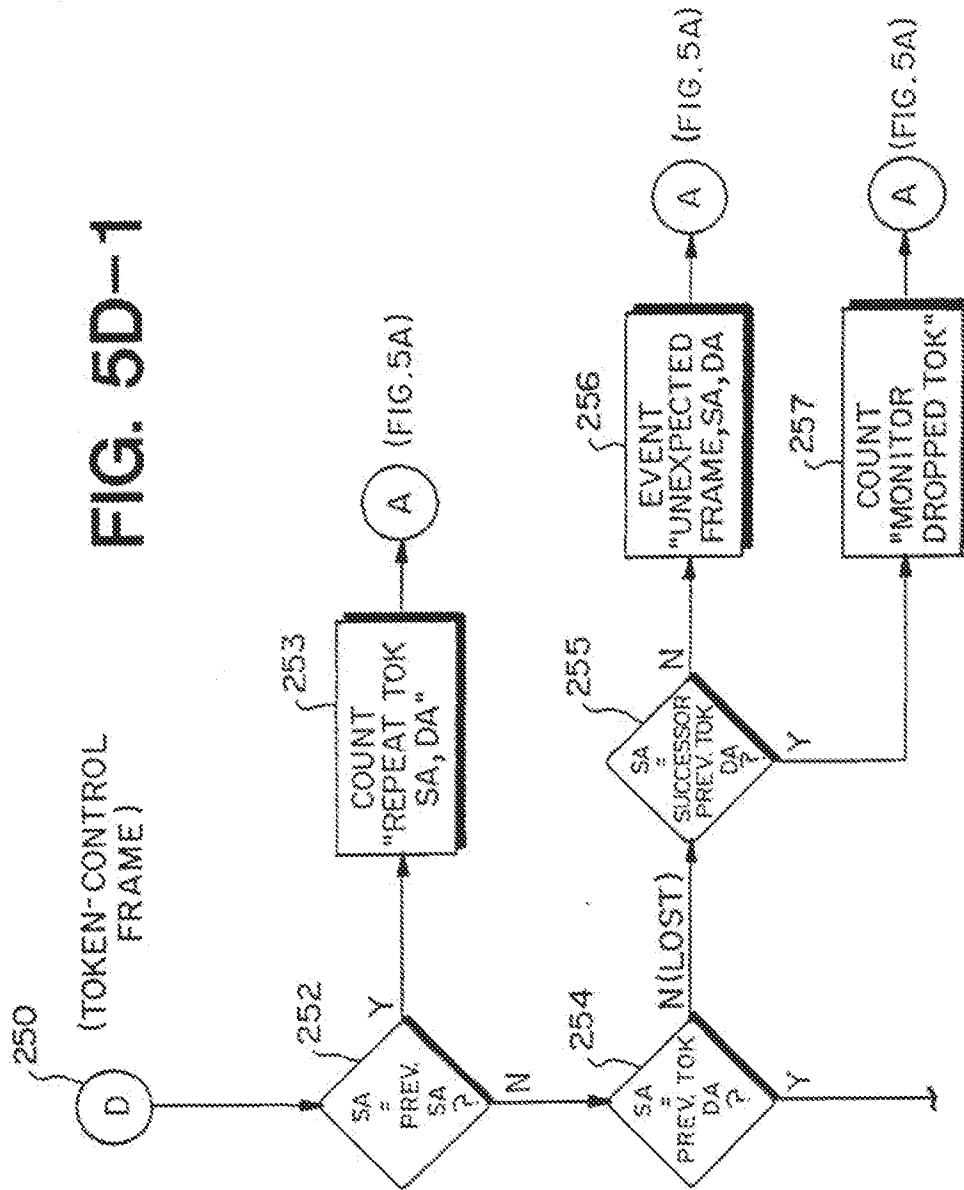


FIG. 5C-2

SUBSTITUTE SHEET

SUBSTITUTE SHEET

FIG. 5D-1



SUBSTITUTE SHEET

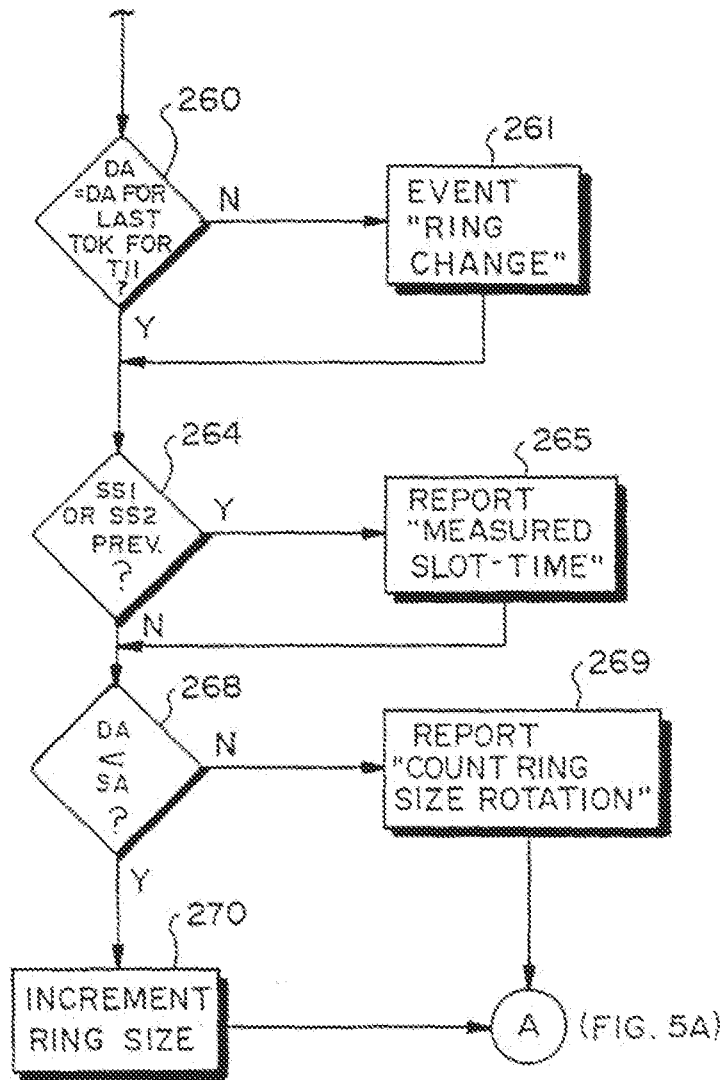


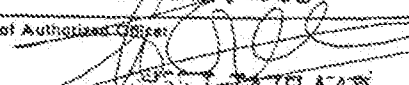
FIG. 5D-2

SUBSTITUTE SHEET



# INTERNATIONAL SEARCH REPORT

International Application No. PCT/US 90/02895

<b>I. CLASSIFICATION OF SUBJECT MATTER</b> (if several classification symbols apply, indicate all) <sup>4</sup>		
According to International Patent Classification (IPC) or to both National Classification and IPC		
IPC <sup>5</sup> : H 04 L 12/26		
<b>II. FIELDS SEARCHED</b>		
Minimum Documentation Searched <sup>7</sup>		
Classification System:	Classification Symbols	
IPC <sup>5</sup>	H 04 L	
Documentation Searched other than Minimum Documentation to the extent that such Documents are included in the Fields Searched <sup>8</sup>		
<b>III. DOCUMENTS CONSIDERED TO BE RELEVANT <sup>9</sup></b>		
Category <sup>6</sup>	Citation of Document, <sup>10</sup> with indication, where appropriate, of the relevant passages <sup>12</sup>	Relevant to Claim No. <sup>13</sup>
A	US, A, 4745598 (ULUG) 17 May 1988 see column 10, lines 1-37; abstract --	1, 2, 18
A	IEEE INFOCOM '87, The Conference on Computer Communications, Proceedings Sixth Annual Conference Global Networks * Concept to Realization, 31 March - 2 April 1987, San Francisco, California, IEEE, (New York, US), T. Saydam et al.: "Token bus/ring local area network management concepts and architecture", pages 988-993 see the whole article --	1, 2, 18
A	Proceedings 11th Conference on Local Computer Networks, 6-8 October 1986, Minneapolis, Minnesota, IEEE, (New York, US), D.C. Feldmeier: "Statistical monitors for local area networks", pages 142-146 see paragraph 2.3	1
*****		
<p>* Special categories of cited documents: <sup>14</sup></p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another claim or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> <p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step</p> <p>"Y" document of particular relevance: the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.</p> <p>"&amp;" document member of the same patent family</p>		
<b>IV. CERTIFICATION</b>		
Date of the Actual Completion of the International Search	Date of Mailing of this International Search Report	
31st August 1990	26 SEP. 1990	
International Searching Authority	Signature of Authorized Officer	
EUROPEAN PATENT OFFICE	 [Signature]	

Form PCT/ISA/210 (second sheet) (January 1985)

ANNEX TO THE INTERNATIONAL SEARCH REPORT  
ON INTERNATIONAL PATENT APPLICATION NO.

US 9002895  
SA 37417

This annex lists the patent family members relating to the patent documents cited in the above-mentioned international search report. The members are as contained in the European Patent Office EDP file as of 24/09/98. The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US-A- 4745598	17-05-88	None	

2003 09/04 04/27

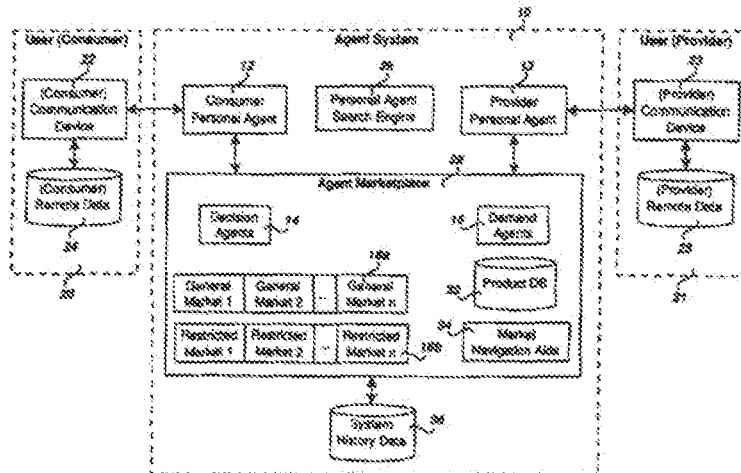
For more details about this annex : see Official Journal of the European Patent Office, No. 12/82



INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification <sup>6</sup> : G06F 17/60, G06G 7/52		A1	(11) International Publication Number: <b>WO 97/26612</b>
			(43) International Publication Date: 24 July 1997 (24.07.97)
(21) International Application Number: PCT/US97/01057		(81) Designated States: AU, CA, CN, IL, JP, KR, MX, Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LI, MC, NL, PT, SE).	
(22) International Filing Date: 17 January 1997 (17.01.97)			
(30) Priority Data: 60/010,087 17 January 1996 (17.01.96) US Not furnished 30 December 1996 (30.12.96) US		Published With international search report.	
(71) Applicant: PERSONAL AGENTS, INC. [US/US], Suite 313, 14651 Dallas Parkway, Dallas, TX 75240 (US).			
(72) Inventor: PECKOVER, Douglas, L.; Personal Agents, Inc., Suite 313, 14651 Dallas Parkway, Dallas, TX 75240 (US).			
(74) Agent: JIMMONS & KELLY; The White House on Turtle Creek, 2401 Turtle Creek Boulevard, Dallas, TX 75219-4760 (US).			

(54) Title: INTELLIGENT AGENTS FOR ELECTRONIC COMMERCE



(57) Abstract

A system for electronic commerce (10) having personal agents (12 and 13) that represent consumers and providers in a virtual marketplace (28). Consumer personal agents conceal the identity of the consumer and are capable of creating decision agents (14) that shop for products and assist consumers in comparing and ranking products. Provider personal agents are capable of creating demand agents (16) that quantify demand and target specific consumers without learning the identity of the consumers. Based on data generated by the activities of the decision agents and on preference data maintained by consumer personal agents, provider personal agents can quantify current, historical, and future demand, simulate demand, and target specific consumers for advertising and other messages. Provider personal agents can cooperate with consumer personal agents to collect data about reasons for sales and lost sales and to offer consideration payments to consumers. Consumer personal agents can automatically reject unsolicited messages that do not satisfy the consumer's preferences.

*FOR THE PURPOSES OF INFORMATION ONLY*

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AM	Armenia	GB	United Kingdom	MW	Malawi
AT	Austria	GE	Georgia	MX	Mexico
AU	Australia	GN	Guinea	NE	Niger
BB	Barbados	GR	Greece	NL	Netherlands
BE	Belgium	HU	Hungary	NO	Norway
BF	Burkina Faso	IE	Ireland	NZ	New Zealand
BG	Bulgaria	IT	Italy	PL	Poland
BJ	Benin	JP	Japan	PT	Portugal
BR	Brazil	KE	Kenya	RO	Romania
BY	Belarus	KG	Kyrgyzstan	RU	Russian Federation
CA	Canada	KP	Democratic People's Republic of Korea	SD	Sudan
CF	Central African Republic	KR	Republic of Korea	SE	Sweden
CG	Congo	KZ	Kazakhstan	SG	Singapore
CH	Switzerland	LA	Laos	SI	Slovenia
CJ	Côte d'Ivoire	LI	Liechtenstein	SK	Slovakia
CM	Cameroon	LK	Sri Lanka	SN	Senegal
CN	China	LR	Liberia	SZ	Swaziland
CS	Czechoslovakia	LT	Lithuania	TD	Chad
CZ	Czech Republic	LU	Luxembourg	TG	Togo
DE	Germany	LV	Latvia	TJ	Tajikistan
DK	Denmark	MC	Monaco	TT	Trinidad and Tobago
EE	Estonia	MD	Republic of Moldova	UA	Ukraine
ES	Spain	MG	Madagascar	UG	Uganda
FI	Finland	ML	Mali	US	United States of America
FR	France	MN	Mongolia	UZ	Uzbekistan
GA	Gabon	MR	Mauritania	VN	Viet Nam

-1-

DescriptionIntelligent Agents for Electronic Commerce5 **Background of the Invention**1. Cross-References to Related Applications

This application is related to Provisional Patent Application Serial Number 60/010,087, Filed 17 January 1996. This application is also related to Provisional Patent Application Serial Number [XXXXXXXXXX], Filed 30 December 1996.

10

2. Field of the Invention

The present invention relates to the gathering and analysis of market transaction data, where such transactions are contemplated or completed by electronic means, and specifically to the use of software agents to represent and to assist the activities of consumers and providers within an electronic "virtual marketplace".

15

3. Description of Related Art

The trading of goods and services is one of the basic human activities. From the first meeting of pre-historic men to trade animal skins for berries, to country fairs, to the most intricate computer-based trading of international financial instruments, the marketplace supports the survival and flourishing of our lives.

20

Every era has established a marketplace based on the technology of its time. Early marketplaces were locations for face-to-face meetings between people offering items for trade. The development of printed material and postal correspondence made it possible for people to trade without ever meeting in

25

-2-

person. In modern times, a sophisticated division of labor system involving producers, suppliers, distributors, advertisers, market researchers, payment clearinghouses, customers, and many others, supports our economic lives.

5 The flow of goods and services, however, is not the whole story. The people and organizations on the production, distribution, sales, and marketing side of trade ("providers") need to understand what goods and services are desired by buyers. The people and organizations who purchase or acquire offered items ("consumers") need to learn what goods and services are available. The flow of this market information is critical to the successful operation of a market.

10 A brief consideration of modern methods of commerce shows us that consumers have many ways to gather information about available goods and services. Some of these are: visiting stores; browsing catalogs; viewing advertisements on television, on billboards, and in magazines and newspapers; soliciting recommendations from friends; and receiving unsolicited mail  
15 advertisements.

We also observe that vendors and other providers use many avenues to disseminate information about available goods and services. These include: broadcast and direct advertisements; in-store displays; telephone solicitations; and  
20 so on.

Providers also try to collect information about consumers' desires and buying habits so that they can better serve their current customers and gain new ones, thereby enhancing profits. Current market research methods include: keeping current customer purchase data on file; buying or renting mailing lists of other vendors; listening to focus groups; running pilot sales in test markets; and so  
25 on.

However, even with so many pathways for information exchange, there are many disadvantages inherent in the current methods of commerce.

-3-

### Disadvantages of Current Methods of Commerce

Although consumers clearly reap many benefits in today's marketplace, there are still many disadvantages that lead to consumer frustration. Here are some obvious disadvantages for consumers:

- 5           •       Just collecting basic information about available goods and services, their features, and their prices is tedious and time-consuming. To find a particular product or verify availability, price, and features, the consumer typically may need to visit several stores across a wide area. Another consumer may choose to spend hours on the telephone, perhaps incurring various communication charges,  
10       navigating irritating automated attendants, trying to reach a human who can answer questions. Yet another consumer will peruse stacks of catalogs and accumulated direct mail advertisements. This process wastes the consumer's valuable time, especially when the search fails.
- Information isn't always available when it's needed. Consumers  
15       frequently rely on ephemeral television and radio advertisements to learn of products and special promotions. But these ads seldom arrive when the consumer is ready to make a selection. Even with print ads, the information is soon lost as the stack of newspapers is carried away for recycling.
- It is very difficult for consumers to pick out items of interest from  
20       the daily bombardment of advertising. Television and radio spots, billboards, street corner kiosks, the daily newspaper, direct mail coupon packages, in-store merchandise displays, magazine advertisements and inserts, posters on and in mass transportation vehicles, storefront banners - these advertisements and a host of  
25       others vie for the consumer's attention daily. Marketing research firms use the term "impression" to denote one occurrence of a person perceiving an advertisement. Some authorities claim that an urban consumer in New York City receives up to 15,000 impressions per day! It is no wonder that consumers

-4-

become desensitized to the advertising around them, and fail to see the items that are truly of interest.

- \* Consumers have little or no control over the timing or presentation of advertising. They can't arrange to receive information at a convenient time.

5 Telephone solicitors always seem to interrupt dinner. The radio advertisement for an anticipated concert is on the air during "drive time" - when the consumer is driving and can't write down the phone number of the ticket agency. Consumers can't even choose a preferred format for receiving advertisements. If the merchant advertises only in broadcast media, the consumer won't be able to find the  
10 information in today's newspaper. Sorting through the barrage of direct mail may require more time than the consumer can allocate to this task, and so the consumer discards a potentially useful notice.

- \* A consumer usually receives no direct benefit for inspecting a provider's advertisements, except for the information itself if the advertisement is  
15 relevant. Occasionally, providers and marketing research firms give consumers a small fee or gift in return for participating in a survey. This is called "paying a consideration." However, there are few opportunities for consumers to receive considerations, and no way for consumers to seek out providers that are willing to pay considerations.

- \* When a consumer has an immediate need for product or service  
20 information, it may be nearly impossible to gather the information quickly. This is especially true when the consumer doesn't know where to look for the information, or doesn't have quick and convenient access to sources of information.

- \* Many consumers rely on the recommendations or evaluations of  
25 third parties to help them make buying decisions. Consumer rating guides and



-5-

endorsers provide this kind of information, but the information is not always available at the time or place of the consumer's purchase decision.

Providers, too, have their share of frustrating difficulties using the current methods of commerce. Some of the disadvantages for providers are:

5           \*       Much of the demographic data from traditional sources is out-of-date or incorrect. Providers frequently buy or rent magazine subscription lists and other providers' customer lists. However, a name on a list is not necessarily removed when the individual no longer subscribes or is no longer a customer. It is expensive to examine lists for data entry errors, duplicates, minor  
10       spelling variations, and so on. When a provider exchanges a list with another provider, who exchanges with a third provider, who exchanges with yet another provider, a provider can easily end up with a list that contains a high proportion of names of consumers who are not at all interested in the provider's goods.

          \*       It is expensive to target advertisements to specific customers. As  
15       mentioned above, mailing lists frequently contain a high percentage of names of uninterested customers, yet buying or renting mailing lists is costly. Controlled circulation magazines, where potential subscribers complete a qualification form to receive a (usually complimentary) subscription, don't always yield truly qualified names, since there typically is no mechanism to verify the information that the  
20       potential subscribers report.

          \*       It is difficult for a provider to deliver information directly to a consumer who is ready to buy. Even if providers could easily identify those consumers, there is a time lag for the delivery of pertinent information. For example, direct mail requires planning weeks in advance. An in-store salesperson  
25       can assist the consumer, but only if the consumer has previously learned that the store carries suitable products. Providers need a mechanism for delivering information to consumers precisely at the moment when it is most helpful.

-6-

\* It is difficult and costly to personalize information to a consumer. Most consumers are unimpressed by feeble attempts at personalization such as form letters that read "Dear MR. JONES JOHN, The JOHN FAMILY may have already won..."

5 \* It is especially difficult to determine what specific interests a particular consumer has. Most data of this nature must be inferred from subscription lists, member lists, spotty purchase history, etc. It is rare that a consumer directly informs a provider of a particular interest.

10 \* Providers have little control over the timing of the delivery of their printed advertising messages. The use of special mailing classes for bulk mail to reduce mailing costs results in erratic delivery times. In the United States, providers using Third Class mail cannot pinpoint even the week that the mail will be delivered. For example, sometimes consumers don't receive a special sale notice until after the sale date. Also, mailed notices must be prepared well in  
15 advance to take advantage of bulk mail, so the provider's quick response to market conditions is impeded.

\* It is difficult for providers to verify delivery of their messages. Did the direct mail piece get read by the consumer? Was it even delivered? Did interested consumers view the television advertisement? How many consumers  
20 noticed the billboard? How many consumers read the newspaper or magazine notice? Market survey and research firms attempt to measure delivery, but their methods are necessarily statistical since they can't survey every household in the target area. Even with their limited usefulness and contested accuracy, these services are expensive.

25 \* The low success rates of direct mail (typically 2% to 4%) wastes much of the natural resources for printing and distributing the mailing, as well as wasting the money for preparation of the direct mail. Huge amounts of unsolicited

-7-

mail end up in the wastebasket. Some authorities estimate that up to 70% of unsolicited mail is never opened.

\* It is expensive and cumbersome for providers to offer "considerations" to consumers. A consideration is a payment or award of some value to a consumer in return for a consumer viewing an advertisement or participating in a marketing survey. Sometimes considerations are given to encourage the consumer to an action, as when marketing research firms include a dollar bill in an unsolicited direct mail survey. Not only is there the cost of the consideration itself, there are the additional costs to the provider of identifying potential consumer recipients and preparing some means of delivery such as direct mail.

\* Providers have no practical way to get real-time (immediate) feedback on the success of their promotions. Marketing research on a particular product typically requires at least several weeks or months and is very costly. This leads marketers to test only large product groups and discourages them from gathering data about individual products.

\* Providers typically have no way to collect information about why a consumer purchased an item. Providers run special promotions, and consumers buy things, but it is arduous, tedious, and error-prone to draw the connection. It is difficult to judge the effects of promotions targeted to different sets of consumers, because providers don't know which promotion persuaded the consumer to buy.

\* Providers have few ways to collect information about "lost sales", or why a consumer did not purchase an item. If lost sale data could be determined, a provider could better tailor offers to the consumer's needs and desires.

\* Providers attempt to measure and predict "consumer demand" to help determine the number and mix of products and services to offer and the prices

-8-

to charge. Consumer demand is a measure of the number of consumers who want to purchase a product or service. It is typically calculated on a large scale with statistical models using historical purchase data. Demand can only be calculated based on purchases that have already occurred, since providers have few  
5 mechanisms to determine what new items consumers might want, or at what price consumers would buy. Demand information would be much more useful if it could guide providers into new territory, or if it could warn providers that a planned product would likely have few buyers or is being offered at an unsuitable price. With more accurate demand information, providers could plan inventories that are  
10 better matched to consumer desires, resulting in fewer markdowns.

- Providers have no mechanism for using actual demand data to simulate consumer demand under varying conditions. It would be useful if providers could run "what if" scenarios to see the effects on demand of different prices, varying packaging, special discounts, etc. Using actual historical and  
15 current data to calculate this "theoretical demand" would be more accurate than using estimated or aggregate data.

#### **The Promise of Electronic Commerce**

The unexpected and explosive growth and popularity of the Internet in  
20 recent years has opened a new avenue for commerce - "electronic commerce". Electronic mail ("e-mail"), the delivery of messages via electronic communication networks, has become a major notification mechanism, especially for point-to-point communications. Numerous "bulletin board" systems and the USENET newsgroup distribution network are popular broadcast notification  
25 systems. But it is the advent of the World Wide Web, frequently referred to as "the Web", that has excited the imagination of thousands of consumers, providers, and entrepreneurs. The Web conveniently delivers text, images, and audio clips to

-9-

individual users. In fact, the Web can be used to distribute any sort of information that can be represented in a computer data file.

The popularity of the Web has encouraged the establishment of many Internet Access Providers (IAPs), who provide communication access to the Internet for individuals and organizations; and Internet Service Providers (ISPs), who provide various services via the Internet, such as e-mail delivery, Web site hosting, search engines, and "chat" areas. This communications and information infrastructure continues to grow at a prodigious rate. With so many individuals and organizations now having convenient and inexpensive communications access, the Internet offers a promising base for a new mode of commerce.

Electronic commerce addresses many of the disadvantages of traditional commerce. It is convenient and inexpensive to prepare and deliver e-mail to specific persons or groups of persons. Many computer systems are repositories for immense databases that are useful for commerce, and the global communication network provides a means for accessing that data. Personal computer systems and specialized software are now enabling consumers to view online product catalogs and other information that providers publish on the Web. A multitude of researchers and organizations are working out the details of payment mechanisms to allow secure monetary transactions across the Internet.

20

#### **The Disadvantages of Today's Electronic Commerce**

Even with the colossal potential of the Internet, there are still a number of problems to be solved to support the establishment of a viable virtual marketplace, especially regarding the collection and exchange of market information. The electronic form of commerce doesn't address all of the problems of traditional commerce, and it raises a number of new difficulties.

25

-10-

Here are some of the disadvantages, from the consumer's point of view, of the electronic form of commerce:

- 5           \*       Most search engines (Web sites that implement a capability for searching a database of information) are generic. They use general words as search keys, whereas consumers would benefit from information that is categorized by brands, product names, product category, store names, etc. Even though search engines are much faster than physical store visits, the search process is still tedious and prone to error.
- 10           \*       Using search engines for comparative shopping is very slow. Search engines return pointers to information sites, not the actual information. Search engines frequently return thousands of "hits", or items that partially match the search request. Consumers must sift through these hits, determine which ones are likely to be truly of interest, and contact the individual Web sites to collect the product information.
- 15           \*       Consumers find comparative shopping tedious because every Web site has its own format for information. It is difficult to automate comparative shopping because of the inconsistent and non-standardized data formats.
- \*       It is difficult for consumers to find independent opinions about product quality, comparative features, and how a provider treats other consumers.
- 20           \*       Every search starts from scratch. Even though some search engines now have the capability to narrow a search during an episode of use, each episode of searching starts anew requiring the searcher to enter all of the relevant keywords again. The preferences of the consumer are not retained between uses of the search engine.
- 25           \*       Consumer searching is not private. The search engine can collect data about who is searching and the keywords of their search. Many Web sites maintain "cookies" or "passports", that is, files that contain information about the

-11-

consumer who is searching. In effect, the consumer's searching and decision making is exposed to public view.

5           \*       Dealing directly with the provider exposes the consumer's identify and other data to the provider. When the consumer orders or purchases a product from a provider's Web site, the consumer must reveal name, delivery address, credit card data, etc. Even if the consumer is merely inspecting the information available on a Web site, the site's owner can still collect data about the consumer from the consumer's browser software.

10           \*       Non-technical consumers may experience frustration in trying to construct appropriate queries for search engines. The syntax rules for queries commonly use Boolean logic and special separator characters. Even when the use of one search engine is mastered, the consumer must learn yet another set of rules for constructing queries for another engine, since the various engines use different syntax rules for their queries.

15           \*       Once a search engine successfully delivers a promising Web address (known as a "URL" for Uniform Resource Locator), the consumer may be disappointed to find that the URL is no longer valid. Thousands of Web pages are published and withdrawn daily, and the search engines are not always informed of the changes. Web pages customarily contain references to other Web pages ("links"), and a link is not always updated when the target URL changes, especially if the target URL names a page that is published by another entity. These "broken URLs" refer to Web pages that no longer exist or have moved to another address, so the consumer can no longer reach the information.

20           \*       The style of presentation is still controlled by the provider. The consumer has no useful mechanism to request, for example, only summary information about products. The avenue of presentation is also fixed. If the data is available on the Web, it must be accessed via the Web; the consumer typically

-12-

cannot arrange to have the data delivered, for example, via pager, facsimile, or cell phone display.

• Usually there is no direct benefit to a consumer (a "consideration") for viewing an electronic advertisement, although some companies have proposed paying consumers for reading advertisements via e-mail or other electronic  
5 delivery.

• Consumers have few means for publishing their own electronic advertisements for buying or selling. Most newsgroups do not accept advertisements. Even in the special newsgroups that do accept advertisements, it  
10 wastes bandwidth since most readers of the newsgroups won't be interested in a specific advertisement.

Electronic commerce also presents a number of difficulties for providers, especially in the areas of deploying advertising and gathering "market intelligence." Some of these disadvantages are:

• Many providers are reluctant to advertise on the Internet because of  
15 software agents that make recommendations based on price alone. For example, the BargainFinder service, a research project of Andersen Consulting, that gathers pricing data on audio compact disks has been blocked from many providers' Web sites. Without the opportunity to present other features that justify a higher price,  
20 higher-priced providers would lose sales or be forced to lower their prices (and erode their retail margins).

• Consumers may not be aware of a provider's Web site. A provider typically advertises the existence of a Web site via traditional means, driving up the cost of maintaining a Web presence.

• Very few tools have emerged to help providers judge the  
25 effectiveness of their Web sites. For example, providers cannot gather enough



-13-

information to calculate market share, since the statistics associated with competitor's Web sites are not publicly available.

5           \*       Providers have little control over the search engines that consumers use to locate products, beyond carefully choosing a few keywords. They can't choose to emphasize different aspects of their products depending on the origin of the request.

          \*       It is impossible to collect useful demographic data about many online consumers, because consumers frequently use pseudonyms to disguise identity.

10          \*       Due the lack of useful demographic data about online consumers, there is little guidance in targeting advertisements to potential customers.

          \*       Even though it is easier to personalize e-mail, how does the provider determine the target audience? Many online users summarily reject unsolicited e-mail advertising, disparagingly called "spam".

15          \*       Many Web sites now have the capability to generate Web pages ("content") on the fly, but it is difficult for the Web server to obtain enough data about the requestor to personalize the content in a useful way.

          \*       "Banner" advertisements placed on popular Web sites have not been particularly successful. Many online users don't "click-through" the banner to the more extensive advertiser information, because the placement of such banners is not finely targeted. Some Web activity statistics indicate that only one and one-half to three and one-half percent of users click-through.

20          \*       Providers lose the goodwill of potential customers when they place advertisements in regular newsgroups.

25          \*       Providers still have few ways to gather real-time feedback on special promotions or specific products.

-14-

\* Perhaps most critically, providers still have no method to derive useful market intelligence from the vast activity online. Providers still can't determine why consumers accept or reject offers, they can't calculate consumer demand, and they can't simulate demand based on actual demand data.

5

#### Other Electronic Commerce Systems

Much of the research relating to electronic commerce has been directed towards designing and implementing secure online money transactions. For example, U.S. Pat. No. 5,557,518 entitled "Trusted Agents for Open Electronic  
10 Commerce" issued 17 September 1996 describes a system wherein a customer and a merchant can exchange electronic merchandise and electronic money by using trusted electronic agents. Even when this crucial aspect of electronic commerce is satisfactorily resolved, there remains the challenge of establishing a mechanism for the presentation, gathering, and exchange of market information in a way that  
15 encourages and supports broad participation in the online market. Of the current mechanisms related to online market information, most tend to fall into two categories: search engines, and various kinds of software or electronic agents.

Various problems with search engines have already been mentioned. Each engine has a different syntax and operation, making them error-prone and tedious  
20 to use. The information that engines return may be out of date or just plain incorrect. Search engines don't generally categorize information in a format that is handy for consumers, since they cater to general information seekers. Searches cannot make use of personal information about users, since the search engine has access only to the specific query data entered by the user.

25 A software agent is a software entity that is capable of performing certain delegated electronic actions (including holding information) on behalf of a user or another agent. An IBM white paper, "The Role of Intelligent Agents in the

-15-

Information Infrastructure" (Gilbert, et. al., IBM Corporation, undated; also published on the Web at URL <http://www.networking.ibm.com/iag/iagptc2.html>; also hyperlinked from <http://www.raleigh.ibm.com/iag/iaghome.html>) describes three dimensions along which intelligent agents may be measured: agency, intelligence, and mobility. "Agency is the degree of autonomy and authority vested in the agent... *Intelligence* is the degree of reasoning and learned behavior... *Mobility* is the degree to which agents themselves travel through the network..." (IBM, italics author's). Software agents can be further classified along the dimension of mobility into three broad categories according to their location of execution and location of data reference: mobile agents, "wandering" agents, and local or static agents.

True mobile agents are software entities that can electronically move from one computer system to another. The software program of a mobile agent actually executes on the target computer system. Although some technology to support mobile agents is available (for example, Sun's Java and General Magic's Telescript), they have not been successful, partly because many computer "firewalls" block the entry of mobile agents for security reasons, and because the agents must be capable of operating on a number of specific kinds of computers.

A wandering agent is a software entity that resides within a single computer system and "visits" or communicates with other computer systems, frequently via the Internet. Wandering agents are being used successfully to map the Web, gathering the data that is used in the internal indexes of search engines. However, these agents are very slow in operation, especially when there are thousands of sites to visit, and some wandering agents may be blocked from accessing some sites (as the BargainFinder agent has been). As described in "Internet Agents: Spiders, Wanderers, Brokers, and 'Bots" (Cheong, Fah-Chun, New Riders Publishing, 1996), wandering agents are also used for various Web maintenance

-16-

tasks and for Web mirroring. Cheong lists and describes many instances of wandering agents. The following list of wandering agents was compiled on 26 December 1995 from Appendix G of Cheong. The purpose of each agent is excerpted by the inventor from short descriptions in Cheong.

	<i>Name</i>	<i>Purpose</i>
	ASpider (Associative Spider)	searches for keywords
	Arachnophilia	collect documents
	Aretha	(none given)
5		
10	CS-HKUST WWW Index Server	Resource Discovery, validate HTML
	ChURL	URL checking
	Checkbot	(none given)
	EIT Link Verifier Robot	verify links
	Emacs W3 Search Engine	Resource Discovery
15	Fish Search	Resource Discovery
	GetURL	validate links, mirroring
	HTML Analyzer	check validity of Web servers
	HTMLgobble	mirroring
	Harvest	Resource
20	InfoSeek Robot	collect information for database
	JumpStation Robot	Resource Discovery
	Katipo	look for changed documents
	Lycos	information retrieval and discovery
	MOMspider	maintenance of distributed hypertext
25	Mac WWWorm	keyword searching
	NHSE Web Forager	Resource Discovery
	NIKOS	Resource Discovery

-17-

	NorthStar Robot	textual analysis, indexing
	Open Text Corporation Robot	(none given)
	Peregrinator	indexing
	Python Robot	(none given)
5	RBSE Spider	Resource Discovery
	SG-Scout	Resource Discovery
	Scooter	Resource Discovery
	Spry Wizard Robot	Resource Discovery
	TITAL	Resource Discovery
10	Tarspider	mirroring
	Tel W3 Robot	validate links
	TkWWW Robot	find logically related pages
	W4 (World Wide Web Wanderer)	measure growth in Web
	WM32 Robot	Resource Discovery, validate links
15	WWW - World Wide Web Worm	indexing
	WebCopy	mirroring
	WebCrawler	Resource Discovery
	WebLinker	traverses Web converting URN->URL
	WebWatch	validate HTML
20	Webfoot Robot	(none given)
	Weblayers	validate, cache, maintain links
	Websnarf	mirroring
	Webwalk	Resource Discovery, validate links, mirroring

25 A local or static agent is a software entity that operates within a single logical computer system, accessing data local to that system. Clearly this kind of agent is of limited usefulness for the electronic marketplace, since, a local agent would not have access to the variety of data that is necessary for a thriving

-18-

marketplace. However, if there were a mechanism to incorporate data from many sources and to provide access to a broad base of users, local agents could be extremely useful.

5 These technologies have not been used to collect market information that providers can use to quantify consumer demand or to help gain customers at reduced cost. Consumers are hesitant to use some of these technologies because of privacy concerns. There isn't a practical mechanism for the user to instruct an agent to "keep looking" if the immediate search fails or is only partially successful. Although these technologies may be useful for the electronic  
10 marketplace, additional mechanisms are required for practical, ubiquitous electronic commerce.

#### The Fundamental Problems to be Solved to Enable Electronic Commerce

15 An electronic marketplace, just like a traditional marketplace, must support the basic process of commerce: offers to sell or buy are made, offers are accepted, and considerations (payments) are paid. If the basic process does not work, there is no marketplace. A viable marketplace must also address side-effects of commerce such as issues of security, privacy, and confidence or trust; otherwise, even if the basic process works, consumers and providers will not feel  
20 comfortable enough to participate in the marketplace.

A practical and viable electronic marketplace involves the exchange of market information, as well as the more obvious trading for goods and services. From a consumer's point of view, shopping is a means of gathering data about goods and services offered. This data is used by the consumer to compare and rank  
25 offerings and to make decisions about purchases. From a provider's point of view, consumer shopping is an opportunity to gather data about consumer needs and

-19-

interests. This data is used by the provider to improve product and service offerings.

For consumer, the fundamental problems relating to the flow of market information in electronic commerce, still to be solved, are:

- 5           \*     Consumers need help in gathering information about available goods and services, quickly and with a minimum of fuss;
- \*     Consumer privacy needs to be assured while gathering information about available goods and services; and
- \*     Consumers need a mechanism for ongoing, autonomous searches  
10       for information about available goods and services, searches that continue even when the consumer is not "on-line".

For providers, the fundamental problems relating to the flow of market information in electronic commerce, still to be solved, are:

- 15           \*     Providers need to target advertising information to truly interested consumers without disturbing the privacy of those consumers;
- \*     Providers need to be able to quantify consumer demand, both offline and in real-time, using historical and current data;
- \*     Providers need to be able to determine reasons for sales and lost sales; and
- 20           \*     Providers need a source of more accurate market data to serve as input to present and yet-to-be-developed market analysis methods.
- \*     Solutions to these problems for providers must be cost-effective.

#### Objects and Advantages

- 25           The principal object of the present invention is to provide a system that facilitates the gathering and exchange of market information in support of

-20-

electronic commerce. The attainment of this object has many advantages for both consumers and providers.

Several objects and advantages of the invention for consumers are the following.

- 5           \*     A consumer's identifying and private information is protected from disclosure as the consumer gathers information about available products.
- \*     Consumers can identify suitable products more easily, with less expenditure of effort, because the product information is presented in a consistent manner.
- 10          \*     Consumers can identify suitable products more quickly.
- \*     Consumers can use advocate recommendations and evaluations in deciding between competing products.
- \*     Consumers have more control over the presentation of advertising information. They can control what information is permitted to be delivered, when  
15       the information is delivered, and what devices are used for delivery.
- \*     Consumers have a standardized mechanism for receiving considerations from advertisers in exchange for allowing delivery of advertisements and other provider information.
- \*     Consumers can launch ongoing searches for products, and the  
20       searches can continue even when the consumer is not online.
- \*     Consumers use search engines that have data that is more up-to-date.
- \*     Consumers access search engines that are easier to use, especially for non-technical users.
- 25          \*     Consumers can place their own want-to-buy and want-to-sell advertisements.



-21-

Several objects and advantages of the invention for providers are the following.

- A provider's privacy is protected while searching for potential customers or surveying competitor's offerings.
- 5       • Providers can use demographic and preference data that is more up-to-date.
- Providers own and control the information about the products they offer, even when the information resides within the system contemplated by the invention.
- 10       • Providers can directly contact more consumers that are ready to buy.
- Providers can target consumers more economically.
- Advertising may have higher success rates since the targeted consumers have expressed an interest in the product.
- 15       • Providers can personalize special offers based on previous buying habits and future intent of the consumer.
- Providers have a mechanism for quantifying consumer demand.
- The mechanism for quantifying consumer demand is based on actual consumer buying data, both historical and current.
- 20       • The mechanism for quantifying consumer demand uses data based on individual buying decisions, not merely aggregate or estimated data.
- Providers can quantify demand in real-time.
- Providers have a mechanism for discovering the reasons for lost sales.
- 25       • Providers can provide a consideration to consumers for viewing advertisements and other notices.

-22-

- Providers can receive feedback in real-time about the success of promotions.

- Providers have access to market data based on individual consumer needs that can be used to simulate demand in various scenarios.

5 Several objects and advantages of the invention for all participants in the system are the following.

- A robust and thriving electronic marketplace may lower the amount of wasted paper and energy for the delivery of printed matter.

- The system provides results faster than mobile or wandering agents.

10 • Many industries and providers can participate in the system.

- Information used by both consumers and providers is more up-to-date.

Referring to the fundamental problems of the flow of market information in electronic commerce, the fundamental objects of the system for consumers are:

15 • to assist consumers in gathering market information quickly and easily;

- to protect consumer identity and private information while gathering market information; and

- to assist consumers in performing ongoing searches.

20 Referring to the fundamental problems of the flow of market information in electronic commerce, the fundamental objects of the system for providers are:

- to assist providers in targeting information delivery to interested consumers;

25 • to assist providers in quantifying consumer demand, both offline and in real-time, using historical and current data;

- to assist providers in determining reasons for sales and lost sales;

and

-23-

- to assist providers by furnishing a huge base of accurate market data based on actual consumer activity to serve as input to present and future market analysis methods; and

- to assist providers in gathering and analyzing market information in a cost effective way.

Further objects and advantages of this invention will become apparent from a consideration of the drawing and ensuing description.

#### Brief Description of the Drawing

10 The invention is described in greater detail below with reference to the attached drawing. In the drawing, closely related figures have the same number but different alphabetic suffixes.

FIGURE 1 is a schematic diagram showing the basic interaction of several kinds of agents within an agent system.

15 FIGURE 2 is a schematic diagram of an agent system and its major components.

FIGURE 3A is a topological diagram showing an example arrangement of processors in an agent system.

FIGURE 3B illustrates the functional components of a processor.

20 FIGURES 4A - 4D illustrate the functional components of Personal Agents.

FIGURE 5A illustrates the data components of a Preference Datum.

FIGURE 5B shows example Preference Data.

FIGURE 6 illustrates the functional components of Decision Agents.

25 FIGURE 7 illustrates the functional components of Demand Agents.

FIGURES 8A - 8C illustrate the functional components of Markets.

-24-

FIGURES 9A - 9C illustrate the functional and data components of a Product Database.

FIGURE 9D shows example Product Template Entries with example values.

5           FIGURE 10 illustrates the data components of an Ad.

FIGURE 11 is a flow diagram representation of an overall method for searching for products.

FIGURES 12A - 12B comprise a flow diagram representation of a method for composing a Decision (product search) query.

10           FIGURE 13 is a flow diagram representation of a method for creating a Decision Agent.

FIGURE 14 is a flow diagram representation of a method for accepting a new Decision Agent into a Market.

15           FIGURE 15 is a flow diagram representation of a method for performing a Decision search.

FIGURE 16 is a flow diagram representation of a method for performing an Immediate search portion of a Decision search.

FIGURE 17 is a flow diagram representation of a method for completing a Decision search.

20           FIGURE 18 is a flow diagram representation of a method for performing an Extended search portion of a Decision search.

FIGURE 19 is a flow diagram representation of a method for delivering Decision search results to the consumer.

25           FIGURE 20 is a flow diagram representation of a method for expiring a Decision Agent that has completed its task.

FIGURE 21 is a flow diagram representation of an overall method for quantifying demand.

-25-

FIGURES 22A - 22B comprise a flow diagram representation of a method for composing a Demand query.

FIGURE 23 is a flow diagram representation of a method for creating a Demand Agent.

5           FIGURE 24 is a flow diagram representation of a method for accepting a new Demand Agent into a Market.

FIGURE 25 is a flow diagram representation of a method for performing a Demand search.

10           FIGURE 26 is a flow diagram representation of a method for performing a search for current demand.

FIGURE 27 is a flow diagram representation of a method for performing a search for historical demand.

FIGURE 28 is a flow diagram representation of a method for delivering Demand search results to a provider.

15           FIGURE 29 is a flow diagram representation of a method for expiring a Demand Agent that has completed its task.

FIGURE 30 is a flow diagram representation of an overall method for placing an Ad in a Market.

20           FIGURES 31A - 31B comprise a flow diagram representation of a method for composing an Ad.

FIGURE 32 is a flow diagram representation of a method for creating an Ad.

FIGURE 33 is a flow diagram representation of a method for accepting a new Ad into a Market.

25           FIGURE 34 is a flow diagram representation of a method for expiring an Ad that has reached its expiry time.

-26-

FIGURE 35 is a flow diagram representation of an overall method for targeting a group of consumers.

FIGURE 36 is a flow diagram representation of a method for selecting Personal Agents that represent targeted consumers.

5        FIGURE 37 is a flow diagram representation of an overall method for rejecting unsolicited messages.

FIGURE 38A-B is a flow diagram representation of an overall method for simulating demand and for replaying demand.

10        FIGURE 39 is a schematic representation of a Web page used to "login" to a agent system.

FIGURE 40 is a schematic representation of an example Web page used to specify search criteria when composing a Decision query in an example consumer electronics Market.

15        FIGURE 41 is a schematic representation of an example Web page used to specify search criteria when composing a Decision query in an example automobile Market.

FIGURE 42 is a schematic representation of an example Web page used when composing an advertisement for a television set.

20        **Summary of the Invention**

The present invention contemplates a system for enabling the collection of market information, especially data needed to quantify various kinds of consumer demand, while protecting the particular identity and privacy of consumers.

25        Consumers, because their identity is protected, feel secure in using the system, thereby generating market data as a by-product of their shopping activities.

Providers can query and analyze this market data in many ways, including the calculation of actual instantaneous and historical consumer demand for products

-27-

and product categories. This kind of market data is not available by any other means.

The system comprises a "virtual marketplace" in which various kinds of agents represent human owners. Although the system has access to data outside its boundaries, the system behaves as a logically single system. The agents of the  
5 system need not travel outside the system to perform their tasks.

Consumers and providers both may place sell and buy advertisements (ads) in the marketplace. Providers can target groups of consumers to receive special messages such as special offer ads.

10 Consumers and providers are each represented in the system by Personal Agents. A Personal Agent stores and learns the preferences of its human owner and arranges for delivery of messages to the owner according to the owner's desired delivery times and desired delivery devices. The Personal Agent ensures that private or identifying data about the owner is never revealed without  
15 authorization to other agents in the system.

Consumers use Decision Agents to gather the information that helps consumers make purchasing and usage decisions. Decision Agents can search for ads meeting various criteria, and order the matching ads according to the consumer's preferences.

20 Providers use Demand Agents to assist with market analysis of various kinds of demand and to target consumers. Demand Agents can target consumers based on consumer preferences, demographics, and shopping activity.

#### Description of the Preferred Embodiment

25 Within this description, the term "product" is understood to include all kinds of merchandise, tangible and intangible goods, services, intellectual

-28-

property, information, electronic merchandise, etc. whether offered for a price, offered for barter, or offered for free.

The term "consumer" is understood to mean a user of the system who is acting to find information about or purchase products offered by other users of the system. A consumer is typically an individual. The term "provider" is understood to mean a user of the system who is acting to present information about products and/or sales offers to other users of the system. The term "provider" includes manufacturers, retailers, wholesalers, distributors, etc. When the term "consumer" is used in this description, it is understood to mean a user of the system acting in the role of a consumer. When the term "provider" is used, it similarly is understood to mean a user of the system acting in the role of a provider. The term "user" is understood to apply in a context where the particular role is unimportant.

#### Agent Interaction

15

-----

Referring now to the drawing, and in particular to Figure 1, an Agent System 10 is shown schematically, together with some of its internal components, in order to illustrate the basic interaction between several system components in a preferred embodiment of the system. Two users, a Consumer 20 and a Provider 21, who are not part of the invention, are shown to illustrate their relationship to Agent System 10. Many components of the system are not illustrated in this figure, in order to focus attention on the basic interaction, which enables the generation and the retrieval of market data.

Referring to the left side of the figure, actions of Consumer 20 generate market data. Consumer 20 controls a Consumer Personal Agent 12 that represents the Consumer to the system. The Consumer Personal Agent is capable of creating a Decision Agent 14 to carry out a search, within a Market 18, for products that

25



-29-

satisfy certain constraints and preferences. For example, a Consumer might query for the local retailers that carry a certain brand of sports shoes. Decision Agent 14 gathers data without knowing, and therefore without revealing, the identity of the Consumer 20. Both Decision Agent 14 and Market 18 store data about the search.

5 Decision Agent 14 returns a set of product recommendations, which Consumer Personal Agent 12 further filters and orders according to Consumer preferences before presenting to Consumer 20.

Referring to the right side of the figure, actions of Provider 21 retrieve and analyze market data. Provider 21 (merchant, service provider, etc.) controls a

10 Provider Personal Agent 13 that represents the Provider to the system. The Provider Personal Agent is capable of creating a Demand Agent 16 to collect data, from a Market 18, about consumer demand. For example, the Provider might query for the number of consumers that are currently searching, or have searched within the past 24 hours, for a certain brand of sports shoes. Demand Agent 16

15 accesses data stored in the Market 18 and in active and expired Decision Agents 14. Demand Agent 16 returns a response for the query to the Provider Personal Agent 13, which uses the Provider's preferences to determine how to present the retrieved data to the Provider 21.

Agent System 10 contains different Markets 18 for various categories of

20 products and services. The various kinds of agents and the markets are software components. These components are more fully described in conjunction with other figures. In a preferred embodiment, the software components utilize but are not limited to conventional object-oriented technology, distributed object-oriented technology, object-oriented database technology, relational database technology,

25 general Internet communication technology, World Wide Web (WWW or Web) technology, and electronic mail (e-mail) technology.

-30-

### Agent System Schematic

-----

Referring to Figure 2, there is shown a more detailed schematic diagram of a preferred embodiment of the invention. Agent System 10 is a combination of hardware and software components; the components, taken together, are considered to be a single, logical system, regardless of the physical topology of the hardware components. It is expected that the physical topology of Agent System 10 will change over time, especially for the addition of processing units to distribute the load as more users participate in the system.

Two users of Agent System 10 (not part of the invention) are shown schematically, a User 21 (a Provider) and another User 20 (a Consumer), to indicate their relationship to the Agent System. When a User 20 or 21 uses Agent System 10 to present information about products and/or sales offers to other users of the system, that User is referred to as a Provider. For example, merchants, distributors, retailers, wholesalers, etc. fall in this category. When a User 20 or 21 uses Agent System 10 to find information about or purchase products offered by other users of the system, that User is referred to as a Consumer. In this document, the term "products" comprises products, services, tangible goods, intellectual property, etc. Persons and organizations are registered to become users of Agent System 10, and each user is authorized to perform certain functions. Not all functions of Agent System 10 are permitted to every user.

Each User of Agent System 10 has a means of communicating with the system, as indicated by Communication Device 22 or 23 of each User 20 or 21 respectively, and may have multiple means and devices. These communication devices can be any device capable of communicating over the Internet (such as personal computers with Web browser and/or e-mail software), other devices capable of operating with computer control (such as facsimile machines and

-31-

5 pagers), and other means of transferring data and commands between the User and the Agent System. A User may also store data on various devices outside Agent System 10, as indicated by Provider Remote Data 25 and Consumer Remote Data 24, provided that such data can be accessed by the system via (at least one of ) the User's Communication Device(s). In this context, "remote" means located outside the direct control of Agent System 10.

10 Agent System 10 contains software agents representing both consumers and providers. Each User controls a Personal Agent 12 or 13 (PA) that coordinates the communication of the User with the other parts of Agent System 10. A User establishes a communication session with User's PA using conventional authentication means appropriate to the Communication Device 22 or 23.

15 A Personal Agent Search Engine 26 maintains indexes over preference data and demographic data of all Personal Agents, so that users may query to identify a set of Personal Agents whose users have certain characteristics or preferences. However, private data about the user (name, address, etc.) is not maintained in Personal Agent Search Engine 26.

20 Continuing to refer to Figure 2, an Agent Marketplace 28 within Agent System 10 provides a means for various agents to interact on behalf of their owners. Consumer's Decision Agents 14 and Provider's Demand Agents 16 are "launched" into the marketplace to perform their delegated tasks. Agent Marketplace 28 comprises a number of Markets 18, which may be either General Markets 18a, in which all Users may launch specialized agents or place advertisements, or Restricted Markets 18b, in which only authorized Users may launch specialized agents (such as Decision Agents 14 or Demand Agents 16) or place advertisements. General Markets 18a correspond to conventional broad product categories; some examples are: Home Appliances, Office Supplies, Groceries, Consumer Electronics, Residential Real Estate, Commercial Real

-32-

Estate, etc. Restricted Markets are used, for example, by wholesalers to restrict access to special prices to distributors. The basic structure of both General Markets 18a and Restricted Markets 18b is the same, and is described in conjunction with Figure 8A below. Various specialized agents are described in conjunction with other Figures. Agents and other components operating in Agent Marketplace 28 have access to a Product Database (Product DB or PDB) 32.

Agent Marketplace 28 contains a number of Market Navigation Aids 34 to help users find the appropriate Market 18 in which to search or place ads. These aids might include keyword searches, word alias searches, hierarchical browsers of market layouts, etc..

Agents and other components of Agent System 10 record and access system history data (records of searches, transactions, etc.) in System History Data 36 component. Most of the system history is more conveniently accessed through logs and archives located within various functional components, but System History Data 36 maintains the "master" copy.

System Administrator users (not shown) perform or supervise various conventional maintenance functions for Agent System 10, such as performing backups, adding new product data, redistributing functions between processors for load balancing, etc.

20

### Agent System Topology

Referring to Figure 3A, there are shown hardware components of Agent System 10 from a topological point of view. Agent System 10 may have any convenient hardware topology; Figure 3A is intended as an example. The hardware of Agent System 10 comprises a number of Processors 38, each capable of communicating with other Processors. As illustrated, normally a group of

25

-33-

Processors is clustered together, with one or more Processors in a group configured to communicate with one or more Processors in other clusters. The clusters may be geographically dispersed, and Processors within a cluster may be geographically dispersed. The actual number of Processors and their topology will change over time, to support additional capacity, load balancing, and ease of administration.

The various functional components of Agent System 10, described in conjunction with several Figures, reside on one or more Processors 38, and may be duplicated to reside on one or more Processors 38 simultaneously. The distribution of the functional components across the various Processors 38 will change over time, to support additional capacity, load balancing, and ease of administration.

Referring to Figure 3B, a Processor 38 comprises the functional components of:

- an Object Server function 40,
- a Communications function 42,
- a Human/Machine Interface function 44,
- a Messaging function 46,
- and a Persistence function 48.

These functional components of Processor 38 are available for use by any software component of Agent System 10 that resides on Processor 38.

A Object Server function 40 executes the software objects that comprise the various software functional components of Agent System 10, for example, the various agents, the markets, the data repositories, and lower level utility software objects (not shown). A particular Object Server 40 need not execute every kind of object; for example, some Object Servers 40 may contain only Personal Agents 12

-34-

or 13 and their related data repositories, but will not contain any Market 18 objects.

A Communications function 42 supports communications between Processor 38 and the outside world. Such communications may be wired or  
5 wireless, broad or narrow band, so long as the Processors 38 use compatible communications. Communications function 42 sets up the connection between two Processors 38, or connects a Processor 38 to a network for indirect connection to another Processor 38 or to a User's Communication Device 22 or 23.

A Human/Machine Interface function 44 provides the look and feel of  
10 Processor 38. It could include a keyboard, mouse, pen, voice, touch screen, icons, menus, etc. Human/Machine Interface function 44 communicates with other functions in Processor 38. In some situations, a Human/Machine Interface function may not be necessary, for example, when a Processor 38 communicates only with other Processors 38 but not with a User's Communication Device 22 or  
15 23.

A Messaging function 46 routes messages between software objects executing on various Processors 38.

A Persistence function 48 manages storage of data belonging to the various software objects that reside on the Processor 38. The actual data is stored on  
20 conventional storage devices (not shown), such as computer disks.

### Personal Agent

-----

Personal Agent 12 or 13 is the point of contact between a user and the  
25 Agent System 10. Personal Agent 12 or 13 acts as an electronic "butler" or assistant, accepting requests from the user, delegating tasks to other agents in the system, and arranging for responses from various agents to the user to be delivered

-35-

at a time and in a manner that is convenient for the user. Consumer Personal Agent 12, via its internal functions, maintains the user's preferences and other data about the user, some of which is protected from unauthorized access.

Referring to Figure 4A, a Personal Agent 12 or 13 comprises the  
5 functional components of:

- a Unique identification (ID) 50,
- an Owner Manager 52,
- a Preference Manager 54,
- a Delivery Manager 56,
- 10 an Individual Firewall 58,
- a Decision Agent Manager 60,
- a Demand Agent Manager 62,
- an Ad Manager 64,
- s Target Manager 66, and
- 15 a Consideration Account 67.

A Unique ID function 50 maintains an identifier that uniquely identifies this agent within Agent System 10. Unique ID 50 is generated automatically when the agent is created, and is never reused to identify a different agent, even if the original agent ceases to exist within the Agent System. Unique ID 50 carries no  
20 information that reveals the human "owner" of this agent. Unique ID 50 is used to address messages to the agent.

An Owner Manager function 52 maintains data about the human "owner" of the agent, i.e. the user that controls this Personal Agent 12. This data includes the user's name, postal addresses, e-mail addresses, telephone and fax numbers,  
25 etc. This data is always protected by an Individual Firewall 58; it is never revealed to other agents, and is used only by components of Personal Agent 12 to deliver messages, for system invoicing, etc.

-36-

A Preference Manager function 54 maintains data about the preferences of the user. Preferences indicate items of interest to the user, such as favorite brands, interest in sports, etc. Within Agent System 10, preference data also includes "demographic" data. Demographic data indicates facts about the user, such as whether the user is a homeowner, the user's gender, the user's age group, etc. Although marketing industry usage of the term "demographics" may include a person's name, address, or other identifying data, a Preference Manager's demographic data does not include data that identifies the particular user. Preference data may be entered manually by the user using, for example, a form on a Web page, or data may be loaded by a System Administrator. Preferences may also be updated automatically by the system as, for example, when the user instructs the system to "remember" a product brand name from a product search. Preference Manager 54 uses preference data to order search results, so that items that are more likely to be preferred by the user will be displayed first when the results are delivered to the user. Referring now to Figure 5A, each preference datum 68 comprises not only a value 72, but also a key 70 for ease of searching. Referring to Figure 5B, a small sample of preference data illustrates the kind of data that might be used. A particular user typically will have much more preference data. Some values are shown as "rank m in n" to illustrate that ranking data may also be stored. The specific keys of any particular set of preference data depends on what the user has entered, etc. Only keys that are relevant to a particular user are included in that user's preferences, and the specific data maintained will change over time.

Referring again to Figure 4A, a Delivery Manager function 56 accepts all messages, generated by agents or other components of the system, that are directed to the user, and delivers those messages according to the user's desired delivery time and delivery media. Default delivery time and delivery media are specified as



-37-

part of the user's preferences (maintained by Preference Manager 54). Individual messages may also have a specified delivery time and delivery media that overrides the defaults. Delivery Manager 56 establishes communication with the user's Communication Device 22 or 23 to effect delivery. Messages may be sent to multiple devices if the user so desires. Delivery Manager 56 queues messages that are to be delivered at a future time.

Delivery Manager 56 also rejects unsolicited messages, unless the message meets the user's preferred criteria as maintained by Preference Manager 54. Delivery Manager 56 sends a rejection message in reply to the original sender of a rejected message. The rejection message indicates why the original message was rejected, so that the sender may gather quantifiable feedback.

An Individual Firewall function 58 mediates all access to the data that is maintained by the various internal functions, ensuring that only authenticated and authorized agents and users can access private data.

A Decision Agent Manager 60 assists the user with the creation and management of Decision Agents 14. Referring now to Figure 4B, a Decision Agent Manager 60 comprises the functional components:

- a Decision Composer 74,
- a Decision Agent Factory 76,
- a Decision Agent Tracker 78,
- and a Decision Agent Archive 80.

Continuing to refer to Figure 4B, a Decision Composer 74 assists the user in composing queries to be executed by Decision Agents. Decision Composer 74 retrieves a Product Template 174 (described later in conjunction with Figure 9B) for a particular product from a Market 18 in which the user wishes to search, present instructions to the user for completing Product Template 174 to describe the object of the search, and produces the appropriate query.

-38-

A Decision Agent Factory 76 creates a new Decision Agent 14 to carry out a query.

A Decision Agent Tracker 78 enables the user to monitor the activities of Decision Agents 14 that are active, i.e., agents that have not completed their tasks. Decision Agent Tracker 78 also enables the user to cancel an active Decision Agent 14 before its scheduled expiry time.

A Decision Agent Archive 80 stores and accesses Decision Agents 14 that are expired, i.e., agents that have completed their tasks, whether successfully or not. For example, if a Demand Agent 16 needs more detailed data about a query than is stored in a Query Logger 136 of a Market 18, it can access the details of the related Decision Agent 14 through Decision Agent Archive 80.

Referring back to Figure 4A, a Demand Agent Manager function 62 assists the user with the creation and management of Demand Agents 16. Only users of Agent System 10 who are authorized to launch Demand Agents will have a Demand Agent Manager 62 as part of their Personal Agent. Referring now to Figure 4C, a Demand Agent Manager 62 comprises the functional components:

- a Demand Composer 82,
- a Demand Agent Factory 84,
- a Demand Agent Tracker 86,
- and a Demand Agent Archive 88.

These components provide functions similar to the analogously-named functional components of Decision Agent Manager 60 (described above), except that Demand Agent Manager 62 components work with Demand Agents 16 instead of Decision Agents 14.

Referring back to Figure 4A, an Ad Manager function 64 assists the user in placing advertisements. Referring now to Figure 4D, an Ad Manager 64 comprises the functional components of:

-39-

an Ad Composer function 90,  
an Ad Delivery function 92,  
an Ad Tracker function 94,  
and an Ad Archive function 96.

5 An Ad Composer function 90 retrieves a Product Template 174 (described later in conjunction with Figure 9B) for a particular product from a Market 18 in which the user wishes to advertise, presents instructions to the user for completing Product Template 174 to describe the product, and produces a new Ad 186 (see Figure 10).

10 An Ad Delivery function 92 delivers Ad 186 to the desired destination. For consumer users, Ad 186 is delivered to Market 18, where it is accessible to other agents in the system. For provider users, Ad 186 may be delivered to Market 18 (just like a consumer ad); or Ad 186 may be delivered (as a special offer) to a set, determined by a Demand Agent 16, of consumer Personal Agents 12.

15 An Ad Tracker function 94 monitors the activity of Ad 186, including any messages received in response to the Ad, until Ad 186 expires or is canceled by the user. Ad Tracker function 94 enables the user to cancel an Ad 186 before its scheduled expiry time.

An Ad Archive function 96 stores and access Ads 186 that are expired.

20 Referring again to Figure 4A, a Target Manager function 66 assists the user in identifying Personal Agents to which targeted ads may be delivered. Target Manager 66 can identify Personal Agents based on preferences, demographic characteristics, and Decision Agent activity. Target Manager 66 does not have access to private data of consumer Personal Agents 12 such as name, address, etc.

25 A Consideration Account function 67 maintains a "consideration" account for the user. When the user earns a consideration by, for example, viewing a directly delivered advertisement or message, or completing a marketing survey,

-40-

the consideration amount is credited to Consideration Account 67. The account is denominated in a convertible exchange media such as electronic cash tokens.

#### Decision Agent

5

Referring to Figure 6, a Decision Agent 14 comprises the functional components of:

- a Unique ID 98,
- a Personal Agent Reference 100,
- 10 a Market Reference 102,
- an Expiry function 104,
- a Query 106,
- a Response Manager 108,
- and a Log function 110.

15 A Decision Agent 14 acts on behalf of a consumer user, as instructed by the consumer's Personal Agent 12, to search out and collect information from Agent System 10 that helps the consumer make purchasing and usage decisions. A consumer may have multiple Decision Agents 14 active within the Agent System 10 at any time. For example, a consumer may have one Decision Agent 14  
20 searching for a good buy on a certain sports shoe, and have another Decision Agent 14 searching for a television set with special features.

A Unique ID function 98 maintains an identifier that uniquely identifies this agent within Agent System 10. Unique ID 98 is generated automatically when the agent is created, and is never reused to identify a different agent, even if the  
25 original agent ceases to exist within Agent System 10. Unique ID 98 carries no information that reveals the human "owner" of this agent. Unique ID 98 is used to address messages to the agent.

-41-

A Personal Agent Reference 100 holds a copy of the Unique ID 50 of consumer Personal Agent 12 that controls this Decision Agent 14. Personal Agent Reference 100 is used to address messages to the controlling Personal Agent 12.

5 A Market Reference 102 indicates in which Market 18 that Decision Agent 14 should search.

An Expiry function 104 indicates how long Decision Agent 14 should continue searching. Expiry 104 may indicate either that the search should be performed and the responses returned immediately (an "immediate search"), or that the search should continue for a specific period of time, for example, one  
10 week, with responses being returned periodically during that time (an "extended search").

A Query 106 describes the product or product category for which to search. Query 106 includes data from Product Template 174 completed by the consumer and relevant data from the consumer's preferences, as assembled by  
15 Decision Agent Factory 76 of the consumer's Personal Agent 12.

A Response Manager 108 receives search results and returns them to the consumer's Personal Agent 12.

A Log function 110 stores records of the activities of Decision Agent 14. These records may be consulted later, for example, by a Demand Agent 16 that is  
20 calculating historical demand for a product.

#### Demand Agent

\*\*\*\*\*

Referring to Figure 7, a Demand Agent 16 comprises the functional  
25 components of:

- a Unique ID 112,
- a Personal Agent Reference 114,

-42-

a Market Reference 116,  
a Datetime Range function 118,  
a Demand Query 120,  
and a Log function 122.

5           A Demand Agent 16 acts on behalf of a provider user, as instructed by the provider's Personal Agent 13, to search out and collect information from the Agent System 10 that helps the provider quantify consumer demand and helps target specialized advertisements to a group of consumers. A provider may have multiple Demand Agents 16 active within Agent System 10 at any time. For  
10           example, a provider may have one Demand Agent 16 calculating historical demand over the past month for a certain model of sports shoe, and have another Demand Agent 16 searching for consumers who have purchased sports shoes in the past month to receive ads for sports socks.

          A Unique ID function 112 maintains an identifier that uniquely identifies  
15           this agent within Agent System 10. Unique ID 112 is generated automatically when the agent is created, and is never reused to identify a different agent, even if the original agent ceases to exist within Agent System 10. Unique ID 112 carries no information that reveals the human "owner" of this agent. Unique ID 112 is used to address messages to the agent.

20           A Personal Agent Reference 114 holds a copy of the Unique ID 50 of provider Personal Agent 13 that controls this Demand Agent 16. Personal Agent Reference 114 is used to address messages to the controlling Personal Agent 13.

          A Market Reference 116 indicates in which Market 18 or Markets 18 that Demand Agent 16 should search.

25           A Datetime Range function 118 indicates that demand should be quantified over the date/time range specified; i.e., only Decision Agents 14 that were (or are)

-43-

active during the datetime range specified should be searched when quantifying demand.

A Demand Query 120 describes a product or product category query that can be matched against the Queries 106 of Decision Agents. Demand Query 120 is similar to a Decision Agent's Query 106, except that a Demand Query 120 is matched against other queries (Decision Agent Queries 106), whereas a Decision Agent's Query 106 is matched against product advertisements. Demand Query 120 causes the selection of Decision Agents 14 whose queries are searching for certain products or product categories.

A Log function 122 stores records of the activities of Demand Agent 16 for later consultation by other components of Agent System 10.

### Market

-----

Referring back briefly to Figure 2, recall that there are a variable number of Markets 18 within Agent System 10. The Markets 18 are of two basic kinds, General Markets and Restricted Markets, which have similar structure. Referring now to Figure 8A, a Market 18, of either the General or Restricted kind, is comprised of various functional components:

- a Product Listing function 124,
- a Cross Reference (Xref) Manager function 126,
- a Sell Ad Manager function 128,
- a Buy Ad Manager function 130,
- an Active Demand Agent Manager function 132,
- a Template Dispenser function 134,
- a Query Logger function 136,
- an Historical Demand Search Engine function 138.

-44-

some number of Remote Database Adaptors 140,  
and an Authorization function 142.

Market 18 corresponds to a traditional broad product category, such as Home Appliances, Office Supplies, Groceries, Consumer Electronics, Residential  
5 Real Estate, Commercial Real Estate, etc. The major purposes of a Market 18 are to maintain the advertisements (ads) for products of that market, to provide the capability for specialized agents to search the advertisements, and to collect data about searches for later demand calculations.

A Product Listing function 124 maintains a list of the products that can be  
10 advertised in this market. Each product references detailed product data that is kept in a Product Database (PDB) 32 described in conjunction with Figure 9A.

Referring again to Figure 8A, a Cross Reference (Xref) Manager function 126 maintains, upon command from a System Administrator, cross references to other Markets 18 that carry similar products.

15 A Sell Ad Manager function 128 accepts advertisements of offers to sell that are submitted by users' Personal Agents 12. A Buy Ad Manager function 130 accepts advertisements of offers to buy that are submitted by users' Personal Agents 12. Both consumers and providers may place ads for selling or buying in a Market 18.

20 The structure of both Sell Ad Manager 128 and Buy Ad Manager 130 are similar, the difference being the kind of advertisements that are accepted. Referring to Figure 8B, either kind of Ad Manager comprises the functional components:

an Ad Indexing function 144,  
25 an Active Ads function 146,  
a Future Ads function 148,  
an Expired Ads function 150,



-45-

an Active Decision Agent Manager function 152,  
and an Expired Decision Agent Manager function 154.

Continuing to refer to Figure 8B, an Ad Indexing function 144 maintains indexes for quick searching of the ads by, for example, brand name, UPC code,  
5 product name, vendor name, etc.

An Active Ads function 146 maintains the ads that are currently active. As each new add is accepted by Active Ads function 146, an Active Decision Agent Manager 152 (see below) is notified so that pending searches can be matched against the new advertisement.

10 A Future Ads function 148 maintains ads that have been submitted to the Market, but are not yet active because their effective datetime has not yet been reached. These ads are moved to Active Ads when their starting datetime is reached.

An Expired Ads function 150 maintains an archive of ads that have  
15 expired, for later analysis by other components.

An Active Decision Agent Manager function 152 maintains a list of all Decision Agents 14 that are currently searching this Market 18 for products. Provider's Demand Agents 16 refer to Active Decision Agent Manager 152 while calculating current (or instantaneous) demand.

20 Referring to Figure 8C, Active Decision Agent Manager 152 comprises a number of functional components:

an Immediate Agents function 156,  
a Basic Search Engine function 158,  
a Pending Agents function 160,  
25 an Incremental Search Engine 162,  
and a Current Demand Search Engine 164.

-46-

An Immediate Agents function 156 keeps track of Decision Agents 14 that are performing an immediate search. An immediate search is a search that is to be performed and results returned as soon as practical. Immediate Agents function 156 uses a Basic Search Engine function 158 to execute the query associated with each incoming Decision Agent 14. For example, a Decision Agent 14 might present a query to find a certain brand of sports shoe within a certain price range. Basic Search Engine 158 consults Active Ads 146 to match the query against all active ads. After the immediate search is complete, if there will not be an extended search, Active Decision Agent Manager 152 moves the Decision Agent 14 to Expired Decision Agent Manager 154 (see below). If there will be an extended search, Active Decision Agent Manager 152 delivers the Decision Agent 14 to Pending Agents 160.

Continuing to refer to Figure 8C, a Pending Agents function 160 keeps track of Decision Agents 14 that are performing an extended search. An extended search is a search that remains active for an extended but specific period of time. Results from an extended search may be returned periodically during the time that the search remains active. Pending Agents 160 is notified by Active Ads 146 when a new advertisement enters the market, and uses an Incremental Search Engine 162 to match each new advertisement against the queries of the pending extended Decision Agents 14. In this way pending Decision Agents 14 are matched against ads, especially limited time special offer ads of providers, that enter the system later than the Decision Agent. Pending Agents 160 also arranges to expire Decision Agents 14 at the end of their expiry time, and to move them to Expired Decision Agent Manager 154 (see below).

A Current Demand Search Engine 164 matches demand queries of Demand Agents 16 against the queries of Decision Agents 14 that are residing in Immediate

-47-

Agents 156 or Pending Agents 160, to identify active Decision Agents 14 that are searching for a certain product or product category.

Referring back to Figure 8B, an Expired Decision Agent Manager function 154 maintains a list of Decision Agents 14 that are expired, that is, Decision Agents 14 that have completed their searches, whether successfully or not. The expired Decision Agents themselves are archived under the control of the consumer Personal Agent 12 that created them. Expired Decision Agent Manager 154 maintains indexes on the expired agents for quick searching by Producer's Demand Agents 16 that are, for example, calculating historical demand for a product.

Referring again to Figure 8A, an Active Demand Agent Manager function 132 maintains a list of all Demand Agents 16 that are currently calculating demand in this Market 18.

A Template Dispenser function 134 retrieves the Product Template 174 for a particular product. Product Template 174 describes the data that is available within the system about the particular product. Personal Agents 12 or 13 use the Template Dispenser 134 when consumers or providers are constructing ads or product search queries. Template Dispenser 134 consults the Product Template Manager 170 in a Product Database 32 (described in conjunction with Figure 9A) to collect the template data.

A Query Logger function 136 archives summary information about queries performed by Basic Search Engine 158 or Incremental Search Engine 162, so that historical data about queries may be quickly accessed without having to access the detailed data archived by the searching agent. For example, summary information about queries launched by Decision Agents 14 are logged so that Demand Agents 16 can perform routine demand calculations without having to access the archived Decision Agents 14.

-48-

An Historical Demand Search Engine 138 matches demand queries of Demand Agents 16 against the queries that have been previously logged by Query Logger 136, to identify Decision Agents 14 that previously, during a specified datetime range, had searched for a certain product or product category.

5 A Remote Database Adaptor 140 provides communication and session management services to connect to a database (a "remote database", not shown) belonging to a manufacturer or a provider. Remote Database Adaptor 140 also provides translation services to translate between the data formats used by a remote database and the data formats used by PDB 32. Remote Database Adaptor  
10 140 allows a provider to submit ads directly from the provider's remote database into Market 18. Remote Database Adaptor 140 also allows access "by reference" to advertisement data that remains stored in a remote database; that is, the data is not copied into Agent System 10, but is accessed as needed. Market 18 includes a Remote Database Adaptor 140 for each provider that chooses to supply ads in this  
15 manner; alternatively, a provider uses various functional components accessed via provider's Personal Agent 13 to place ads manually.

An Authorization function 142 restricts the placement and searching of ads in the Market 18 to authorized users only. General Markets 18a allow any authorized user of the system to place and search ads. A Restricted Market 18b  
20 allows market access only to certain authorized users of the system. For example, a Restricted Market might be used by wholesalers marketing exclusively to distributors.

#### Product Database

25

Referring to Figure 9A, a Product Database 32 (PDB) comprises functional components:

-49-

a Database Administration function 166,  
a Product Data Storage function 168,  
a Product Template Manager function 170,  
and, (optionally) some number of Remote Database Adaptors 172.

5 PDB 32 maintains generic data about products, to be referenced by ads placed by providers. Although PDB 32 is illustrated here as a single database (with several internal components) for ease of understanding, the contemplated PDB 32 will be split across several processors 38, as illustrated previously in Figure 3A.

Referring to Figure 9A, a Database Administration function 166 provides  
10 conventional add, delete, update, query, and backup access for a System Administrator user to the other components of PDB 32.

A Product Data Storage function 168 stores data about different products, for example, product name, product model number, manufacturer's suggested retail price for product, etc.

15 A Product Template Manager function 170 maintains a set of Product Templates 174, one for each product listed in PDB 32. Product Template 174 describes the kinds of data that is kept in PDB 32 for a product. PDB 32 makes Product Templates 174 available to other components, for example, a Template Dispenser 134 as illustrated in Figure 8A. Referring now to Figure 9B, Product  
20 Template 174 is comprised of a number of Product Template Entries 176 and, optionally, some Instructions for Use 178. Instructions for Use 178, if any, may be presented to the user when the user is supplying values for Product Template 174, to help the user decide what values to choose. A Product Template Entry 176 describes one property of a product. Referring to Figure 9C, Product Template  
25 Entry 176 comprises several data components. A Keyword 180 names the property, for example, "Model Number" or "Brand Name". A Specification 182 indicates how values may be specified for the property, for example, as an integer

-50-

number, as a text string, as one item from an enumeration, etc. A set of Use Flags 184 indicate where the property is used, for example, when entering an ad, or when composing a search query. Product Template Manager 170 consults Use Flags 184 when collecting a set of Product Template Entries 176 to satisfy a  
5 request from Template Dispenser 134. Referring to Figure 9D, there is shown an example of some Product Template Entries 176 for a hypothetical television set product, including sample values that would be stored in PDB 32. As illustrated, some products will contain advocate information. Some advocate information may be a ranking done by an independent rating organization. Another kind of advocate  
10 information is an endorsement by a person or organization.

Referring again to Figure 9A, a Remote Database Adaptor 172 provides communication and session management services to connect to a product database (a "remote database", not shown) belonging to a manufacturer or a provider. Remote Database Adaptor 172 also provides translation services to translate  
15 between the data formats used by a remote database and the data formats used by PDB 32. Remote Database Adaptor 172 is used to provide product data in real-time for manufacturers or providers that choose not to maintain product data directly in PDB 32 of Agent System 10, or to periodically update product data that is maintained directly in PDB 32. PDB 32 includes a Remote Database Adaptor  
20 172 for each manufacturer or provider that chooses to supply product data in this manner; alternatively, a System Administrator may use Database Administration function 166 to maintain the data based on instructions from a manufacturer or provider.

25

**Advertisement (Ad)**  
-----

-51-

An advertisement (ad) is an offer to sell or buy a product. A placer is the user (person or organization) who is selling or buying.

Referring to Figure 10, a preferred embodiment of Ad 186 comprises various data components:

- 5 a Unique ID 188,
- a Buy/Sell Flag 190,
- a Reference to Placer component 192,
- a Reference to Market component 194,
- a Reference to Product Listing component 196,
- 10 a Product Template Value component 198,
- a Description component 200,
- a Price component 202,
- a Start Datetime component 204,
- and an Expiry Datetime component 206.

15 A Unique ID component 188 uniquely identifies this advertisement within Agent System 10. Unique ID 188 is generated automatically when the advertisement is created, and is never reused to identify a different ad, even after the advertisement is expired.

20 A Buy/Sell Flag 190 indicates that this advertisement is either an offer to buy or an offer to sell a product.

A Reference to Placer component 192 identifies the provider Personal Agent 13 of the user placing Ad 186.

A Reference to Market component 194 identifies a Market 18 in which Ad 186 is placed.

25 A Reference to Product Listing component 196 refers to standard data about the product in Product Listing 124 of Market 18. Brand name,

-52-

manufacturer, manufacturer's suggested retail price, etc. are examples of standard data.

5 A Product Template Values component 198 holds values, corresponding to the Product Template 174, that the placer specified when composing the advertisement. Offering price and locations of stores that carry the product are examples of values.

A Description component 200 holds additional data, not in Product Listing 124 nor in Product Template Values 198, that the placer wishes to make known about the product.

10 A Price component 202 states the price at which the product is offered (for selling) or requested (for buying). Price 202 may also be a price range, especially for buy ads.

A Start Datetime component 204 states the date and time at which the advertisement becomes effective, that is, the point at which the advertisement will  
15 be visible to Decision Agents 14 that are searching the market for products.

An Expiry Datetime component 206 states the date and time at which the advertisement expires, that is, the point at which the advertisement will no longer be visible to Decision Agents 14 that are searching the market for products.

20 However, even after expiry, the advertisement is accessible through an Ad Archive 96.

### Flow Charts

-----

25 The flow charts indicate the functional component primarily responsible for carrying out a given task. For example, "Decision Composer" listed in the top part of a step means that the recited task is carried out by Decision Composer function



-53-

74 (see Figure 11). The flow charts also use subroutines to make it easier to follow high-level flows.

All communication between a user (either a consumer user or a provider user) and Agent System 10 is mediated by user's Personal Agent 12 or 13. The flow charts and descriptions sometimes illustrate or state that a component receives input from the user or directs output to the user. These statements should be understood to mean that the component carries out the communication with the help of user's Personal Agent 12 or 13.

Some Figures illustrate example screen layout for input and output using a Web browser interface. Underlined text represents hyperlinks.

Simple, conventional processes are not illustrated by flow charts. For example, the process whereby a user invokes Ad Tracker 94 to view the status of active ads placed by the user is not shown, since this type of process is well-known to practitioners.

### Product Search

-----

One of the major consumer uses of Agent System 10 is to assist a consumer in locating information about a product that is advertised for sale. It need not be possible for the consumer to carry out the actual purchase within Agent System 10; it is only necessary that products be advertised within the system. However, when secure electronic transactions are available, it is anticipated that consumers will make actual purchases through the system. The product search process, while directly helping consumers, also generates consumer market data that is so crucial to providers. This data tells providers the products for which consumers are searching, the criteria that are important to those consumers, and how many consumers are searching the various markets.

-54-

Referring to Figure 11, an overall method according to the present invention for searching for a product is referred to generally by reference numeral 220. When a user acting as a consumer decides to search within Agent System 10 for a product or product category, the consumer establishes a communications session with consumer's Personal Agent 12 (steps 222 - 224). Typically the consumer, using a personal computer, connects to consumer's Internet access provider, directs consumer's Web browser software to Agent System's electronic address (known as a URL), and enters a login name and password. A sample login screen is illustrated in Figure 39.

Referring again to Figure 11, the consumer specifies that a product search is desired, which invokes Decision Agent Manager 60 (step 226) to supervise the subsequent steps. A Compose Decision Query subroutine of Decision Composer 74 is called to assist the consumer in composing the query for the desired product (step 228).

Referring now to Figure 12A, there is shown a method for a Compose Decision Query subroutine, referred to generally by reference numeral 228. If the consumer wishes to specify a search that is similar to a previously performed search, Decision Agent Archive 80 displays a list of search queries from expired Decision Agents from which the consumer may select (steps 242 - 246). Decision Composer retrieves the Product Template mentioned in the selected Decision Agent, and also the current instructions, from the Market mentioned in the selected Decision Agent (step 248). The search criteria (values) from the expired Decision Agent are used to initialize the new search criteria (step 250).

Still referring to Figure 12A, if the consumer alternatively wishes to specify an entirely new search, the consumer selects a Market 18 in which to search (step 252). If the selected Market is a Restricted Market for which the consumer is not authorized, an error message is displayed to the consumer, and the

-55-

consumer is returned to the initial menu where another action may be selected (steps 254 - 260). If the consumer is authorized for the restricted Market, or if the Market is not restricted, the consumer selects a product for which to search (step 262). Decision Composer 74 retrieves Product Template and instructions from the Market's Template Dispenser 134 (step 264).

At this point Decision Composer 74 arranges to format and display the Product Template and the instructions (step 266). The consumer, following the instructions, completes the search criteria in the Product Template (step 268). When the consumer's interface is a Web browser, the Product Template is typically displayed as a combination of fill-in fields, selection lists, radio buttons, etc. as illustrated in the sample screens of Figure 40 (searching for consumer electronics) and Figure 41 (searching for automobiles).

Referring to Figure 12B, if the consumer wishes to perform an extended search, that is, a search that will continue for a period of time, the consumer enters a period of time for the search to continue (step 272). The extended search continues even when the consumer is not "on-line", that is, even when the consumer is not participating in a communication session with the Agent System. Search results are collected, as described below, for later delivery to the consumer. Alternatively, the consumer may instead choose an immediate search, that is, a search that will return results as soon as possible (step 274). The consumer need not be on-line to receive results from an immediate search; the results may be delivered later. The consumer may select a delivery media (e-mail, Web page display, etc.) and a delivery time and period (e.g., 6:00 p.m. daily, Monday noon weekly, etc.), or default media and time is noted (steps 276 - 280). At this point the Decision Query composition is complete (step 282).

Referring briefly to Figure 11, Decision Agent Factory 76 invokes a Create Decision Agent subroutine to create a new Decision Agent 14. Referring now to

-56-

Figure 13, a Create Decision Agent subroutine is referred to generally by reference numeral 230. Decision Agent Factory 76 creates a new Decision Agent 14 possessing a unique identifier (step 288). This unique identifier can be used to send messages to the agent even after the agent has expired (completed its task).

5 Decision Agent Factory 76 also initializes the other data components of the new agent by storing a reference to the Personal Agent of the consumer, a reference to the Market that is to be searched, the search expiry time, the delivery media, time, and period, and the query (search criteria) (step 290). Decision Agent Factory 76 logs the creation of the new agent with the new agent's Log function (step 292).

10 Now the new Decision Agent 14 is ready to be launched.

Referring again to Figure 11, Decision Agent Factory 76 delivers the new Decision Agent to the specified Market (step 232), where an Accept New Decision Agent subroutine is invoked (step 234). Referring now to Figure 14, an Accept New Decision Agent subroutine is referred to generally by reference numeral 234.

15 Active Decision Agent Manager 152 of the Sell Ad Manager 128 or Buy Ad Manager 130, as appropriate, accepts the new agent, logs the query from the agent to the Market's Query Logger function, and adds the agent to a queue of Immediate Agents 156 (steps 298 - 302).

20 Referring back to Figure 11, Decision Agent 14 is now ready to perform the search for a product according to the consumer's criteria, so it invokes a Perform Decision Search subroutine (step 236). Referring to Figure 15, a Perform Decision Search subroutine is referred to generally by reference numeral 236.

Decision Agent 14 performs an immediate search by invoking a Perform Immediate Search subroutine (step 308). Even if an extended search is chosen by  
25 the consumer, an immediate search is done first to get initial results. Because the data to be searched resides within Agent System 10 or is easily and directly

-57-

accessible to Agent System 10, the search process can be faster than a search that employs agents which visit multiple Web sites or databases over the Internet.

Referring now to Figure 16, a Perform Immediate Search subroutine is referred to generally by reference numeral 308. An immediate search begins when Immediate Agents selects the next Decision Agent from its internal queue (step 320). Immediate Agents delivers the query from the chosen Decision Agent to Basic Search Engine 158 (step 322). Basic Search Engine 158 uses conventional database techniques to match the query against the ads in Active Ads, noting the ads that satisfy the query (step 324). The Decision Agent's Response Manager 108 collects references (step 326) to the matching ads found by Basic Search Engine. The Response Manager also sends a response to the Personal Agent that placed the advertisement (if the placer so desired and marked in the ad), providing real-time feedback to the placer. Immediate Agents then removes the Decision Agent from its internal queue and gives the Decision Agent back to Active Decision Agent Manager 152 (step 328).

Referring back to Figure 15, if an extended search was chosen by the consumer, Active Decision Agent Manager delivers the Decision Agent to Pending Agents (step 312), so that the query of the Decision Agent will continue to be matched against incoming ads until the Decision Agent's expiry time is reached. If the consumer chose only an immediate search, an End Decision Search subroutine is called to end the search (step 314).

Referring to Figure 17, an End Decision Search subroutine is referred to generally by reference numeral 314. The Decision Agent is removed from the queue of Immediate Agents (if the agent was performing an immediate search) or Pending Agents (if the agent was performing an extended search), and is delivered back to Personal Agent's Decision Agent Manager (step 334). Decision Agent Tracker 78 logs the end of the search (step 336). Decision Agent's Response

-58-

Manager 108 may still have undelivered search results. The results are held by the Response Manager until the consumer's specified delivery time arrives.

Referring now to Figure 18, an Extended Search subroutine is generally referred to by reference numeral 340. An episode of extended search begins each  
5 time a new advertisement arrives in a Market 18 (step 342). If there are no Decision Agents in Pending Agents (steps 344 - 346), there is no work to be done. However, if there are one or more Decision Agents pending for an extended search, the next agent is selected from the queue (step 348). If the agent's expiry time has been reached since the last sweep through the queue, the agent's search is  
10 stopped (step 352) with the End Decision Search subroutine previously illustrated. There is also a process (not shown) that periodically sweeps the queue and ends agents' searches, in case there is not enough advertisement activity in this market to activate Pending Agents on a regular basis. If the selected agent is not expired, Incremental Search Engine matches the agent's query against the data in the new  
15 advertisement (step 354). If the advertisement satisfies the query, Response Manager includes this advertisement in its list of results (steps 356 - 358), and notifies (if the advertisement so indicates) the placer of the advertisement that the advertisement was selected. This search process is repeated for each agent in Pending Agents.

Referring now to Figure 19, a Deliver Search Results subroutine is referred  
20 to generally by reference numeral 360. Immediate search results are delivered to the consumer when the consumer's desired delivery time is reached (which may be immediately if the consumer has so requested). Intermediate results from extended searched are delivered periodically according to the consumer's desired delivery  
25 period. When the desired delivery time is reached (step 362), Preference Manager 54 organizes the not-yet-delivered results according to the consumer's preferences (step 364). For example, results that mention favored brands are ordered before

-59-

results with less favored brands. Delivery Manager 56 formats the responses according to the consumer's desired delivery media (step 366). For example, if the consumer's desired delivery media is the Web, a Web page in HTML is generated. For another example, if the consumer desires e-mail delivery, a suitable  
5 representation is generated. When formatting is complete, Delivery Manager 56 arranges the actual delivery of the search results (step 368). If the Decision Agent has completed its search, no more results will be forthcoming, so a subroutine Expire Decision Agent expires the Decision Agent (steps 370 - 372).

Referring to Figure 20, an Expire Decision Agent subroutine is referred to generally by reference numeral 372. When a Decision Agent is expired, Expired  
10 Decision Agent Manager 154 logs the expired Decision Agent (step 378) so that Demand Agents can easily search through the expired Decision Agents of this market when calculating historical demand. The Decision Agent Tracker 78 notes that the agent is now expired (step 380), and the agent is permanently archived in  
15 Decision Agent Archive 80 (step 382).

### Quantify Demand

-----

Quantifying demand is a major activity of Agent System 10. Demand is a  
20 measure of the number of consumers interested in purchasing a product or interested in products in a category. Providers may quantify current demand or historical demand. Current demand measures the count of consumers that are currently searching for a product or searching within a product category. Historical demand measures the count of consumers that have searched for a  
25 product, or searched within a product category, during a previous time period. Agent System 10 can not only calculate demand, it can also deliver a means of contacting those consumers (without revealing the actual identity of those

-60-

consumers). The demand search uses data that is generated by consumers as they search for products in the system.

Referring to Figure 21, an overall method according to the present invention for quantifying demand is referred to generally by reference numeral 386. When a user acting as a provider decides to quantify demand (perform a demand search) within Agent System 10 for a product or product category, the provider establishes a communication session with provider's Personal Agent 13 (steps 388 - 390). Typically the provider, using a personal computer, connects to provider's Internet access provider, directs provider's Web browser software to Agent System's electronic address (known as a URL), and enters a login name and password. A sample login screen has already been illustrated in Figure 39.

Referring to still to Figure 21, the provider specifies that a quantify demand function is desired, which invokes Demand Agent Manager 62 (step 392) to supervise the subsequent steps. A Compose Demand Query subroutine of Demand Composer 82 is called to assist the provider in composing the query that will gather the demand data (step 394).

Referring now to Figure 22, a Compose Demand Query subroutine is referred to generally by reference numeral 394. If the provider wishes to specify a demand search that is similar to a previously performed search, Demand Agent Archive 88 displays a list of search queries from expired Demand Agents from which the provider may select (steps 408 - 412). Demand Composer 82 retrieves the Product Template mentioned in the selected Demand Agent, and also the current instructions, from the Market mentioned in the selected Demand Agent (step 414). The search criteria (values) from the expired Demand Agent are used to initialize the new search criteria (step 416).

Still referring to Figure 22A, if the provider alternatively wishes to specify an entirely new search, the provider selects a Market 18 in which to search (step



-61-

418). If the selected Market is a Restricted Market for which the provider is not authorized, an error message is displayed to the provider, and the provider is returned to the initial menu where another action may be selected (steps 422 - 426). If the provider is authorized for the restricted Market, or if the Market is not  
5 restricted, the provider selects a product for which to search (steps 428). Demand Composer 82 retrieves Product Template and instructions from the Market's Template Dispenser 134 (step 430).

At this point Demand Composer 82 arranges to format and display the Product Template and the instructions (step 432). The provider, following the  
10 instructions, completes the search criteria in the Product Template (step 434). When the provider's interface is a Web browser, the Product Template is typically displayed as a combination of fill-in fields, selection lists, radio buttons, etc. For example, the provider might use screens similar to the sample consumer screens previously illustrated in Figures 40 and 41.

Referring to Figure 22B, the provider selects the type of demand to  
15 quantify (step 436). If the provider chooses to quantify current demand, Demand Composer fills in the datetime range to indicate that only currently active Decision Agents should be searched (steps 438 - 440). If the provider chooses to quantify historical demand, the provider selects a datetime range (steps 442 - 444) to  
20 indicate that only Decision Agents that were active during that datetime range should be searched. The provider may select a delivery media (e-mail, Web page display, etc.) and a delivery time and period (e.g., 6:00 p.m. daily, Monday noon weekly, etc.), or default media and time is noted (steps 446 - 450). At this point the Demand Query composition is complete (step 452).

Referring briefly to Figure 21, Demand Agent Factory 84 invokes a Create  
25 Demand Agent subroutine to create a new Demand Agent 16 (step 396). Referring now to Figure 23, a Create Demand Agent subroutine is referred to generally by

-62-

reference numeral 396. Demand Agent Factory 84 creates a new Demand Agent 16 possessing a unique identifier (step 458). This unique identifier can be used to send messages to the agent even after the agent has expired (completed its task). Demand Agent Factory 84 also initializes the other data components of the new agent by storing a reference to the Personal Agent of the provider, a reference to the Market that is to be searched, a datetime range indicating that only Decision Agents that were (are) active during that datetime range should be searched, the delivery media, time, and period, and the query (search criteria) (step 460).

5 Demand Agent Factory 84 logs the creation of the new agent with the new agent's Log function (step 462). Now the new Demand Agent 16 is ready to be launched.

Referring again to Figure 21, Demand Agent Factory 84 delivers the new Demand Agent to the specified Market (step 398), where an Accept New Demand Agent subroutine is invoked (step 400). Referring now to Figure 24, an Accept New Demand Agent subroutine is referred to generally by reference numeral 400. Active Demand Agent Manager 132 of the Market accepts the new agent, and logs the query from the agent to the Market's Query Logger 136 function (steps 468 - 470).

Referring back to Figure 21, Demand Agent 16 is now ready to perform the search for Decision Agents 14 that satisfy the provider's criteria, so it invokes a Perform Demand Search subroutine (step 402). Referring to Figure 25, a Perform Demand Search subroutine is referred to generally by reference numeral 402. Demand Agent 16 determines if the search is for current or historical demand, and invokes an appropriate subroutine, either a Perform Current Demand subroutine, or a Perform Historical Demand subroutine (steps 476 - 480).

Referring now to Figure 26, a Perform Current Demand subroutine is referred to generally by reference numeral 478. Demand Agent 16 delivers its query to a Current Demand Search Engine 164 (step 490). Current Demand

-63-

Search Engine 164 matches the query, using conventional database techniques, against the Decision Agents that are listed in Immediate Agents 156 and Pending Agents 160 (step 492), as these Decision Agents are the ones that are currently searching for products. During the search, Current Demand Search Engine 164  
5 collects references to Decision Agents 14 whose queries satisfy the query of the Demand Agent 16. For example, if the Demand Agent is looking for consumers who are currently looking for sports shoes, the Current Demand Search Engine will collect references to Decision Agents that are searching for sports shoes. Current Demand Search Engine 164 delivers the collected list of references to the  
10 Demand Agent (step 494). When the search is complete, Demand Agent notifies Active Demand Agent Manager 132 that the search is complete (step 496).

Referring now to Figure 27, a Perform Historical Demand subroutine is referred to generally by reference numeral 480. Demand Agent 16 delivers its query to an Historical Demand Search Engine 138 (step 502). Historical Demand  
15 Search Engine 138 matches the query, using conventional database techniques, against the expired queries that are kept in Query Logger 136 (step 504). During the search, Historical Demand Search Engine 138 collects references to expired queries, and the Decision Agents to which they belong, that were active during the specified datetime range of the Demand Agent's query and that otherwise satisfy  
20 the Demand Agent's query. Historical Demand Search Engine 138 delivers the collected list of references to the Demand Agent (step 506). When the search is complete, Demand Agent notifies Active Demand Agent Manager 132 that the search is complete (step 508).

Referring back to Figure 25, the search is complete, so Active Demand  
25 Agent Manager 132 delivers the Demand Agent back to Personal Agent's Demand Agent Manager 62 (step 482), and Personal Agent's Demand Agent Tracker 86 logs the search completion (step 484). The demand search results are held by the

-64-

Demand Agent 16 until the provider's desired delivery time (which may be immediately if the provider has so requested).

The search has now ended. It remains for Demand Agent 16 to deliver the demand search results to the provider. Referring to Figure 28, a Deliver Demand  
5 Results subroutine is referred to generally by reference numeral 512. When the desired delivery time is reached (step 514), Preference Manager 54 organizes the not-yet-delivered results according to the provider's preferences (step 516). For example, the provider may prefer to see only numeric totals, or the provider may prefer to see a detailed listing of all the Decision Agent queries that satisfied the  
10 demand search. Delivery Manager 56 formats the responses according to the provider's desired delivery media (step 518). For example, if the provider's desired delivery media is the Web, a Web page in HTML is generated. If the provider desires e-mail delivery, a suitable representation is generated. When formatting is complete, Delivery Manager 56 arranges the actual delivery of the  
15 search results (step 520). The Demand Agent has completed its task, so it can be expired (step 522).

Referring to Figure 29, an Expire Demand Agent subroutine is generally referred to by reference numeral 522. The Demand Agent Tracker 86 notes that the agent is now expired (step 528), and the agent is permanently archived in  
20 Demand Agent Archive 88 (step 530).

#### Place Ad

-----

Both providers and consumers may place ads in Agent System 10. An  
25 advertisement may be an offer to sell or an offer to buy. A placed advertisement becomes effective at a particular time and expires at a particular time, and searching Decision Agents consider an advertisement only during the ad's effective

-65-

time. Even after ads expire, they may be accessed for historical reasons. Users may place ads manually, or they may cause ads to be loaded from or referenced from remote systems via a remote database adapter. Referring to Figure 30, an overall method according to the present invention for placing a sell or buy advertisement is referred to generally by reference numeral 534. When a provider (a user acting in the role of a provider) desires to place an advertisement manually within Agent System 10 for a product, the provider establishes a communication session with provider's Personal Agent 13 (steps 536 - 538). Typically the provider, using a personal computer, connects to provider's Internet access provider, directs provider's Web browser software to Agent System's electronic address (known as a URL), and enters a login name and password. A sample login screen has already been illustrated in Figure 39.

Referring to Figure 30, the provider invokes Sell Ad Manager 128 or Buy Ad Manager 130 as appropriate (step 540) to supervise the subsequent steps of placing the advertisement. A Compose Ad subroutine of Ad Composer 90 is called to assist the provider in composing the advertisement (step 542).

Referring now to Figure 31, a Compose Ad subroutine is referred to generally by reference numeral 542. The provider selects the type of ad: a sell advertisement (an offer to sell) or a buy advertisement (an offer to buy) (step 552). If the provider wishes to compose an advertisement that is similar to a previously placed ad, Ad Archive 96 displays a list of expired ads from Ad Archive 96 from which the provider may select (steps 554 - 558). Ad Composer 90 retrieves the Product Template mentioned in the selected ad, and also the current instructions, from the Market mentioned in the selected advertisement (step 560). The values from the selected advertisement are used to initialize the new advertisement (step 562).

-66-

Still referring to Figure 31A, if the provider alternatively wishes to specify an entirely new ad, the provider selects a Market 18 in which the advertisement will be placed (step 564). If the selected Market is a Restricted Market for which the provider is not authorized, an error message is displayed to the provider, and  
5 the provider is returned to the initial menu where another action may be selected (steps 566 - 570). If the provider is authorized for the restricted Market, or if the Market is not restricted, the provider selects a product for which to search (steps 568 - 574). Ad Composer 90 retrieves Product Template and instructions from the Market's Template Dispenser 134 (step 576). If the particular product is not listed  
10 in the Market, the provider instead indicates a "generic" ad, and Template Dispenser 134 supplies a generic template that can be used for any product suitable for the Market.

Ad Composer 90 arranges to format and display the Product Template and the instructions (step 578). The provider, following the instructions, selects and  
15 enters values describing the product in the Product Template (step 580), adding additional description if desired. When the provider's interface is a Web browser, the Product Template is typically displayed as a combination of fill-in fields, selection lists, radio buttons, etc. as illustrated in the sample screen of Figure 42.

Referring again to Figure 31B, the provider enters the price for the product  
20 (step 582). Generally, a sell advertisement will contain a specific price for the product, while a buy advertisement will contain a price range. The provider specifies the datetime that the advertisement should become effective and the datetime that the advertisement should expire (step 584). This allows providers to compose batches of ads ahead of time, for example with lower prices during a  
25 sale, and arrange for the ads to become affective when the sale starts. For receiving responses to the ad, the provider may select a delivery media (e-mail, Web page display, etc.) and a delivery time and period (e.g., immediately, 6:00

-67-

p.m. daily, Monday noon weekly, etc.), or default media and time is noted (steps 586 - 590). At this point the advertisement composition is complete (step 592), and Ad Composer 90 can create the actual advertisement with a Create Ad subroutine (step 594).

5 Referring now to Figure 32, a Create Ad subroutine is referred to generally by reference numeral 594. Ad Composer 90 creates a new Ad 186 possessing a unique identifier (step 600). This unique identifier can be used to access Ad 186 even after the advertisement has expired. Ad Composer 90 indicates that this is a buy advertisement or sell advertisement. Ad Composer 90 also inserts values (step  
10 602) for the other data components as specified by the provider in previous steps: Template Values, Description, Price, Start and Expiry Datetime. Ad Composer 90 inserts references to the Personal Agent 12 or 13 that is controlling the advertisement creation, and to the Personal Agent 12 or 13 of the principal (buyer or seller). Ad Composer 90 notes in which Market 18 the advertisement is to be  
15 placed, and inserts a reference to the standard data about the product from the Product Listing 124. Ad Tracker 94 logs the creation of the new Ad 186 (step 604). Now the new Ad is ready to be delivered.

Referring again briefly to Figure 30, Ad Delivery function 92 delivers the newly created Ad 186 to the Sell Ad Manager 128 or Buy Ad Manager 130, as  
20 appropriate, of the provider's chosen Market (step 544), and the Ad Manager invokes an Accept New Ad subroutine to incorporate the new advertisement (step 546).

Referring now to Figure 33, an Accept New Ad subroutine is referred to generally by reference numeral 546. Sell Ad Manager 128 or Buy Ad Manager  
25 130, as appropriate, accepts the Ad 186 and checks the ad's Start Datetime to see if the advertisement should become active (effective) now. (steps 612 - 614). If it is not time for the advertisement to become effective, the advertisement is passed

-68-

to Future Ads 148, which holds the advertisement until the appropriate future time (step 616). Future Ads arranges to give the advertisement back to the appropriate Ad Manager for activation at the appropriate time.

5 If it is time for the advertisement to become active, Active Ads 146 inserts the advertisement into its internal queue and Ad Indexing 144 indexes the advertisement for searching (steps 618 - 620). Active Ads notifies Active Decision Agent Manager 152 that a new advertisement has arrived (step 622), so that ongoing extended searches may be matched against the new advertisement.

10 Once Ad 186 is in Active Ads 146, the advertisement is available for searching by Decision Agents 14 that are looking for products. The advertisement remains available for searching until its Expiry Datetime is reached, when Ad Manager invokes an Expire Ad subroutine.

15 Referring now to Figure 34, an Expire Ad subroutine is referred to generally by reference numeral 626. Sell Ad Manager 128 or Buy Ad Manager 130, as appropriate, removes the Ad 186 from Active Ads 146 so that the advertisement is no longer visible to searching Decision Agents 14 (step 628). The indexes for the advertisement are transferred to Expired Ads 150 (step 630) to make historical searches easier. Ad Tracker 94 logs the expiration of the advertisement (step 632). Ad Archive 96 permanently archives the advertisement  
20 (step 634). Even though the advertisement is expired, it can still be referenced out of the Ad Archive for historical searches.

### Target Consumers

-----

25 To "target" a message is to select message recipients according to certain criteria intended to yield recipients that are interested in receiving the information, as opposed to delivering the message to a wider audience where fewer recipients



-69-

are truly interested in the information. Within Agent System 10, targeting consumers is a process of targeting Personal Agents 12 that represent consumers that satisfy the desired criteria. Providers use the targeting process, for example, to send ads to consumers that have previously searched in a particular Market 18  
5 or for a particular product. Providers may also use targeting to offer a product at a different price to a different groups of consumers. Providers might also send market surveys, brand name awareness notices, etc.

Providers can also target consumers who have recently searched a Market 18 to deliver a "reason for sale" or "lost sales" questionnaire. The questionnaire  
10 inquires if the consumer actually bought a product, and if the purchased product was the one offered by the inquiring provider or some other provider. The questionnaire typically includes a list of sales reasons, that is, reasons why the consumer purchased the product or purchased from the inquiring provider. For example, some sales reasons are: price suitable, available in desired color, a  
15 particular special feature, etc. The questionnaire also typically includes a list of lost sales reasons, that is, reasons why the consumer purchased a competing product or purchased from another provider. For example, some lost sales reasons are: price too high, prefer another brand, store location not convenient, etc. The questionnaire may also include a place for general comments from the consumer.  
20 By analyzing returned questionnaires, the provider gains valuable information about why a sale was gained or why a competitor got the sale.

Referring to Figure 35, an overall method according to the present invention for targeting consumers is referred to generally by reference numeral 638. When a provider (a user acting in the role of a provider) desires to target a  
25 message to a select group of consumers, the provider establishes a communication session with provider's Personal Agent 13 (steps 640 - 642). Typically the provider, using a personal computer, connects to provider's Internet access

-70-

provider, directs provider's Web browser software to Agent System's electronic address (known as a URL), and enters a login name and password. A sample login screen has already been illustrated in Figure 39.

Referring again to Figure 35, Target Manager 66 assists the provider in  
5 identifying the target set of Personal Agents that will receive the message by invoking a Target Personal Agents subroutine. Referring to Figure 36, a Target Personal Agents subroutine is referred to generally by reference numeral 644. The provider executes a process of refinement (steps 662 - 670) to collect references to appropriate Personal Agents.

10 The provider may start by quantifying demand, previously described in conjunction with Figure 21, and use the set of consumer Personal Agents 12 thereby identified. For example, the provider may quantify current demand for sports shoes, and collect the Personal Agents that currently have Decision Agents that are looking for sports shoes.

15 Alternatively, the provider may select, from Demand Agent Archive 88, a Demand Agent 16 that previously identified an appropriate set of consumer Personal Agents 12.

As yet another alternative, the provider may use Personal Agent Search Engine 26 to collect references to a set of consumer Personal Agents 12 that have  
20 certain preferences or demographic characteristics. For example, the provider may search for Personal Agents that list a preference for a certain favorite brand, or for Personal Agents whose owners are males between the ages of 25 and 40. Personal Agent Search Engine 26 also identifies Personal Agents that are willing to accept unsolicited notices only if accompanied by a consideration. In this context,  
25 Personal Agent Search Engine 26 automatically filters out Personal Agents that belong to persons or organizations that are no longer users of the system.

-71-

The provider may keep applying search criteria to filter the set of consumer Personal Agents 12 at will, until the provider is satisfied that an appropriate set has been identified. By choosing suitable search criteria, the provider may also select a set of consumers to quantify anticipated or future demand. For example,  
5 the provider may select consumers that have recently searched a real estate market, and anticipate that those consumers will soon desire mortgage lending information.

Referring again to Figure 35, the provider composes the actual message to be sent (step 646). For example, if the provider wants to send an ad, the provider may use the Ad Composer 90 to assist in the composition, using a Compose Ad  
10 subroutine previously described. Other notices, messages, consumer surveys, etc. could also be composed (not shown) for delivery.

The message is delivered to each consumer Personal Agent 12 that was identified with the help of Target Manager 66 (step 648). For example, if the message is an ad, Ad Delivery 92 arranges the delivery.

15 Consumers receive the messages via their Personal Agents 12 and compose replies if they wish (step 650). This may involve filling out an on-line form presented by the provider. The replies are sent back to the originating provider.

The provider may have specified a consideration amount to be paid to consumers that reply to the message (step 652). If so, Target Manager 66 arranges  
20 to send a consideration notice to the consumer Personal Agent 12 of each consumer that replies (step 654). Consideration Account 67 of each consumer receiving a consideration notice credits the consideration account with the amount of the consideration (step 656).

25 **Reject Unsolicited Message**

\*\*\*\*\*

-72-

Even unsolicited advertisements and other unsolicited messages that are rejected by a consumer's Personal Agent 12 become sources of market data to a provider, if the rejection generates a rejection reason back to the provider.

Referring to Figure 37, an overall method according to the present  
5 invention for rejecting an unsolicited message is referred to generally by reference numeral 674. When a consumer's Delivery Manager 56 receives an ad, market survey, notice, or other message that is unsolicited, Delivery Manager 56 matches the data in the message against the preferences maintained by Preference Manager 54 (steps 676 - 678). If the message content does not violate any of the consumer's  
10 preferences, the message is delivered by Delivery Manager 56 in the usual fashion according to the delivery media and delivery time preferences of the consumer (step 682).

If, however, the message content violates the consumer's preference in some way, Delivery Manager 56 composes a rejection message indicating the  
15 reason for rejection, and sends the rejection message back to the Personal Agent 13 of the provider that originated the unsolicited message (steps 684 - 686).

For example, if a provider sends, to Personal Agent 13, an unsolicited advertisement about sports shoes, specifying a consideration amount of fifty cents, and the user has previously specified a consideration preference of seventy-five  
20 cents, Delivery Manager 56 will reject the advertisement and reply with a rejection message indicating that the consideration amount must be at least seventy-five cents.

As another example, perhaps a provider sends an unsolicited advertisement about a Chinese food dinner, and the advertisement does not specify the MSG  
25 content of the food. If the user has specified a preference for "no MSG", Delivery Manager 56 will reject the advertisement and reply with a rejection message indicating that the consumer prefers food without MSG.

-73-

The provider has gained valuable market information about consumer preferences, even though the provider's message was not successfully delivered.

### Simulate Demand

5

Providers may also simulate demand using current market data. To simulate demand is to determine the demand for a hypothetical product or service, or for an actual product or service with different features or pricing.

Referring to Figure 38A, when a provider decides to simulate demand for a product, the provider composes and places an Ad 186 in a Market 18 in the regular fashion, but the provider additionally marks the Ad as "invisible" (step 694). The provider composes the Ad to represent the hypothetical product, or the product with different features or pricing. The Ad is (during its effective datetime) available to be matched by consumers' Decision Agents 14 performing decision searches.

When a searching Decision Agent 14 matches the invisible Ad 186, the Ad is referred to the Response Manager 108 and the Preference Manager 54 ranks the Ad in the normal fashion (steps 696 - 698). However, because the Ad is marked invisible, the Response Manager additionally sends a reply to the provider indicating that the invisible Ad was matched by a Decision Agent 14, and indicating the ranking of the invisible Ad (step 700). The Ad 186 reference is not removed from the Decision Agent 14, but remains with the other Ad references of the Decision Agent in the normal fashion. When Delivery Manager 56 is preparing search results for delivery to the consumer, it does not include the invisible Ad (step 702), so that the consumer remains unaware that the invisible Ad existed. The provider has collected valuable market data without annoying the consumers who generated the data.

-74-

Referring to Figure 38B, a variation of this process allows providers to "replay" a product offering, that is, to estimate what effect an advertisement would have had if, for example, the price had been lower. This process variation matches the invisible advertisement against expired Decision Agents 14 over a  
5      datetime range.

#### **Other Embodiments**

The foregoing description is of a preferred embodiment of the invention. Other embodiments are anticipated. For example, it is expected that future  
10      embodiments of the invention will use a variety of communication devices, such as, but not limited to, facsimile machines, pagers, Personal Digital Assistants (PDAs), Network Computers (NCs), postal mail, telephone voice recognition, satellite links, video cable, etc.

It is also anticipated that, in the future, the system will further comprise  
15      actual purchase transactions.

It is also anticipated that additional kinds of data will be collected by the system, and additional methods of analysis of such data will be developed.

#### **Conclusion**

20      From the foregoing it will be seen that this invention is well adapted to attain all of the ends and objectives hereinabove set forth, together with other advantages which are inherent to the apparatus.

It will be understood that certain features and sub-combinations are of utility and may be employed without reference to other features and  
25      sub-combinations. This is contemplated by and is within the scope of the claims.

The foregoing description of the preferred embodiment of the invention has been presented for the purposes of illustration and description. It is not intended

-75-

to be exhaustive or to limit the invention to the precise form disclosed. Many modifications and variations are possible in light of the above teaching.

5

-76-

The Claims

1. A computer network agent system for providing communication between  
an anonymous potential consumer of products which can be goods or  
5 services and a provider of such products, comprising in combination:  
a consumer personal agent for receiving product queries from the potential  
consumer and transmitting product recommendations to the potential  
consumer;  
a decision agent for receiving anonymous product queries from the  
10 consumer personal agent and transmitting product recommendations  
to the consumer personal agent;  
a provider personal agent for receiving demand queries from the provider  
and transmitting quantified demand information to the provider;  
a demand agent for receiving demand queries from the provider personal  
15 agent and transmitting quantified demand information to the  
provider personal agent; and  
a market for gathering information from the agents, organizing the  
information and distributing organized information to the agents.
  
- 20 2. A computer network agent system according to Claim 1 wherein the  
consumer personal agent comprises, in combination:  
a unique identifier function for maintaining an identifier that uniquely  
identifies the consumer personal agent within the agent system;  
an owner manager function for maintaining data about the consumer;  
25 an individual firewall for protecting the data about the consumer from other  
agents, controlling all access to data that is maintained by the



-77-

- various internal functions, ensuring that only authenticated and authorized agents and users can access private data;
- a preference manager for maintaining data about the preferences of the consumer;
- 5 a delivery manager for accepting messages generated by other agents or other components of the system, that are directed to the consumer and delivers those messages according to the consumer's desired delivery time and delivery media and rejecting unsolicited messages, unless an unsolicited message meets the consumer's
- 10 preferred criteria as maintained by the preference manager; and
- a decision agent manager for assisting the consumer with the creation and management of decision agent.
3. A computer network agent system according to Claim 1 wherein the
- 15 consumer personal agent further comprises a consideration account.
4. A computer network agent system according to Claim 2 wherein the decision agent manager comprises, in combination:
- a decision composer for assisting the consumer in composing queries to be
- 20 executed by decision agents;
- a decision agent factory for creating a new decision agent to carry out a query; and
- a decision agent tracker for enabling the consumer to monitor the activities of decision agents that have not completed their tasks.
- 25

-78-

5. A computer network agent system according to Claim 4 wherein the decision agent manager further comprises a decision agent archive for storing and accessing decision agents that have completed their tasks.
- 5 6. A computer network agent system according to Claim 1 wherein the provider personal agent comprises, in combination:  
a unique identifier function for maintaining an identifier that uniquely  
identifies the provider personal agent within the agent system;  
an owner manager function for maintaining data about the provider;  
10 an individual firewall for protecting the data about the provider from other  
agents, controlling all access to data that is maintained by the  
various internal functions, ensuring that only authenticated and  
authorized agents and users can access private data;  
a preference manager for maintaining data about the preferences of the  
15 provider;  
a delivery manager for accepting messages generated by other agents or  
other components of the system, that are directed to the provider  
and delivers those messages according to the provider's desired  
delivery time and delivery media and rejecting unsolicited  
20 messages, unless an unsolicited message meets the provider's  
preferred criteria as maintained by the preference manager; and  
a demand agent manager for assisting the provider with the creation and  
management of demand agents.
- 25 7. A computer network agent system according to Claim 6 wherein the demand agent manager comprises, in combination:

-79-

- a demand composer for assisting the provider in composing queries to be executed by demand agents;
- a demand agent factory for creating a new demand agent to carry out a query; and
- 5 a demand agent tracker for enabling the provider to monitor the activities of demand agents that have not completed their tasks.
8. A computer network agent system according to Claim 7 wherein the demand agent manager further comprises a demand agent archive for storing and accessing demand agents that have completed their tasks.
- 10
9. A computer network agent system according to Claim 6 further comprising an advertisement manager for assisting the provider in placing advertisements.
- 15
10. A computer network agent system according to Claim 9 wherein the advertisement manager comprises, in combination:
- an advertisement composer for retrieving product information;
- an advertisement delivery function for delivering an advertisement to a
- 20 desired destination;
- an advertisement tracker for monitoring the activity of the advertisement, including any messages received in response to the advertisement, until the advertisement expires or is canceled by the user.
- 25 11. A computer network agent system according to Claim 10 wherein the advertisement manager further comprises an advertisement archive for storing and accessing advertisements that are expired.

-80-

12. A computer network agent system according to Claim 6 wherein the provider personal agent further comprises a target manager for assisting the provider in identifying consumer personal agents to which targeted messages may be delivered.
- 5
13. A computer network agent system according to Claim 1 wherein the decision agent comprises, in combination:
- 10
- a unique identifier function for maintaining an identifier that uniquely identifies this decision agent within the agent system;
  - a personal agent reference for holding a copy of the unique identifier of the consumer personal agent that controls this decision agent;
  - a market reference for indicating in which market the decision agent should search;
  - 15
  - an expiry function for indicating how long the decision agent should continue searching;
  - a query for describing the product or product category for which to search;
  - a response manager for receiving search results and returning the search results to the consumer personal agent; and
  - 20
  - a log function for storing records of the activities of the decision agent.
14. A computer network agent system according to Claim 1 wherein the demand agent comprises, in combination:
- 25
- a unique identifier function for maintaining an identifier that uniquely identifies this demand agent within the agent system;
  - a personal agent reference for holding a copy of the unique identifier of the provider personal agent that controls this demand agent;

-81-

- a market reference for indicating in which market or markets the demand agent should search;
- a datetime range function for indicating that demand should be quantified over the date/time range specified;
- 5 a demand query for describing a product or product category query that can be matched against the queries of decision agents; and
- a log function for storing records of the activities of the demand agent for later consultation by other components of the agent system.
- 10 15. A computer network agent system according to Claim 1 wherein the market comprises, in combination:
- a product listing function for maintaining a list of the products that can be advertised in this market;
- 15 a cross reference manager for maintaining cross references to other markets that carry similar products;
- a sell advertisement manager for accepting advertisements of offers to sell that are submitted by consumer personal agents;
- a buy advertisement manager for accepting advertisements of offers to buy that are submitted by consumer personal agents;
- 20 an active demand agent manager for maintaining a list of all demand agents that are currently calculating demand in this market;
- a template dispenser for retrieving data that is available within the agent system about a particular product;
- 25 a query logger for archiving summary information about queries so that historical data about queries may be quickly accessed without having to access the detailed data which has been archived; and

-82-

an historical demand search engine for matching demand queries of demand agents against the queries that have been previously logged by the query logger to identify decision agents that previously, during a specified datetime range, had searched for a certain product or product category.

5

16. A computer network agent system according to Claim 15 wherein the market further comprises a remote database adaptor for providing communication and session management services to connect to a remote database belonging to a manufacturer or a provider and translating between the data formats used by the remote database and the data formats used by the market.

10

17. A computer network agent system according to Claim 15 wherein the market further comprises an authorization function for restricting the placement and searching of advertisements in the market to authorized consumers and providers only.

15

18. A computer network agent system according to Claim 15 wherein the buy advertisement manager further comprises, in combination:  
an advertisement indexer for maintaining indexes for quick searching of the advertisements by product and vendor characteristics;  
an active advertisements function for maintaining information about advertisements that are currently active, wherein an active decision agent manager is notified as each new advertisement is accepted by the active advertisements function so that pending searches can be matched against the new advertisement;

20

25

-83-

a future advertisements function for maintaining advertisements that have been submitted to the market, but are not yet active because their effective datetime has not yet been reached;

an expired advertisements function for maintaining an archive of advertisements that have expired, for later analysis;

an active decision agent manager for maintaining a list of all decision agents that are currently searching this market for products; and

an expired decision agent manager for maintaining a list of decision agents that have completed their searches, whether successfully or not.

19. A computer network agent system according to Claim 18 wherein the active decision agent manager comprises, in combination:

an immediate agents function for keeping track of decision agents that are performing searches that are to be performed and results returned as soon as practical;

a basic search engine for executing queries associated with each incoming decision agent by consulting active advertisements to match the query against all active advertisements;

a pending agents function for keeping track of decision agents that are performing extended searches;

an incremental search engine for matching each new advertisement against the queries of the pending decision agents; and

a current demand search engine for matching demand queries of demand agents against the queries of decision agents that are residing in immediate agents or pending agents, to identify active decision agents that are searching for a certain product or product category.

-84-

20. A computer network agent system according to Claim 15 wherein the sell advertisement manager further comprises, in combination:
- an advertisement indexer for maintaining indexes for quick searching of the advertisements by product and vendor characteristics;
  - 5 an active advertisements function for maintaining information about advertisements that are currently active, wherein an active decision agent manager is notified as each new advertisement is accepted by the active advertisements function so that pending searches can be matched against the new advertisement;
  - 10 a future advertisements function for maintaining advertisements that have been submitted to the market, but are not yet active because their effective datetime has not yet been reached;
  - an expired advertisements function for maintaining an archive of advertisements that have expired, for later analysis;
  - 15 an active decision agent manager for maintaining a list of all decision agents that are currently searching this market for products; and
  - an expired decision agent manager for maintaining a list of decision agents that have completed their searches, whether successfully or not.
- 20 21. A computer network agent system according to Claim 20 wherein the active decision agent manager comprises, in combination:
- an immediate agents function for keeping track of decision agents that are performing searches that are to be performed and results returned as soon as practical;
  - 25 a basic search engine for executing queries associated with each incoming decision agent by consulting active advertisements to match the query against all active advertisements;



-85-

a pending agents function for keeping track of decision agents that are performing extended searches;  
an incremental search engine for matching each new advertisement against the queries of the pending decision agents; and  
5 a current demand search engine for matching demand queries of demand agents against the queries of decision agents that are residing in immediate agents or pending agents, to identify active decision agents that are searching for a certain product or product category.

- 10 22. A method for searching for a product by a consumer, comprising in combination the steps of:  
selecting a decision agent manager to supervise the subsequent steps;  
composing a decision query;  
creating a decision agent;  
15 delivering the decision agent to a specified market;  
accepting the decision agent by the market; and  
searching for the product.
- 20 23. A method for searching for a product according to Claim 22 wherein the step of composing a decision query comprises, in combination, the steps of:  
if specifying an entirely new search, selecting a market in which to search;  
if the selected market is a restricted market for which the consumer is not authorized, displaying an error message to the consumer, and  
25 returning to the initial menu where another action may be selected;  
if the consumer is authorized for the restricted market, or if the market is not restricted, selecting the product for which to search;

-86-

retrieving a product template and instructions from a market template  
dispenser;

formatting and displaying the product template and the instructions;  
completing the search criteria in the product template;

5 if performing a search that will continue for a period of time, entering a  
period of time for the search to continue;

if performing a search that will return results as soon as possible, indicating  
such; and

selecting a delivery media and a delivery time and period.

10

24. A method for searching for a product according to Claim 22 wherein the  
step of creating a decision agent comprises, in combination, the steps of:  
creating a decision agent with a unique identifier;

15

storing a reference to the personal agent of the consumer, a reference to the  
market that is to be searched, the search expiry time, the delivery  
media, time, and period, and the query; and  
logging the creation of the decision agent with the new agent's log  
function.

20

25. A method for searching for a product according to Claim 22 wherein the  
step of accepting the decision agent comprises, in combination, the steps  
of:

accepting the new agent by an active decision agent manager;

logging the query from the agent to the market's query logger function;

25

and

adding the agent to a queue of immediate agents.

-87-

26. A method for searching for a product according to Claim 22 wherein the step of searching for the product comprises, in combination, the steps of: searching for the product as soon as possible;  
if performing a search that will continue for a period of time, delivering  
5 the decision agent to queue of pending agents; and  
if performing a search that will return results as soon as possible, ending the decision search.
27. A method for searching for a product according to Claim 26 wherein the  
10 step of searching for the product as soon as possible comprises, in combination, the steps of:  
selecting the next decision agent from the queue;  
delivering the query from the decision agent to a search engine;  
matching the query against active advertisements;  
15 collecting matching advertisements;  
responding to each placer of an advertisement to indicate that the advertisement was collected; and  
giving the decision agent back to the active decision agent manager.
- 20 28. A method for quantifying demand by a provider for a product, comprising in combination the steps of:  
selecting a demand agent manager to supervise the subsequent steps;  
composing a demand query;  
creating a demand agent;  
25 delivering the demand agent to a market;  
accepting the demand agent by the market; and  
searching demand.

-88-

29. A method for quantifying demand according to Claim 28, wherein the step of composing a demand query comprises, in combination, the steps of:  
if specifying an entirely new search, selecting a market in which to search;  
if the selected market is a restricted market for which the provider is not  
5 authorized, displaying an error message to the provider, and  
returning to the initial menu where another action may be selected;  
if the provider is authorized for the restricted market, or if the market is  
not restricted, selecting the product for which to search;  
retrieving a product template and instructions from a market template  
10 dispenser;  
formatting and displaying the product template and the instructions;  
completing the search criteria in the product template;  
if performing a search for historical demand, entering a date and time  
range;  
15 if performing a search for current demand, indicating such; and  
selecting a delivery media and a delivery time.
30. A method for quantifying demand according to Claim 28, wherein the step  
of creating a demand agent comprises, in combination, the steps of:  
20 creating a decision agent with a unique identifier;  
storing a reference to the personal agent of the provider, a reference to the  
market that is to be searched, the search expiry time, the delivery  
media, time, and period, and the query; and  
logging the creation of the new agent with the new agent's log function.  
25
31. A method for quantifying demand according to Claim 28, wherein the step  
of accepting the demand agent comprises, in combination, the steps of:

-89-

accepting the agent by an active demand agent manager; and logging the query from the demand agent to the market's query logger function.

- 5     32. A system for electronic commerce wherein market data can be collected and analyzed comprising:
- a plurality of consumer agents, each associated with and capable of communicating with a consumer;
- a consumer data base comprising consumer preference data associated with
- 10           each said consumer;
- a plurality of provider agents, each associated with and capable of communicating with a provider; and
- a data base of offers to sell and offers to buy;
- wherein said consumer agents conceal the identity of the associated
- 15           consumer from agents not associated with said consumer in said system;
- wherein said consumer agents are capable of searching said data base of offers to sell and offers to buy;
- wherein said consumer agent searching generates persistent market data;
- 20           wherein said provider agents are capable of searching said consumer database and said persistent market data; and
- wherein said provider agents analyze said consumer database and said persistent market data to quantify consumer demand.
- 25     33. The system of claim 32 wherein said consumer data base furthers comprises non-identifying demographic data.

-90-

34. A computer network agent system according to Claim 32 wherein each consumer personal agent comprises, in combination:
- a unique identifier function for maintaining an identifier that uniquely identifies the consumer personal agent within the agent system;
  - 5 an owner manager function for maintaining data about the consumer;
  - an individual firewall for protecting the data about the consumer from other agents, controlling all access to data that is maintained by the various internal functions, ensuring that only authenticated and authorized agents and users can access private data;
  - 10 a preference manager for maintaining data about the preferences of the consumer;
  - a delivery manager for accepting messages generated by other agents or other components of the system, that are directed to the consumer and delivers those messages according to the consumer's desired
  - 15 delivery time and delivery media and rejecting unsolicited messages, unless an unsolicited message meets the consumer's preferred criteria as maintained by the preference manager; and
  - a decision agent manager for assisting the consumer with the creation and management of decision agent.
  - 20
35. A computer network agent system according to Claim 32 wherein each provider personal agent comprises, in combination:
- a unique identifier function for maintaining an identifier that uniquely identifies the provider personal agent within the agent system;
  - 25 an owner manager function for maintaining data about the provider;
  - an individual firewall for protecting the data about the provider from other agents, controlling all access to data that is maintained by the

-91-

various internal functions, ensuring that only authenticated and authorized agents and users can access private data;

a preference manager for maintaining data about the preferences of the provider;

5 a delivery manager for accepting messages generated by other agents or other components of the system, that are directed to the provider and delivers those messages according to the provider's desired delivery time and delivery media and rejecting unsolicited messages, unless an unsolicited message meets the provider's  
10 preferred criteria as maintained by the preference manager; and  
a demand agent manager for assisting the provider with the creation and management of demand agents.

36. A method for searching for product offers, comprising:
- 15 providing a computer system adapted to operation of agents;  
providing a consumer agent, each associated with and capable of communicating with a consumer;  
providing a consumer data base of consumer preference data associated with each said consumer;
- 20 providing a data base of offers to sell and offers to buy;  
concealing the identity of said consumer from agents not associated with said consumer;  
said consumer agent assisting said consumer in composing a query for a product or product category;
- 25 said consumer agent searching said data base of offers to sell and offers to buy, wherein said searching generates persistent market data;

-92-

- said consumer agent retaining search results of said searching until the associated consumer's preferred delivery time;
- said consumer agent automatically filtering out any of said search results that violate any of said consumer preference data;
- 5 said consumer agent ordering or ranking said search results according to said consumer preference data;
- said consumer agent formatting said search results for delivery to said associated consumer's preferred communication device; and
- said consumer agent delivering said search results to said communication
- 10 device;
- whereby said consumer can gather product data that is automatically filtered and ranked according to said consumer preferences.
37. The method of claim 36 further comprising:
- 15 providing a data base of advocate evaluation and recommendation data;
- said consumer selecting data from said data base of advocate evaluation and recommendation data to include in said consumer's said consumer data base of consumer preference data;
- said consumer agent thereby further automatically filtering out any of said
- 20 results that violate consumer's selected advocate evaluation and recommendation data;
- whereby said consumer has a convenient way to use advocate evaluation and recommendation data to automatically filter and rank said search results.
- 25
38. A method for collecting and analyzing market data, comprising:
- providing a computer system adapted to operation of agents;



-93-

- providing a plurality of consumer agents, each associated with and capable of communicating with a consumer;
- providing a consumer data base of consumer preference data associated with each said consumer;
- 5 providing a plurality of provider agents, each associated with and capable of communicating with a provider;
- providing a data base of offers to sell and offers to buy;
- concealing the identity of said consumer from agents not associated with said consumer;
- 10 searching by said consumer agents of said data base of offers to sell and offers to buy, wherein said searching generates persistent market data;
- searching by said provider agents of said consumer data base and of said persistent market data to discover which of said consumer agents
- 15 possess certain preferences and generated certain records within said persistent market data;
- analyzing the results of said searching by said provider agents to quantify consumer demand;
- whereby consumers are encouraged to utilize said system because the
- 20 identity of each said consumer is concealed from said agents not associated with said consumer in said system; and
- whereby providers can gain access to valuable said persistent market data without imposing on or invading the privacy of said consumers.
- 25 39. The method of claim 38 wherein said searching by said provider agents is restricted to current data within said persistent market data, and said analyzing quantifies current consumer demand.

-94-

40. The method of claim 38 wherein said searching by said provider agents is restricted to historical data within said persistent market data, and said analyzing quantifies historical consumer demand.
- 5 41. A method for quantifying future demand for a certain product or a certain product category, utilizing persistent market data generated by consumer agents that conceal the identity of said consumer agent's associated consumer, while searching a data base of offers to sell and offers to buy, and utilizing a consumer data base of consumer preference data,  
10 comprising:  
searching said consumer data base to discover which of said consumer agents possess certain preferences;  
searching said persistent market data to discover which of said consumer agents, while searching for products related to said certain product  
15 or certain product category, generated certain records within said persistent market data;  
whereby a provider can select specific consumers that may be interested in said certain product or certain product category.
- 20 42. A method for targeting specific consumers, each of whose identity remains concealed, according to their on-line shopping activities and preferences, utilizing persistent market data generated by consumer agents that conceal said identity while searching a data base of offers to sell and offers to buy, and utilizing a consumer data base of consumer preference data,  
25 comprising:  
searching said consumer data base to discover which of said consumer agents possess certain preferences;

-95-

searching said persistent market data to discover which of said consumer agents generated certain records within said persistent market data; whereby a provider can select specific consumers to receive messages.

- 5      43. The method of claim 42 wherein said certain records pertain to said consumer agents searching for specific products.
44. The method of claim 42 wherein said certain records pertain to said consumer agents searching within a product category.
- 10
45. A method of extending a consideration payment to a consumer, whose identity remains concealed, in return for said consumer providing useful market data to a provider, comprising:
- 15      said provider selecting consumer agents to receive a message;
- said provider causing said message to be delivered to said consumer agents; each of said consumer agents displaying said message to said consumer agent's associated consumer;
- each of said associated consumers generating a response to said message;
- said provider's associated provider agent generating, for each said response
- 20      received, a consideration notice addressed to the consumer agent associated with the consumer that generated the response;
- said associated provider agent causing each said consideration notice to be delivered to said associated consumer agent;
- each said consumer agent crediting said associated consumer's
- 25      consideration account;
- whereby said consumer can receive a consideration payment for divulging useful market data to said provider; and

-96-

whereby said provider can solicit valuable market data without imposing on  
or invading the privacy of said consumers.

46. The method of claim 45 wherein said message is an advertisement.

5

47. The method of claim 45 wherein said message is a marketing survey.

48. The method of claim 45 wherein said message is a questionnaire about the  
reason for a sale.

10

49. The method of claim 45 wherein said message is a questionnaire about the  
reason for a lost sale.

50. A method of a consumer automatically rejecting certain unsolicited  
15 messages from a provider, comprising:  
said provider causing a message to be delivered to a consumer agent;  
said consumer agent comparing aspects of said message to a consumer data  
base of consumer preference data;  
if said message satisfies said consumer preference data, said consumer  
20 agent allowing said message to complete delivery to said consumer;  
if said message violates said consumer preference data, said consumer  
agent rejecting said message by:  
automatically generating a rejection message including an indication  
of the violated consumer preferences;  
25 causing said rejection message to be delivered to said provider;  
whereby said provider can gain valuable market data even from messages  
that are blocked from delivery.

-97-

51. A method of a provider simulating demand, comprising:  
providing a data base of offers to sell and offers to buy;  
providing a provider agent associated with and capable of communicating  
with a provider;  
5 providing a plurality of consumer agents, each associated with and capable  
of communicating with a consumer;  
said provider places an invisible advertisement in said data base of offers to  
sell and offers to buy;  
a consumer agent, when ordering or ranking search results, if said search  
10 results include a reference to said invisible advertisement, ranks said  
invisible advertisement along with other said search results;  
said consumer agent, when ranking said invisible advertisement, generates  
a message indicating the ranking of the invisible advertisement;  
said consumer agent sends said message to the associated provider agent;  
15 said consumer agent, when delivering said search results to the preferred  
communication device of the associated consumer, omits said  
invisible ad;  
whereby said provider can determine simulated demand for the product  
described by said invisible ad.  
20
52. A method of a provider replaying demand, comprising:  
providing a plurality of consumer agents, each associated with and capable  
of communicating with a consumer;  
providing a data base of offers to sell and offers to buy;  
25 consumer agents searching said data base of offers to sell and offers to buy,  
whereby said consumer agent searching generates persistent market  
data;

-98-

a provider composes an invisible advertisement;  
said provider selects at least one said consumer agent that has completed  
said searching;  
said consumer agent is instructed to rank said invisible advertisement;  
5 said consumer agent ranks said invisible advertisement along with other  
said search results;  
said consumer agent, when ranking said invisible advertisement, generates  
a message indicating the ranking of the invisible advertisement;  
said consumer agent sends said message to the associated provider agent;  
10 whereby said provider can determine simulated demand in historical time  
for the product described by said invisible ad.

53. In a computer network agent system for providing communication between  
an anonymous potential consumer of products which can be goods or  
15 services and a provider of such products, the combination comprising:  
a decision agent for receiving anonymous product queries from the  
consumer and transmitting product recommendations to the  
consumer;  
a demand agent for receiving demand queries from the provider and  
20 transmitting quantified demand information to the provider; and  
a market for gathering information from the agents, organizing the  
information and distributing organized information to the agents.
54. A combination according to Claim 53 wherein the decision agent  
25 comprises, in combination:  
a unique identifier function for maintaining an identifier that uniquely  
identifies this decision agent within the agent system;

-99-

a market reference for indicating in which market the decision agent should search;

an expiry function for indicating how long the decision agent should continue searching;

5 a query for describing the product or product category for which to search;

a response manager for receiving search results and returning the search results to the consumer; and

a log function for storing records of the activities of the decision agent.

10 55. A combination according to Claim 53 wherein the demand agent comprises, in combination:

a unique identifier function for maintaining an identifier that uniquely identifies this demand agent within the agent system;

15 a market reference for indicating in which market or markets the demand agent should search;

a datetime range function for indicating that demand should be quantified over the date/time range specified;

a demand query for describing a product or product category query that can be matched against the queries of decision agents; and

20 a log function for storing records of the activities of the demand agent for later consultation by other components of the agent system.

56. A combination according to Claim 53 wherein the market comprises, in combination:

25 a product listing function for maintaining a list of the products that can be advertised in this market;

-100-

- a cross reference manager for maintaining cross references to other markets that carry similar products;
- a sell advertisement manager for accepting advertisements of offers to sell that are submitted by consumers;
- 5 a buy advertisement manager for accepting advertisements of offers to buy that are submitted by consumers;
- an active demand agent manager for maintaining a list of all demand agents that are currently calculating demand in this market;
- a template dispenser for retrieving data that is available within the agent system about a particular product;
- 10 a query logger for archiving summary information about queries so that historical data about queries may be quickly accessed without having to access the detailed data which has been archived; and
- an historical demand search engine for matching demand queries of demand agents against the queries that have been previously logged by the query logger to identify decision agents that previously, during a specified datetime range, had searched for a certain product or product category.
- 15
- 20 57. A combination according to Claim 56 wherein the market further comprises a remote database adaptor for providing communication and session management services to connect to a remote database belonging to a manufacturer or a provider and translating between the data formats used by the remote database and the data formats used by the market.
- 25



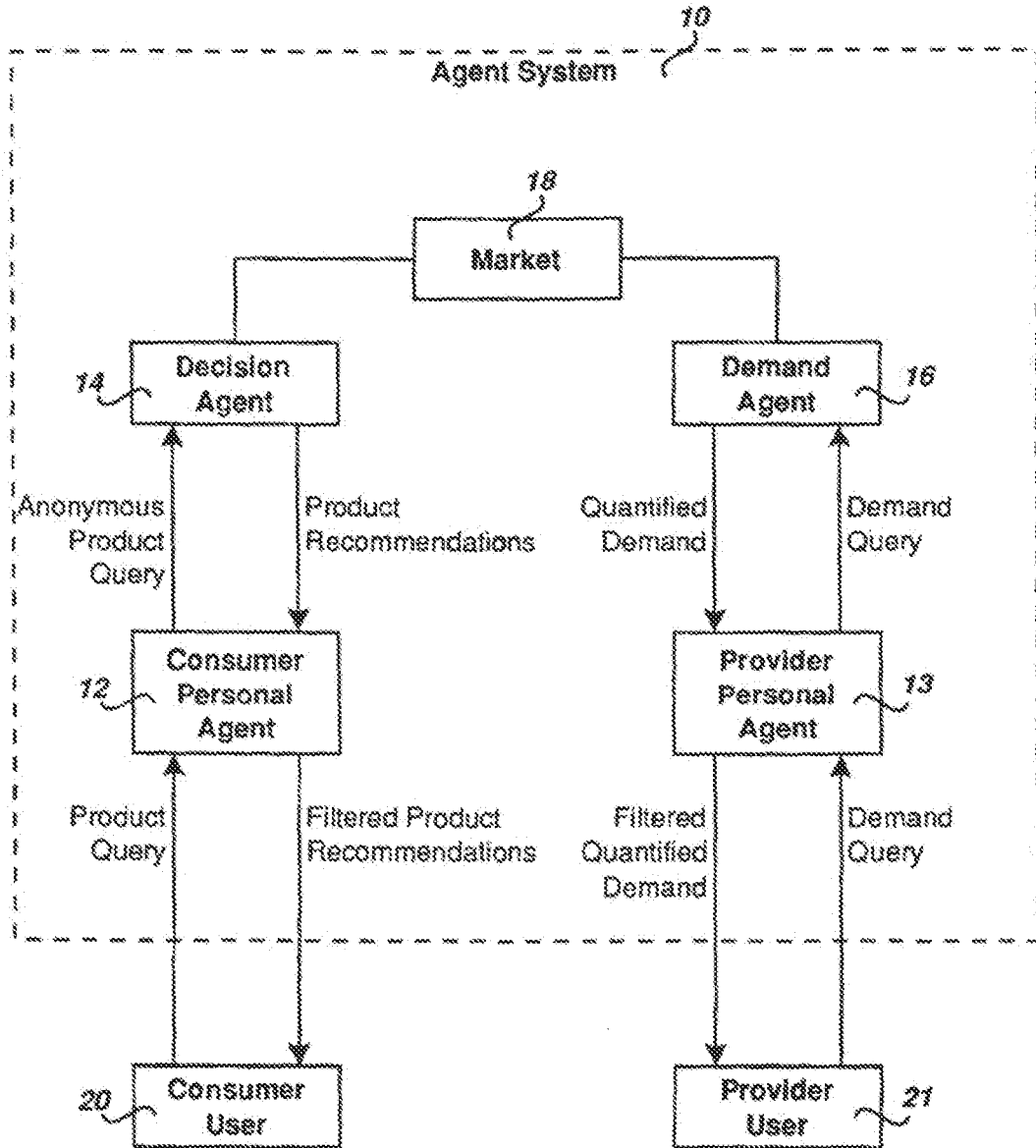


Fig. 1

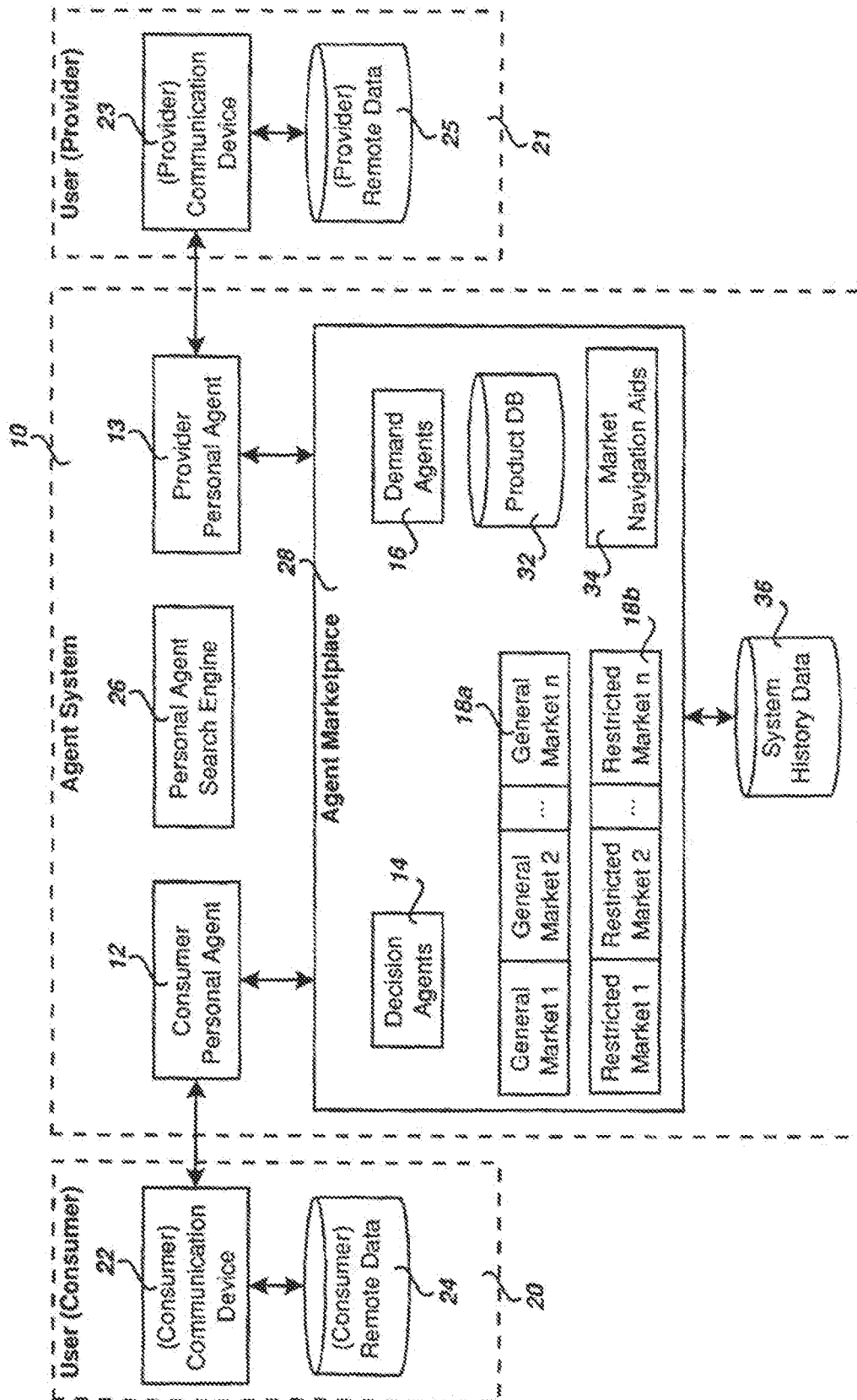


Fig. 2

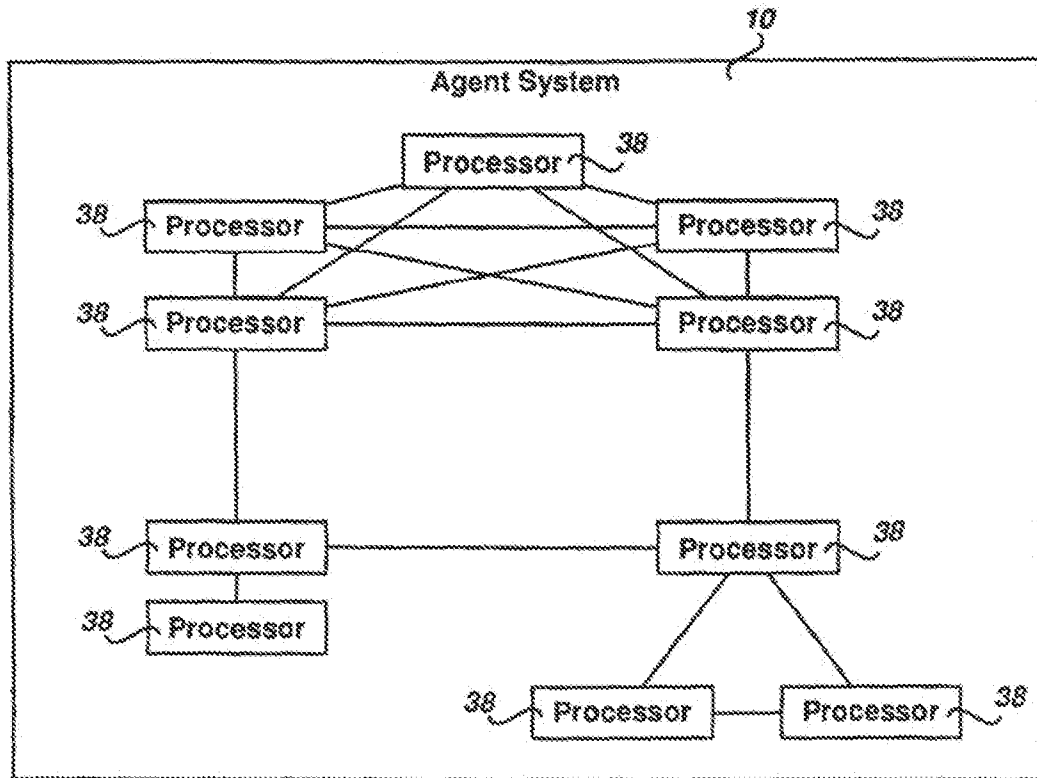
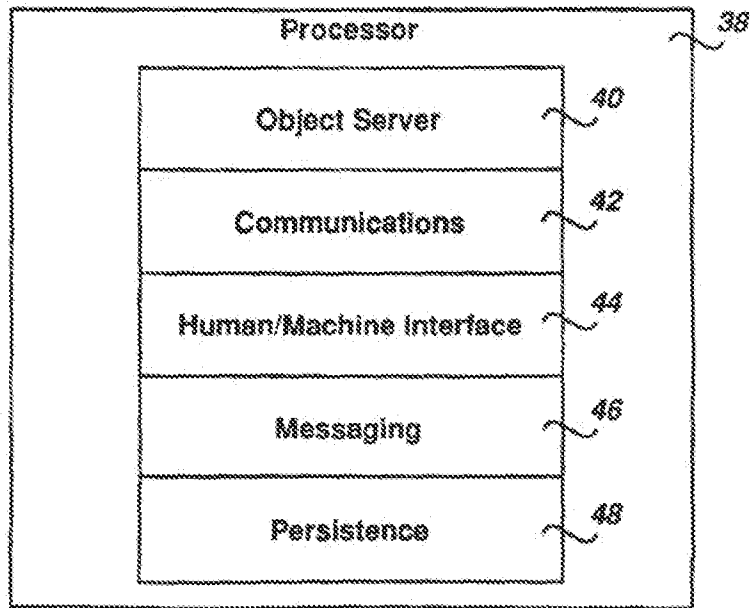


Fig. 3A

Fig. 3B



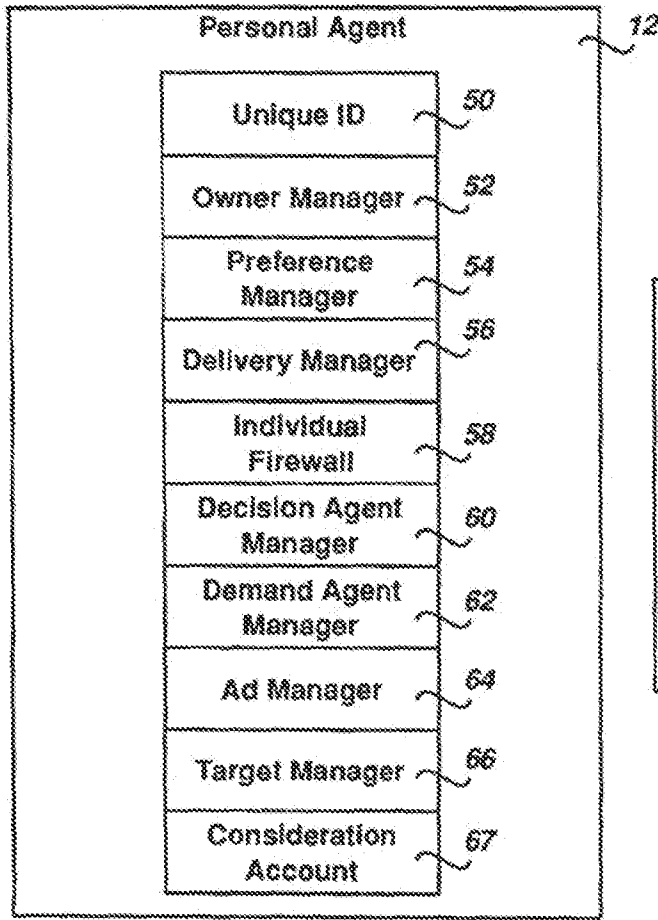


Fig. 4A

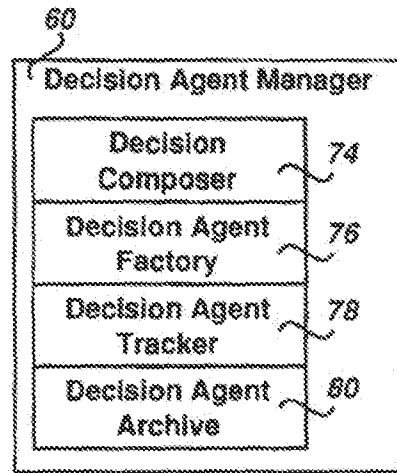


Fig. 4B

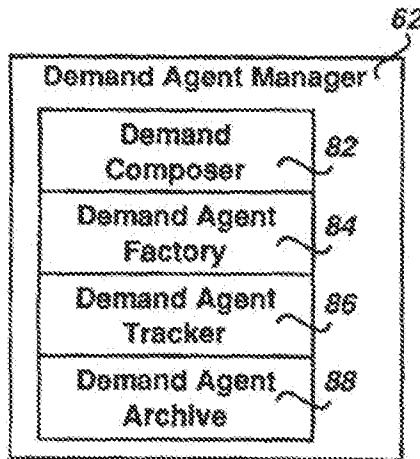


Fig. 4C

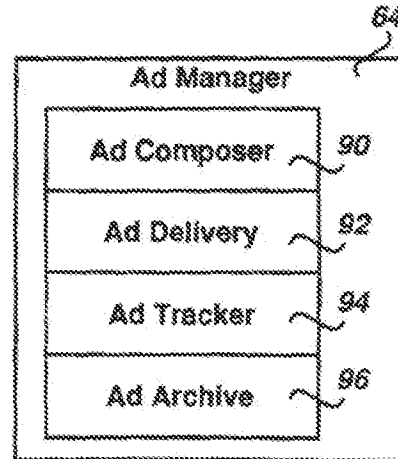


Fig. 4D

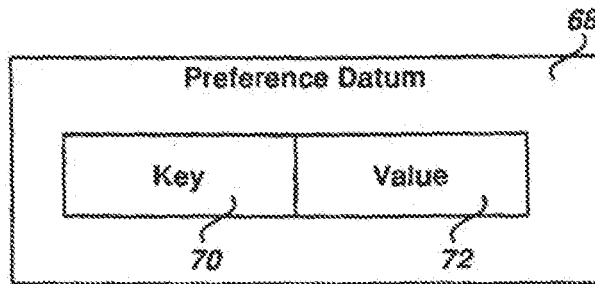


Fig. 5A

Key	Value
Age	34
Homeowner	Yes
Gender	Male
Cats	interested
brand name 1	like
brand name 2	dislike
brand name 3	neutral
brand name 4	like > brand name 3
brand name 5	a favorite
email Consideration Fee	greater than \$1.00
alpine skiing	dislike
cross country skiing	like
MSG in food	dislike
delivered pizza	No
phone solicitation	never
favorite color	blue, red
health and fitness	interested
weight lifting	rank 1 in 10
stair climbing	rank 3 in 10
swimming	rank 10 in 10

Fig. 5B

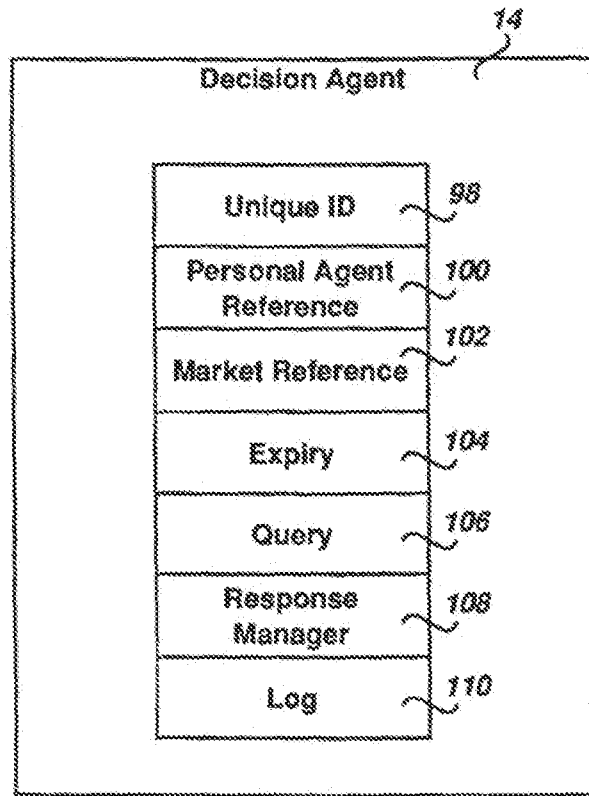


Fig. 6

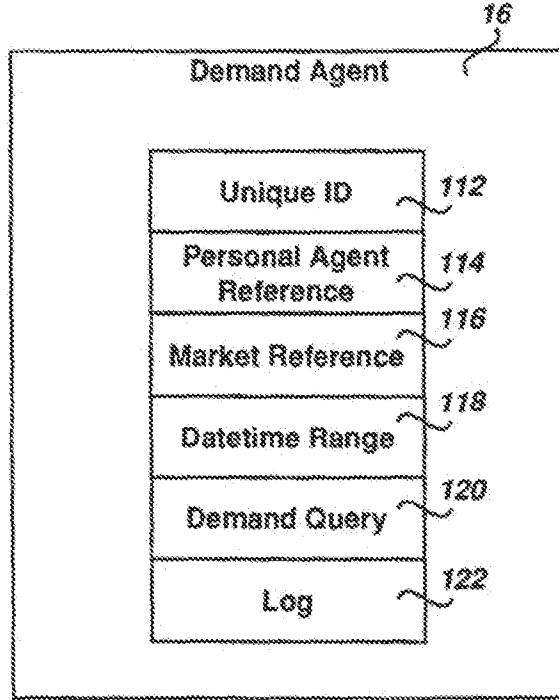
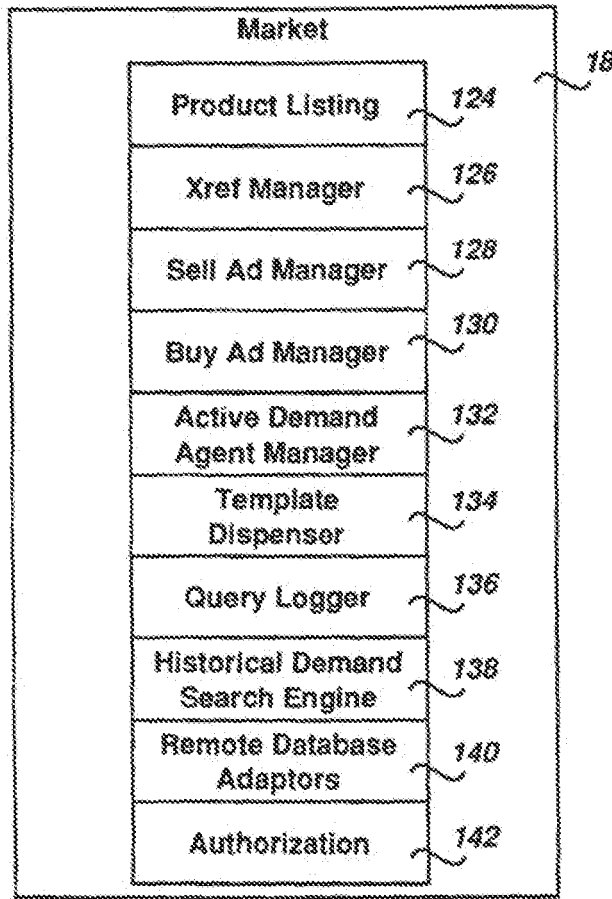


Fig. 7

Fig. 8A



118

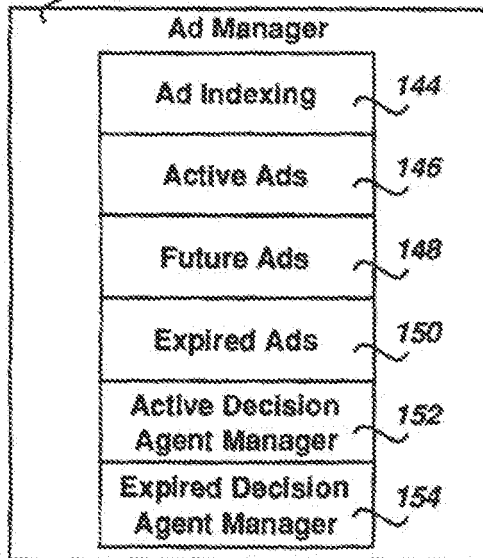


Fig. 8B

152

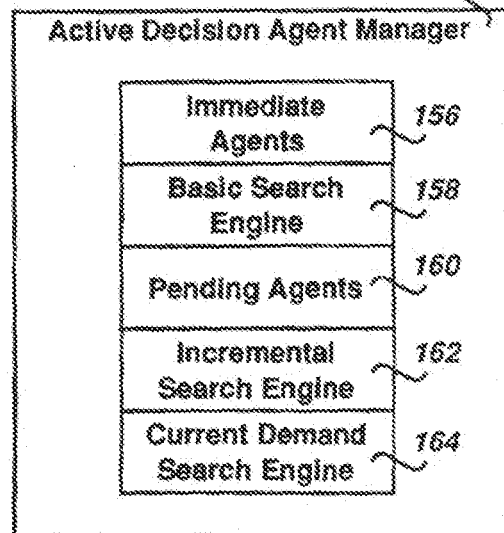


Fig. 8C



Fig. 9A

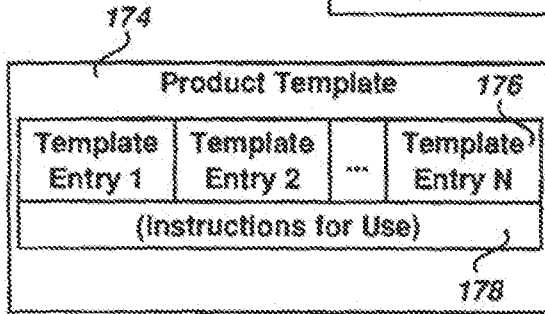
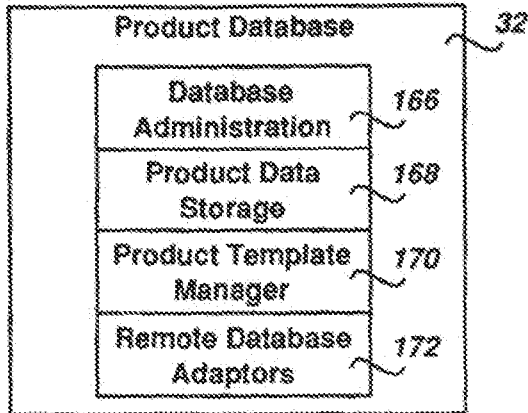


Fig. 9B

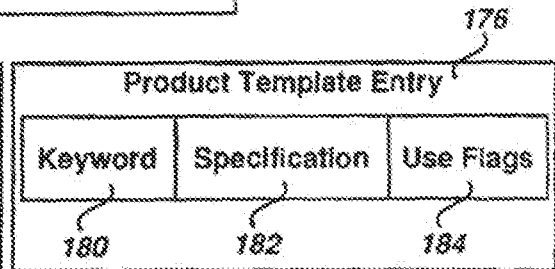


Fig. 9C

<i>Keyword</i>	<i>Specification</i>	<i>Use Flags</i>	<i>Value</i>
Product	enumeration	search,ad	Television Set
Brief Description	text	ad	27" TV
Brand	enumeration	search,ad	brand name
Model	text	search,ad	392-43
Mfr Sug Retail Price	money	search,ad	\$500.00
Screen Size	number	search,ad	27
Remote Control	boolean	search,ad	yes
Cable Ready	boolean	search,ad	yes
Stereo Sound	boolean	search,ad	yes
Cabinet Color	enumeration	search,ad	black
Expanded Info	text	ad	Futuristic design...
Image	image	ad	(picture of product)
rating guide Rating	rank	search	3 of 14
Endorser	text	search	endorser

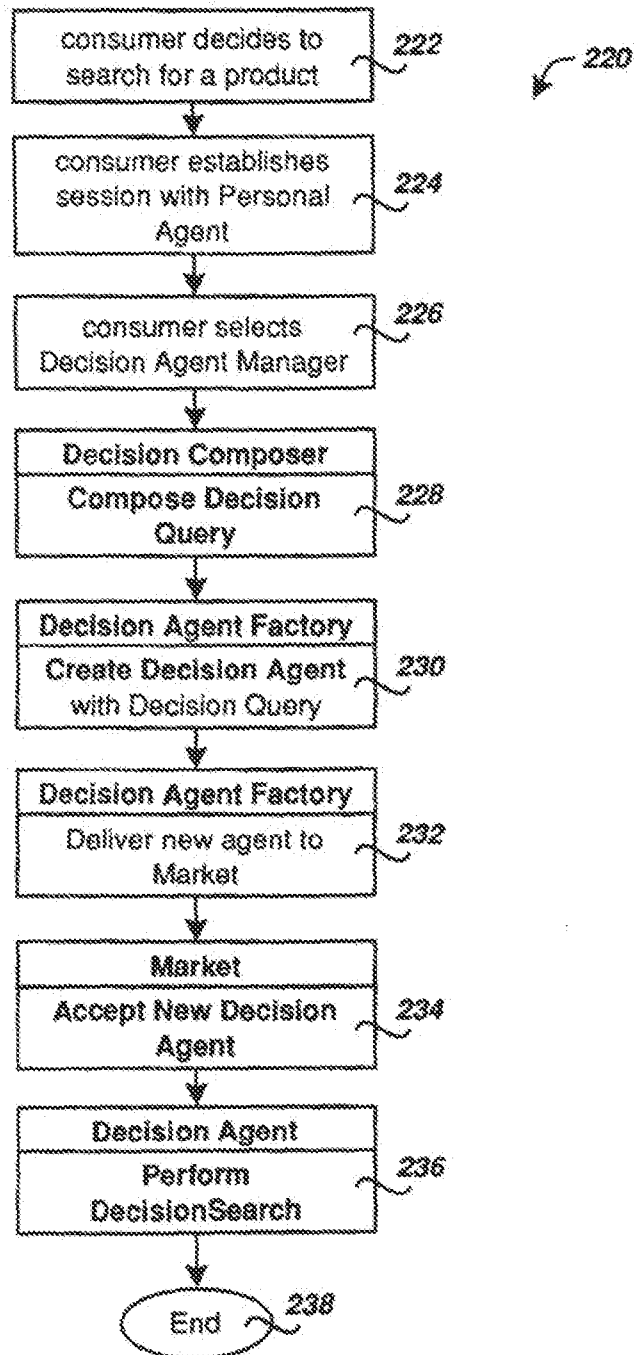
Fig. 9D

Ad				
Unique ID	Buy/Sell Flag	Reference to Placer	Reference to Market	Reference to Product Listing
Template Values	Description	Price	Start Datetime	Expiry Datetime

Fig. 10

### Product Search Method

Fig. 11



12/46

**Compose Decision Query Subroutine**

228

Fig. 12A

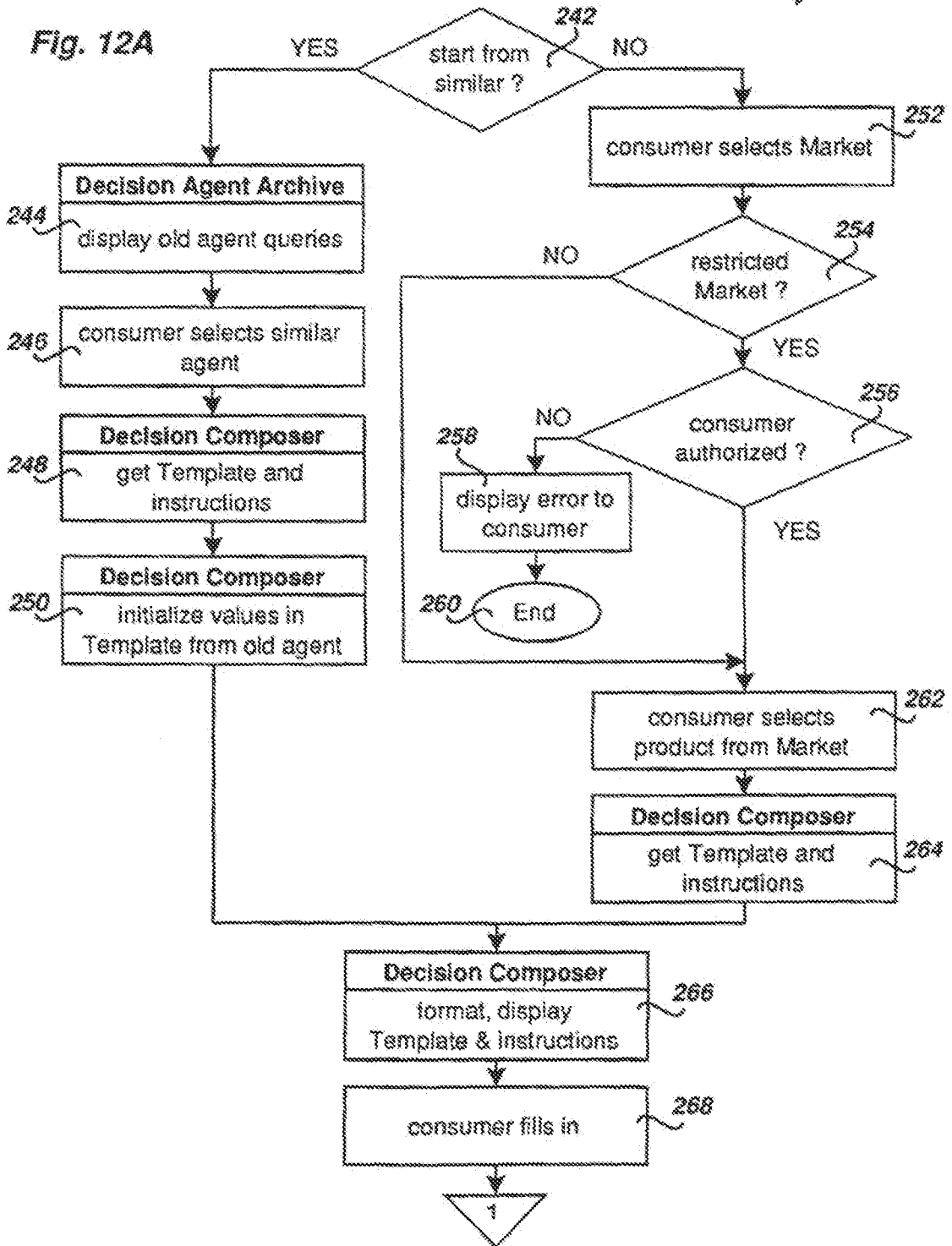
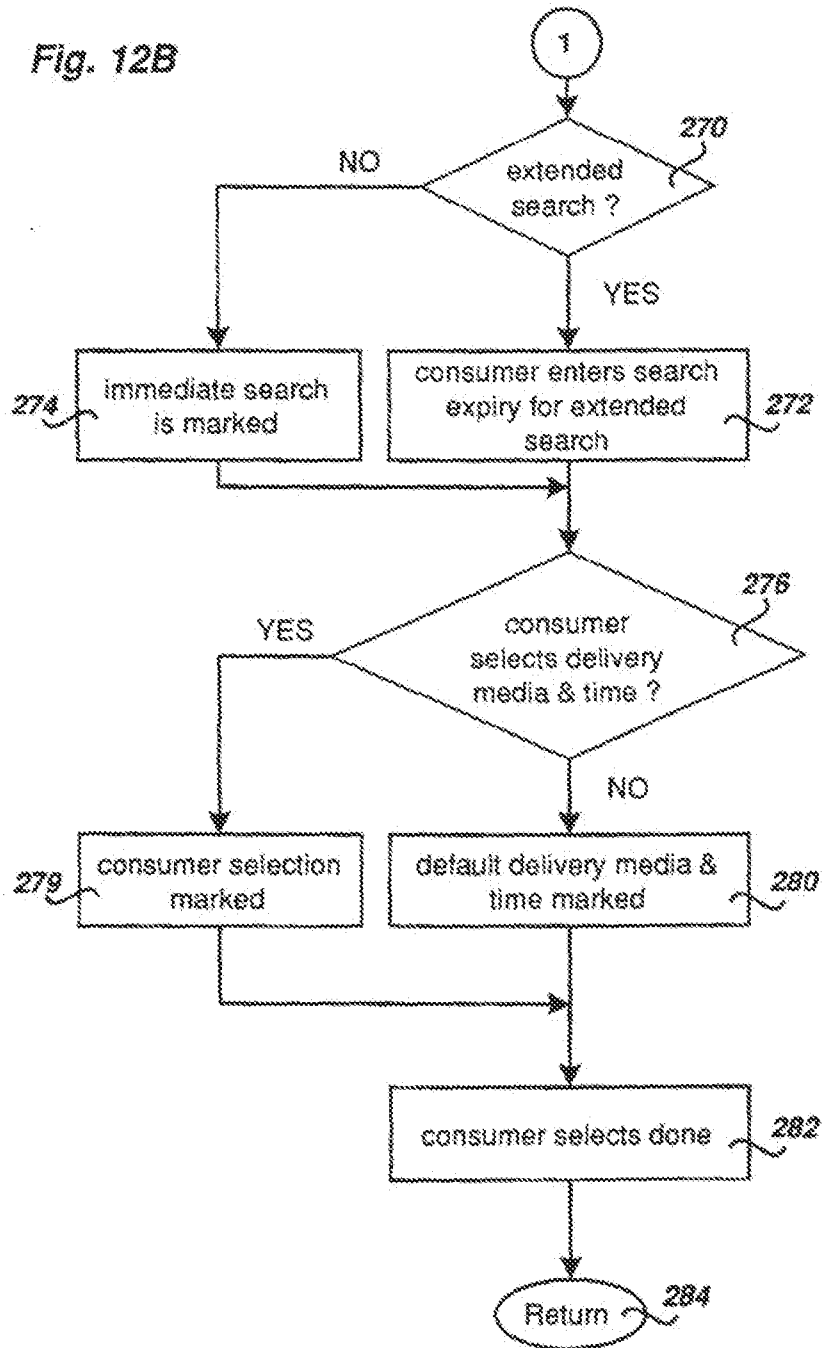
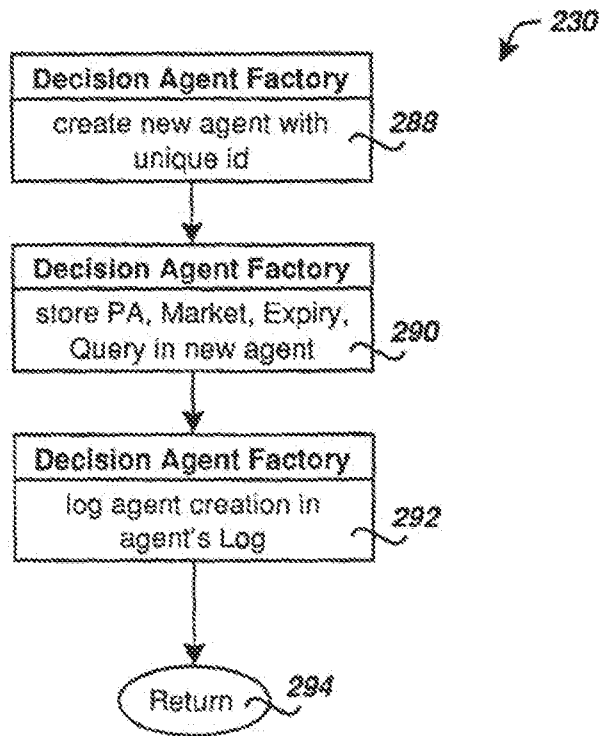


Fig. 12B



### Create Decision Agent Subroutine

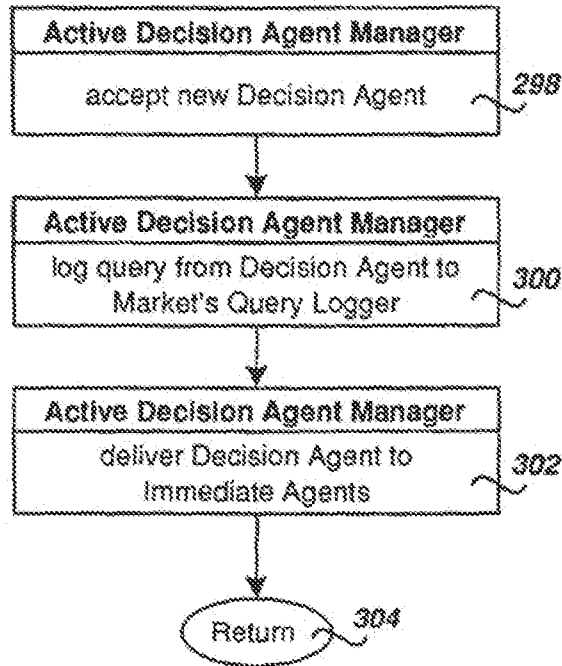
Fig. 13



### Accept New Decision Agent Subroutine

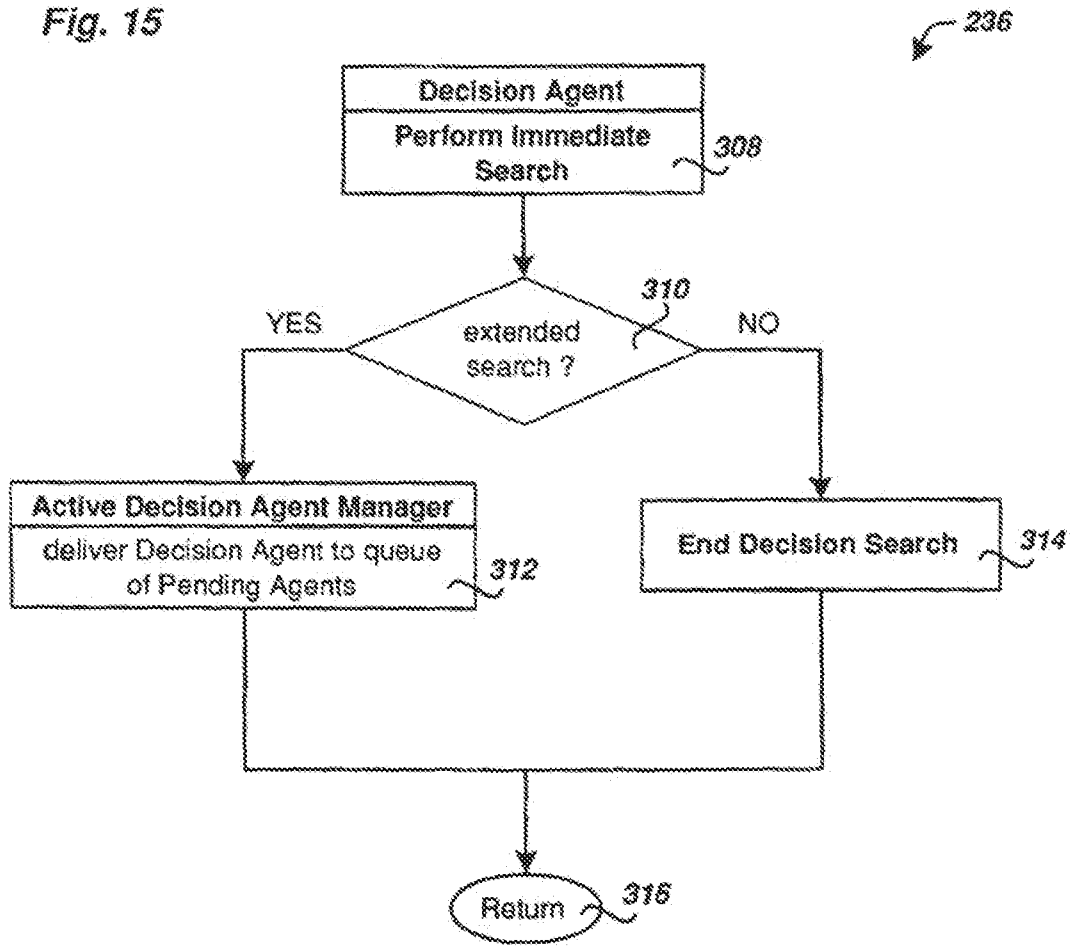
Fig. 14

234



### Perform Decision Search Subroutine

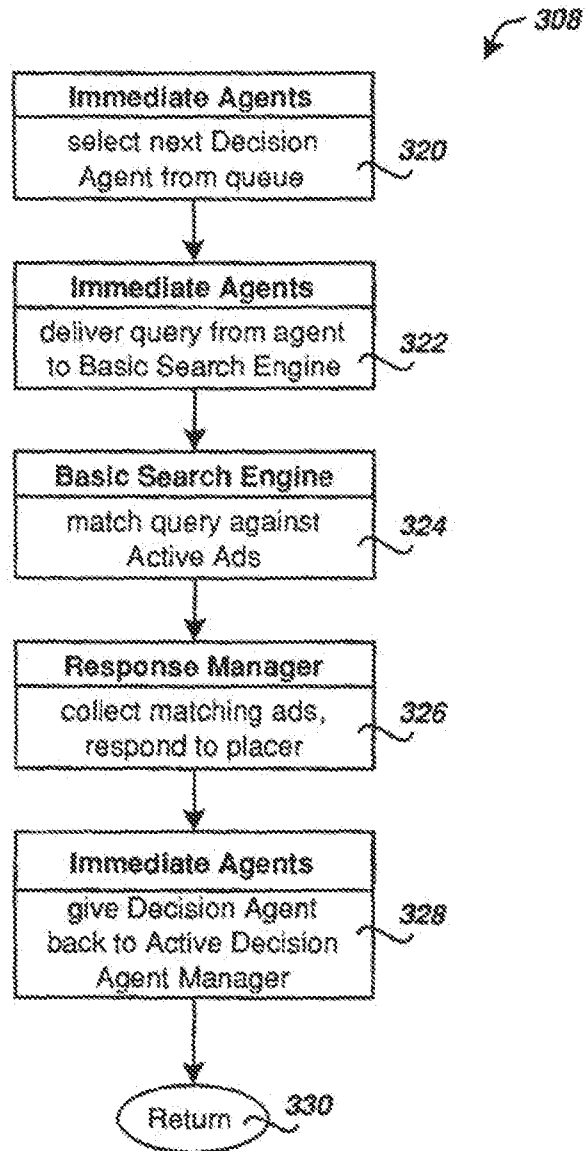
Fig. 15





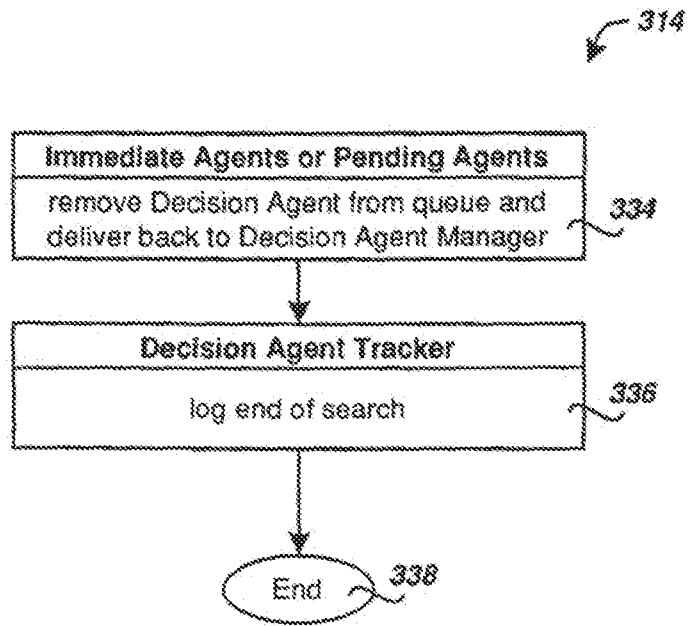
### Perform Immediate Search Subroutine

Fig. 16



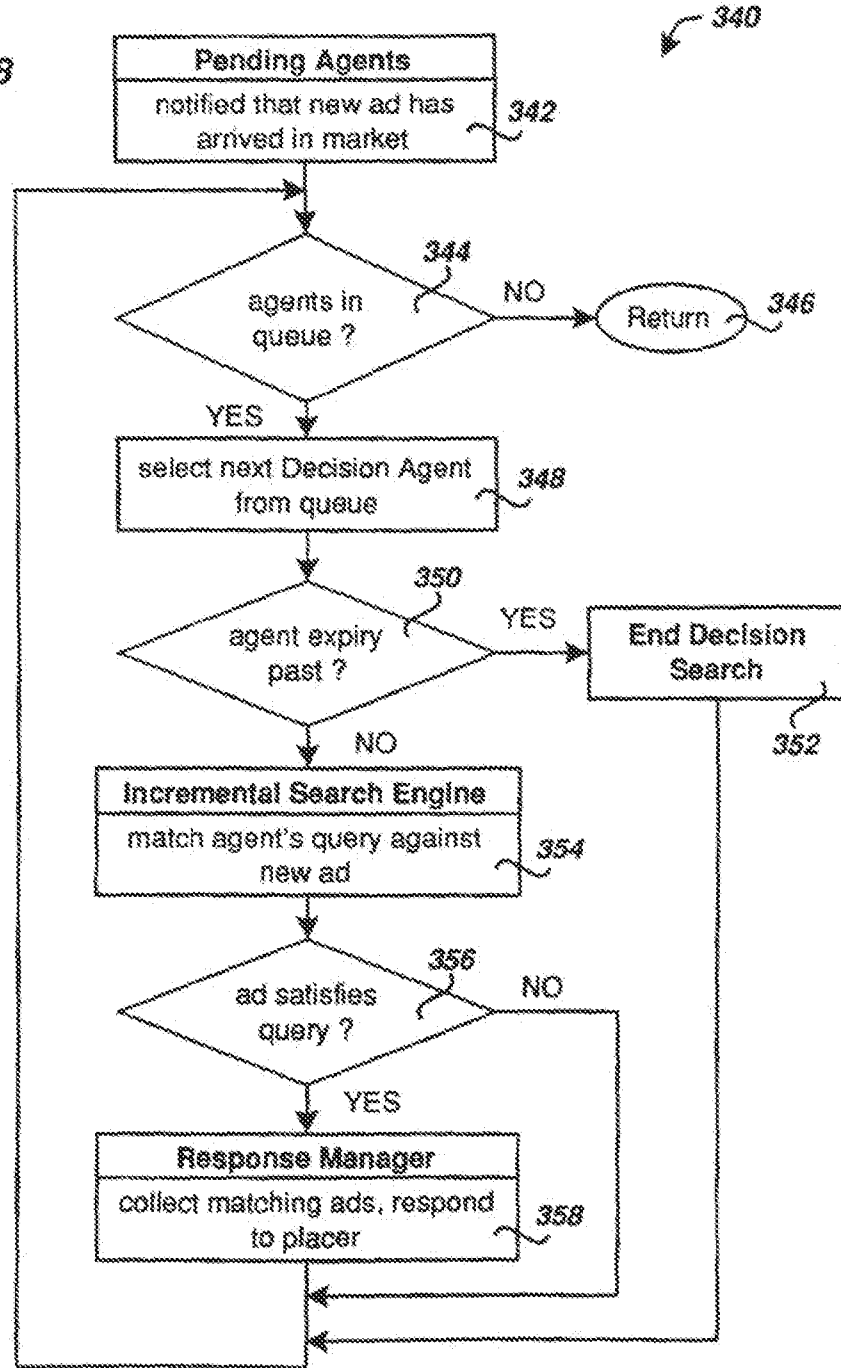
*End Decision Search Subroutine*

*Fig. 17*



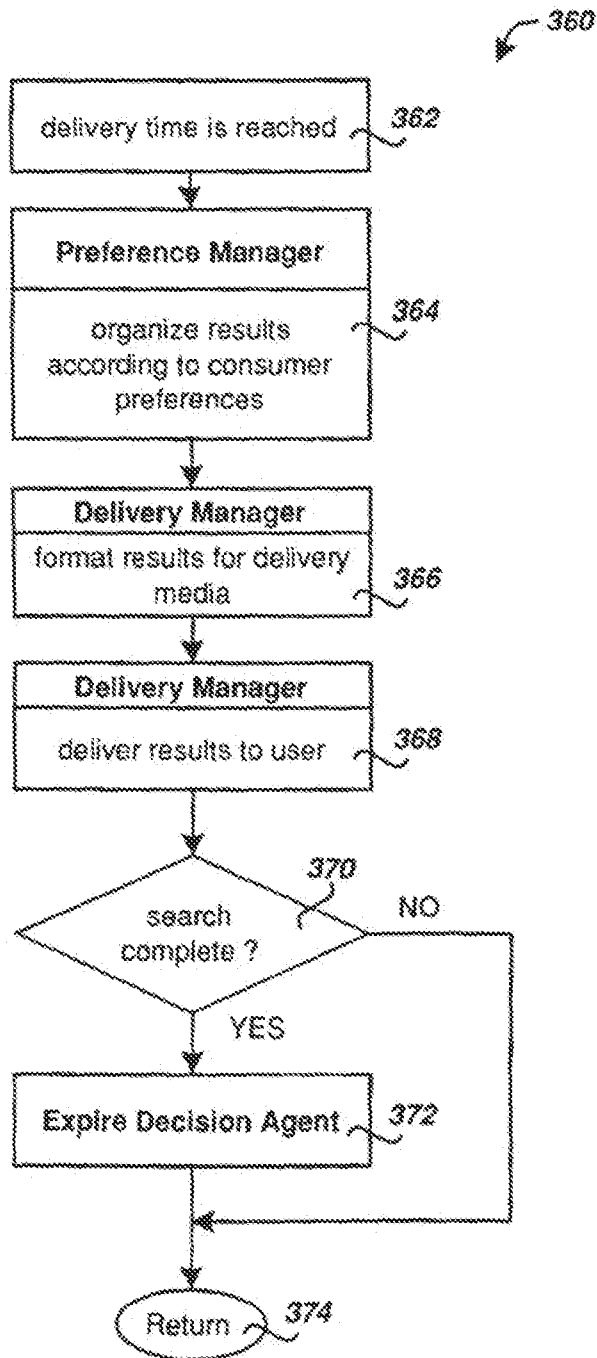
### Extended Search Subroutine

Fig. 18



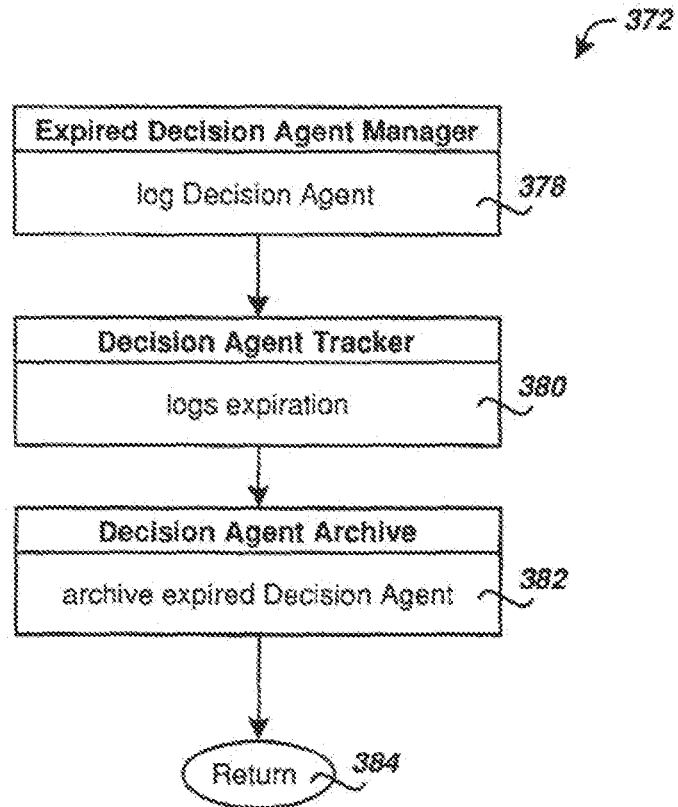
### Deliver Search Results Subroutine

Fig. 19



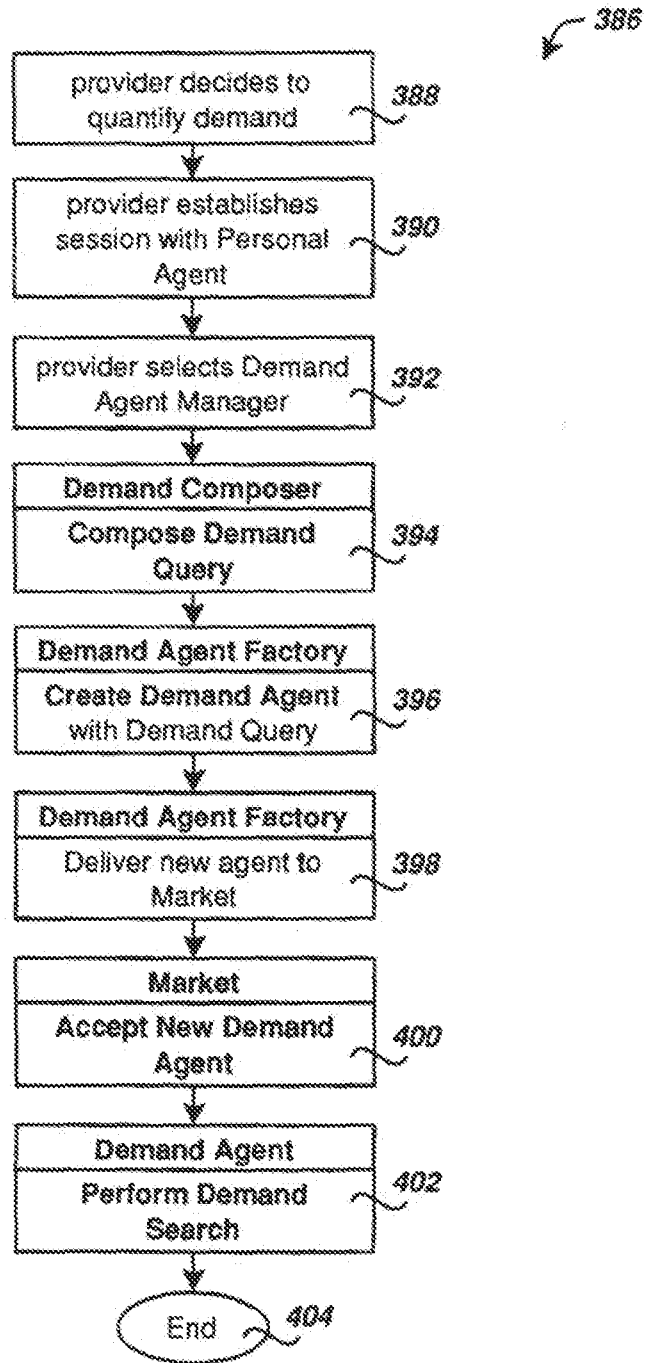
### Expire Decision Agent Subroutine

Fig. 20



### Quantify Demand Method

Fig. 21



### Compose Demand Query Subroutine

Fig. 22A

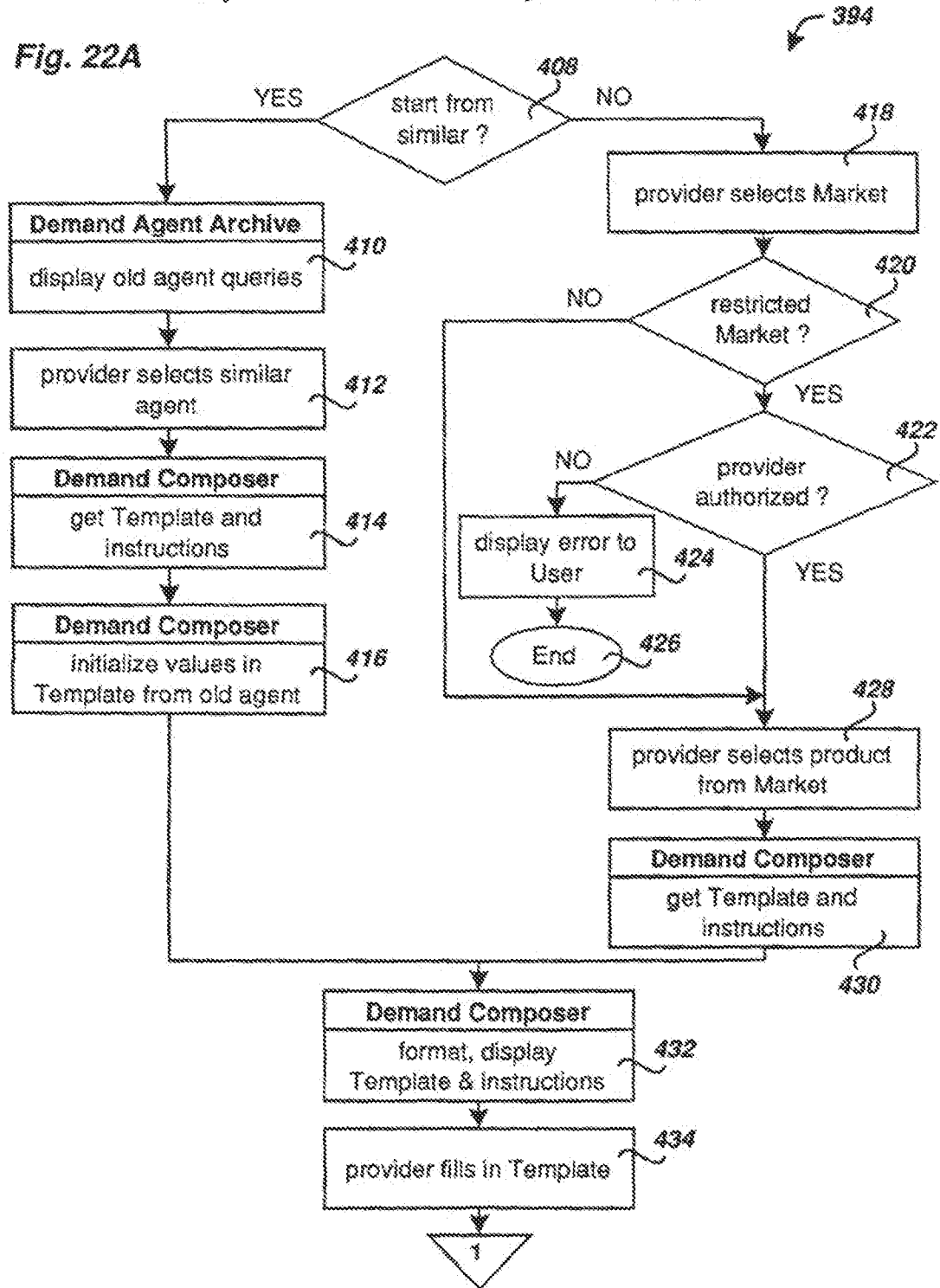
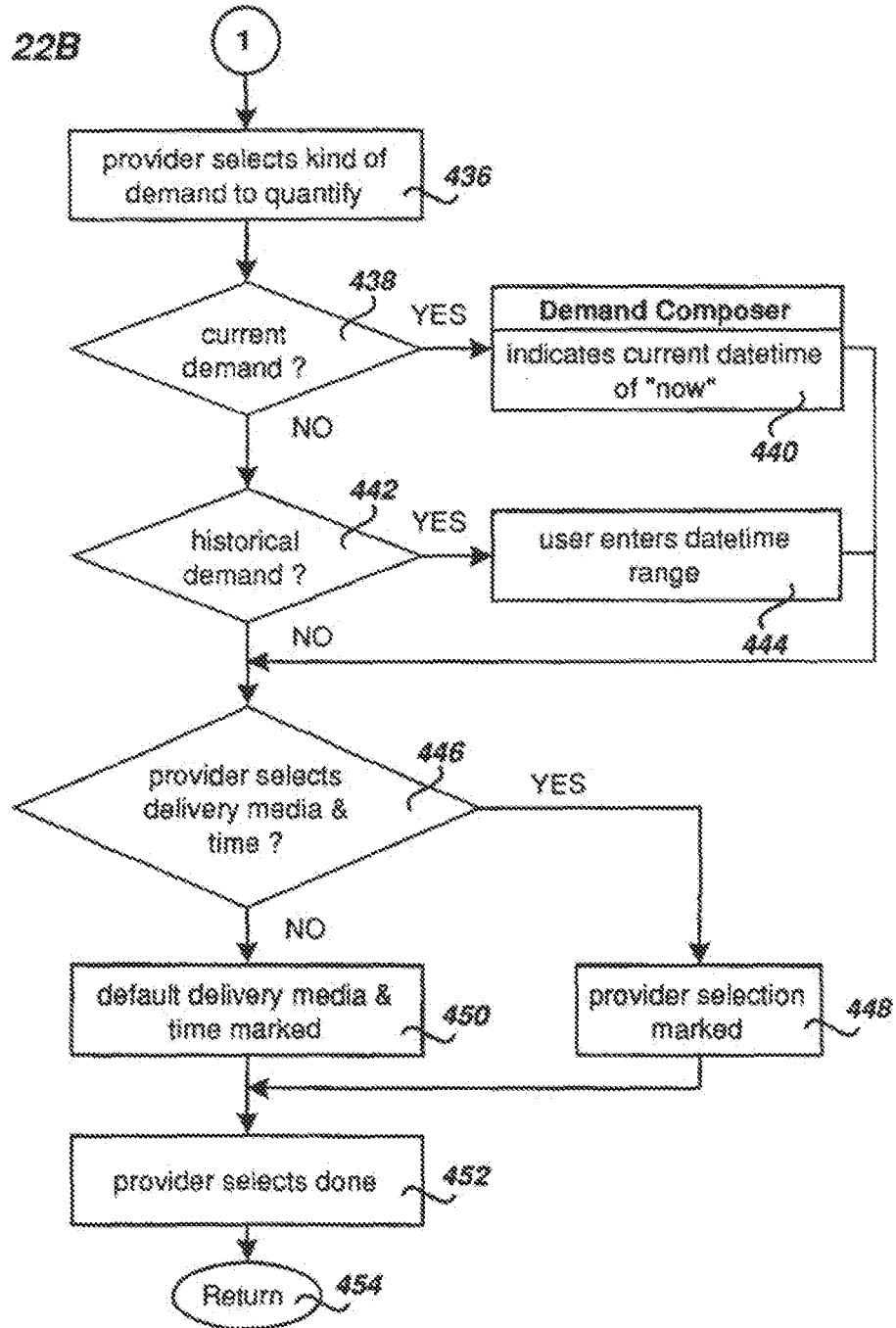


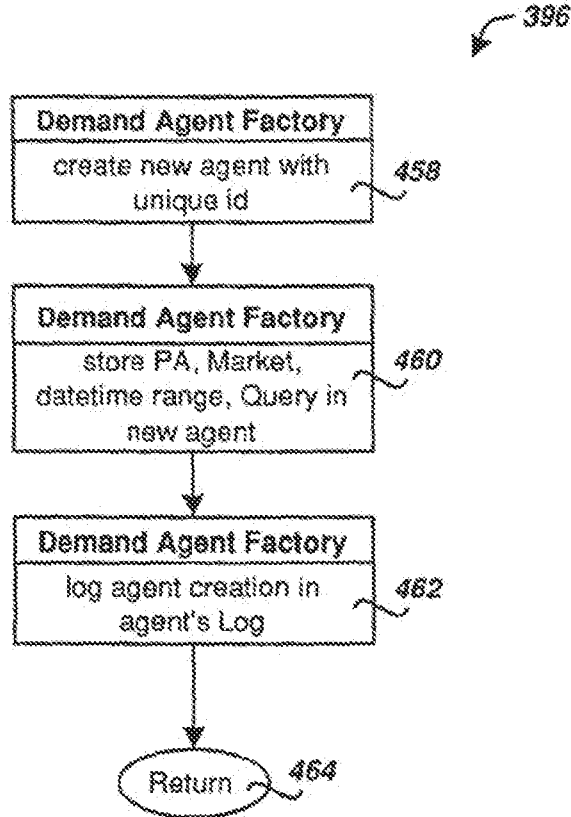
Fig. 22B





### Create Demand Agent Subroutine

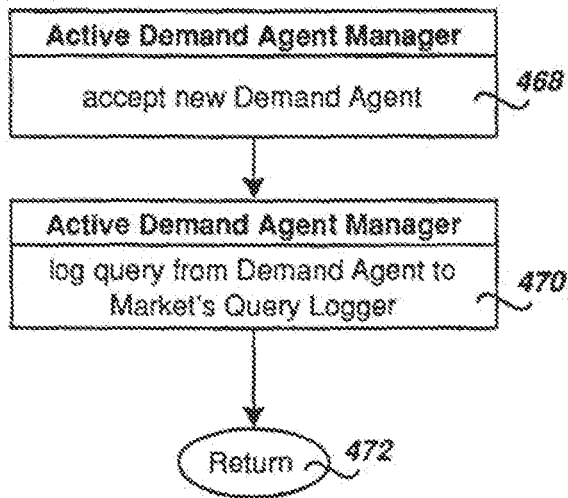
Fig. 23



### Accept New Demand Agent Subroutine

Fig. 24

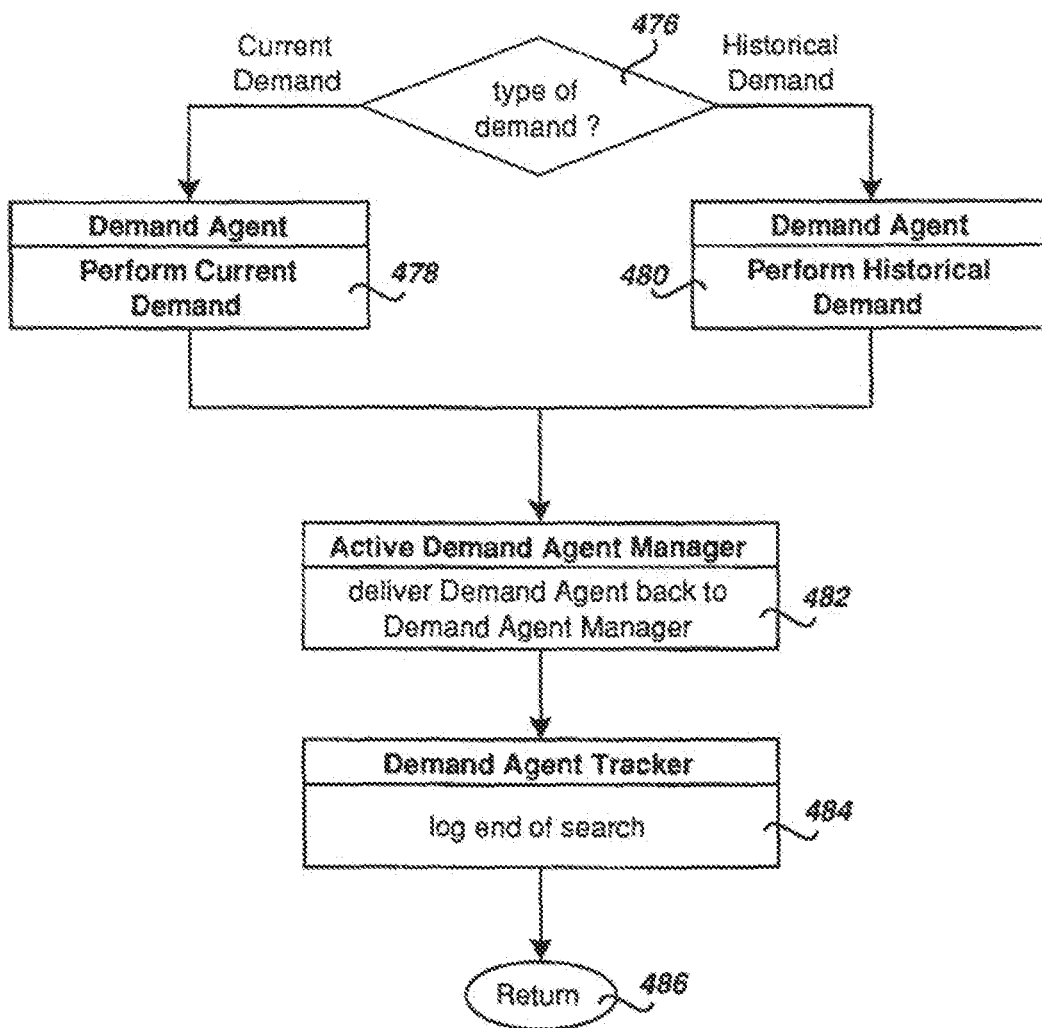
400



### Perform Demand Search Subroutine

Fig. 25

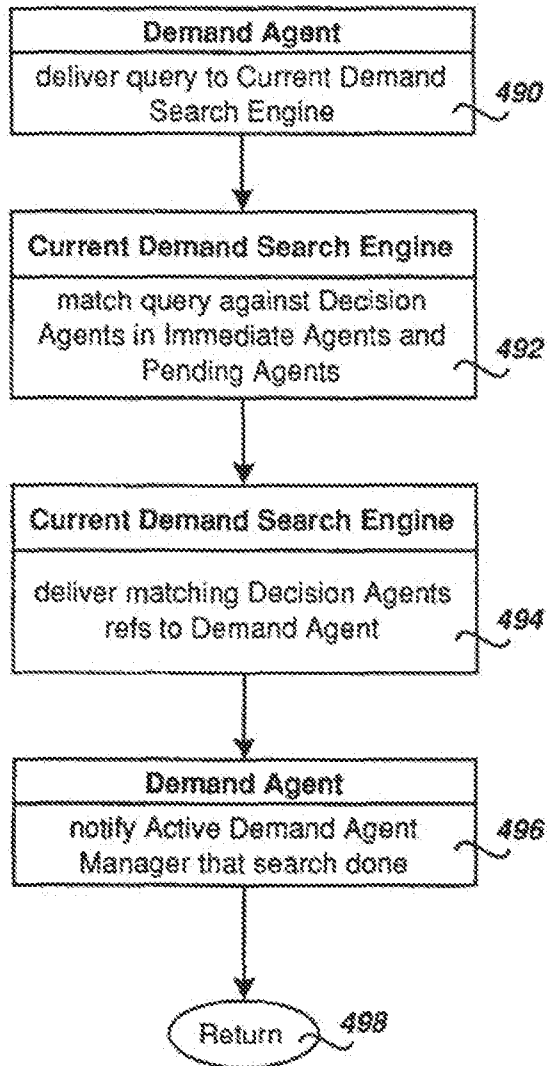
402



### Perform Current Demand Subroutine

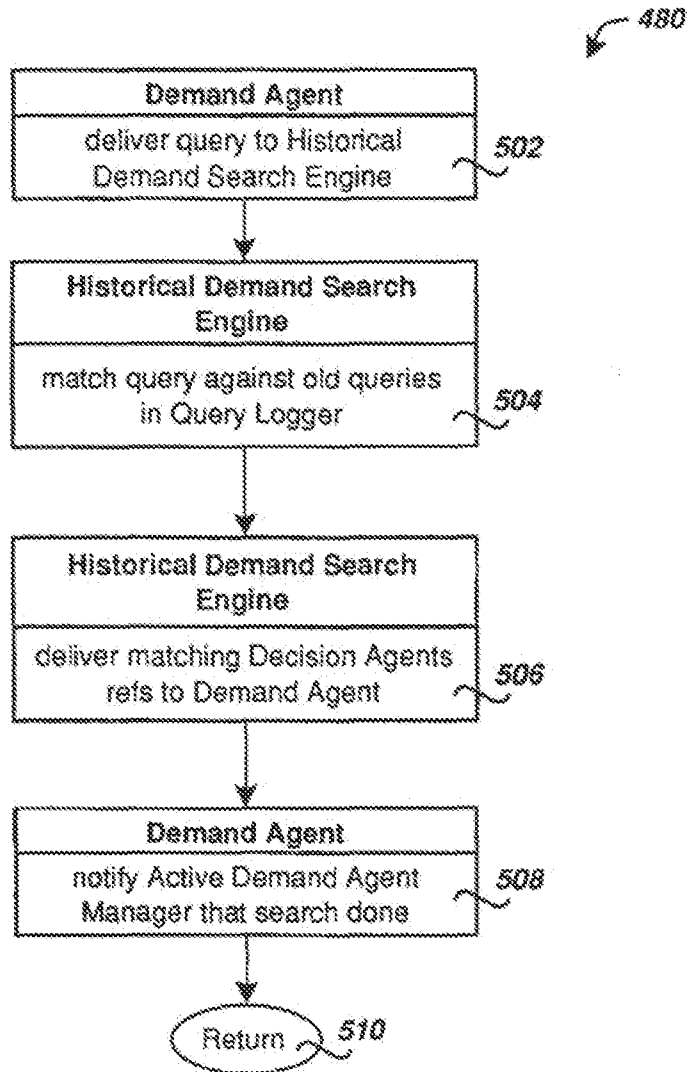
Fig. 26

478



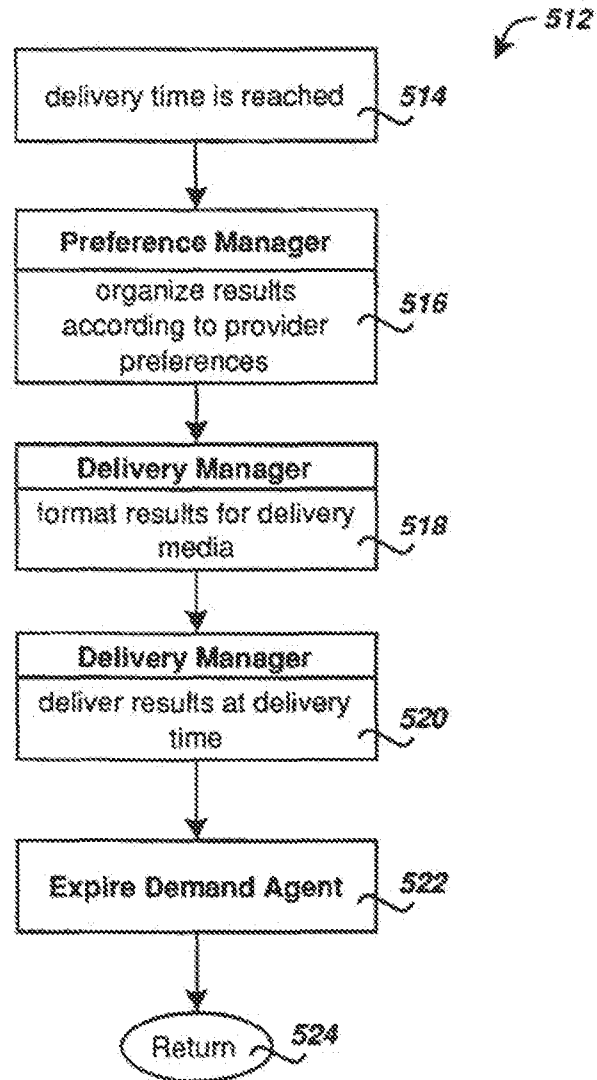
### Perform Historical Demand Subroutine

Fig. 27



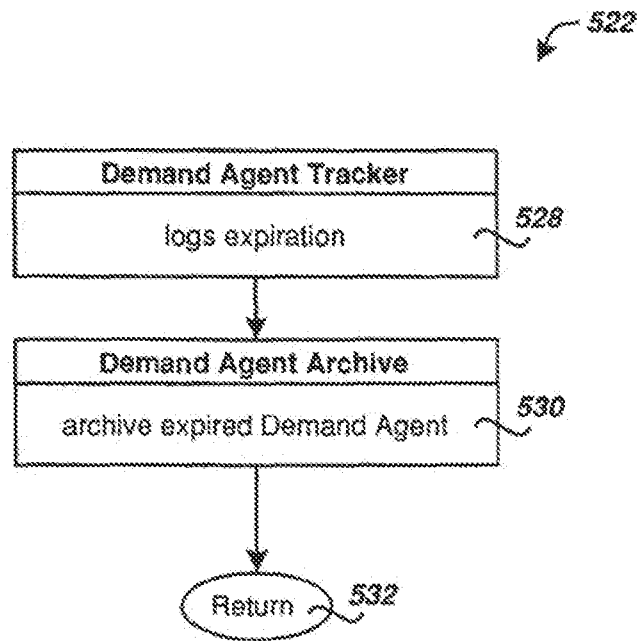
### Deliver Demand Results Subroutine

Fig. 28



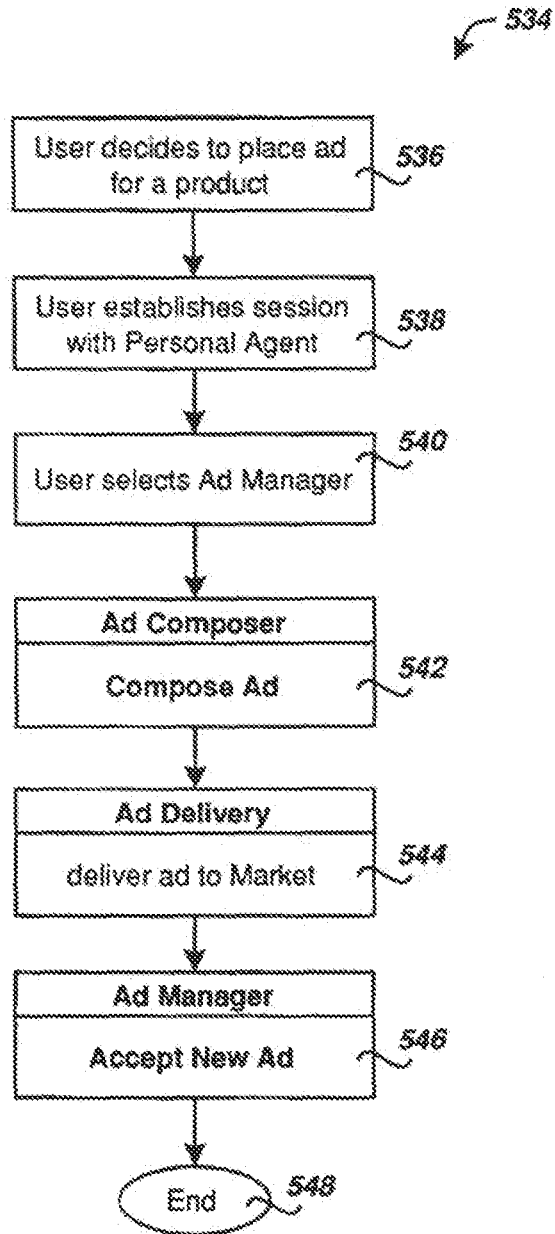
### Expire Demand Agent Subroutine

Fig. 29



### Place Ad Method

Fig. 30





### Compose Ad Subroutine

Fig. 31A

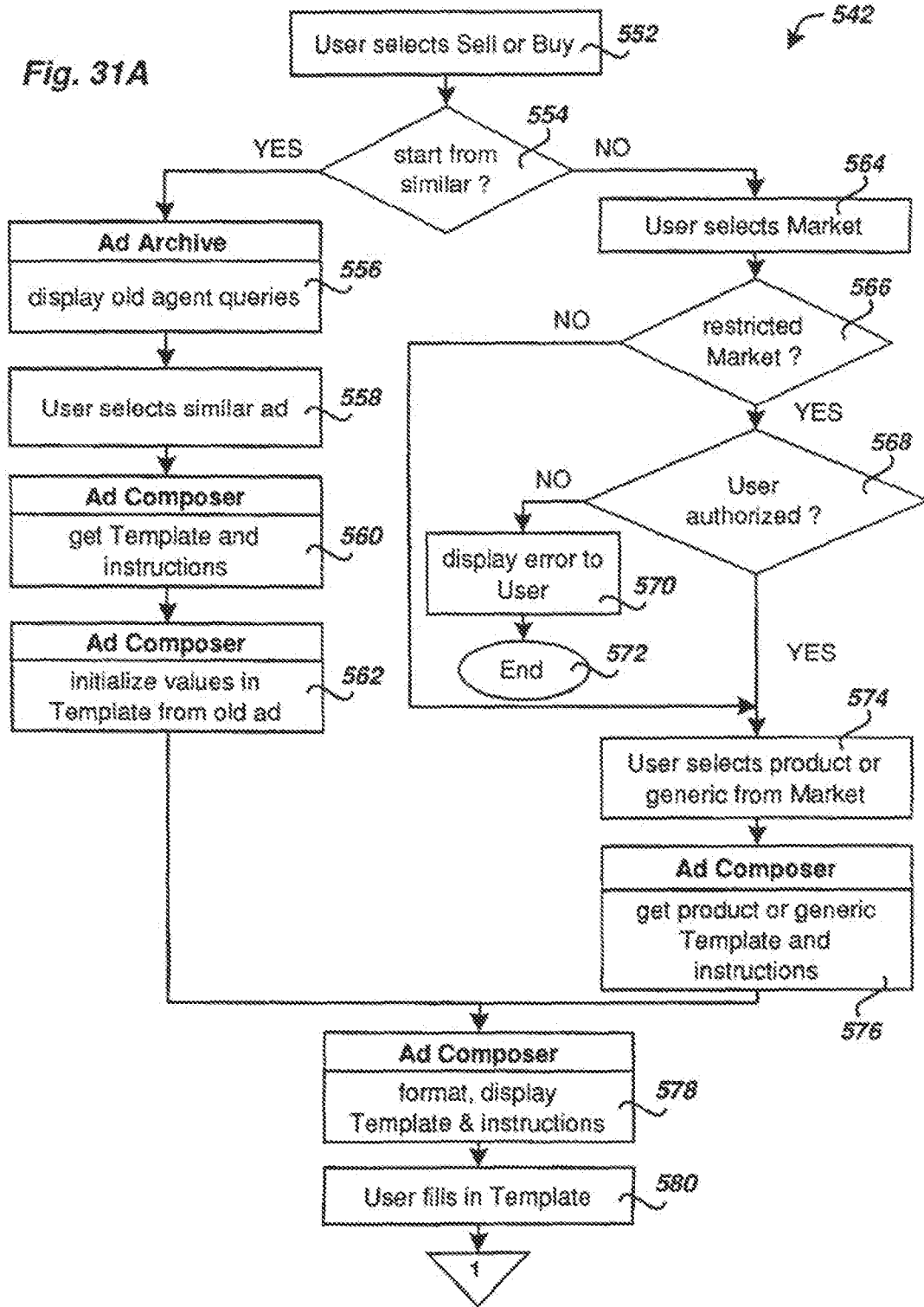
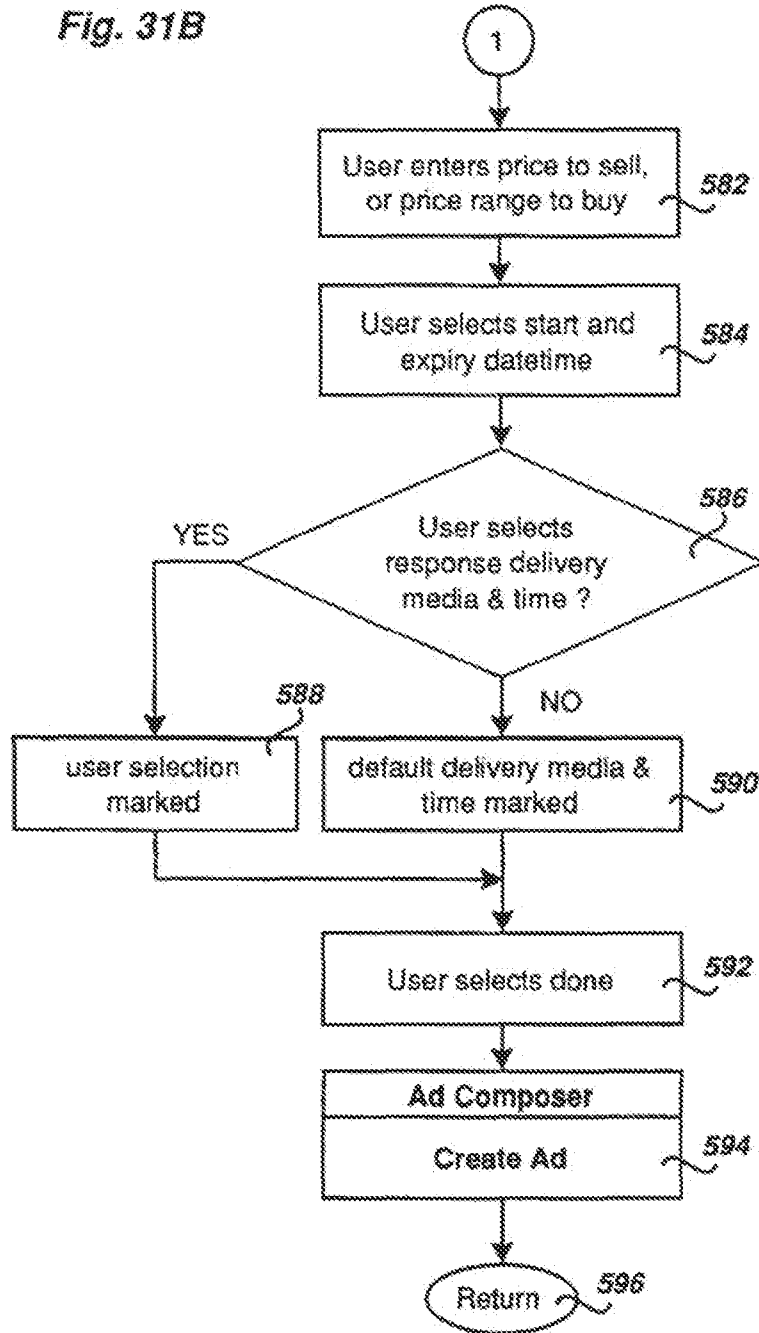


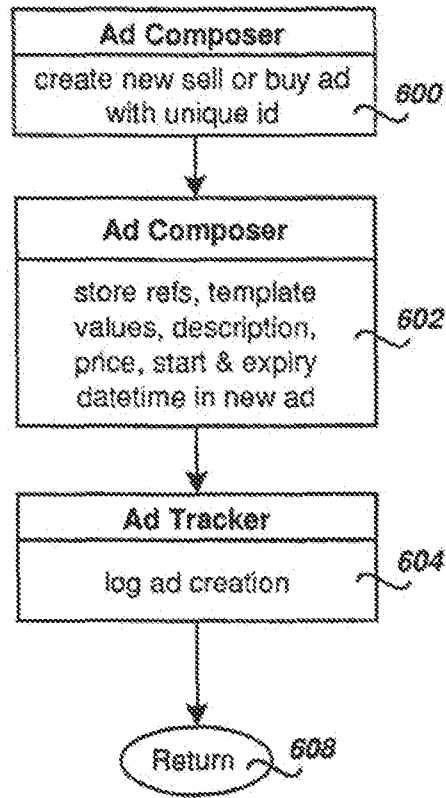
Fig. 31B



### Create Ad Subroutine

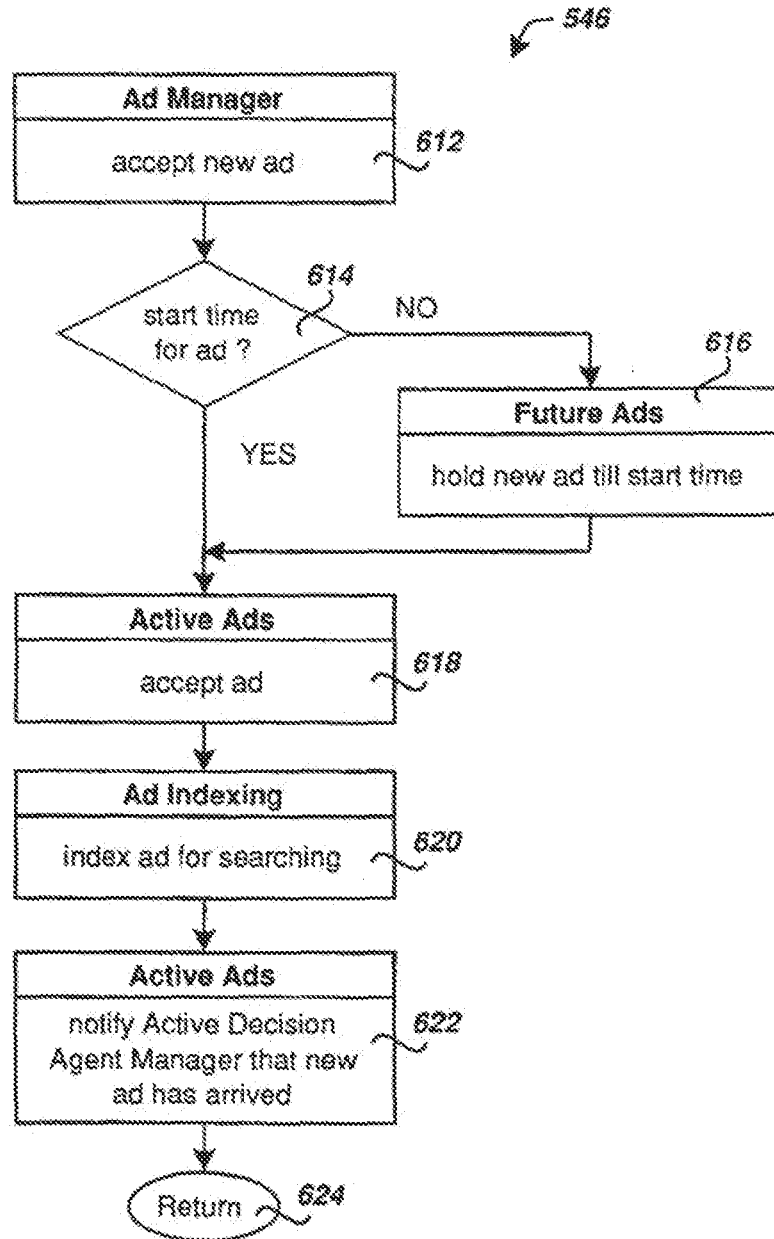
Fig. 32

594



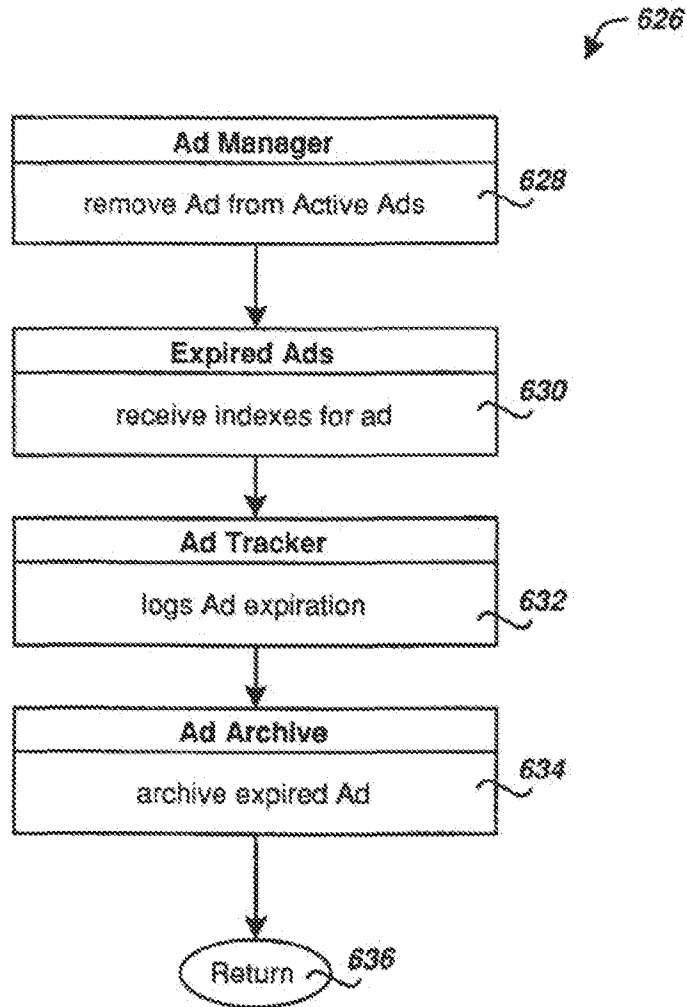
### Accept New Ad Subroutine

Fig. 33



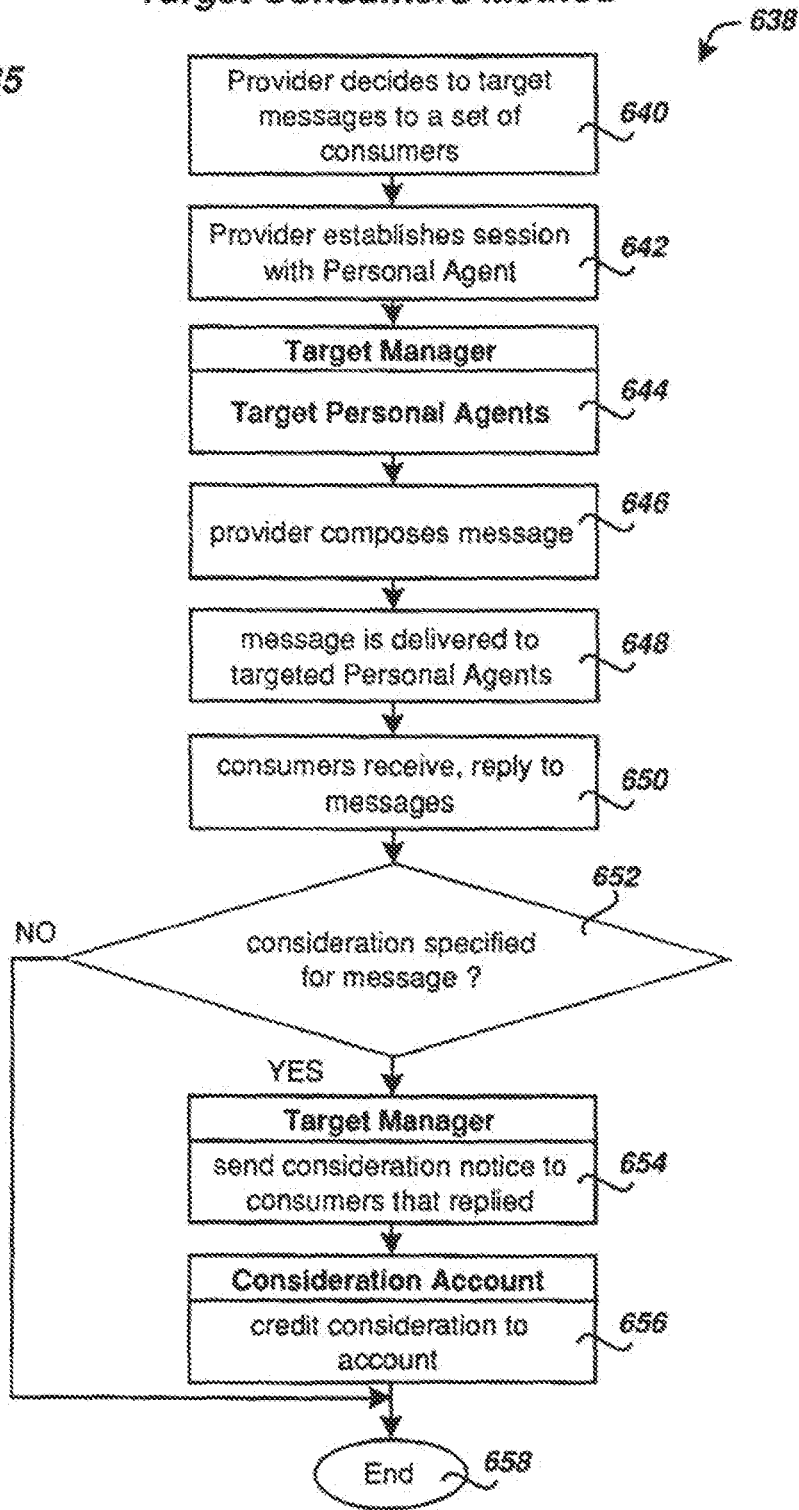
### Expire Ad Subroutine

Fig. 34

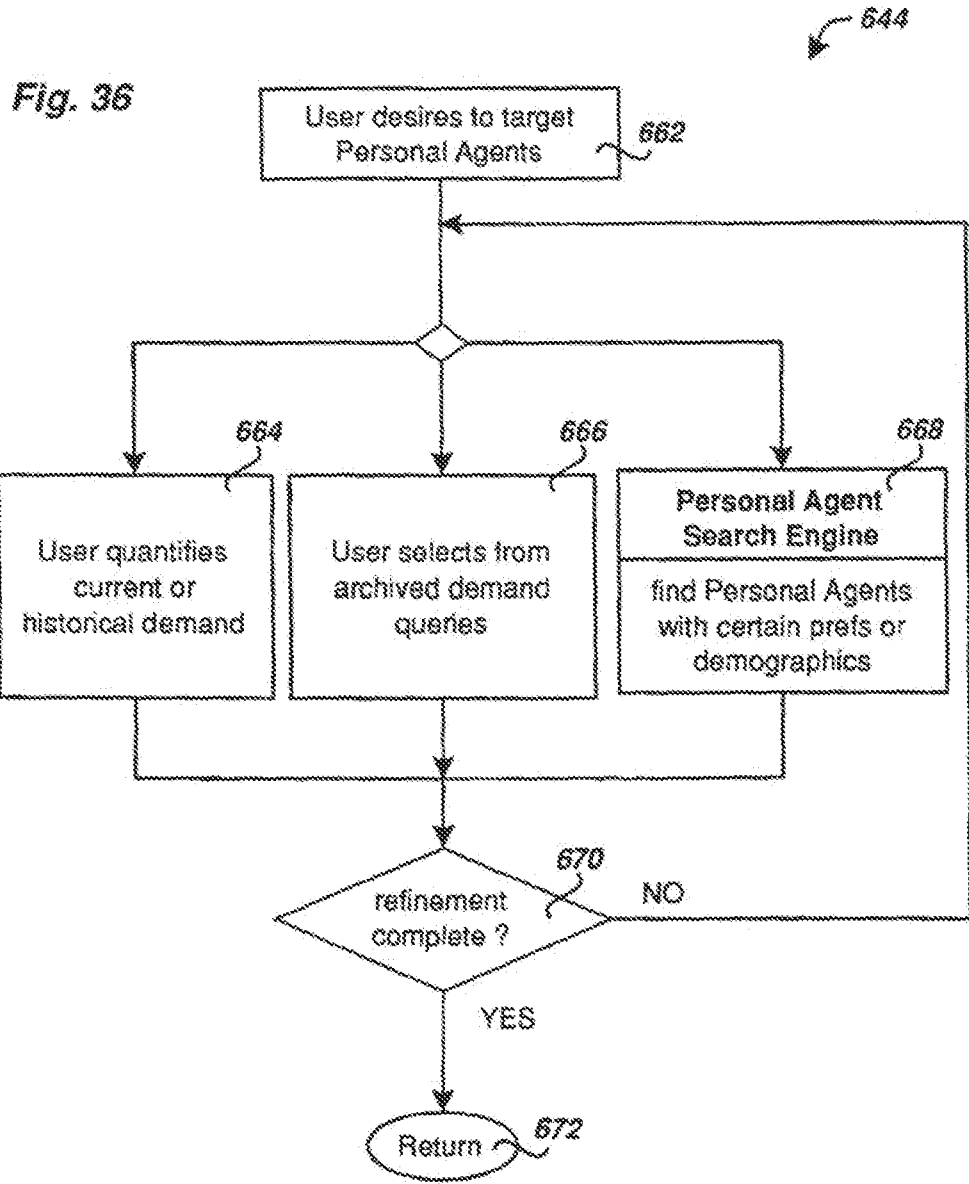


### Target Consumers Method

Fig. 35

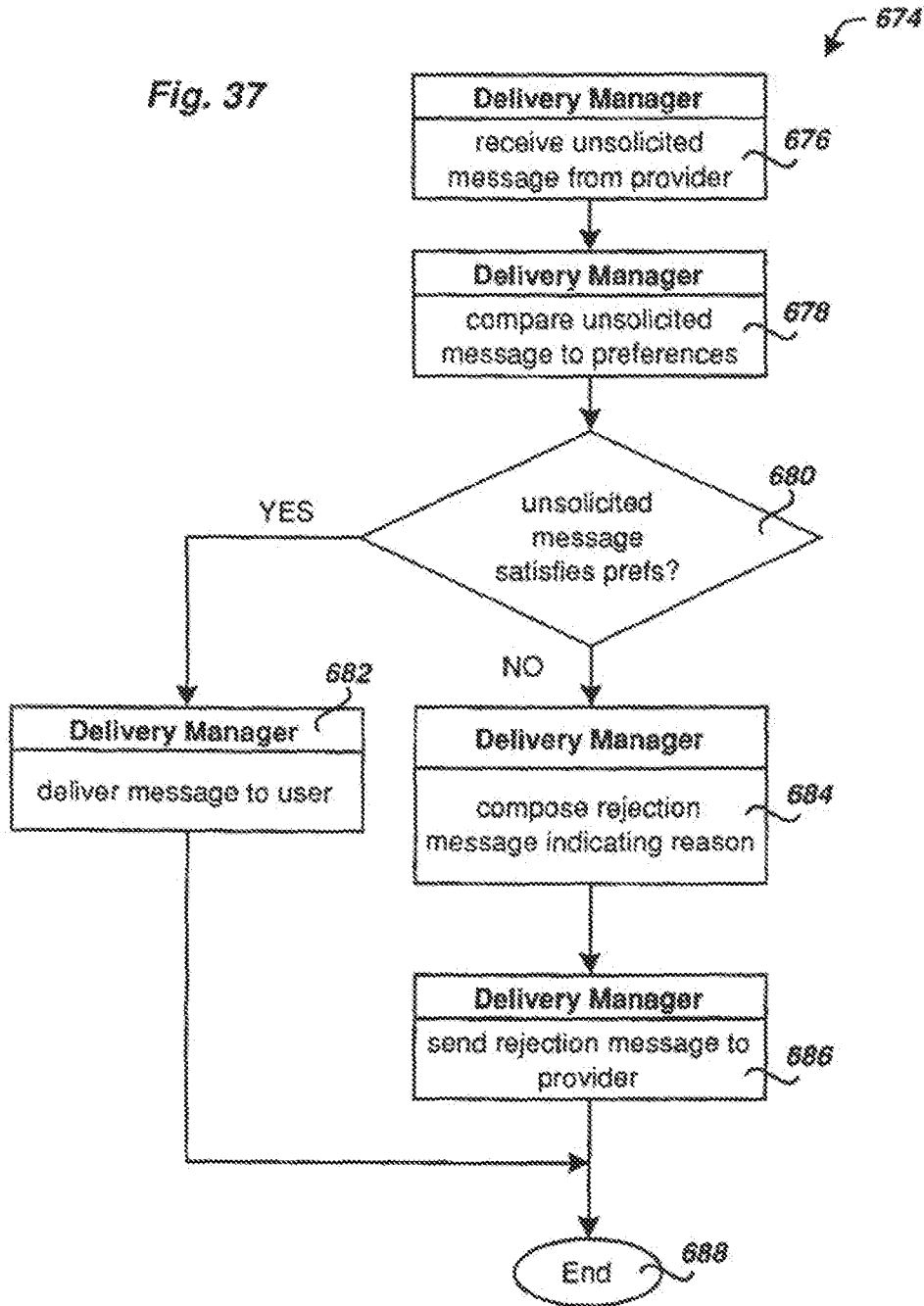


### Target Personal Agents Subroutine



### Reject Unsolicited Message Method

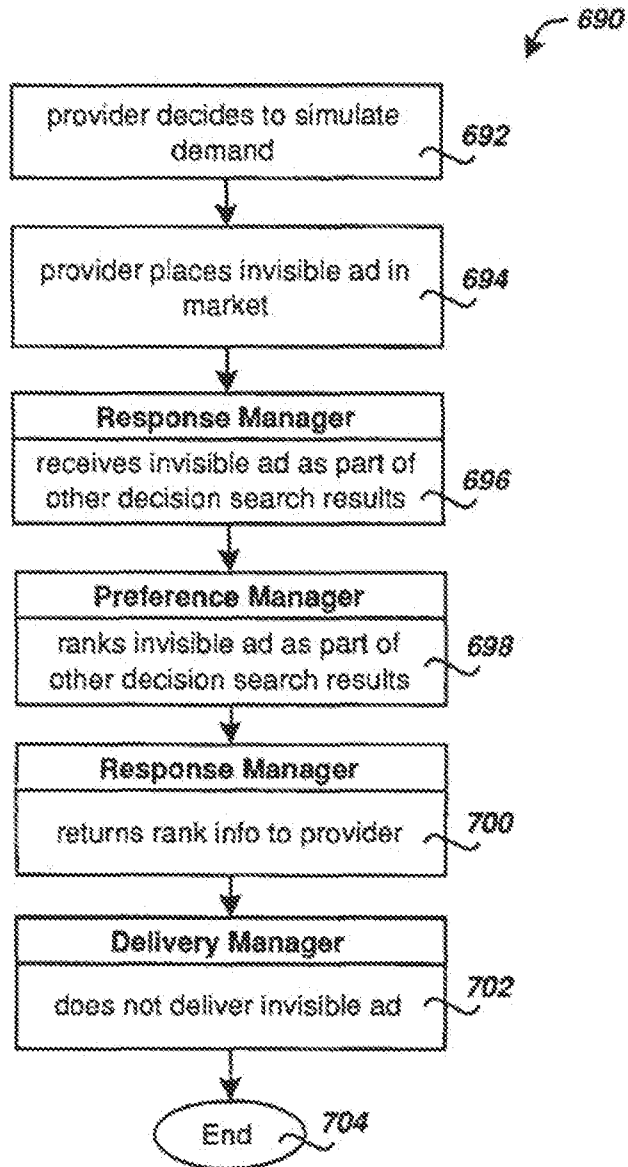
Fig. 37





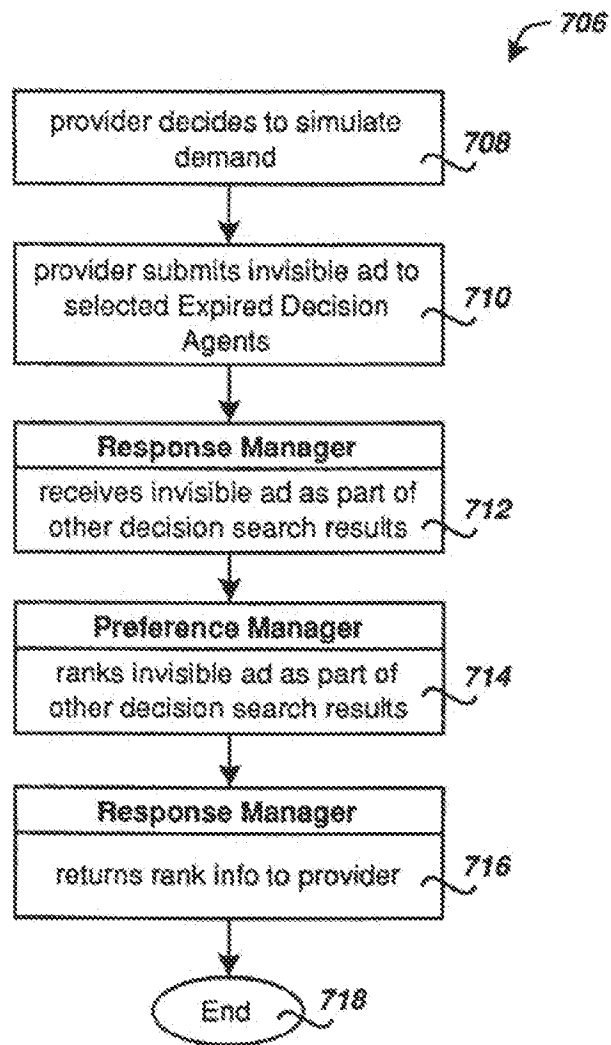
### Simulate Demand Method

Fig. 38A



### Replay Demand Method

Fig. 38B



Login to Agent System

*Agent Logo* *Agent System Name*

Welcome to Agent System

What is a Personal Agent? Create your own for FREE!


If you already have a Personal Agent,  
enter your Agent Id:   
and Password:

[then Click here to enter the system](#)

*Fig. 39*

Search the Consumer Electronics Market

*Need detailed instructions? [Click here](#)*

 **Search for Consumer Electronics**

Tell us what you're looking for, and let your Personal Agent immediately search for you!

**Category**

TV                                       VCR                                       Laser Disk Player  
 Cassette Player                       Cassette Recorder                   Compact Disc Player  
 Complete Stereo System               Speakers  
 Receiver                                       Amplifier                                   Tuner  
 Game Systems                               Clock Radio                               Radio  
 Accessories  
 Component                                   Portable                                   Console

<b>Product</b>	Brand:	<input type="text"/>	Model:	<input type="text"/>
<b>Location</b>	Merchant:	<input type="text"/>	City:	<input type="text"/>
<b>Price Range</b>	From:	<input type="text"/>	Up to:	<input type="text"/>

**Fig. 40**

Search the Automobile Market

*Need detailed instructions? [Click here](#)*

**icon** Search for Automobiles

Tell us what you're looking for, and let your Personal Agent immediately search for you!

Sedan                       Mini Van                       Full size Van  
 Sport Utility               Mini Pickup                   Full size Pickup  
 High Performance       Luxury                           Convertible  
 2 door                           4 door                           Hatch back  
 4 wheel drive               Front wheel drive           Rear wheel drive  
 Compact                       Midsize                           Fullsize  
 New                               Used

Vehicle	Make: <i>select</i> <input type="checkbox"/>	Model:	
Location	Dealer:	City:	
Age	From Year:	Thru Year:	
Price Range	From:	Up to:	
Maximum mileage:			

[Click here to specify additional features](#)                      [Click here to start looking](#)

**Fig. 41**

Compose Ad

*Need detailed instructions? [Click here](#)*

*icon* **Compose a Sell Ad for Television Set**

Details from Product Database are automatically included in ad.

Brand name:	<input type="text"/>	Model number:	<input type="text"/>
UPC code:	<input type="text"/>	<input type="checkbox"/>	Identify seller in ad
Price:	<input type="text"/>	<input type="checkbox"/>	Buyer responses to Personal Agent

*If neither box is checked, responses will go to Personal Agent only*

Start date & time:	<input type="text"/>	Run through:	<input type="text"/>
--------------------	----------------------	--------------	----------------------

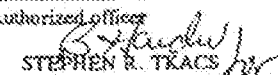
Enter additional text for ad. Delivered to searchers who request more info.

[Click here to continue to next step](#)

Fig. 42

INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US87/01057

<p><b>A. CLASSIFICATION OF SUBJECT MATTER</b>                  IPC(6) :G06F 17/60; G06G 7/52                  US CL :395/226,227                  According to International Patent Classification (IPC) or to both national classification and IPC</p>																	
<p><b>B. FIELDS SEARCHED</b>                  Minimum documentation searched (classification system followed by classification symbols)                  U.S. : 395/201,226,227,228,229,235,239                  Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched                  Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)                  APS:                  agent, shopping, search, query, product, catalog</p>																	
<p><b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b></p> <table border="1"> <thead> <tr> <th>Category*</th> <th>Citation of document, with indication, where appropriate, of the relevant passages</th> <th>Relevant to claim No.</th> </tr> </thead> <tbody> <tr> <td>Y</td> <td>Chaum; "Security without Identification: Card Computers to Make Big Brother Obsolete"; Communications of the ACM; v28 n10; pp. 1030-1044; October 1985; see pages 1-24 of printout</td> <td>1-57</td> </tr> <tr> <td>Y</td> <td>US 4,984,155 A (GEIER et al.) 08 JANUARY 1991 see cols. 2-10</td> <td>1-57</td> </tr> <tr> <td>A</td> <td>US 4,992,940 A (DWORKIN) 12 FEBRUARY 1991 see Abstract</td> <td>1-57</td> </tr> <tr> <td>A</td> <td>Chaum; "Achieving Electronic Privacy"; Scientific American; August 1992; pp. 96-101; see pages 1-8 of printout</td> <td>1-57</td> </tr> </tbody> </table>			Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.	Y	Chaum; "Security without Identification: Card Computers to Make Big Brother Obsolete"; Communications of the ACM; v28 n10; pp. 1030-1044; October 1985; see pages 1-24 of printout	1-57	Y	US 4,984,155 A (GEIER et al.) 08 JANUARY 1991 see cols. 2-10	1-57	A	US 4,992,940 A (DWORKIN) 12 FEBRUARY 1991 see Abstract	1-57	A	Chaum; "Achieving Electronic Privacy"; Scientific American; August 1992; pp. 96-101; see pages 1-8 of printout	1-57
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.															
Y	Chaum; "Security without Identification: Card Computers to Make Big Brother Obsolete"; Communications of the ACM; v28 n10; pp. 1030-1044; October 1985; see pages 1-24 of printout	1-57															
Y	US 4,984,155 A (GEIER et al.) 08 JANUARY 1991 see cols. 2-10	1-57															
A	US 4,992,940 A (DWORKIN) 12 FEBRUARY 1991 see Abstract	1-57															
A	Chaum; "Achieving Electronic Privacy"; Scientific American; August 1992; pp. 96-101; see pages 1-8 of printout	1-57															
<p><input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C. <input type="checkbox"/> See patent family annex.</p>																	
<p>* Special categories of cited documents:</p> <table border="0"> <tr> <td>"A" document defining the general state of the art which is not considered to be part of particular relevance</td> <td>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</td> </tr> <tr> <td>"E" earlier document published on or after the international filing date</td> <td>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone</td> </tr> <tr> <td>"L" document which may throw doubt on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</td> <td>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art</td> </tr> <tr> <td>"O" document referring to an oral disclosure, use, exhibition or other means</td> <td>"Z" document member of the same patent family</td> </tr> <tr> <td>"P" document published prior to the international filing date but later than the priority date claimed</td> <td></td> </tr> </table>			"A" document defining the general state of the art which is not considered to be part of particular relevance	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention	"E" earlier document published on or after the international filing date	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone	"L" document which may throw doubt on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art	"O" document referring to an oral disclosure, use, exhibition or other means	"Z" document member of the same patent family	"P" document published prior to the international filing date but later than the priority date claimed						
"A" document defining the general state of the art which is not considered to be part of particular relevance	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention																
"E" earlier document published on or after the international filing date	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone																
"L" document which may throw doubt on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art																
"O" document referring to an oral disclosure, use, exhibition or other means	"Z" document member of the same patent family																
"P" document published prior to the international filing date but later than the priority date claimed																	
Date of the actual completion of the international search 05 APRIL 1997		Date of mailing of the international search report <b>15 APR 1997</b>															
Name and mailing address of the ISA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. (703) 305-3236		Authorized officer  STEPHEN R. TRACS Telephone No. (703) 305-3800															

## INTERNATIONAL SEARCH REPORT

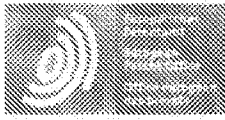
International application No.  
PCT/US97/01957

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5,283,731 A (LALONDE et al.) 01 FEBRUARY 1994 see cols. 3-11	1-57
A	US 5,319,542 A (KING, Jr. et al.) 07 JUNE 1994 see Abstract	1-57

Form PCT/ISA/210 (continuation of second sheet)(July 1992)\*







Espacenet

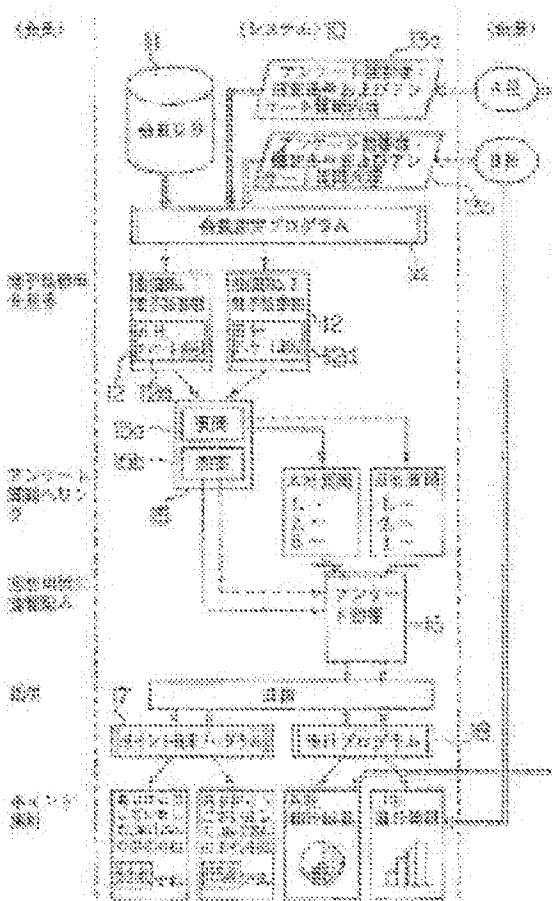
# Bibliographic data: JP 10143491 (A)

## QUESTIONNAIRE SYSTEM

**Publication date:** 1998-05-29  
**Inventor(s):** SUZUKI YASUSHI; SAKAI KIYOE +  
**Applicant(s):** DAINIPPON PRINTING CO LTD +  
**Classification:** - international: G06F13/00; G06F17/00; G06Q50/00; (IPC1-7): G06F13/00; G06F17/00  
 - European:  
**Application number:** JP19960299959 19961112  
**Priority number(s):** JP19960299959 19961112

### Abstract of JP 10143491 (A)

**PROBLEM TO BE SOLVED:** To efficiently provide the answers of a questionnaire by sending out questionnaires while utilizing a computer network.  
**SOLUTION:** A system 10 sends out questionnaires to members while using an electronic post-office box 12 accessible from the computers of member through a communication line. The system 10 is provided with a member DB 11 for storing member information concerning members, questionnaire information storage parts 13 (13a and 13b) for storing the contents of a questionnaire and the answerer selection conditions of that questionnaire, and member selection program 14 for selecting the members suited to the answerer selection conditions in the questionnaire information storage part 13 based on the member information in the member DB 11. Then, guidance information for guiding the questionnaire is placed in the electronic post-office box 12 for selected members, the contents of the questionnaire are opened from the electronic post-office box 12 and further, the answers of the questionnaires are received.



Last updated: 26.04.2011 Worldwide  
 Database: 5.7.23, 92p

(19)日本特許庁 (J P)

(12) 公開特許公報 (A)

(11)特許出願公開番号

特開平10-143491

(43)公開日 平成10年(1998)5月29日

(51)Int.Cl. <sup>5</sup>	識別記号	F 1
G 0 6 F 17/00		C 0 6 F 15/20
13/00	3 5 1	13/00
		N
		3 5 1 C

審査請求 未請求 請求項の数 6 OL (全 7 頁)

(21)出願番号 特願平8-299959

(22)出願日 平成8年(1996)11月12日

(71)出願人 000002897  
大日本印刷株式会社  
東京都新宿区市谷加賀町一丁目1番1号

(72)発明者 鈴木 晴  
東京都新宿区市谷加賀町一丁目1番1号  
大日本印刷株式会社内

(73)発明者 額井 清恵  
東京都新宿区市谷加賀町一丁目1番1号  
大日本印刷株式会社内

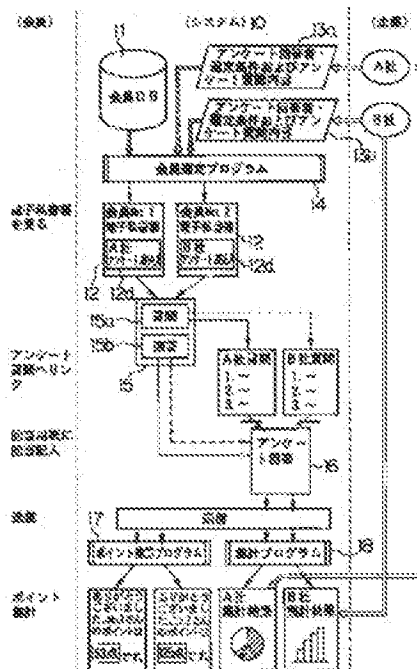
(74)代理人 弁理士 鎌田 久男

(54)【発明の名称】 アンケートシステム

(57)【要約】

【課題】 コンピュータネットワークを利用してアンケートを行い、アンケートの回答を効率良く得る。

【解決手段】 システム10は、会員のコンピュータから通信回線を介してアクセス可能な電子私書箱12を用いて会員にアンケートを行うシステムである。システム10は、会員に関する会員情報を記憶する会員DB11と、アンケート内容及びそのアンケートの回答者選定条件を記憶するアンケート情報記憶部13と、会員DB11の会員情報に基づいて、アンケート情報記憶部13の回答者選定条件に適合する会員を選定する会員選定プログラム14とを備える。そして、選定された会員の電子私書箱12にアンケートを案内するための案内情報をおき、電子私書箱12からアンケートの内容を開示し、さらにはアンケートの回答を受け取る。



## 【特許請求の範囲】

【請求項1】 ホストコンピュータと会員のコンピュータとが通信回線によって接続されており、前記ホストコンピュータ側で会員ごとに電子私書箱を付与し、会員のコンピュータから前記通信回線を介して前記電子私書箱にアクセス可能に形成されたシステムにおいて、前記電子私書箱を用いて会員にアンケートを行うアンケートシステムであって、

会員の属性情報を含む会員情報を記憶する会員情報記憶手段と、

アンケート内容及びそのアンケートの回答者を選定するための回答者選定条件を記憶するアンケート情報記憶手段と、

前記会員情報記憶手段に記憶された前記会員情報に基づいて、前記アンケート情報記憶手段に記憶された前記回答者選定条件に適合する会員を選定する適合会員選定手段と、

前記適合会員選定手段により選定された会員の前記電子私書箱に、アンケートを案内するための案内情報をおく案内情報設置手段と、

前記電子私書箱の前記案内情報に基づいて、前記電子私書箱からアンケート内容の開示の要求があったときに、前記アンケートの内容を開示するアンケート内容開示手段とを備えることを特徴とするアンケートシステム。

【請求項2】 請求項1に記載のアンケートシステムにおいて、

前記電子私書箱の前記案内情報に基づいて、前記電子私書箱からアンケートの回答の要求があったときに、前記アンケートの回答を受け取るアンケート回答受け取り手段を備えることを特徴とするアンケートシステム。

【請求項3】 請求項2に記載のアンケートシステムにおいて、

前記アンケート回答受け取り手段により前記アンケートの回答を受け取ったときに、その会員に対して前記アンケートの回答に対応するポイントを付与するポイント付与手段を備えることを特徴とするアンケートシステム。

【請求項4】 請求項2又は請求項3に記載されたアンケートシステムにおいて、

前記アンケート回答受け取り手段により受け取った前記アンケートの回答の集計結果を作成するアンケート集計手段を備えることを特徴とするアンケートシステム。

【請求項5】 請求項4に記載のアンケートシステムにおいて、

前記アンケート集計手段により作成した前記アンケートの回答の集計結果を、所定のアクセスがあったときに開示する集計結果開示手段を備えることを特徴とするアンケートシステム。

## 【発明の詳細な説明】

## 【0001】

【発明の属する技術分野】この発明は、通信回線を介し

てアクセス可能な電子私書箱を会員ごとに付与したシステムにおいて、前記電子私書箱を用いて会員にアンケートを行うアンケートシステムに関するものである。

## 【0002】

【従来の技術】従来、複数人に対してアンケートを行い、回答を集計しようとするときは、例えばダイレクトメールで行うか、又は街頭若しくは店内でアンケートを求めて行うような方法が採られていた。

【0003】また、上記ダイレクトメールによるときは、電子メールを用いて行う方法がある。電子メールは、インターネットに接続された宛先ドメイン（管轄するコンピュータ）に送信される。管轄するコンピュータでは、指定された宛先ユーザのメールボックスにそのダイレクトメールを届け、蓄積する。すなわち、ダイレクトメールは、管轄するコンピュータのメモリに宛先ユーザと関連づけられた状態で保存される。一方、宛先ユーザは、適当な時に自分のメールボックスの申からダイレクトメールを取り出す。そして、ダイレクトメールに回答した後は、上記の管轄するコンピュータにその回答を返送する。これにより、ダイレクトメールの発送元では、ダイレクトメールを送信し、その回答を受信することが可能となる。

## 【0004】

【発明が解決しようとする課題】しかし、前述の従来の方法では、第1に、人件費等が高くつき、アンケートに伴うコストが高くなるという問題があった。一方、電子メールを用いた方法では、アンケートに伴うコストの低減を図ることが可能となる。しかし、不特定多数の者に対してダイレクトメールを送信又は送付する方法では、相手がダイレクトメールを見たか否かが不明であるとともに、回答率が低下するという問題があった。

【0005】ここで、回答者に景品や粗品等を与えて回答率を高めることができるが、特定の分野において、それに興味がある者に絞ったアンケートを行うことができないという問題があった。本発明の課題は、コンピュータネットワークを利用してアンケートを行い、アンケートの回答を効率良く得ることにある。

## 【0006】

【課題を解決するための手段】上述の課題を解決するために、請求項1の発明は、ホストコンピュータと会員のコンピュータとが通信回線によって接続されており、前記ホストコンピュータ側で会員ごとに電子私書箱を付与し、会員のコンピュータから前記通信回線を介して前記電子私書箱にアクセス可能に形成されたシステムにおいて、前記電子私書箱を用いて会員にアンケートを行うアンケートシステムであって、会員の属性情報を含む会員情報を記憶する会員情報記憶手段と、アンケート内容及びそのアンケートの回答者を選定するための回答者選定条件を記憶するアンケート情報記憶手段と、前記会員情

報記憶手段に記憶された前記会員情報に基づいて、前記アンケート情報記憶手段に記憶された前記回答者選定条件に適合する会員を選定する適合会員選定手段と、前記適合会員選定手段により選定された会員の前記電子私書箱に、アンケートを案内するための案内情報をおく案内情報設置手段と、前記電子私書箱の前記案内情報に基づいて、前記電子私書箱からアンケート内容の開示の要求があったときに、前記アンケートの内容を開示するアンケート内容開示手段とを備えることを特徴とする。

【0007】請求項2の発明は、請求項1に記載のアンケートシステムにおいて、前記電子私書箱の前記案内情報に基づいて、前記電子私書箱からアンケートの回答の要求があったときに、前記アンケートの回答を受け取るアンケート回答受け取り手段を備えることを特徴とする。

【0008】請求項3の発明は、請求項2に記載のアンケートシステムにおいて、前記アンケート回答受け取り手段により前記アンケートの回答を受け取ったときに、その会員に対して前記アンケートの回答に対応するポイントが付与するポイント付与手段を備えることを特徴とする。

【0009】請求項4の発明は、請求項2又は請求項3に記載されたアンケートシステムにおいて、前記アンケート回答受け取り手段により受け取った前記アンケートの回答の集計結果を作成するアンケート集計手段を備えることを特徴とする。

【0010】請求項5の発明は、請求項4に記載のアンケートシステムにおいて、前記アンケート集計手段により作成した前記アンケートの回答の集計結果を、所定のアクセスがあったときに開示する集計結果開示手段を備えることを特徴とする。

【0011】請求項1の発明においては、会員情報及びアンケートの回答者選定条件から、アンケートに答えて欲しい会員が選定され、その選定された会員の電子私書箱に、アンケートの案内情報がおかれる。そして、電子私書箱の案内情報に基づいてアンケート内容の開示の要求があったときは、その会員に対してアンケート内容が開示される。

【0012】請求項2の発明においては、電子私書箱の案内情報に基づいて、アンケートの回答の要求があったときは、その会員のアンケートの回答が受け取られる。請求項3の発明においては、アンケートに回答した会員に対して、所定のポイントが付与される。請求項4の発明においては、アンケートの回答から、集計結果が作成される。請求項5の発明においては、アンケートの集計結果に所定のアクセスがあったときは、その集計結果が開示される。

【0013】

【発明の実施の形態】以下、図面等を参照して、本発明の一実施形態について説明する。図1は、本発明による

アンケートシステムの一実施形態を説明する図である。本発明のアンケートシステムは、ホストコンピュータと会員のパソコンとが通信回線によって接続されており、ホストコンピュータ側で会員ごとに電子私書箱を付与し、会員のパソコンから通信回線を介して電子私書箱にアクセス可能に形成されたシステムにおいて、電子私書箱を用いて会員にアンケートを行うシステムである。

【0014】特に、本実施形態でのアンケートシステム10（以下、単に「システム10」という。）は、インターネット上で行うものであり、本件出願人により既に出願された電子私書箱システム（平成8年9月18日出願の特開平8-246482号）を用いるものである。

【0015】図1において、システム10は、会員に関する情報を記憶している会員DB（データベース）11を備えている。会員DB11に記憶されている情報としては、例えば会員の氏名、住所、生年月日、趣味等があげられる。システム10は、全ての会員に対して、電子私書箱12を与えている。電子私書箱12は、インターネット上でアクセス可能な会員個人のページである。

【0016】図2は、会員として登録を行うときに、その者の種々のデータを入力する画面を示す図である。この会員の登録は、パソコン画面を通じて行われる。図2に示すように、会員の登録時には、氏名、住所、電話番号、職業、勤務先、学歴、生年月日、性別、出身地、出生時間、血液型、嗜好、購読新聞や雑誌、家族構成、使用しているクレジットカード、メモリアルデー、又は好きなクレント等を入力する。そして、会員として登録されたときは、これらの情報が会員DB11に記憶され、その会員に電子私書箱12が与えられる。また、その会員に対して、その会員の識別情報となるURLが報告される。会員は、このURLに基づいて、自己の電子私書箱12にアクセスすることができる。

【0017】図3は、電子私書箱12を画面表示したときの一実施形態を示す図である。システム10は、会員全員へのメッセージを、全ての会員の電子私書箱12のメッセージ欄12aに表示する。また、システム10は、会員の電子私書箱12に、その会員に適合する情報を表示するために、複数のプログラム（古いプログラムやダイレクトメールの選定プログラム等）を備えている。古いプログラムは、会員DB11に記憶された会員の生年月日、出生時間及び出生地等に基づいて、毎日、会員ごとの運勢を作成する。システム10は、その内容を電子私書箱12の運勢表示欄12cに表示する。

【0018】また、ダイレクトメールの選定プログラムは、企業から提示されたダイレクトメールの送信条件と、会員DB11に記憶された会員の趣味や嗜好等を含む情報とから、その企業のダイレクトメールの送信条件に適合する会員を選定する。システム10は、その選定した会員の電子私書箱12のDM欄12bに、ダイレクトメールをおく。ここでのダイレクトメールは、ある企

業でその会員の趣味に合致したホームページを出している旨の表示である。例えば、ある企業で映画を紹介したホームページを有している場合には、映画を趣味として登録した会員に対してのみ、その企業のダイレクトメールをおくようにする。

【0019】システム10は、会員からURLによって電子私書箱12へのアクセスがあったとき、そのURLに対応する電子私書箱12の参照を許可する。これにより、会員は、自己の電子私書箱12を参照して、メッセージや運勢等を見ることができる。さらに、DM欄12bにダイレクトメールがおかれている場合に、その部分をクリックしたときは、そのダイレクトメールに対応するホームページに直接飛んでいくことができる。

【0020】さらに、システム10は、各会員の電子私書箱12におかれたダイレクトメールからホームページへのアクセス率を集計し、アクセス率が所定値以下であった場合には、会員DB11に記憶されているその会員の属性を変更するようにする。例えば、ある会員の趣味が「映画」として会員DB11に記憶されている場合には、その会員に対しては、映画を紹介したホームページを有する企業のダイレクトメールがおかれるが、10回のダイレクトメールのうち一度もホームページにアクセスがなかったときや、50回のダイレクトメールのうちアクセスが2回以下であった場合等には、その会員の趣味から「映画」を除くように会員DB11の内容を変更する。

【0021】また、会員は、電子私書箱12にアクセスしている時に、既に登録した登録内容の更新を行うことができる。図3において、「登録内容の更新」のアイコン12eをクリックすることによって、例えば図2で示した登録内容が表示され、会員は、これに基づいて登録内容を更新(訂正)することができる。更新された内容は、会員DB11に再登録される。これにより、会員の趣味等が変わったときでも、それを更新することが可能となる。

【0022】次に、アンケートの方法について説明する。図1において、企業(図1中、A社やB社)は、システム10側に、アンケート質問内容及びアンケート回答者の選定条件(例えば、男女の別、年齢層、職業又は趣味等)を送信する。システム10は、これをアンケート情報記憶部13(13a、13b、...)に記憶しておく。会員選定プログラム14は、会員DB11に登録された会員の生年月日や趣味等(属性情報)に基づいて、アンケート情報記憶部13に記憶されたアンケートの回答者の選定条件に適合する会員を選定する。システム10は、会員を選定したときは、その選定した会員の電子私書箱12のメッセージ欄12dに、アンケートがある旨のメッセージをおく。

【0023】そして、このメッセージ欄12dをクリックされると、次に、図4に示すアンケート調査用のペー

ジ15に飛ぶ。このページ15では、アンケート用紙を取り出す旨が表示された欄15aと、アンケートに回答する旨が表示された欄15bとが表示される。会員は、最初に欄15aをクリックする。システム10は、この信号を受信すると、会員側のパソコンにダウンロードし、又はプリントアウトすることを許可する。会員は、出力されたアンケート内容を見て、そのアンケートに回答する。アンケート内容のダウンロード等が終了すると、再度電子私書箱12の画面に戻る。会員は、ここで一旦通信回線を切り、アンケートの質問に答える。

【0024】次に、会員は、アンケートに回答をするときは、再度自己の電子私書箱12にアクセスし、メッセージ欄12dをクリックして、図4で示したページ15に飛ぶ。ここで、会員は、欄15bをクリックする。システム10は、この信号を受信すると、アンケートの回答を許可し、図5に示すアンケート回答用のページ16に飛ぶ。このアンケート回答用のページ16のフォーマットは、アンケートの質問内容等に応じていかなる形態であっても良いが、本実施形態では、五者択一式や記述式等を含むものである。また、フォーマットは、企業ごとに異なっても良いが、全ての企業で統一しておけば、簡素化を図ることができる。

【0025】会員は、このページ16に自己の回答をパソコンで入力する。そして、ページ16の送信用のアイコン16aをクリックされると、この回答がシステム10側に送信される。ここで、システム10は、アンケートの回答が全て入力されているか否かをチェックするのが一般的である。システム10は、アンケートの回答を受け取ると、アンケートの回答に応じて、会員に対してポイントを付与する。システム10には、会員のポイントを算出するためのポイント換算プログラム17が設けられている。システム10は、ポイント換算プログラム17により算出された後の会員の累積ポイント数を会員に画像表示する。ここで、各会員のポイント数は、会員DB11に記憶されている。システム10は、会員にポイントを付与するときは、会員DB11から、その会員の過去のポイントを検索する。

【0026】このようにして会員にポイントを付与したときは、そのポイント数に応じて、換金や景品等を与えるようにする。このようにすれば、アンケートの回答率を高めることができる。また、システム10には、会員から送信されてきたアンケートの回答を集計し、アンケートの統計その他の集計結果を作成する集計プログラム18が設けられている。ここで、集計結果の作成は、アンケートの回答が送信されてきた時点で逐次作成することが好ましいが、ある程度のアンケートの回答が集まってから作成しても良い。

【0027】システム10は、この集計結果の画像表示を可能としておく。企業側は、その集計結果のページに割り当てられているURLを指定することにより、この

集計結果のページにアクセスし、集計結果を見ることが  
できる。ここで、集計結果のページにアクセスするとき  
に、パスワードを入力させるようにして、アンケートを  
依頼した企業のみがアクセスできるようにする。

【0028】以上、本発明の一実施形態について説明し  
たが、本発明は、上述した実施形態に限定されることな  
く、均等の範囲内で種々の変形が可能である。例えば、  
会員選定プログラム14は、会員DB11に記憶された  
会員情報に基づいて、アンケートの回答者の選定条件に  
適合する会員を選定したが、ここでの選定は、会員が最  
初に登録した情報に基づいて選定しても良く、あるい  
は、更新(訂正)された情報に基づいて選定しても良  
い。

【0029】

【発明の効果】請求項1の発明によれば、コンピュータ  
ネットワークを利用して、効率良くアンケートを発信す  
ることができる。請求項2の発明によれば、効率良くアン  
ケートの回答を得ることができる。

【0030】請求項3の発明によれば、アンケートの回  
答意欲を高めることができる。請求項4の発明によれ  
ば、アンケートの集計を自動で行うことができる。請求  
項5の発明によれば、特定の者に対してのみ、アンケー

トの集計結果を開示することができる。

【図面の簡単な説明】

【図1】本発明によるアンケートシステムの一実施形態  
を説明する図である。

【図2】会員として登録を行うときに、その者の種々の  
データを入力する画面を示す図である。

【図3】電子私書箱12を画面表示したときの一実施形  
態を示す図である。

【図4】アンケート調査用のページ15を示す図であ  
る。

【図5】アンケート回答用のページ16を示す図であ  
る。

【符号の説明】

- 10 アンケートシステム
- 11 会員DB
- 12 電子私書箱
- 13 アンケート情報記憶部
- 14 会員選定プログラム
- 15 アンケート調査用のページ
- 16 アンケート回答用のページ
- 17 ポイント換算プログラム
- 18 集計プログラム

【図2】

氏名：姓  名

ふりがな：姓  名

性別：男性  女性

住所：〒

電話番号：

E-mail：

職業：

所属会社名(学名)：

学年：

---

選定日の情報登録

去年同日：19  年  月  日

性別： 男性  女性

出生地：

出生時期：

趣味： A型  B型  AB型  O型

読書、嗜好： 読書  対アク  読書  AV鑑賞  パソコン

(複数選択可)  写真  料理  資格・教養  ベット

家族構成：

メモリアルデーの登録

誕生日の登録： 年  月  日

結婚記念日の登録： 19  年  月  日

その他のメモリアルデー： 年  月  日

好きなタレント： ○○○△△  △△×××  ×××○○  ○×△△△

【図3】

10月15日  
○○○○○さん こんにちは！

◆全員へのメッセージ

◆あなたへのDM

◆今日のあなたの運勢

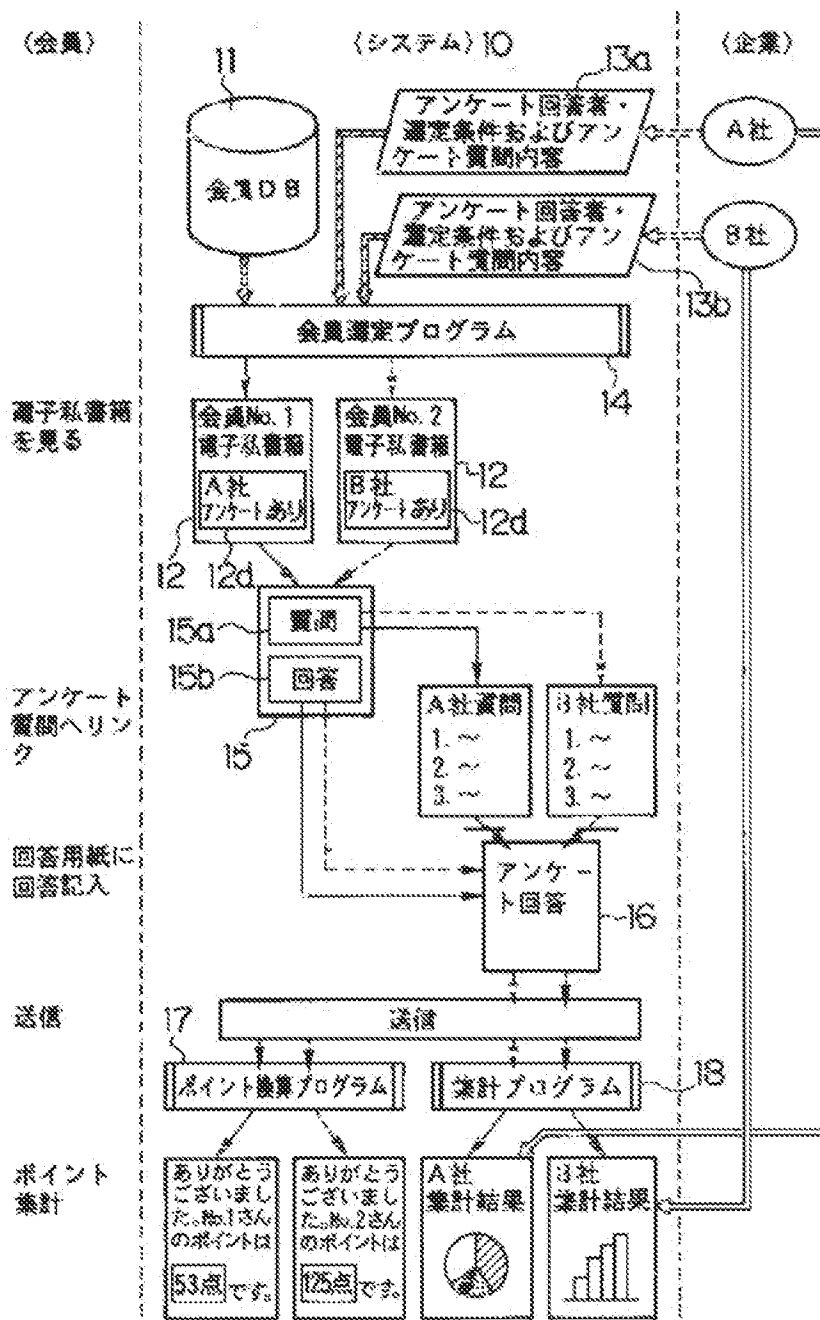
◆今日のIV Station

◆メッセージ

本日返信/アンケート調査があります。

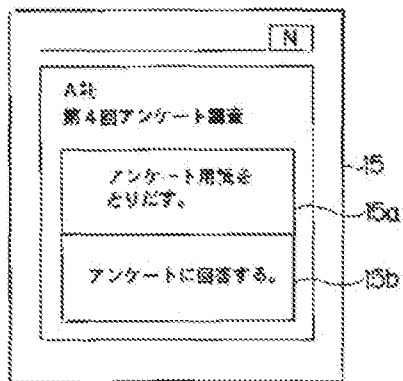
VXXコーナー | 登録内容の更新 | 5556667777

【図1】

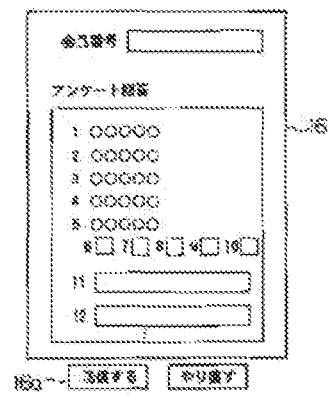




【図4】



【図5】

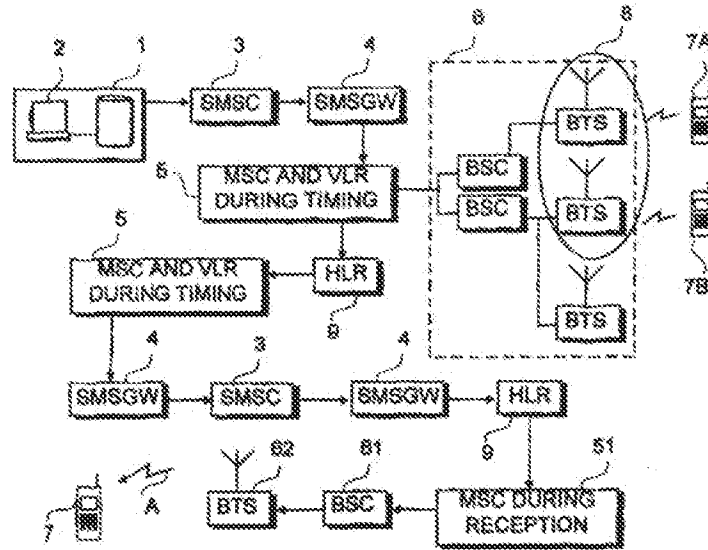




INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

<p>(51) International Patent Classification <sup>6</sup> : <b>H04Q 7/22</b></p>	<p><b>A1</b></p>	<p>(11) International Publication Number: <b>WO 98/09451</b> (43) International Publication Date: 5 March 1998 (05.03.98)</p>
<p>(21) International Application Number: PCT/FI97/00490 (22) International Filing Date: 26 August 1997 (26.08.97) (30) Priority Data: 963375 29 August 1996 (29.08.96) FI (71) Applicant (for all designated States except US): NOKIA MOBILE PHONES LTD. [FI/FI]; Keskitalonkatu 4, FIN-02150 Espoo (FI). (72) Inventors; and (75) Inventors/Applicants (for US only): HEINONEN, Pekka [FI/FI]; Hakakatu 2 B 28, FIN-02100 Espoo (FI), OKKONEN, Harri [FI/FI]; Salomkatu 5 as 3, FIN-02940 Espoo (FI), TUOMI, Ilkka [FI/FI]; Arkadiankatu 20 A 19, FIN-00100 Helsinki (FI). (74) Agent: JOHANSSON, Folke; Nokia Mobile Phones Ltd., P.O. Box 100, FIN-00045 Nokia Group (FI).</p>	<p>(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, HU, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, ARIPO patent (GH, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BI, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG).</p> <p><b>Published</b> <i>With international search report. Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments. In English translation (filed in Finnish).</i></p>	

(54) Title: AN OPINION POLL UTILIZING A WIRELESS DATA TRANSMISSION CONNECTION



(57) Abstract

The scope of the present invention is a method and a system for sending messages and for the processing of the received answers to the messages sent. In order to that it would be possible to make for example a quick and local opinion poll, a message (A) is fed from a communicator's (1) data processing system (2) over a service center (3) utilizing a wireless telecommunication connection essentially simultaneously to at least two recipients in the telecommunication devices (7) of the recipients, the recipients enter the answer to the message (A) with their telecommunication devices (7) over the service center (3) utilizing a wireless telecommunication connection back to the communicator's (1) data processing system (2) which waits for the answers for a certain, predetermined time, and the information contained in the answers is processed in a predetermined way in the communicator's (1) data processing system (2).

*FOR THE PURPOSES OF INFORMATION ONLY*

Codex used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AL	Albania	ES	Spain	LS	Lesotho	SI	Slovenia
AM	Armenia	FI	Finland	LT	Lithuania	SK	Slovakia
AT	Austria	FR	France	LU	Luxembourg	SN	Senegal
AU	Australia	GA	Gabon	LV	Latvia	ST	Swaziland
AZ	Azerbaijan	GB	United Kingdom	MC	Monaco	TD	Chad
BA	Bosnia and Herzegovina	GE	Georgia	MD	Republic of Moldova	TG	Togo
BB	Barbados	GH	Ghana	MG	Madagascar	TJ	Tajikistan
BE	Belgium	GN	Guinea	MK	The former Yugoslav Republic of Macedonia	TM	Turkmenistan
BF	Burkina Faso	GR	Greece	ML	Mali	TR	Turkey
BG	Bulgaria	HU	Hungary	MN	Mongolia	TT	Trinidad and Tobago
BJ	Benin	IE	Ireland	MR	Mauritania	UA	Ukraine
BR	Brazil	IL	Israel	MW	Malawi	UG	Uganda
BY	Belarus	IS	Iceland	MX	Mexico	US	United States of America
CA	Canada	IT	Italy	NE	Niger	UZ	Uzbekistan
CF	Central African Republic	JP	Japan	NL	Netherlands	VN	Viet Nam
CG	Congo	KE	Kenya	NO	Norway	YU	Yugoslavia
CH	Switzerland	KG	Kyrgyzstan	NZ	New Zealand	ZW	Zimbabwe
CI	Côte d'Ivoire	KP	Democratic People's Republic of Korea	PL	Poland		
CM	Cameroon	KR	Republic of Korea	PT	Portugal		
CN	China	KZ	Kazakhstan	RO	Romania		
CU	Cuba	LC	Saint Lucia	RU	Russian Federation		
CZ	Czech Republic	LJ	Liechtenstein	SD	Sudan		
DE	Germany	LK	Sri Lanka	SE	Sweden		
DK	Denmark	LR	Liberia	SG	Singapore		
EE	Estonia						

## AN OPINION POLL UTILIZING A WIRELESS DATA TRANSMISSION CONNECTION

The present invention relates to a method for transmitting messages and the processing of received answers to the transmitted messages. A further object of the invention is a system for transmitting messages and the processing of received answers to the transmitted messages, which system comprises a communicator's (message sender's) data processing system comprising means for selecting a target group, for transmitting a message and for receiving answers, a service center comprising means for transferring the message and the answer, and a telecommunication device for receiving messages.

The invention relates in particular to making small-size opinion polls, but it is possible to utilize the method according to the invention also in other two-way communication. In the following the invention is though explained in an exemplary way in particular in connection with making opinion polls.

Opinion polls have traditionally been made by mailing a questionnaire to the answering party, by making personal on-site interviews, by making personal interviews by telephone and by requesting in television and/or radio broadcasts the interviewees to call certain telephone numbers, in which case the opinion is expressed by dialing a telephone number corresponding to the opinion or by entering DTMF -signals, i.e. by pushing the telephone keys based upon a voice or a vocal message heard from the called-up telephone number. In publication WO 88 05 239 "Improved polling system" it is explained a system operating in the fixed telephone network, in which system by utilizing programmable units and a voice messages a data system is made to call the interviewees, who answer the questions using their telephone devices according to the instructions of the voice message.

A letter poll can be directed to a certain area, in which case the persons selected to be interviewed are selected based upon their area of residence. A letter poll cannot be directed to persons who were in a certain area at a certain moment.

The problem of a letter poll is also its slowness. The preparing of the material, mailing and the passage of mail itself to both directions all consume their own time. The slowness is increased by the fact that the transfer of the answer information to the enquirer's data processing system for analyzing involves a delay. Another disadvantage is also that a letter poll is delivered to an interviewee's address or to an address into which the interviewee has redirected his/her mail, independent of where the interviewee is at the moment. A further problem of a letter poll from a recipient's point of view is that if he/she does not check his/her mail during the answering period, an outdated enquiry cannot be removed from his/her mail. Answering a letter poll further requires that the interviewee takes his/her answer to a letter box.

Personal on-site interviews can be directed to a certain area. Additionally, they can be directed to persons being in this area during a certain period. The period must however be rather long. Normally there are so many persons in an area that only a small part of them is reached. Interviewees selected based upon their place of residence are only reached when at home, in which case an interviewer may have to make several visits. The problem is, independent of the selecting criterion, that the coverage of a poll is highly dependent on the number of persons present on the site. A further problem is that the interviewees cannot be reached simultaneously. From an interviewee's point of view the disadvantage is that he/she should have time to answer the questions just at the time of an interview. Also slowness is a problem of an on-site interview. The preparing of material, printing, an eventual selecting of the interviewers and the interviewers' moving to the site of interview, the interview itself, delivering the answers to the subscriber of the poll and transferring the answer information into the enquirer's data processing systems consume time. In addition to above, the problem of an on-site personal interview is that an interviewer may unconsciously, or even consciously, influence the answers given by the interviewee with his/her body language and/or by presenting the question using his/her own words.

Telephone interviews can be directed to a certain area. In this case the persons selected to be interviewed are selected based upon their place of residence. In prior known methods enquiries cannot be directed to persons who were in a certain place at a certain moment. Even the telephone interview method utilizing a voice message and several telephone lines simultaneously, which was presented in publication WO 88 05 239, has shortcomings. If there is no answer in a telephone number or it is busy, it must be called again, possibly even a number of times during the interview period. In addition to that the number of telephone lines connected to a "polling center" limits the number of interviewees who can be reached simultaneously. Because in the method the answering is done using the dialing equipment of a telephone, the questions are limited to multiple-choice questions only. From the point of view of an interviewee who has answered the phone, the problem of the method is that he/she should have just at the moment of enquiry time to answer the questions.

An opinion poll, in which answers are requested over a television and/or radio broadcast to call certain telephone numbers or to express their opinions in another way, has the problem of limiting the target group and the geographical focusing of a poll. It is possible to try to limit the target group through selecting the media and the broadcasting time, but it is not possible to select the target group demographically. The problem in geographic focusing is that even the smallest area to which a poll can be focused, is geographically a quite large one (e.g. the coverage of a local radio broadcast).

The problem of all above presented methods is that they are very poorly suited for making a small poll with at most a few questions.

The object of this invention is to solve the above problems and to provide a quick method, which reaches one target group at one time and offers versatile geographic focusing possibilities and normal other selecting criterion and which is well suited for even small opinion polls. This goal is achieved with the method according to the invention, which method is characterized in that a message is

entered from a communicator's data system through a service center utilizing wireless data transmission connection essentially simultaneously to at least two recipients to the recipients' telecommunication devices, the interviewees use their telecommunication devices to feed the answer to the message through the service center utilizing wireless data transmission back to the communicator's data system, which expects the answers for a certain, predetermined time, and the information contained in each answer is processed in a predetermined way in the communicator's data system.

10 The concept essentially simultaneously means in this context that small differences may occur in the time of transmitting a message, which differences are due to delays connected with data processing and data transfer caused by the executing equipment and/or software for example because of eventually required database searches.

15 A further object of the invention is a system in which the method according to the invention can be utilized. A system according to the invention is characterized in that a communicator's data system comprises means for feeding a message to a service center, and means for receiving each answer to the message from the service center and means for analyzing the information in an answer in the communicator's data system, the service center comprises means for receiving a message from a communicator's data system and means for transferring the message over a wireless data transfer system essentially simultaneously to the telecommunication devices of at least two recipients and means for receiving the answers of the recipients and for transferring them further to the communicator's data system, and

20 the telecommunication device comprises means for receiving a message, a user interface for presenting the information contained in a message to the recipient, and means for transmitting the answer entered by the recipient using the user interface over the wireless data transfer connection, utilizing the service center, to the communicator's data system.

The concept message means in this context any message containing at least one question, which a recipient is desired to answer. A message can thus be an opinion poll with one or several questions or some other opinion enquiry, an official communication containing a question or an advertisement containing a question.

The concept communicator means in this context a sender of a message who makes the inquiries for himself or as a research assignment.

The concept service center means in this context a center belonging to a telecommunication network, which center is capable of attending to the transmitting of messages to right recipients in a format suitable for the latter and of transferring the answers to the communicator in a correct format. Such a service center can be e.g. the short message service center of a GSM -mobile communication network.

The concept telecommunication device means in this context any device suited for wireless communication, with the help of which a recipient can both receive a message and send an answer to the message. Such a telecommunication device can be for example any radio transmitter, such as e.g. a mobile telephone operating over base stations or eventually over a satellite or e.g. a two-way -pager or e.g. a device of PDA (Personal Digital Assistant) -type.

The concept user interface means in this context those parts of a telecommunication device or a part or sub-unit connected to a telecommunication device, by using which the communication is executed. Such a user interface is e.g. the entity formed by the display and keypad of a mobile telephone.

The invention is based upon the concept that polls can be made quickly thanks to the wireless telecommunication, effectively and using little manpower by focusing a poll according to the present selecting criterion (e.g. area of residence, demographic factors) or based upon the location of a telecommunication device at a given moment (e.g. a superstore). The invention is very well suited for small-form polls including a few questions. The most significant advantages of the solution according to the invention are thus the simultaneous distribution of the message to an unlimited amount of recipients, the reaching of the recipients



based upon their location at the moment of reception, and that the message can be answered when it is best suited for the recipient and the answer can be sent from the recipient's present location, and that it is possible to select persons who have been in a certain area at a given moment as a target group, and that said  
5 area can be limited to be very small by utilizing the cellular structure of the telecommunication system, and that a message can be provided with a time stamp, in which case an outdated message is automatically removed, and that the invention offers the possibility of crediting an interviewee's account with an answering fee.

10

In a preferable embodiment of the invention the GSM -mobile telephone system is used as the wireless telecommunication system. This embodiment according to the invention is very advantageous, because its short messages can be delivered even if a telecommunication device is busy. In addition to it, its short message  
15 service center takes care of delivering a message during the validity of the message, if a recipient's telecommunication device, i.e. a mobile telephone of the GSM -system, has not been in connection with the mobile telephone network at the moment a message was transmitted.

20

The preferable embodiments of the method and system according to the invention are presented in enclosed un independent claims 2 - 5 and 7 - 10.

The invention is described in more detail in the following with reference to enclosed figures, of which

25

Figure 1 presents the transmitting of a message to recipients who were in a certain area at a certain moment,

and

Figure 2 presents the delivering of an answer to a communicator.

30

Figure 1 presents a block diagram connected with the transmitting of a message in a first preferable embodiment of the system according to the invention, in which embodiment it is as an example assumed the wireless telecommunication system

to be the GSM (Global System for Mobile Communications) -system, the service center to be the short message service center SMSC (Short Message Service Center) of the GSM -system, the telecommunication device to be a mobile station MS (Mobile Subscriber) of the GSM -system and the target group selected to be  
5 the persons staying in a certain area at the so called timing moment. In connection with the short message service center it has been used the term SMSGW (Short Message Service Gateway), which is the common term for SMS-GMSC (Gateway Mobile Switching Center for Short Message Services) and IWMSC (Interworking Gateway Mobile Switching Center for Short Message  
10 Services). The invention is explained in the following as an example assuming that the length of a message to be transmitted is between 94 and 160 characters, in which case it can, according to the present GSM -specifications, be transmitted as a normal short message SM (Short Message) of the mobile communication system, but it cannot be transmitted using the general short message  
15 broadcasting service because of the length of the message. The GSM -system and its short message service have been explained in more detail for example in publication "The GSM -system for Mobile Communications", M. Mouly, M. B. Pautet, Plaseau, France, 1992 ISBN:2-9507190-0-7, and thus it is not described in more detail in this context.

20  
When communicator 1 has prepared message A, selected using his data system target area 8 and a timing, i.e. the moment when persons in area 8 with their mobile telephones are of interest, and possibly the moment for transmitting the message, if it deviates from the timing, the last time of validity for the message,  
25 the last reception time of the answers and possibly the bonus to be granted, the data system of the communicator sends, based upon the command of the communicator, the above information, as a common term for which it is used in the following the term assignment, to short message service center 3. The sending can take place over any network, for example such as the digital  
30 multiservice network ISDN (Integrated services digital network), the public, fixed telephone network PSTN (Public Switched Telephone Network) or PLMN (Public Land Mobile Network). Short message service center 3 decodes the received

message into parts and enquires using short message service gateway 4, utilizing mobile switching center MSC (Mobile Switching Center ) and visitor register VLR (Visitor Location Register) 5 and base area subsystem BSS (Base Station Subsystem) 6, from home register HLR (Home Location Register) 9 the required  
5 subscriber data of mobile stations 7A and 7B in target area 8. The subscriber data of each mobile station 7A and 7B in target area 8 is transferred from the own home register 9 of each one, using the assistance of the mobile switching center of the timing moment and visitor register 5 and short message service gateway 4,  
10 to short message service center 3, which at the desired moment of enquiry, which in the following is called reception moment, transmits message A, which is a short message, which it has extracted from the assignment, to mobile telephone 7 asking for the routing instructions to mobile telephone 7 from home register 9 of the mobile telephone using reception moment mobile switching center 51, base station controller BSC (Base Station Controller) 61 and base station BTS (Base  
15 Transceiver Station) 62. If mobile telephone 7 is switched off or in a shade area, short message service center 3 buffers message A to mobile telephone 7, and transmits message A when mobile telephone 7 again is in connection with the network, if the message still is valid. Target area 8 can consist of one cell, a combination of several cells, a location area or location areas. It is also possible  
20 to define the cell of a movable base station as a target area. Depending on the movements of the mobile telephone the mobile switching center, the visitor register and/or the location cell of the mobile telephone may remain the same or change between the timing moment and the reception moment. In any case the system takes care of the message being delivered to the recipient based upon the  
25 actual location of the recipient.

Figure 2 presents a block diagram connected with answering to a message in the first preferable embodiment of the system according to the invention, which has been explained earlier. In Figure 2 a recipient has received message A and read  
30 it in display 10 of his/her mobile station 7. At a time suitable for him/her he/she answers the question/questions using display 10 and keypad 11 and transmits his/her answer A' as a short message over base station 62' corresponding his/her

present location, i.e. the location at the answering moment, base station controller 61', and mobile switching center 51', assisted by short message service gateway 4, to short message service center 3. Short message service center 3 checks whether the answering time of communicator 1 still is valid and if it is, it sends  
5 answer A' to the communicator's data system 2 for further processing. If the answering time has expired, short message service center 3 throws the answer to a "dustbin". Short message service center 3 credits the interviewee's account 12 according to the instructions of communicator 1. The instructions are received by short message service center 3 either together with the assignment from a data  
10 processing system or afterwards from the communicator, when the communicator's data system has analyzed answer A' and verified it to be worth a reward. Data system 2 of communicator 1 processes the answers by analyzing them in a way desired by the communicator. The analyzing may include creating statistics and/or other prior known methods of analyzing opinion polls.

15

It is self evident for a person skilled in the art how the communication in Figure 1 takes place in the GSM -system using the general distribution of a short message service center, and how it takes place when the selecting of a target group is made based upon something else than the location at a given time. It is also self  
20 evident for a person skilled in the art how the communication explained above in Figures 1 and 2 is arranged using other wireless data transfer systems and/or service centers. It is further self evident for a person skilled in the art that the invention in no way limits the length of a message.

25

It has to be understood that the above explanation and the figures connected with it have only been meant to illustrate the present invention. To a person skilled in the art the different variations and modifications of the invention will be evident without deviating from the scope and spirit of the invention presented in enclosed  
claims.

30

Claims

1. A method for sending messages and for the processing of the received answers to the messages sent, **characterized** in that
- 5 a message (A) is entered from the data processing system (2) of a communicator (1) over a service center (3) utilizing a wireless data transmission connection essentially simultaneously to at least two recipients to the recipients' telecommunication devices (7),
- the recipients enter an answer (A') to the message (A) using
- 10 their telecommunication devices (7) over the service center (3) utilizing the wireless data transmission connection back to the communicator's (1) data processing system (2), which waits for the answers (A') for a certain, predetermined time, and
- the information contained in each answer (A') is processed in a
- 15 predetermined way in the communicator's (1) data processing system (2).
2. A method according to claim 1, **characterized** in that the wireless data transfer connection utilizes a mobile communication system.
- 20 3. A method according to claim 2, **characterized** in that the service center (3) is a short message service center of a mobile communication system.
4. A method according to claim 1, 2 or 3, **characterized** in that the recipients (7A, 7B) are selected based upon their location (8) at a given time, which
- 25 location (8) is determined utilizing the cellular structure of the system used in the wireless data transmission connection with the accuracy of at least one cell.

5. A method according to claim 1, in which the communicator (1) sends messages connected with an opinion poll, characterized in that the information contained in said answers (A') is statistically analyzed in the communicator's (1) data processing system (2).
- 5
6. A system for transmitting messages (A) and for the processing of the answers arrived to the questions, which system comprises
- a communicator's (1) data processing system (2), comprising means for selecting a target group, for transmitting a message (A) and for receiving answers (A'),
  - 10 a service center (3) comprising means for transferring the message (A) and the answer (A'), and
  - a telecommunication device (7) for receiving messages (A),
- characterized in that
- 15 the communicator's (1) data processing system (2), comprises means for feeding the message (A) to the service center (3), and means for receiving each answer (A') to the message (A) from the service center (3) and means for analyzing the information contained in the answers (A') in the communicator's (1) data processing system (2),
  - 20 the service center (3) comprises means for receiving the message (A) from the communicator's (1) data processing system (2) and means for transferring the message (A) over a wireless telecommunication system essentially simultaneously to the telecommunication devices (7) of at least two recipients and means for
  - 25 receiving the recipients' answers (A') and for transferring them further to the communicator's (1) data processing system (2), and
  - the telecommunication device (7) comprises means for receiving the message (A), a user interface for presenting the information contained in the message (A) to the recipient, and means for transmitting
  - 30 the answer (A') entered by the recipient using the user interface, utilizing the service center (3), over the wireless data transmission connection to the communicator's (1) data processing system (2).

7. A method according to claim 6, **characterized** in that the recipient's telecommunication device (7) is a mobile telephone or a two-way pager, and that the service center (3) is a part of a mobile communication system.
8. A system according to claim 7, **characterized** in that said service center (3) is the short message service center of a mobile communication system.
9. A system according to claim 6, 7 or 8, **characterized** in that the service center (3) and the telecommunication device (7) comprise means for transferring the message (A) in a digital format between the communicator's (1) data processing system (2) and the recipient's telecommunication device (7) .
10. A system according to claim 6, 7, 8 or 9, **characterized** in that the service center (3) comprises means for crediting an interviewee's account (12) with a sum determined by the communicator as a response to receiving the answer (A) or as a response to a message received from the data processing system (2) of the communicator (1).

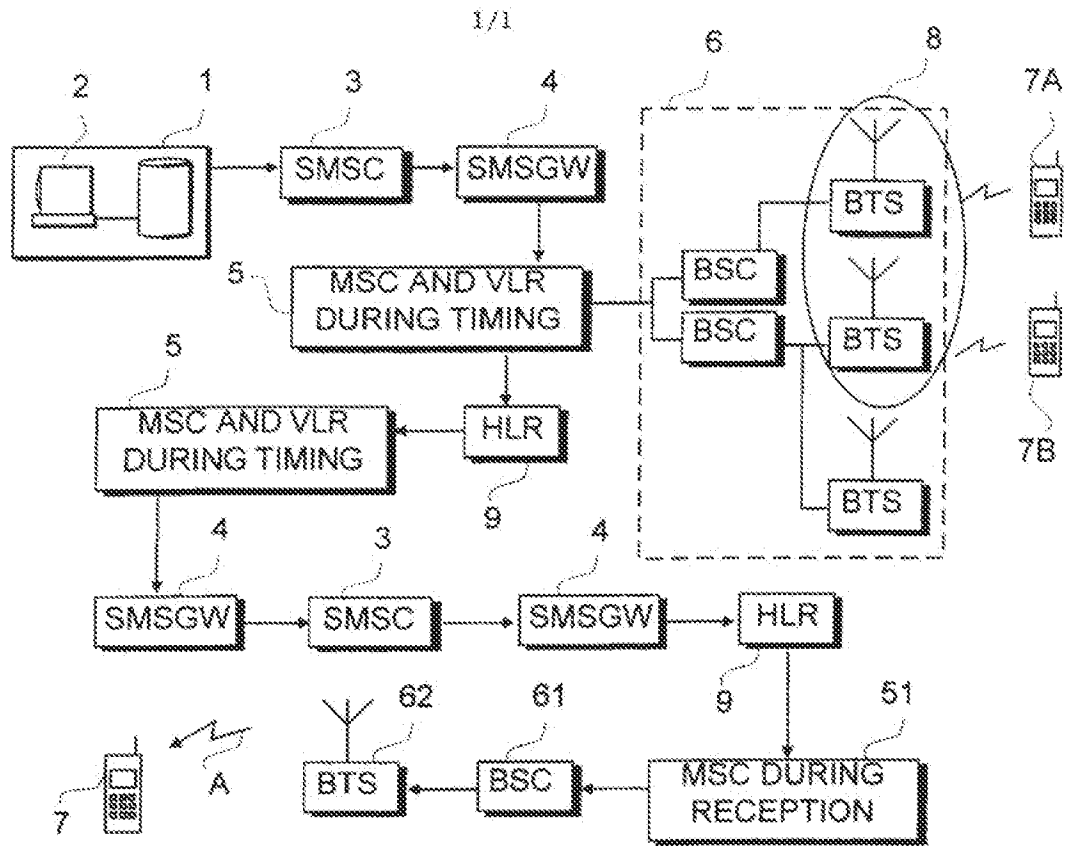


FIG. 1

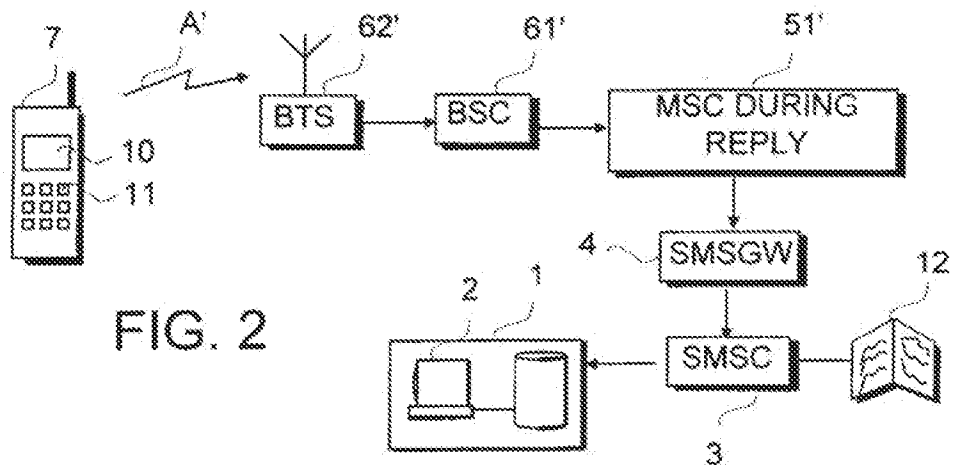


FIG. 2



## INTERNATIONAL SEARCH REPORT

International application No.

PCT/FI 97/00490

A. CLASSIFICATION OF SUBJECT MATTER		
IPC6: H04Q 7/22 According to International Patent Classification (IPC) or to both national classification and IPC.		
B. FIELDS SEARCHED		
Minimum documentation searched (classification system followed by classification symbols)		
IPC6: H04Q		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
SE,DK,FI,NO classes as above		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 8805239 A1 (M.A. KEMPNER INC.), 14 July 1988 (14.07.88), page 12, line 4 - line 32; page 53, line 24 - line 32	1,2,5-7,10
A	---	3,4,8,9
X	WO 8909530 A1 (CREATIVE COMMUNICATIONS ASSOCIATES INC.), 5 October 1989 (05.10.89), page 2, line 1 - page 3, line 22; page 11, line 5 - line 14; page 15, line 17 - line 27, abstract.	1,4,5,6,9
Y	---	2,3,7,8,10
<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C. <input checked="" type="checkbox"/> See patent family annex.		
* Special categories of cited documents: "A" document defining the general state of the art which is not considered to be of particular relevance "B" other document not published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed "T" later document published after the international filing date or priority date and not in conflict with the application but cited to underpin the principle or theory underlying the invention "X" document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance: the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "Z" document member of the same patent family		
Date of the actual completion of the international search		Date of mailing of the international search report
4 February 1998		09 -02- 1998
Name and mailing address of the ISA/ Swedish Patent Office Box 5055, S-102 42 STOCKHOLM Facsimile No. +46 8 666 02 86		Authorized officer  Göran Petersson Telephone No. +46 8 782 25 00

Form PCT/ISA/210 (second sheet) (July 1992)

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/FI 97/00490

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5036399 A (FERNANDO MORALES), 30 July 1991 (30.07.91), column 3, line 9 - line 28; column 4, line 17 - line 37	1,4,5,6,9
Y	--	2,3,7,8,10
X	US 5311507 A (BEDROS A. BEDROSSIAN), 10 May 1994 (10.05.94), abstract	1-3,5-9
A	--	4,10
X	US 5226177 A (RAND B. NICKERSON), 6 July 1993 (06.07.93), column 2, line 55 - line 68; column 4, line 25 - column 5, line 5	1,5,6,9
A	--	2-4,7,8,10

Form PCT/ISA/210 (continuation of second sheet) (July 1992)

INTERNATIONAL SEARCH REPORT  
Information on patent family members

07/01/98

International application No.

PCT/FI 97/00490

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 8805239 A1	14/07/88	AU 1107588 A US 4922520 A ZA 8709731 A	27/07/88 01/05/90 24/06/88
WO 8909530 A1	05/10/89	CA 1336840 A EP 0359757 A	29/08/95 28/03/90
US 5036389 A	30/07/91	US 5663757 A	02/09/97
US 5311507 A	10/05/94	NONE	
US 5226177 A	06/07/93	CA 2033558 A,C	28/09/91

## Electronic Patent Application Fee Transmittal

<b>Application Number:</b>	12910706
<b>Filing Date:</b>	22-Oct-2010
<b>Title of Invention:</b>	SYSTEM AND METHOD FOR DATA MANAGEMENT
<b>First Named Inventor/Applicant Name:</b>	J. David Payne
<b>Filer:</b>	Scott R. Zingerman/Jamie Robinson
<b>Attorney Docket Number:</b>	71855/10-351

Filed as Small Entity

### Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
<b>Basic Filing:</b>				
<b>Pages:</b>				
<b>Claims:</b>				
<b>Miscellaneous-Filing:</b>				
<b>Petition:</b>				
<b>Patent-Appeals-and-Interference:</b>				
<b>Post-Allowance-and-Post-Issuance:</b>				
<b>Extension-of-Time:</b>				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
<b>Miscellaneous:</b>				
Submission- Information Disclosure Stmt	1806	1	180	180
<b>Total in USD (\$)</b>				<b>180</b>

## Electronic Acknowledgement Receipt

<b>EFS ID:</b>	14929576
<b>Application Number:</b>	12910706
<b>International Application Number:</b>	
<b>Confirmation Number:</b>	8703
<b>Title of Invention:</b>	SYSTEM AND METHOD FOR DATA MANAGEMENT
<b>First Named Inventor/Applicant Name:</b>	J. David Payne
<b>Customer Number:</b>	22206
<b>Filer:</b>	Scott R. Zingerman/Jamie Robinson
<b>Filer Authorized By:</b>	Scott R. Zingerman
<b>Attorney Docket Number:</b>	71855/10-351
<b>Receipt Date:</b>	11-FEB-2013
<b>Filing Date:</b>	22-OCT-2010
<b>Time Stamp:</b>	16:47:40
<b>Application Type:</b>	Utility under 35 USC 111(a)

### Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	\$180
RAM confirmation Number	4094
Deposit Account	
Authorized User	

### File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi-Part (.zip)	Pages (if appl.)

1	Information Disclosure Statement (IDS) Form (SB08)	IDS4.pdf	615961	no	13
			7cadd50b64a1ddc9247a6f2589dc276a8ff6888d		
<b>Warnings:</b>					
<b>Information:</b>					
2	Foreign Reference	AU716184.pdf	16255182	no	151
			ec8c246e5a53c71ff58f24eb94571ae2e7700459		
<b>Warnings:</b>					
<b>Information:</b>					
3	Foreign Reference	CA2242874.pdf	18652534	no	149
			3be33439f9dd262f99414cf90c0111493c33b570		
<b>Warnings:</b>					
<b>Information:</b>					
4	Foreign Reference	CA2314513.pdf	10661613	no	81
			6356f8fcc767a08dffbe60d373f079cf64711ff55		
<b>Warnings:</b>					
<b>Information:</b>					
5	Foreign Reference	CA2387039.pdf	8646864	no	63
			b2b5f86dd49fd5b8f7a88de81227d0069f81aae		
<b>Warnings:</b>					
<b>Information:</b>					
6	Foreign Reference	CA2553120-pages1-50.pdf	14400537	no	50
			e8968e8d0eaa965d7aa14701e0a5ff2b60d98c6a		
<b>Warnings:</b>					
<b>Information:</b>					
7	Foreign Reference	CA2553120-pages51-100.pdf	15249682	no	50
			0a712623d69924904e1000e5cc5d3c022edee8ab		
<b>Warnings:</b>					
<b>Information:</b>					
8	Foreign Reference	CA2553120-pages101-150.pdf	11702031	no	50
			6e58c2a0802612473d86f64ef19c4d0cef7e7bf5		
<b>Warnings:</b>					
<b>Information:</b>					
9	Foreign Reference	CA2553120-pages151-197.pdf	8635200	no	47
			3f37260254f2ec5ee90a3b0435f1eeb656b30e4		
<b>Warnings:</b>					
<b>Information:</b>					

10	Foreign Reference	EP0364638.pdf	3661845	no	17
			0b690786c8d39e1958ad4842b3ed0c8016845057		
<b>Warnings:</b>					
<b>Information:</b>					
11	Foreign Reference	EP0866590.pdf	2661983	no	16
			0cb966b60dc9eafae6bf65f9127be760c6a93188		
<b>Warnings:</b>					
<b>Information:</b>					
12	Foreign Reference	EP0875823.pdf	3836440	no	22
			768471821b7563ae0819658f798d34f1a43ad726		
<b>Warnings:</b>					
<b>Information:</b>					
13	Foreign Reference	EP1035490.pdf	3313525	no	25
			58ef0b627796bd9ca33a0c5c0c30768f07ca4d11		
<b>Warnings:</b>					
<b>Information:</b>					
14	Foreign Reference	EP1072994.pdf	7067430	no	48
			d1e39b7afe5cd7512c17696777ee78dd77194d35		
<b>Warnings:</b>					
<b>Information:</b>					
15	Foreign Reference	JP2001-216219.pdf	4855086	no	19
			055feceedd8fd34d08dfcba319bf029b3bb21c55		
<b>Warnings:</b>					
<b>Information:</b>					
16	Foreign Reference	JP2001-249914.pdf	4593323	no	17
			e9823dd76a780927190e359d07dd5d27ac3111ce		
<b>Warnings:</b>					
<b>Information:</b>					
17	Foreign Reference	JP2004-205368.pdf	163047	no	1
			2e8bba074e08b92677b99435e93ae59517eade2b		
<b>Warnings:</b>					
<b>Information:</b>					
18	Foreign Reference	EP4288664.pdf	1287623	no	8
			f9f82726716f1e8ec5103da9bc50037027d07704		
<b>Warnings:</b>					
<b>Information:</b>					



19	Foreign Reference	KR2002-006393.pdf	2757095	no	22
			903708bc4de4f160fd58455fba780b98482735ad		
<b>Warnings:</b>					
<b>Information:</b>					
20	Foreign Reference	WO0013121-pages1-75.pdf	9813309	no	75
			020b0c64688a3f4f0a1ff56a6b0a3e1a8c172ecd		
<b>Warnings:</b>					
<b>Information:</b>					
21	Foreign Reference	WO0013121-pages75-150.pdf	10216715	no	75
			6c740906e69bce351cafeaac9336aab5b7b72ce0		
<b>Warnings:</b>					
<b>Information:</b>					
22	Foreign Reference	WO0013121-pages151-225.pdf	10181226	no	75
			555005e2d148252db89cac52ad8ff17452156ede		
<b>Warnings:</b>					
<b>Information:</b>					
23	Foreign Reference	WO0013121-pages226-266.pdf	3825981	no	41
			7772aad628a0188566d9accc958c1c2286423f63		
<b>Warnings:</b>					
<b>Information:</b>					
24	Foreign Reference	WO0023905.pdf	4930137	no	37
			2ea620f1a970f02f38743b505b20b8f3f64ae3e4		
<b>Warnings:</b>					
<b>Information:</b>					
25	Foreign Reference	WO0060490.pdf	7427790	no	55
			9dde684f6e809bf23870fd482d3aaa44a55aa6a		
<b>Warnings:</b>					
<b>Information:</b>					
26	Foreign Reference	WO0075779.pdf	6618096	no	52
			37aea716488536e4e14ec41863f9d721acd153da		
<b>Warnings:</b>					
<b>Information:</b>					
27	Foreign Reference	WO0122308.pdf	5950560	no	41
			e92a27c28ba53d64f3d36c007aadaed1c4776bd2		
<b>Warnings:</b>					
<b>Information:</b>					

28	Foreign Reference	WO0140899.pdf	5121035	no	38
			504939d5c5ee5a35ada2b8bf67475ca5d4a63115		
<b>Warnings:</b>					
<b>Information:</b>					
29	Foreign Reference	WO0142873.pdf	13169325	no	84
			4e3d4409025f49e161ae045955a4cd516a612f20		
<b>Warnings:</b>					
<b>Information:</b>					
30	Foreign Reference	WO0148660.pdf	11719618	no	76
			51d6a05a68bb2cd465fca368ff9a583379991e28		
<b>Warnings:</b>					
<b>Information:</b>					
31	Foreign Reference	WO0169436.pdf	7768120	no	45
			d4501735edc9483d52333caf1cdc165d39083498		
<b>Warnings:</b>					
<b>Information:</b>					
32	Foreign Reference	WO0173628.pdf	9144390	no	79
			508087e7b7bd9ae1bb74ba96b8b35ef3277e4df0		
<b>Warnings:</b>					
<b>Information:</b>					
33	Foreign Reference	WO9007830.pdf	14108885	no	87
			3b02db29f09889231f3e8039dcb0c832f62e4670		
<b>Warnings:</b>					
<b>Information:</b>					
34	Foreign Reference	WO9014725.pdf	6642340	no	48
			681d3270dc7350312b5bf187c3ebfca9ed3ce236		
<b>Warnings:</b>					
<b>Information:</b>					
35	Foreign Reference	WO9726612.pdf	17881408	no	151
			d307c0b27166e96f2e6f0e3a018a9f98da5abd84		
<b>Warnings:</b>					
<b>Information:</b>					
36	Foreign Reference	JP10143491.pdf	1520088	no	8
			a1df5b0d8300713d735a45155b05bcd3ef4b89f8		
<b>Warnings:</b>					
<b>Information:</b>					

37	Foreign Reference	WO9809451.pdf	2775522 19a90b309fd8895fd6c3b73617e1677002b7fe02	no	18
<b>Warnings:</b>					
<b>Information:</b>					
38	Non Patent Literature	ThomasJensenAndEwenDenney_CorrectnessOfJava.pdf	2591122 748768f98d627a4772a7791ec9cbfa51bbcd9bb1	no	15
<b>Warnings:</b>					
<b>Information:</b>					
39	Non Patent Literature	ClaireGroverEtAlTTT-AFlexibleTokenisationTool.pdf	2600966 efec180be9c7e3d14e5919f142ba58c14163f777	no	8
<b>Warnings:</b>					
<b>Information:</b>					
40	Non Patent Literature	EnaKaasinenEtAl_TwoApproachesToBringingInternet.pdf	5041040 9fc23f9565d34e40968c24e4974caa04165bfa80	no	23
<b>Warnings:</b>					
<b>Information:</b>					
41	Non Patent Literature	ArmandoFoxEtAl_IntegratingInformationAppliances.pdf	3568932 967ee4ad329ac2d3f2bae9e0c04ff1e1b4f42f09	no	12
<b>Warnings:</b>					
<b>Information:</b>					
42	Non Patent Literature	Sawako-EevaHayashi_DevelopmentOfMobileTokensHandlingApplication_Applying.pdf	13460143 b6f12ab6e36c2fa7f65cb9fc25ff122d47ec6e81	no	78
<b>Warnings:</b>					
<b>Information:</b>					
43	Non Patent Literature	JonathanECookAndAlexanderLWolf_Balboa_AFrameworkForEvent-Based.pdf	3448420 63b7e2fd0e44cb58e2fc2ab3c5fcc84b73daebfc	no	18
<b>Warnings:</b>					
<b>Information:</b>					
44	Non Patent Literature	VikramRamamoorthy_DevelopmentOfADecisionSupport.pdf	22429428 664378e4d0df27e033f61637cfb22d5958e3bcf6	no	177
<b>Warnings:</b>					
<b>Information:</b>					
45	Non Patent Literature	KennethBaclawskEtAl_KnowledgeRepresentationAndIndexing.pdf	1692532 34982a54b604307cae795d73cbd8facf0a199fa	no	12
<b>Warnings:</b>					
<b>Information:</b>					

46	Non Patent Literature	WirelessAgendaPresentation.pdf	8143725 04fc47304a7821de6d283fe548a9730843966c4b	no	16
<b>Warnings:</b>					
<b>Information:</b>					
47	Non Patent Literature	MattiHamalainen_SoutionsForInteractiveConcent.pdf	6200881 1f00024d23a031c4d9d97238c0a58c2179b2635f	no	26
<b>Warnings:</b>					
<b>Information:</b>					
48	Non Patent Literature	NormanCohenEtAl_iQueue_APervasiveDataComposition.pdf	2351067 3b2d599c768045dd32d7713c637423b069961f5b	no	8
<b>Warnings:</b>					
<b>Information:</b>					
49	Non Patent Literature	MattiHamalainenAndJosephSack_WirelessSurveys.pdf	981301 fb544b5daced075e81328da1e91d90fc59043962	no	6
<b>Warnings:</b>					
<b>Information:</b>					
50	Non Patent Literature	JamieCattell_TheMobileInternetRevolution.pdf	3472828 7015170f3d6fee36cbce73c5aec2cf0827aa1d56	no	16
<b>Warnings:</b>					
<b>Information:</b>					
51	Non Patent Literature	Triple-S_XML_TheSurveyInterchangeStandard.pdf	2628035 139422f4eccf7b31db8993764870eb832adffe09d	no	19
<b>Warnings:</b>					
<b>Information:</b>					
52	Non Patent Literature	GadNathan_MethodologiesforInternetSurveys.pdf	1985477 dc4d88938dfde491c1d699a48f796e5693981007	no	10
<b>Warnings:</b>					
<b>Information:</b>					
53	Non Patent Literature	RachelBellamyEtAl_DesigningANE-GroceryApplication.pdf	1821552 9aef596d332e73c2751662bc13da753956b42286	no	5
<b>Warnings:</b>					
<b>Information:</b>					
54	Non Patent Literature	KariMikkonen_FeedbackSystemToSupportInteractivePlanning.pdf	1558047 b7615e2c65dc6bbf38c7a790407d54141899a830	no	6
<b>Warnings:</b>					
<b>Information:</b>					

55	Non Patent Literature	Quizcode_CodeOnlineWireless FeedbackSolutionsPressReleas e2011.pdf	366990 2a4363ed5c5e72c9cebdc514300cb097d1 7ff25	no	2
<b>Warnings:</b>					
<b>Information:</b>					
56	Non Patent Literature	RyanMDonahue_Palmques_AP almOsQuestionnaireSystem.pdf	10323507 469bb234100809456be79fa85e6368fd6b7 cdfbb	no	79
<b>Warnings:</b>					
<b>Information:</b>					
57	Non Patent Literature	SurveyWorkbench_Entryware. pdf	2218725 62b9a48fb7d9af29c67b62c4b0eea6d39de 43790	no	16
<b>Warnings:</b>					
<b>Information:</b>					
58	Non Patent Literature	TimMacerAHandyTechnology. pdf	470792 2d6ebfec2e4f173cbbc1ea1ebf7322afd1fab fce	no	2
<b>Warnings:</b>					
<b>Information:</b>					
59	Non Patent Literature	StephenJenkinsAndTonySolom ondes_ConnectingBitsAndPiec es.pdf	1730419 594b5229415efb13ba9d31664dd9037f162 a72a6	no	11
<b>Warnings:</b>					
<b>Information:</b>					
60	Non Patent Literature	RobertADennisAndSanjivSGam bhir_InternetQuestionAndAns wer.pdf	3006749 50e53f3f2872f316db2ed6e2718937ac0c6c 5f04	no	10
<b>Warnings:</b>					
<b>Information:</b>					
61	Fee Worksheet (SB06)	fee-info.pdf	30200 23bdf73e64b31d58355191da89fca24716a 8aaf8	no	2
<b>Warnings:</b>					
<b>Information:</b>					
<b>Total Files Size (in bytes):</b>			389954424		

**This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.**

**New Applications Under 35 U.S.C. 111**

**If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.**

**National Stage of an International Application under 35 U.S.C. 371**

**If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.**

**New International Application Filed with the USPTO as a Receiving Office**

**If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.**

<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b> ( Not for submission under 37 CFR 1.99)	Application Number		12910706	
	Filing Date		2010-10-22	
	First Named Inventor	Payne		
	Art Unit		2451	
	Examiner Name	BACKHEAN TIV		
	Attorney Docket Number		71855/10-351	

U.S.PATENTS						Remove
Examiner Initial*	Cite No	Patent Number	Kind Code <sup>1</sup>	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	7072354	B1	2006-07-04	BEATHARD	
	2	7085672	B2	2006-08-01	ISHII et al.	
	3	7349873	B2	2008-03-25	GINSBERG	
	4	7370032	B2	2008-05-06	LEHNERT	
	5	7475339	B2	2009-01-06	HOLLOWAY et al.	
	6	7509499	B2	2009-03-24	von MUELLER et al.	
	7	7539656	B2	2009-05-26	FRATKINA et al.	
	8	6058416		2000-05-02	MUKHERJEE et al.	

**INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT**  
( Not for submission under 37 CFR 1.99)

Application Number	12910706
Filing Date	2010-10-22
First Named Inventor	Payne
Art Unit	2451
Examiner Name	BACKHEAN TIV
Attorney Docket Number	71855/10-351

9	7392308	B2	2008-06-24	AUFRICHT et al.	
---	---------	----	------------	-----------------	--

If you wish to add additional U.S. Patent citation information please click the Add button. [Add](#)

**U.S.PATENT APPLICATION PUBLICATIONS**

[Remove](#)

Examiner Initial*	Cite No	Publication Number	Kind Code <sup>1</sup>	Publication Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines where Relevant Passages or Relevant Figures Appear
	1	20010044827	A1	2001-11-22	ZHUK	
	2	20010049688	A1	2001-12-06	FRATKINA et al.	
	3	20010052009	A1	2001-12-13	DESAI et al.	
	4	20010052122	A1	2001-12-13	NANOS et al.	
	5	20020004739	A1	2002-01-10	ELMER et al.	
	6	20020029154	A1	2002-03-07	MAJOOR	
	7	20020029159	A1	2002-03-07	LONGDEN	
	8	20020052774	A1	2002-05-02	PARKER et al.	



**INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT**  
( Not for submission under 37 CFR 1.99)

Application Number		12910706
Filing Date		2010-10-22
First Named Inventor	Payne	
Art Unit		2451
Examiner Name	BACKHEAN TIV	
Attorney Docket Number		71855/10-351

9	20020119433	A1	2002-08-29	CALLENDER	
10	20020002482	A1	2002-01-03	THOMAS	
11	20020035633	A1	2002-03-21	BOSE et al.	
12	20020038302	A1	2002-03-28	MAEDA	
13	20020099595	A1	2002-07-25	KELLY et al.	
14	20020147850	A1	2002-10-10	RICHARDS et al.	
15	20030060284	A1	2003-03-27	HAMALAINEN et al.	
16	20030097457	A1	2003-05-22	SARAN et al.	
17	20030113692	A1	2003-06-19	KAMANO	
18	20030115467	A1	2003-06-19	AULL et al.	
19	20030204498		2003-10-30	LEHNERT	

**INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT**  
( Not for submission under 37 CFR 1.99)

Application Number	12910706
Filing Date	2010-10-22
First Named Inventor	Payne
Art Unit	2451
Examiner Name	BACKHEAN TIV
Attorney Docket Number	71855/10-351

20	20030220831	A1	2003-11-27	SON	
21	20030088452	A1	2003-05-08	KELLY	
22	20040002301	A1	2004-01-01	ROSS et al.	
23	20050075919	A1	2005-04-07	KIM	

If you wish to add additional U.S. Published Application citation information please click the Add button. **Add**

**FOREIGN PATENT DOCUMENTS**

**Remove**

Examiner Initial*	Cite No	Foreign Document Number <sup>3</sup>	Country Code <sup>2</sup> i	Kind Code <sup>4</sup>	Publication Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines where Relevant Passages or Relevant Figures Appear	T <sup>5</sup>
	1	3613898	DE	A1	1987-10-29	Siemens AG		<input type="checkbox"/>

If you wish to add additional Foreign Patent Document citation information please click the Add button **Add**

**NON-PATENT LITERATURE DOCUMENTS**

**Remove**

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T <sup>5</sup>
	1	Clarence C. Gravlee, Mobile Computer-Assisted Personal Interviewing with Handheld Computers: The Entryware System 3.0, vol. 14 Field Methods pp. 322-326 (2002)	<input type="checkbox"/>
	2	Clarence C. Gravlee et al., Handheld Computers for Direct Observation of the Social and Physical Environment, Field Methods	<input type="checkbox"/>

**INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT**  
( Not for submission under 37 CFR 1.99)

Application Number	12910706
Filing Date	2010-10-22
First Named Inventor	Payne
Art Unit	2451
Examiner Name	BACKHEAN TIV
Attorney Docket Number	71855/10-351

3	Paul D. Greene, Handheld Computers as Tools for Writing and Managing Field Data, vol. 13 Field Methods pp. 181-197 (2001)	<input type="checkbox"/>
4	Visor Handheld User Guide, Handspring, Inc. (1999-2000)	<input type="checkbox"/>
5	Development Kit for Handspring Handheld Computers – Release 1.0, Handspring, Inc. (1999)	<input type="checkbox"/>
6	Dave Johnson, Handheld Management Can Be A Handful, InformatioWeek.Com News, 03/26/2001	<input type="checkbox"/>
7	JTECH and TOUCHPAK Join Forces to Develop New Wireless Technologies for Restaurant Guests and Operators Elected to Suburban Lodges Board, 05/24/2001	<input type="checkbox"/>
8	Lowering Merchandising Costs and Increasing Competitiveness(2000)	<input type="checkbox"/>
9	Manish Malik, MDC: A Mobile Data Collection System For Pocket PC (2002)	<input type="checkbox"/>
10	Daniel Barbara, Mobile Computing and Databases – A Survey, vol.11 IEEE Transactions on Knowledge and Data Engineering (1999)	<input type="checkbox"/>
11	James Bryan Zimmerman, Mobile Computing: Characteristics, Business Benefits, and the Mobile Framework (1999)	<input type="checkbox"/>
12	Johnson Dave, Handheld Management Can Be A Handful, Information Week (2001)	<input type="checkbox"/>
13	nHand Survey (2002)	<input type="checkbox"/>

**INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT**  
( Not for submission under 37 CFR 1.99)

Application Number	12910706
Filing Date	2010-10-22
First Named Inventor	Payne
Art Unit	2451
Examiner Name	BACKHEAN TIV
Attorney Docket Number	71855/10-351

14	nHand Solutions, Inc. (2000)	<input type="checkbox"/>
15	Conducting Surveys With Personal Digital Assistants, NRCS – Natural Resources Inventory and Analysis Institute	<input type="checkbox"/>
16	S.M. Nusser et al., Using Personal Digital Assistants to Collect Survey Data (1996)	<input type="checkbox"/>
17	Sarah Nusser et al., Web-Based Survey Tools (1998)	<input type="checkbox"/>
18	Palm OS Programmer's Companion (Preliminary) (1996-1999)	<input type="checkbox"/>
19	Handbook for Palm m500 Series Handhelds (1998-2001)	<input type="checkbox"/>
20	Palm Desktop Software for Mac User's Guide (1995-2001)	<input type="checkbox"/>
21	Palm OS Programmer's Companion (1996-1999)	<input type="checkbox"/>
22	Handbook for the Palm VII Handheld (1998-2000)	<input type="checkbox"/>
23	James Niccolai, Palm VII Goes Wireless, IDG News, 12/02/1998	<input type="checkbox"/>
24	Neil Rhodes, and Julie McKeethan, Palm Programming: The Developer's Guide (1998)	<input type="checkbox"/>

**INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT**  
( Not for submission under 37 CFR 1.99)

Application Number	12910706
Filing Date	2010-10-22
First Named Inventor	Payne
Art Unit	2451
Examiner Name	BACKHEAN TIV
Attorney Docket Number	71855/10-351

25	Handbook for the Palm IIIc Organizer (1998-1999)	<input type="checkbox"/>
26	PalmPilot Professional Handbook (1997)	<input type="checkbox"/>
27	David Pogue, PalmPilot: The Ultimate Guide, O'Reilly & Associates, Inc. (1998)	<input type="checkbox"/>
28	PalmPilot Handbook (1997)	<input type="checkbox"/>
29	Getting Started with the Palm VII Organizer (1998)	<input type="checkbox"/>
30	PC World's Enterprise Technology: Real Wireless on the Go (1998-2012)	<input type="checkbox"/>
31	James Pitkow and Mimi Recker, Using the Web as a survey tool: Results from the second WWW user survey (1995)	<input type="checkbox"/>

If you wish to add additional non-patent literature document citation information please click the Add button **Add**

**EXAMINER SIGNATURE**

Examiner Signature	Date Considered
--------------------	-----------------

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>1</sup> See Kind Codes of USPTO Patent Documents at [www.USPTO.GOV](http://www.USPTO.GOV) or MPEP 901.04. <sup>2</sup> Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). <sup>3</sup> For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. <sup>4</sup> Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. <sup>5</sup> Applicant is to place a check mark here if English language translation is attached.

**INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT**  
( Not for submission under 37 CFR 1.99)

Application Number	12910706		
Filing Date	2010-10-22		
First Named Inventor	Payne		
Art Unit	2451		
Examiner Name	BACKHEAN TIV		
Attorney Docket Number	71855/10-351		

**CERTIFICATION STATEMENT**

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

**OR**

That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

- See attached certification statement.
- The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.
- A certification statement is not submitted herewith.

**SIGNATURE**

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/scott r. zingerman/	Date (YYYY-MM-DD)	2013-02-11
Name/Print	Scott R. Zingerman	Registration Number	35422

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. **DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

## Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

## Electronic Acknowledgement Receipt

<b>EFS ID:</b>	14931200
<b>Application Number:</b>	12910706
<b>International Application Number:</b>	
<b>Confirmation Number:</b>	8703
<b>Title of Invention:</b>	SYSTEM AND METHOD FOR DATA MANAGEMENT
<b>First Named Inventor/Applicant Name:</b>	J. David Payne
<b>Customer Number:</b>	22206
<b>Filer:</b>	Scott R. Zingerman/Jamie Robinson
<b>Filer Authorized By:</b>	Scott R. Zingerman
<b>Attorney Docket Number:</b>	71855/10-351
<b>Receipt Date:</b>	11-FEB-2013
<b>Filing Date:</b>	22-OCT-2010
<b>Time Stamp:</b>	18:03:36
<b>Application Type:</b>	Utility under 35 USC 111(a)

### Payment information:

Submitted with Payment	no
------------------------	----

### File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Foreign Reference	DE3613898.pdf	3206800 <small>3aa9ab346767d979e308d5359d44ec20c66c6a03</small>	no	15

### Warnings:

Unified Patents

### Information:

Exhibit 1002



2	Non Patent Literature	ClarenceCGravlee_MobileCom puter-AssistedPersonal.pdf	2319339 905bb835c27fac88ba3325831711dda1f86 da06a	no	15
<b>Warnings:</b>					
<b>Information:</b>					
3	Non Patent Literature	ClarenceCGravleeEtAl_Handhel dComputersForDirect.pdf	3412741 a1dc04a8c5801e53b4a2d2fc15a136afefe0 214f	no	17
<b>Warnings:</b>					
<b>Information:</b>					
4	Non Patent Literature	PaulDGreene_HandheldCompu tersAsToolsForWriting.pdf	2807244 325c8936f314e414a8afafb473dfa30406a01 2a1	no	17
<b>Warnings:</b>					
<b>Information:</b>					
5	Non Patent Literature	VisorHandheldUserGuide_Han dspringIncPage1-150.pdf	19559185 088aa92c0b3afd83c39a4baf7850eef7a6e0 6b5	no	150
<b>Warnings:</b>					
<b>Information:</b>					
6	Non Patent Literature	VisorHandheldUserGuide_Han dspringIncPage151-282.pdf	19036229 c9c4714e9ae13f1a8d166fd96b954d6031c bd5bf	no	132
<b>Warnings:</b>					
<b>Information:</b>					
7	Non Patent Literature	DevelopmentKitForHandspring HandheldComputers.pdf	15343576 862ec011735ffcb0ad6255822840c5cbde6 6b29	no	106
<b>Warnings:</b>					
<b>Information:</b>					
8	Non Patent Literature	DaveJohnson_HandheldManag ementCanBeAHandful.pdf	517955 dc2e8d91da563da85b58070790d10dc68d 80fb13	no	4
<b>Warnings:</b>					
<b>Information:</b>					
9	Non Patent Literature	JTECHandTOUCHPAKJoinForce sToDevelopNewWireless.pdf	1163163 a93ce24ebc69641bcd3266a985e67dd871 b6994	no	3
<b>Warnings:</b>					
<b>Information:</b>					
10	Non Patent Literature	LoweringMerchandsingCostsA ndIncreasingCompetitiveness. pdf	1773269 d1a37ca6db03e04dad0c272231325c5731e 956e9	no	9
<b>Warnings:</b>					
<b>Information:</b>					

11	Non Patent Literature	ManishMalik_MDC_AMobileDataCollectionSystemforPocketPC.pdf	7049831 2d314b90150f37dfb92a9ee34f3ac5a3825e61a3	no	61
<b>Warnings:</b>					
<b>Information:</b>					
12	Non Patent Literature	DanielBarbara_MobileComputingAndDatabases.pdf	3517687 767e824c5ab382e4becfb573b3c82e0f75971be	no	10
<b>Warnings:</b>					
<b>Information:</b>					
13	Non Patent Literature	JamesBryanZimmerman_MobileComputing.pdf	5234452 33ff4f93cd3cfc1fbee60ac26738b5cd9aafcd8b	no	27
<b>Warnings:</b>					
<b>Information:</b>					
14	Non Patent Literature	JohnsonDave_HandheldManagementCanBeAHandful.pdf	108484 f89fa8d96986d13538efd9818c3f877fc77f5b7	no	1
<b>Warnings:</b>					
<b>Information:</b>					
15	Non Patent Literature	nHandSurvey.pdf	516525 3f1e14235023502bbf4603119c50aea953d31e09	no	3
<b>Warnings:</b>					
<b>Information:</b>					
16	Non Patent Literature	nHandSolutions.pdf	134601 7b4402c59581a1c06781b81613bba176e9d6ec2e	no	1
<b>Warnings:</b>					
<b>Information:</b>					
17	Non Patent Literature	ConductingSurveysWithPersonalDigitalAssistants.pdf	499307 161870248602e7e1e277db068574f1a01a335d1e	no	2
<b>Warnings:</b>					
<b>Information:</b>					
18	Non Patent Literature	SMNausserEtAl_UsingPersonalDigitalAssistants.pdf	1633876 07817a9136a602ded653e601c6ad646fa7d5f6ef	no	6
<b>Warnings:</b>					
<b>Information:</b>					
19	Non Patent Literature	SarahNusserEtAl_Web-BasedSurveyTools.pdf	1518421 16c86373ee369369937df24f218fe917009b4f78	no	6
<b>Warnings:</b>					
<b>Information:</b>					

20	Non Patent Literature	PalmOSProgrammersCompani onPreliminaryPage1-160.pdf	23468397 26c9ab3e196134f9a141c669be313983d11 a0d5a	no	160
<b>Warnings:</b>					
<b>Information:</b>					
21	Non Patent Literature	PalmOSProgrammersCompani onPreliminaryPage161-314.pdf	23709306 0b43149a015ccde9002af79c54ae63574f2 1250	no	154
<b>Warnings:</b>					
<b>Information:</b>					
22	Non Patent Literature	HandbookForPalmm500Series HandheldsPages1-150.pdf	19909616 12da849a432fd069008ca043a5244c5ac634 3c47	no	150
<b>Warnings:</b>					
<b>Information:</b>					
23	Non Patent Literature	HandbookForPalmm500Series HandheldsPages151-286.pdf	19501510 9d13c4234b4e56ce88a1de4cdda0fb6d31ff6 4570	no	136
<b>Warnings:</b>					
<b>Information:</b>					
24	Non Patent Literature	PalmDesktopSoftwareforMacU sersGuid.pdf	24116886 bf5279e7f613551312a551740ef461b0b6fd b429	no	176
<b>Warnings:</b>					
<b>Information:</b>					
25	Non Patent Literature	PalmOSProgrammersCompani onPages1-170.pdf	25381512 ae24946c5b8102b30b9fcc7eb4061b3b784 d1e18	no	170
<b>Warnings:</b>					
<b>Information:</b>					
26	Non Patent Literature	PalmOSProgrammersCompani onPages171-328.pdf	24118604 3d4863c4a080d87c5c40bf7b5bc8fdff0679 4de1	no	158
<b>Warnings:</b>					
<b>Information:</b>					
27	Non Patent Literature	HandbookForthePalmVIIHandh eldPages1-150.pdf	21281162 f771cff0ec4a76a8d3f0ad38616ab37d561cc 936	no	150
<b>Warnings:</b>					
<b>Information:</b>					
28	Non Patent Literature	HandbookForthePalmVIIHandh eldPages151-310.pdf	23582809 e07644f39fb5b3a63b856a3e87ddb6ce15c 3fc4a	no	160
<b>Warnings:</b>					
<b>Information:</b>					

29	Non Patent Literature	JamesNiccolai_PalmVIIGoesWireless.pdf	556530 0c21220f8552224436c2a077cfcb5fe3f3a1291e	no	3
<b>Warnings:</b>					
<b>Information:</b>					
30	Non Patent Literature	NeilRhodesAndJulieMcKeehan_PalmProgrammingPages1-120.pdf	19678504 ee12268d18ed35381e6b3e4b0fb9c907bdae77b8	no	120
<b>Warnings:</b>					
<b>Information:</b>					
31	Non Patent Literature	NeilRhodesAndJulieMcKeehan_PalmProgrammingPages121-240.pdf	16559379 f1f73094575de442f488b99483779d08f645f46	no	120
<b>Warnings:</b>					
<b>Information:</b>					
32	Non Patent Literature	NeilRhodesAndJulieMcKeehan_PalmProgrammingPages241-355.pdf	15678476 057f9b97cb3340d9029e88578971b72935b1cc4d	no	115
<b>Warnings:</b>					
<b>Information:</b>					
33	Non Patent Literature	DavidPogue_PalmPilotTheUltimateGuidePages1-105.pdf	21711736 f34fcfd0f4d7c4a7e2b6d9d3c1088c3a1ab93c95	no	105
<b>Warnings:</b>					
<b>Information:</b>					
34	Non Patent Literature	DavidPogue_PalmPilotTheUltimateGuidePages106-210.pdf	22855154 9dc0fa6ccd62a5b1ef6c8933a758253a5e85240	no	105
<b>Warnings:</b>					
<b>Information:</b>					
35	Non Patent Literature	DavidPogue_PalmPilotTheUltimateGuidePages211-315.pdf	22618009 2541ad239ee1ab5a11ed61d6d4943f370985650e	no	105
<b>Warnings:</b>					
<b>Information:</b>					
36	Non Patent Literature	DavidPogue_PalmPilotTheUltimateGuidePages316-425.pdf	23120922 6677f0ca237fdca69a54c3f27aba05f36837d557	no	110
<b>Warnings:</b>					
<b>Information:</b>					
37	Non Patent Literature	DavidPogue_PalmPilotTheUltimateGuidePages426-525.pdf	20754255 3733d53c89675e1566c4f7865940c8858a5e26a3	no	100
<b>Warnings:</b>					
<b>Information:</b>					

38	Non Patent Literature	PalmPilotHandbook1997_Pages1-100.pdf	13445250 cc6a71e34736519965818439bbf5894e5b8a5465	no	100
<b>Warnings:</b>					
<b>Information:</b>					
39	Non Patent Literature	PalmPilotHandbook1997_Pages101-202.pdf	14653254 b4f567285700f71c5085a07c37318f7ac7d77173	no	102
<b>Warnings:</b>					
<b>Information:</b>					
40	Non Patent Literature	GettingStartedWiththePalmVIIOrganizer_Pages1-133.pdf	21226106 087082124daa56cabaa21dfc28ac139acba3be34	no	133
<b>Warnings:</b>					
<b>Information:</b>					
41	Non Patent Literature	GettingStartedWiththePalmVIIOrganizer_Pages134-267.pdf	18612851 f56e64d1423e7167748ee5cccf73d3f62489a03d	no	134
<b>Warnings:</b>					
<b>Information:</b>					
42	Non Patent Literature	GettingStartedWiththePalmVIIOrganizer_Pages268-369.pdf	13742379 f5064ef4c9de19b15e8c2a421589bcf9e5965af6	no	102
<b>Warnings:</b>					
<b>Information:</b>					
43	Non Patent Literature	PCWorldsEnterpriseTechnology_RealWirelessOnTheGo.pdf	306762 8f67b449ba626c2eea95ce54da02c83ee262fba2	no	2
<b>Warnings:</b>					
<b>Information:</b>					
44	Non Patent Literature	JamesPitkowAndMimiRecker_UsingTheWebAsASurveyTool.pdf	3811322 a2ee0d3a22e86e2921b6c896dd6926e3cef33d	no	19
<b>Warnings:</b>					
<b>Information:</b>					
45	Information Disclosure Statement (IDS) Form (SB08)	IDS5_02-11-2013.pdf	614519 02f73f5e0a8200581857040336b48735ffec6d7a	no	9
<b>Warnings:</b>					
<b>Information:</b>					
<b>Total Files Size (in bytes):</b>				544367895	

**This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.**

**New Applications Under 35 U.S.C. 111**

**If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.**

**National Stage of an International Application under 35 U.S.C. 371**

**If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.**

**New International Application Filed with the USPTO as a Receiving Office**

**If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.**

### ABSTRACT OF DE 3613898 (A1)

In this system, station-individual network control devices (N5) in each case contain a CSMA/CD access control device (ZC) and a token access control device (ZT) which are activated below or above certain predetermined values (D1, D2) of the data traffic loading in the transmission network (B).

### DESCRIPTION

The data traffic between different subscriber stations, which are mostly equipped with data processing capacity representing devices and systems that are increasingly used broadcast networks, which are referred to as local networks (Local Area Networks). Such a local network is a transmission network for the bit-serial transmission of information between interconnected independent representation of the devices. Local networks are usually distinguished by the classification criteria for transmission media, topology and access mechanism. The most common transmission media in local area networks are twisted copper cable, coaxial cable and fiber optics. The most common network configurations are star-shaped, annular or bus or baumförmig. The two most common access mechanisms are CSMA / CD (Carrier Sense Multiple Access With Collision Detection) or TOKEN Access. Practically running local area networks come in various combinations of transmission media, topology and access mechanism, although in view of the data to be transmitted rate, cost and transport behavior of certain combinations of subscriber stations are regarded as particularly favorable. How to find, for example, in practice, very often baseband bus systems with coaxial cables as transmission medium and CSMA / CD as the access methods, as well as ring systems with fiber optic cables and access token as the access method.

The choice of the access method is determined mainly by the transport behavior and the average or maximum waiting time is determined to secure access to one of the subscriber stations to the transmission medium. An advantage of the CSMA / CD access method is to overlook the fact that the available bandwidth can be optimally used; this method provides access to. Thus if you want to transfer subscriber stations at irregular intervals data very quickly. Also in regard to waiting times, the CSMA / CD access method is at least equal average real-time requirements; measurements for example, have shown that in 50% of channel utilization, waiting time for accessing one of the subscriber stations in 90% of all cases below 1 ms liegt. Für stringent real time requirements, however, the CSMA / CD access method inherent disadvantage to not neglect that this access method is not deterministic, i.e. the waiting time for access to any user station to the transmission network is not set exactly.

The advantages of the token access method are the independence of traffic behavior on the transmission network by both the speed and length of the data packet. For real-time applications, despite the often longer than the average waiting time CSMA / CD access method, the deterministic behavior, i.e. the availability of reliable transmission medium by the subscriber stations and the precise predetermination of the maximum waiting time to see a major advantage. In general, the local networks are regarding the access method for each of the more important of the two aspects, either after the traffic behavior of the transmission network is connected to the subscriber stations or on the maximum

waiting time ausgelegt. So egg preferred for compounds of typical office equipment as a transmission network of arbitrary topology connected subscriber stations due to the comparatively stochastically generated data, the CSMA / CD access method, while integrated into a process control devices, such as manufacturing machines, often the token access method is favored, the Although mean longer waiting times, but a clear maximum waiting time implies.

During the operation of such a local network varies in general, the traffic load becomes so strong that a working example with the token access method causes local network at very low traffic load unnecessarily large delays ora working according to the CSMA / CD access method local network at high traffic load while still relatively low average waiting time but also occurring singly or inadmissible caused at least annoying to wait long.

The problem underlying the invention consists in a local network traffic behavior and the waiting times and maximum waiting times of each of the current system requirements for this parameter better match. This is achieved by a communications system achieved a number of local stations on an all stations common transmission network (Local Area Network) via a respective transmit and receive separation device access, which are under the control authority in each case a network control device, a CSMA / CD access control device and a token access control device, one of which the CSMA / CD access control device drops below a predetermined value of Traffic load in the transmission network determined current traffic load, the token-access control device, however when exceeding a preset value of the traffic load is effectively connected.

Such a communication system is especially to be considered advantageous if each of groups formed on the common transmission network connected subscriber stations that provide data relating to traffic among different areas of the requirements for the transmission characteristics of the communication system. So, for example in the control of production or supply facilities at certain points, such as while the occurrence of faults or a change in the production program could, with an accumulation of information to be transmitted to rechnen. Bei using the CSMA / CD access method in this case the maximum access time of individual subscriber stations to the transmission network is so great that practically the accessibility of all subscriber stations within tolerable periods is not secured, in such cases, the token access method is preferred. Such a temporal clustering of access requests of the subscriber stations, however, is relatively typical for devices of the office or operation of office communications rare, so that in such cases, the preferred access method CSMA/CD-. In particular, when in practice to be observed increasing merging of electronic office equipment and communications systems with largely automated factories, begin the so-called computer-integrated manufacturing (CIM) such different demands on the transmission of data to determine the common transmission network connected subscriber stations. The inventive communication system is present in different time periods such different demands on the properties of the data transmission by a dependent of the current traffic load switching between two different access methods in a simple way meet. The selection of appropriate values given the traffic load in the transmission network, each involving a switch to from one place to another access method, is based primarily on certain of the transmission network connected subscriber stations authorized maximum waiting time of access to the transmission network or measure of the probability of occurrence of such a maximum waiting time when applying the



CSMA/CD- access method and the known effect of the exponential dependence of the maximum waiting time of traffic congestion and density of traffic on the transmission network. The default value of the traffic load at which the switchover is, therefore, in practice, generally between 30% and 60% of the maximum load of the data transmission network.

To particularly at current traffic loads that vary over time happen to be a given value of traffic load, to prevent frequent switching between the two different access methods, two different values given the data traffic, of which the higher value only when exceeding the same, the lower value only when falling short of the same individual by the current traffic load to a switch for the other access methods leads. The area between the two predetermined values so as hysteresis when switching between two access methods anzusehen. Bei a simplified design, but both can set values into a single value are summarized, below which, and crossing each case leads to a switchover to the respective other access methods .

The switching of the access method for exceeding the preset value of the traffic load is preferably shared access of a network control devices on the transmission network so that a defined Umsteuerkennzeichen transmitted via the transmission network to all other network control devices, and there in terms of deactivation of each CSMA / CD access control device and activation of the token-access control device evaluated. This Umsteuerkennzeichen has a very specific pattern; the same time without separate address label inside the data format received from all other subscriber stations (broadcasting) and can be evaluated accordingly.

Analogously, the same procedure can be performed such also falls below the preset value of the traffic load generated that, when receiving the token in one of the network control means a reverse signal and transmitted via the transmission network to all other network control devices, and there in terms of deactivation of the respective token-access control device and Activation of the CSMA / CD access control device is evaluated. The reverse signal occurs here almost to the point of the TOKEN, and leads to a simultaneous switching of all network control devices in terms of changing the access method.

It is also conceivable that sent drops below the specified value of the traffic load and receiving the token in one of the network control devices, the reverse signal from the network control device in direct connection to the token and all other participating stations sequentially received - in terms of the switchover of the access control method is evaluated - and is sent along with the token again.

An advantageous embodiment of the invention, in connection with the storage of the preset value of the traffic load and determine the current value of the traffic load at least one programmatic simplification by the predetermined value of the traffic load in only one of the network control equipment is stored, in addition to the current value of the traffic load is determined. From this it also ensures that the reverse signal only from a single network control devices and not - in case of multiple storage of the predetermined value or more times to determine the current value of the traffic load - be emitted from multiple network control devices is what constraints to control technical modifications in the protocol.

To the circuitry and technical realization of the inventive communication system can generally known network control devices are used, supplemented mainly by one each additional access control device

and a Betriebsumschalteinrichtung. Accordingly, each is provided so that the images taken by the transmission and reception separating means receiving data from a Betriebsumschalteinrichtung are fed, which controls the operation state of the token CSMA/CD- and access control device.

Regarding the adjustment of an additional access control device to a known in a Netzwerksteuereinrichtung already contained other access control device to another access mode, an advantageous embodiment of the invention that the token-access control device and the CSMA / CD access control device are connected in parallel to the transmission and reception separating means and the influence of the control functions of Betriebsumschalteinrichtung communication processor are realizable. This communication processor is usually also part of known network control devices and can be programmed to store the corresponding value of the given traffic load and determining the current value of the traffic load used in the transmission network in a simple manner.

The necessary control data and user data between the token-access control device or the CSMA/CD-access control device on the one hand and the communication processor on the other hand is a further embodiment of the invention according to the token-access control device, the CSMA / CD access control device, the communication processor and a data storage a common control bus are connected.

Regarding the communication processor, it is also possible to control access to resort facilities, which are designed as an integrated module, and include a communication processor. Preferably, then the integrated building blocks are chosen so that only one of each of the two access control devices includes a communication processor modules realizable. In principle, however, the presence is always a communication processor in a possible as an integrated module running access control device, in which case the necessary control and data transfer tasks are performed by two communication processors können. Denkbar for example, that one of the two communication processors essentially the task of controlling the caching of received or abzusendender data is assigned, while the other processor communication is essentially the control of the actual access to the network controller on the transmission network.

Regardless of the number and arrangement of communication processors, it is regarded as an advantage that one main computing device - a so-called host - the subscriber stations connected to the control bus. Over the control is done essentially the transmission of address data and user data, while current access requirements may not necessarily be over the control, but instead communicated via separate interrupt lines.

The invention will now be described with reference to two embodiments shown in three figures. The figures show the

1 shows the time course of the traffic load of a transmission network.

FIG2 is a first schematic embodiment of a network control device and

3 shows a second schematic embodiment of a network control device.

1, an arbitrary temporal profile of the traffic load is shown a transmission network. In about 60% and 40% of the theoretical maximum data traffic load  $D_{max}$  are two values  $D1$ ,  $D2$  of the traffic load  $D$  specified, if exceeded, or falls below a switch to a different access control each process takes place. At the time  $T0$  to work all the network control devices with the CSMA / CD access control method.  $T1$  at the time, the traffic load  $D2$  (60% of  $D_{max}$ ) is reached and it is the reversal of all connected to a common transmission network, network control devices on the token-access control method until the time  $T2$ , which fell below the traffic load  $D1$  (40% of  $D_{max}$ ) is again replaced by the CSMA / CD access control method wird. Bis  $T3$  is then maintained at the time of this access control method can be expediently to determine the current traffic loads by evaluating the bit streams over a number of consecutive bytes extensive period, with the end of the analysis supervised bytes even stronger than at the beginning of the monitoring period occurring Bytes weighted in order to quickly adjust to, sudden changes to achieve particular increases in the current traffic load.

Figures2 shows a schematic diagram of the essential building blocks of a network control device, and - as represented by arrows effect - the information flow between these blocks.

On one hand, the actual transmission network bus  $B$  performing a network control device by means of their Nazi Sende-/Empfangstrenneinrichtung  $SE$  is connected. The signals received by the transceiver  $SE$  signals are fed to a Betriebsumschalteinrichtung  $BU$ , are stored in the two fixed values  $D1$ ,  $D2$  (Fig. 1) the traffic load. The  $BU$  Betriebsumschalteinrichtung determined in each case over a period of several consecutive bytes wide, the current traffic load on the bus and  $B$  are possibly Umsteuerbefehle a token access control device  $ZT$  and a CSMA / CD access control device  $ZC$ . During the active state of the token-access control device  $ZT$  are the bits of the token signals are not taken into account, as would otherwise be determined, for example, in the absence of useful data by permanently consecutive token signals maximum load on the bus  $B$ . The two access control facilities  $ZT$ ,  $ZC$  turn affect a transmission control device  $SS$  such that the transmission is transmitted over a subscriber station  $TS$  data interface to the bus  $B$  as the token protocol or according to the CSMA / CD protocol.

The system shown in Figure 3 embodiment of a network controller based on the use of integrated modules for access control devices. On the network bus  $B$  is again a transceiver connected to a separator  $SE$  Busschnittstelleneinrichtung  $BS$ , which is an adapter bus  $AB$  to the actual network control device in conjunction. To the adapter bus  $AB$  is an integrated module, "CSMA / CD access control device" or an integrated module  $IC$  "token-access control device"  $IT$  are connected. Via a system bus  $SB$  both have built-in components  $IC$ ,  $IT$  access to a storage  $S$ , the activation of either one of two integrated components  $IC$ ,  $IT$  is using a communication processor  $CP$ , which is also connected to the system bus  $SB$ . Also a main computer  $HT$  (host) of the actual subscriber station is connected to the same system bus  $SB$  and essentially controls the data transfer between memory and a  $S$   $HT$  associated to the main computer, not shown, further memory. Are using one of the two modules integrated  $IC$ ,  $IT$  via the adapter bus  $AB$  to the network bus  $B$  to be dispensed data taken from the storage  $S$ . In the event that the structure of the transmission network is a ring, as an integral component of  $IT$  may, for example, 38 020 TMS chip from Texas Instruments, are used for the integrated module of the  $IC$  chip 82 586 Controller from the Intel Corporation.

## CLAIMS

1st Communication system with multiple subscriber stations based on an all subscriber stations common transmission network (Local Area Network) (B) with each of a transmission and reception separating means (SE) that can be under the control of each of a network control device (NS), are a CSMA / CD (Carrier Sense Multiple Access With Collision Detection) access controller (ZC) and a token-Zugriffsteuereinrichtung (ZT), one of which the CSMA / CD access control device (ZC) drops below a predetermined value of the traffic load in the transmission network (B), the token access controller (CT), however, when exceeding a predetermined value (D2) of the traffic load is switched effectively.

2nd Communication system according to claim 1, wherein the determination is made of the respective current value of the traffic load by measuring the number of bits per predetermined time unit, while the effectiveness of the token-access control device (ZT) are not the token forming bits into account.

3rd Communication system according to claim 1 or 2, characterized generated that falls below the predetermined value (D1) of the traffic load and receiving the token in one of the network control means a reverse signal and the transmission network (B) transferred to any other network control devices, and there in terms of deactivation evaluates the respective token-access control device (ZT) and activation of the CSMA / CD access control device.

4th Communication system according to claim 3, wherein the reverse signal is sent out in direct connection to the token and the subscriber stations sequentially received and sent back together with the token.

5th Communication system according to claims 1 to 4, wherein upon exceeding the predetermined value (D2) of the data traffic load (D) and shared access of a network control devices (NS) on the transmission network (B) a defined Umsteuerkennzeichen via the transmission network (B) transmitted to all other network control devices, and there in terms of deactivation of each CSMA / CD access control device (ZC) and activation of token-access control device (CT) were evaluated.

6. Kommunikationssystem according to one of claims 1 to 5, wherein the predetermined values (D1, D2) of the data traffic load (D) are only stored in one of the network control devices (NS), in addition to the current value of the data traffic load (D) is determined.

7th Communication system according to claim 1-6, characterized in that the transmission and reception separating means (SE) recorded receiving data from a Betriebsumschalteinrichtung (BU) are fed to the operational status of CSMA/CD- and the token-access control devices (ZC or ZT controls).

8th Communication system according to claims 1 to 7, wherein the token access controller (IT) and the CSMA/CD- access control device (IC) are parallel connected to the transmission and reception separating

means (SE) and under the control influence of the functions of the Betriebsumschalteneinrichtung realizable communication processor (CP) are available.

9th Communication system according to claim 8, wherein the token access controller (IT), the CSMA / CD access control device (IC), the communication processor (CP) and a data storage (S) to a common system bus (SB) are connected.

10th Communication system according to claim 8 or 9, wherein the CSMA/CD- access control device (IC) and / or the token-access control device (IT) and communications processor (CP) comprehensive integrated component are formed.

11th Communication system according to claim 9 or 10, characterized in that a main computing device (HT) (host) of the subscriber station to the control bus (SB) is connected.



DEUTSCHES  
PATENTAMT

⑮ Aktenzeichen: P 36 13 898.3  
⑯ Anmeldetag: 24. 4. 86  
⑰ Offenlegungstag: 28. 10. 87

*Behördeneigentum*

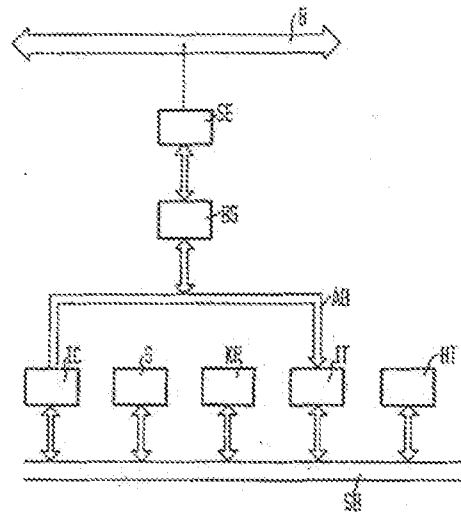
DE 3613898 A1

⑱ Anmelder:  
Siemens AG, 1000 Berlin und 8000 München, DE

⑲ Erfinder:  
Glander, Georg, 8000 München, DE

⑳ **Kommunikationssystem mit mehreren auf ein gemeinsames Übertragungsnetzwerk zugreifenden Teilnehmerstationen**

In einem Kommunikationssystem mit mehreren auf ein gemeinsames Übertragungsnetzwerk (B) zugreifenden Teilnehmerstationen ist in stationsindividuellen Netzwerksteuer-einrichtungen (NS) jeweils eine CSMA/CD-Zugriffsteuereinrichtung (ZC) und eine TOKEN-Zugriffsteuereinrichtung (ZT) enthalten, die unterhalb bzw. oberhalb bestimmter vorgegebener Werte (D1, D2) der Datenverkehrsbelastung im Übertragungsnetzwerk (B) wirksam geschaltet werden.



DE 3613898 A1

## Patentansprüche

1. Kommunikationssystem mit mehreren Teilnehmerstationen, die auf ein allen Teilnehmerstationen gemeinsames Übertragungsnetzwerk (Local Area Network) (*B*) mittels jeweils einer Sende- und Empfangsstreueinrichtung (*SE*) zugreifen, die unter dem Steuereinfluß jeweils einer Netzwerksteuer-einrichtung (*NS*) stehen, die eine CSMA/CD (Carrier Sense Multiple Access With Collision Detection)-Zugriffsteuereinrichtung (*ZC*) und eine TO-KEN-Zugriffsteuereinrichtung (*ZT*) aufweist, von denen die CSMA/CD-Zugriffsteuereinrichtung (*ZC*) bei Unterschreiten eines vorgegebenen Wertes der Datenverkehrsbelastung im Übertragungsnetzwerk (*B*), die Token-Zugriffsteuereinrichtung (*ZT*) dagegen bei Überschreiten eines vorgegebenen Wertes (*D2*) der Datenverkehrsbelastung wirksam geschaltet wird.
2. Kommunikationssystem nach Anspruch 1, dadurch gekennzeichnet, daß die Ermittlung des jeweiligen aktuellen Wertes der Datenverkehrsbelastung durch Messungen der Anzahl der Bits je vorbestimmter Zeiteinheit erfolgt, wobei während der Wirksamkeit der TOKEN-Zugriffsteuereinrichtung (*ZT*) die das TOKEN bildenden Bits nicht berücksichtigt werden.
3. Kommunikationssystem nach Anspruch 1 oder 2, dadurch gekennzeichnet, daß bei Unterschreiten des vorgegebenen Wertes (*D1*) der Datenverkehrsbelastung und Empfang des TOKEN in einer der Netzwerksteuer-einrichtungen ein Umsteuersignal erzeugt und über das Übertragungsnetzwerk (*B*) an alle anderen Netzwerksteuer-einrichtungen übertragen und dort im Sinne der Deaktivierung der jeweiligen TOKEN-Zugriffsteuereinrichtung (*ZT*) und Aktivierung der CSMA/CD-Zugriffsteuereinrichtung ausgewertet wird.
4. Kommunikationssystem nach Anspruch 3, dadurch gekennzeichnet, daß das Umsteuersignal im direkten Anschluß an das TOKEN ausgesandt und von den Teilnehmerstationen nacheinander empfangen und zusammen mit dem TOKEN wieder ausgesandt wird.
5. Kommunikationssystem nach einem der Ansprüche 1 bis 4, dadurch gekennzeichnet, daß bei Überschreiten des vorgegebenen Wertes (*D2*) der Datenverkehrsbelastung (*D*) und freigegebenem Zugriff einer der Netzwerksteuer-einrichtungen (*NS*) auf das Übertragungsnetzwerk (*B*) ein definiertes Umsteuereckzeichen über das Übertragungsnetzwerk (*B*) an alle anderen Netzwerksteuer-einrichtungen übertragen und dort im Sinne der Deaktivierung der jeweiligen CSMA/CD-Zugriffsteuereinrichtung (*ZC*) und Aktivierung der TOKEN-Zugriffsteuereinrichtung (*ZT*) ausgewertet wird.
6. Kommunikationssystem nach einem der Ansprüche 1 bis 5, dadurch gekennzeichnet, daß die vorgegebenen Werte (*D1*, *D2*) der Datenverkehrsbelastung (*D*) nur in einer der Netzwerksteuer-einrichtungen (*NS*) gespeichert sind, in der außerdem der jeweils aktuelle Wert der Datenverkehrsbelastung (*D*) bestimmt wird.
7. Kommunikationssystem nach einem der Ansprüche 1 bis 6, dadurch gekennzeichnet, daß die von der Sende- und Empfangsstreueinrichtung (*SE*) aufgenommenen Empfangsdaten einer Betriebsumschalt-einrichtung (*BU*) zugeführt sind, die den

- Betriebszustand der CSMA/CD- und der TOKEN-Zugriffsteuereinrichtungen (*ZC* bzw. *ZT*) steuert.
8. Kommunikationssystem nach einem der Ansprüche 1 bis 7, dadurch gekennzeichnet, daß die TOKEN-Zugriffsteuereinrichtung (*IT*) und die CSMA/CD-Zugriffsteuereinrichtung (*IC*) parallel an die Sende- und Empfangsstreueinrichtung (*SE*) angeschaltet sind und unter dem Steuereinfluß eines die Funktionen der Betriebsumschalt-einrichtung realisierenden Kommunikationsprozessor (*KP*) stehen.
  9. Kommunikationssystem nach Anspruch 8, dadurch gekennzeichnet, daß die TOKEN-Zugriffsteuereinrichtung (*IT*), die CSMA/CD-Zugriffsteuereinrichtung (*IC*), der Kommunikationsprozessor (*KP*) und ein Datenspeicher (*S*) an einen gemeinsamen Systembus (*SB*) angeschlossen sind.
  10. Kommunikationssystem nach Anspruch 8 oder 9, dadurch gekennzeichnet, daß die CSMA/CD-Zugriffsteuereinrichtung (*IC*) und/oder die TOKEN-Zugriffsteuereinrichtung (*IT*) als den Kommunikationsprozessor (*KP*) umfassender integrierter Baustein ausgebildet sind.
  11. Kommunikationssystem nach Anspruch 9 oder 10, dadurch gekennzeichnet, daß eine Hauptre-cheneinrichtung (*HT*) (Host) der Teilnehmerstation an den Steuerbus (*SB*) angeschlossen ist.

## Beschreibung

Im Datenverkehr zwischen unterschiedlichen Teilnehmerstationen, die zumeist mit Datenverarbeitungskapazität ausgestattete Geräte und Systeme darstellen, werden zunehmend Übertragungsnetzwerke eingesetzt, die als lokale Netze (Local Area Networks) bezeichnet werden. Ein solches lokales Netz stellt ein Übertragungsnetzwerk für die bitserielle Übertragung von Informationen zwischen untereinander verbundenen unabhängigen Geräten dar. Lokale Netze werden üblicherweise mittels der Klassifizierungskriterien Übertragungsmedium, Topologie und Zugriffsmechanismus unterschieden. Die gebräuchlichsten Übertragungsmedien in lokalen Netzen sind verdrehte Kupferkabel, Koaxialkabel und Lichtwellenleiter. Die am häufigsten auftretenden Netzwerkkonfigurationen sind sternförmig, ringförmig oder bus- bzw. baumförmig. Die beiden am häufigsten eingesetzten Zugriffsmechanismen sind CSMA/CD (Carrier Sense Multiple Access With Collision Detection) bzw. TOKEN Access. Praktisch ausgeführte lokale Netze treten in unterschiedlichen Kombinationen von Übertragungsmedium, Topologie und Zugriffsmechanismus auf, wogegen im Hinblick auf die zu übertragende Datenrate, die Kosten und das Verkehrsverhalten der Teilnehmerstationen bestimmte Kombinationen als besonders günstig anzusehen sind. So finden sich z. B. in der Praxis sehr häufig Basisband-Bussysteme mit Koaxialkabeln als Übertragungsmedium und CSMA/CD als Zugriffsverfahren, aber auch Ringsysteme mit Lichtwellenleitern und TOKEN Access als Zugriffsverfahren.

Die Wahl des Zugriffsverfahrens wird im wesentlichen durch das Verkehrsverhalten und die durchschnittliche oder auch maximale Wartezeit bis zum sicheren Zugriff einer der Teilnehmerstationen auf das Übertragungsmedium bestimmt. Als Vorteil des CSMA/CD-Zugriffsverfahrens ist dabei anzusehen, daß die zur Verfügung stehende Bandbreite optimal genutzt werden kann; dieses Zugriffsverfahren bietet sich also dann an,

wenn von Teilnehmerstationen in unregelmäßigen Zeitabständen Daten sehr schnell übertragen werden sollen. Auch bezüglich der Wartezeiten ist das CSMA/CD-Zugriffsverfahren zumindest durchschnittlichen Realzeitanforderungen gewachsen: Messungen haben beispielsweise ergeben, daß bei 50% Kanalauslastung die Wartezeit für den Zugriff einer der Teilnehmerstationen in 90% aller Fälle unter 1 ms liegt. Für strengere Realzeitanforderungen ist allerdings der dem CSMA/CD-Zugriffsverfahren immanente Nachteil nicht zu vernachlässigen, daß diese Zugriffsmethode nicht deterministisch ist, d. h. die Wartezeit für den Zugriff einer beliebigen Teilnehmerstation auf das Übertragungsnetzwerk nicht exakt festzulegen ist.

Die Vorteile der TOKEN-Zugriffsmethode sind die Unabhängigkeit des Verkehrsverhaltens auf dem Übertragungsnetzwerk sowohl von der Übertragungsgeschwindigkeit als auch von der Datenpaketlänge. Für Realzeit-Anwendungen ist trotz der häufig längeren durchschnittlichen Wartezeit als beim CSMA/CD-Zugriffsverfahren das deterministische Verhalten, d. h. die sichere Erreichbarkeit des Übertragungsmediums durch die Teilnehmerstationen bzw. die exakte Vorherbestimmung der maximalen Wartezeit, als wesentlicher Vorteil anzusehen. Im allgemeinen werden die lokalen Netzwerke bezüglich der Zugriffsmethode nach dem jeweils wichtigeren der beiden Aspekte, also entweder nach dem Verkehrsverhalten der an das Übertragungsnetzwerk angeschlossenen Teilnehmerstationen oder aber nach der maximalen Wartezeit ausgelegt. So wird z. B. bei Verbindungen von typischen Bürogeräten als an ein Übertragungsnetzwerk beliebiger Topologie angeschlossenen Teilnehmerstationen wegen der vergleichsweise stochastisch anfallenden Daten das CSMA/CD-Zugriffsverfahren bevorzugt, während bei in eine Prozeßsteuerung integrierten Geräten, z. B. Fertigungsautomaten, häufig das TOKEN-Zugriffsverfahren favorisiert wird, das zwar durchschnittliche längere Wartezeiten aber eine eindeutige maximale Wartezeit impliziert.

Während des Betriebes eines derartigen lokalen Netzwerkes schwankt im allgemeinen die Datenverkehrsbelastung so stark, daß z. B. ein mit dem TOKEN-Zugriffsverfahren arbeitendes lokales Netzwerk bei sehr geringer Verkehrsbelastung unnötig große Wartezeiten verursacht bzw. ein nach dem CSMA/CD-Zugriffsverfahren arbeitendes lokales Netzwerk bei hoher Verkehrsbelastung zwar weiterhin durchschnittlich verhältnismäßig geringe Wartezeiten aber auch einzeln auftretende unzulässig oder zumindest störend lange Wartezeiten verursacht.

Die der Erfindung zugrundeliegende Aufgabe besteht darin, in einem lokalen Netzwerk das Verkehrsverhalten und die Wartezeiten bzw. maximalen Wartezeiten den jeweils momentanen Systemanforderungen bezüglich dieser Parameter besser anzupassen. Dies wird durch ein Kommunikationssystem mit mehreren Teilnehmerstationen erreicht, die auf ein allen Stationen gemeinsames Übertragungsnetzwerk (Local Area Network) mittels jeweils einer Sende- und Empfangseinrichtung zugreifen, die unter dem Steuereinfluß jeweils einer Netzwerksteuereinrichtung stehen, die eine CSMA/CD-Zugriffsteuereinrichtung und eine TOKEN-Zugriffsteuereinrichtung aufweist, von denen die CSMA/CD-Zugriffsteuereinrichtung bei Unterschreiten eines vorgegebenen Wertes der Datenverkehrsbelastung im Übertragungsnetzwerk ermittelten aktuellen Datenverkehrsbelastung, die TOKEN-Zugriffsteuer-

einrichtung dagegen bei Überschreiten eines vorgegebenen Wertes der Datenverkehrsbelastung wirksam geschaltet wird.

Ein derartiges Kommunikationssystem ist insbesondere dann als vorteilhaft anzusehen, wenn jeweils Gruppen von an das gemeinsame Übertragungsnetzwerk angeschlossenen Teilnehmerstationen gebildet sind, die bei Datenverkehr untereinander unterschiedliche Schwerpunkte bezüglich der Anforderungen an die Übertragungseigenschaften des Kommunikationssystems stellen. So ist z. B. bei der Steuerung von Fabrikations- oder Versorgungsanlagen in gewissen Zeitpunkten, z. B. während des Auftretens von Störungen oder einer Änderung im Fertigungsprogramm, mit einer Häufung von zu übertragenden Informationen zu rechnen. Bei Verwendung des CSMA/CD-Zugriffsverfahrens könnten hierbei die maximalen Zugriffszeiten einzelner Teilnehmerstationen zum Übertragungsnetzwerk so groß werden, daß praktisch die Erreichbarkeit aller Teilnehmerstationen in tolerablen Zeiträumen nicht mehr gesichert ist; in solchen Fällen wird das TOKEN-Zugriffsverfahren bevorzugt. Eine derartige Häufung von Zugriffsanforderungen der Teilnehmerstationen ist dagegen für typische Geräte des Bürobetriebes bzw. der Bürokommunikation verhältnismäßig selten, so daß in solchen Fällen das CSMA/CD-Zugriffsverfahren bevorzugt wird. Insbesondere bei der in der Praxis zu beobachtenden zunehmenden Zusammenführung von Geräten der Bürokommunikation mit Systemen und Geräten weitgehend automatischer Fabriken, z. B. im sogenannten Computer Integrated Manufacturing (CIM) sind solche unterschiedlichen Anforderungen an die Datenübertragung der an das gemeinsame Übertragungsnetzwerk angeschlossenen Teilnehmerstationen festzustellen. Das erfindungsgemäße Kommunikationssystem wird solchen in unterschiedlichen Zeiträumen vorliegenden unterschiedlichen Anforderungen an die Eigenschaften der Datenübertragung durch eine von der momentanen Datenverkehrsbelastung abhängige Umschaltung zwischen zwei verschiedenen Zugriffsverfahren in einfacher Weise gerecht. Die Auswahl der geeigneten vorgegebenen Werte der Datenverkehrsbelastung im Übertragungsnetzwerk, bei denen jeweils eine Umschaltung von dem einen zum anderen Zugriffsverfahren erfolgen soll, orientiert sich primär an der für bestimmte an das Übertragungsnetzwerk angeschlossenen Teilnehmerstationen zugelassenen maximalen Wartezeit des Zugriffs zum Übertragungsnetzwerk bzw. des Maßes der Wahrscheinlichkeit des Auftretens einer solchen maximalen Wartezeit bei Anwendung des CSMA/CD-Zugriffsverfahrens und am bekannten Effekt der exponentiellen Abhängigkeit der maximalen Wartezeit von der Verkehrsbelastung bzw. Verkehrsdichte des Datenverkehrs auf dem Übertragungsnetzwerk. Der vorgegebene Wert der Datenverkehrsbelastung, bei dem die Umschaltung erfolgt, wird in der Praxis deshalb im allgemeinen zwischen 30% und 60% der maximalen Datenbelastung des Übertragungsnetzwerkes liegen. Um insbesondere bei aktuellen Datenverkehrsbelastungen, die über einen längeren Zeitraum zufälligerweise um einen vorgegebenen Wert der Datenverkehrsbelastung schwanken, eine häufige Umschaltung zwischen den beiden unterschiedlichen Zugriffsverfahren zu verhindern, werden zwei verschiedene Werte der Datenverkehrsbelastung vorgegeben, von denen der höhere Wert nur bei Überschreiten desselben, der niedrigere Wert nur bei Unterschreiten desselben durch die



jeweilige aktuelle Datenverkehrsbelastung zu einer Umschaltung für das jeweils andere Zugriffsverfahren führt. Der Bereich zwischen den beiden vorgegebenen Werten ist also als Schalthysterese bei der Umschaltung zwischen beiden Zugriffsverfahren anzusehen. Bei einer vereinfachten Auslegung können aber auch beide vorgegebenen Werte zu einem einzigen Wert zusammengefaßt werden, dessen Unterschreiten und Überschreiten jeweils zu einer Umschaltung auf das jeweils andere Zugriffsverfahren führt.

Die Umschaltung des Zugriffsverfahrens bei Überschreiten des vorgegebenen Wertes der Datenverkehrsbelastung erfolgt vorzugsweise bei freigegebenem Zugriff einer der Netzwerksteuereinrichtungen auf das Übertragungsnetzwerk derart, daß ein definiertes Umsteuerkennzeichen über das Übertragungsnetzwerk an alle anderen Netzwerksteuereinrichtungen übertragen und dort im Sinne der Deaktivierung der jeweiligen CSMA/CD-Zugriffsteuereinrichtung und Aktivierung der TOKEN-Zugriffsteuereinrichtung ausgewertet wird. Dieses Umsteuerkennzeichen weist ein ganz bestimmtes Bitmuster auf, das auch ohne gesonderte Adressenkennzeichnung innerhalb des Datenformates von allen anderen Teilnehmerstationen gleichzeitig empfangen (Broadcasting) und entsprechend ausgewertet werden kann.

Sinngemäß das gleiche Verfahren kann auch bei Unterschreiten des vorgegebenen Wertes der Datenverkehrsbelastung derart durchgeführt werden, daß bei Empfang des TOKEN in einer der Netzwerksteuereinrichtungen ein Umsteuersignal erzeugt und über das Übertragungsnetzwerk an alle anderen Netzwerksteuereinrichtungen übertragen und dort im Sinne der Deaktivierung der jeweiligen TOKEN-Zugriffsteuereinrichtung und Aktivierung der CSMA/CD-Zugriffsteuereinrichtung ausgewertet wird. Das Umsteuersignal tritt hierbei quasi an die Stelle des TOKEN und führt zu einer gleichzeitigen Umschaltung aller Netzwerksteuereinrichtungen im Sinne der Änderung des Zugriffsverfahrens.

Es ist aber auch denkbar, daß bei Unterschreiten des vorgegebenen Wertes der Datenverkehrsbelastung und Empfang des TOKEN in einer der Netzwerksteuereinrichtungen das Umsteuersignal von dieser Netzwerksteuereinrichtung im direkten Anschluß an das TOKEN ausgesandt und von allen anderen Teilnehmerstationen nacheinander empfangen — im Sinne der Umschaltung des Zugriffsverfahrens ausgewertet — und zusammen mit dem TOKEN wieder ausgesandt wird.

Eine vorteilhafte Weiterbildung der Erfindung führt im Zusammenhang mit der Speicherung des vorgegebenen Wertes der Datenverkehrsbelastung und Ermittlung des jeweils aktuellen Wertes der Datenverkehrsbelastung zumindest zu einer programmtechnischen Vereinfachung, indem der vorgegebene Wert der Datenverkehrsbelastung nur in einer der Netzwerksteuereinrichtungen gespeichert ist, in der außerdem der jeweils aktuelle Wert der Datenverkehrsbelastung bestimmt wird. Damit ist zugleich sichergestellt, daß die Umsteuersignale jeweils nur von einer einzigen der Netzwerksteuereinrichtungen und nicht — bei mehrfacher Speicherung des vorgegebenen Wertes bzw. mehrfacher Ermittlung des aktuellen Wertes der Datenverkehrsbelastung — von mehreren Netzwerksteuereinrichtungen aussendbar ist, was zu steuerungs-technischen Modifikationen im Übertragungsprotokoll zwänge.

Zur schaltungstechnischen und programmtechnischen Realisierung des erfindungsgemäßen Kommuni-

kationssystemes können grundsätzlich bekannte Netzwerksteuereinrichtungen verwendet werden, die im wesentlichen durch eine jeweils zusätzliche Zugriffssteuereinrichtung und eine Betriebsumschalteneinrichtung ergänzt werden. Demgemäß ist also jeweils vorgesehen, daß die von der Sende- und Empfangsrenneinrichtung aufgenommenen Empfangsdaten einer Betriebsumschalteneinrichtung zugeführt sind, die den Betriebszustand der CSMA/CD- und der TOKEN-Zugriffsteuereinrichtung steuert.

Bezüglich der Anpassung einer zusätzlichen Zugriffssteuereinrichtung an eine in einer bekannten Netzwerksteuereinrichtung bereits enthaltene weitere Zugriffssteuereinrichtung einer anderen Zugriffsart sieht eine vorteilhafte Weiterbildung der Erfindung vor, daß die TOKEN-Zugriffsteuereinrichtung und die CSMA/CD-Zugriffsteuereinrichtung parallel an die Sende- und Empfangsrenneinrichtung angeschlossen sind und unter dem Steuereinfluß eines die Funktionen der Betriebsumschalteneinrichtung realisierenden Kommunikationsprozessors stehen. Dieser Kommunikationsprozessor ist üblicherweise ebenfalls Bestandteil bekannter Netzwerksteuereinrichtungen und kann in einfacher Weise durch entsprechende Programmierung für die Speicherung des vorgegebenen Wertes der Datenverkehrsbelastung und der Ermittlung des aktuellen Wertes der Datenverkehrsbelastung auf dem Übertragungsnetzwerk ausgenutzt werden.

Der notwendige Steuerdaten- und Nutzdatenaustausch zwischen der TOKEN-Zugriffsteuereinrichtung bzw. der CSMA/CD-Zugriffsteuereinrichtung einerseits und dem Kommunikationsprozessor andererseits dient eine weitere Ausgestaltung der Erfindung gemäß der die TOKEN-Zugriffsteuereinrichtung, die CSMA/CD-Zugriffsteuereinrichtung, der Kommunikationsprozessor und ein Datenspeicher an einen gemeinsamen Steuerbus angeschlossen sind.

Bezüglich des Kommunikationsprozessors ist es auch möglich, auf Zugriffsteuereinrichtungen zurückzugreifen, die als integrierter Baustein ausgebildet sind und einen Kommunikationsprozessor umfassen. Bevorzugt werden dann die integrierten Bausteine derart ausgewählt, daß nur einer der beiden jeweils Zugriffsteuereinrichtungen realisierenden Bausteine einen Kommunikationsprozessor umfaßt. Im Prinzip ist aber auch das Vorhandensein jeweils eines Kommunikationsprozessors in einem als integrierter Baustein ausgeführten Zugriffsteuereinrichtung möglich, wobei dann die notwendigen Steuerungs- und Datenübermittlungsaufgaben von beiden Kommunikationsprozessoren übernommen werden können. Denkbar ist z. B., daß dem einen der beiden Kommunikationsprozessoren im wesentlichen die Aufgabe der Steuerung der Zwischenspeicherung empfangener bzw. abzusendender Daten zugewiesen wird, während der andere Kommunikationsprozessor im wesentlichen der Steuerung des eigentlichen Zugriffs der Netzwerksteuereinrichtung auf das Übertragungsnetzwerk dient.

Unabhängig von der Zahl und der Anordnung der Kommunikationsprozessoren ist es als Vorteil anzusehen, daß jeweils eine Hauptrecheneinrichtung — ein sogenannter Host — der Teilnehmerstationen an den Steuerbus angeschlossen ist. Über den Steuerbus erfolgt dabei im wesentlichen die Übermittlung von Adreßdaten und Nutzdaten, während aktuelle Zugriffswünsche nicht unbedingt über den Steuerbus, sondern stattdessen auch über gesonderte Interrupt-Leitungen übermittelt werden können.

Die Erfindung wird im folgenden anhand zweier in drei Figuren dargestellten Ausführungsbeispiele erläutert. Dabei zeigen die

Fig. 1 den zeitlichen Verlauf der Datenverkehrsbelastung eines Übertragungsnetzwerkes.

Fig. 2 ein erstes schematisches Ausführungsbeispiel einer Netzwerksteuereinrichtung und

Fig. 3 ein zweites schematisches Ausführungsbeispiel einer Netzwerksteuereinrichtung.

In Fig. 1 ist ein beliebiger zeitlicher Verlauf der Datenverkehrsbelastung eines Übertragungsnetzwerkes dargestellt. Bei etwa 60% bzw. 40% der theoretisch maximalen Datenverkehrsbelastung  $D_{max}$  sind zwei Werte  $D_1$ ,  $D_2$  der Datenverkehrsbelastung  $D$  vorgegeben, bei deren Überschreiten bzw. Unterschreiten eine Umschaltung auf ein jeweils anderes Zugriffssteuerungsverfahren stattfindet. Zum Zeitpunkt  $T_0$  arbeiten alle Netzwerksteuereinrichtungen mit dem CSMA/CD-Zugriffssteuerungsverfahren. Im Zeitpunkt  $T_1$  ist die Datenverkehrsbelastung  $D_2$  (60% von  $D_{max}$ ) erreicht und es erfolgt die Umsteuerung aller an ein gemeinsames Übertragungsnetzwerk angeschlossenen Netzwerksteuereinrichtungen auf das TOKEN-Zugriffssteuerungsverfahren, das bis zum Zeitpunkt  $T_2$ , in dem die Datenverkehrsbelastung  $D_1$  (40% von  $D_{max}$ ) unterschritten wird, wieder durch das CSMA/CD-Zugriffssteuerungsverfahren ersetzt wird. Bis zum Zeitpunkt  $T_3$  wird dann dieses Zugriffssteuerungsverfahren beibehalten. Zweckmäßigerweise erfolgt die Bestimmung der jeweils aktuellen Datenverkehrsbelastungen durch Auswertung der Bitströme über einen mehrere aufeinanderfolgende Bytes umfassenden Zeitraum, wobei die am Ende des Auswertezitraumes überwachten Bytes auch stärker als die am Anfang des Überwachungszeitraumes auftretenden Bytes gewichtet werden können, um eine schnelle Anpassung an stoßartige Veränderungen, insbesondere Erhöhungen der aktuellen Datenverkehrsbelastung zu erzielen.

Die Fig. 2 zeigt in schematischer Darstellung die wesentlichen Bausteine einer Netzwerksteuereinrichtung und — repräsentiert durch Wirkungspfeile — den Informationsfluß zwischen diesen Bausteinen.

An einen das eigentliche Übertragungsnetzwerk darstellenden Bus  $B$  ist eine Netzwerksteuereinrichtung  $NS$  mittels ihrer Sende-/Empfangsstreineinrichtung  $SE$  angeschlossen. Die von der Sende-/Empfangseinrichtung  $SE$  empfangenen Signale werden einer Betriebsumschalteinrichtung  $BU$  zugeführt, in der zwei feste Werte  $D_1$ ,  $D_2$  (Fig. 1) der Datenverkehrsbelastung gespeichert sind. Die Betriebsumschalteinrichtung  $BU$  ermittelt jeweils über einen mehrere aufeinanderfolgende Bytes umfassenden Zeitraum die aktuelle Datenverkehrsbelastung auf dem Bus  $B$  und gibt gegebenenfalls Umsteuerbefehle an eine TOKEN-Zugriffssteuereinrichtung  $ZT$  und eine CSMA/CD-Zugriffssteuereinrichtung  $ZC$ . Während des aktiven Zustandes der TOKEN-Zugriffssteuereinrichtung  $ZT$  werden die Bits der TOKEN-Signale nicht mitberücksichtigt, da anderenfalls beispielsweise bei Fehlen von Nutzdaten durch permanent aufeinanderfolgende TOKEN-Signale Maximalbelastung auf dem Bus  $B$  ermittelt würde. Die beiden Zugriffssteuereinrichtungen  $ZT$ ,  $ZC$  beeinflussen ihrerseits eine Sendesteuereinrichtung  $SS$  derart, daß das Aussenden von über eine Teilnehmerstationsschnittstelle  $TS$  übermittelten Daten an den Bus  $B$  nach dem TOKEN-Protokoll bzw. nach dem CSMA/CD-Protokoll erfolgt.

Das in der Fig. 3 dargestellte Ausführungsbeispiel einer Netzwerksteuereinrichtung basiert auf dem Einsatz integrierter Bausteine für die Zugriffssteuereinrichtung.

An den Netzwerkbus  $B$  ist wiederum über eine Sende-Empfangsstreineinrichtung  $SE$  eine Busschnittstelleneinrichtung  $BS$  angeschlossen, die über einen Adapterbus  $AB$  mit der eigentlichen Netzwerksteuereinrichtung in Verbindung steht. An den Adapterbus  $AB$  sind ein integrierter Baustein "CSMA/CD-Zugriffssteuereinrichtung"  $IC$  bzw. ein integrierter Baustein "TOKEN-Zugriffssteuereinrichtung"  $IT$  angeschlossen. Über einen Systembus  $SB$  haben beide integrierten Bausteine  $IC$ ,  $IT$  Zugriff zu einem Speicher  $S$ , wobei die wahlweise Aktivierung eines der beiden integrierten Bausteine  $IC$ ,  $IT$  mittels eines Kommunikationsprozessors  $KP$  erfolgt, der ebenfalls an den Systembus  $SB$  angeschlossen ist. Auch ein Hauptrechner  $HT$  (Host) der eigentlichen Teilnehmerstation ist an den gleichen Systembus  $SB$  angeschlossen und steuert im wesentlichen den Datentransfer zwischen dem Speicher  $S$  und einem dem Hauptrechner  $HT$  zugeordneten, nicht dargestellten weiteren Speicher. Die mittels eines der beiden integrierten Bausteine  $IC$ ,  $IT$  über den Adapterbus  $AB$  an den Netzwerkbus  $B$  abzugebenden Daten werden aus dem Speicher  $S$  entnommen. Für den Fall, daß die Struktur des Übertragungsnetzwerkes einen Ring darstellt, kann als integrierter Baustein  $IT$  z. B. der TMS 38020 Chip der Firma Texas Instruments, für den integrierten Baustein  $IC$  der Controller Chip 82586 der Firma Intel, verwendet werden.

- Leerselle -

FIG 1

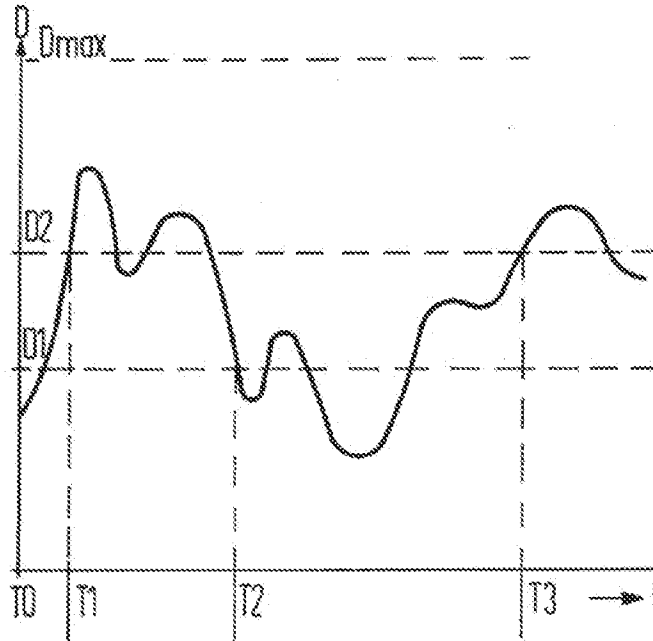
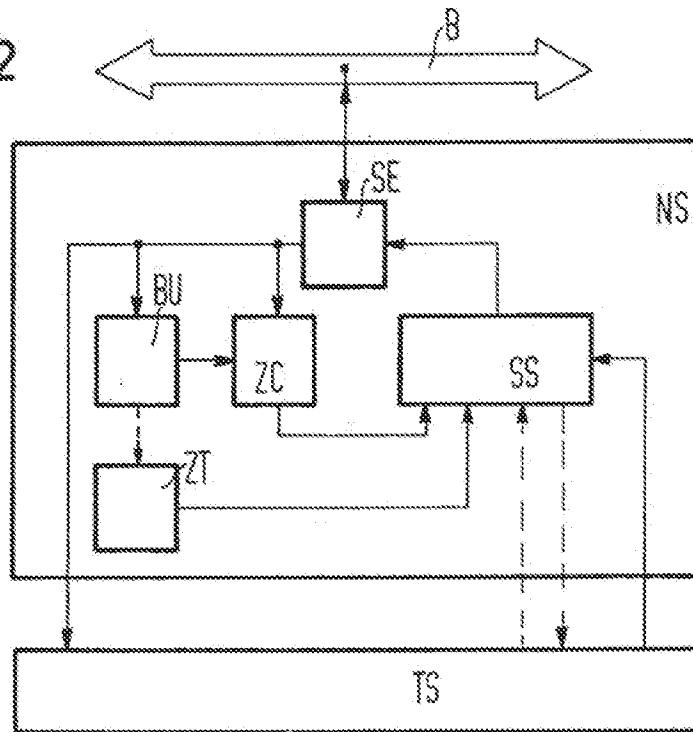


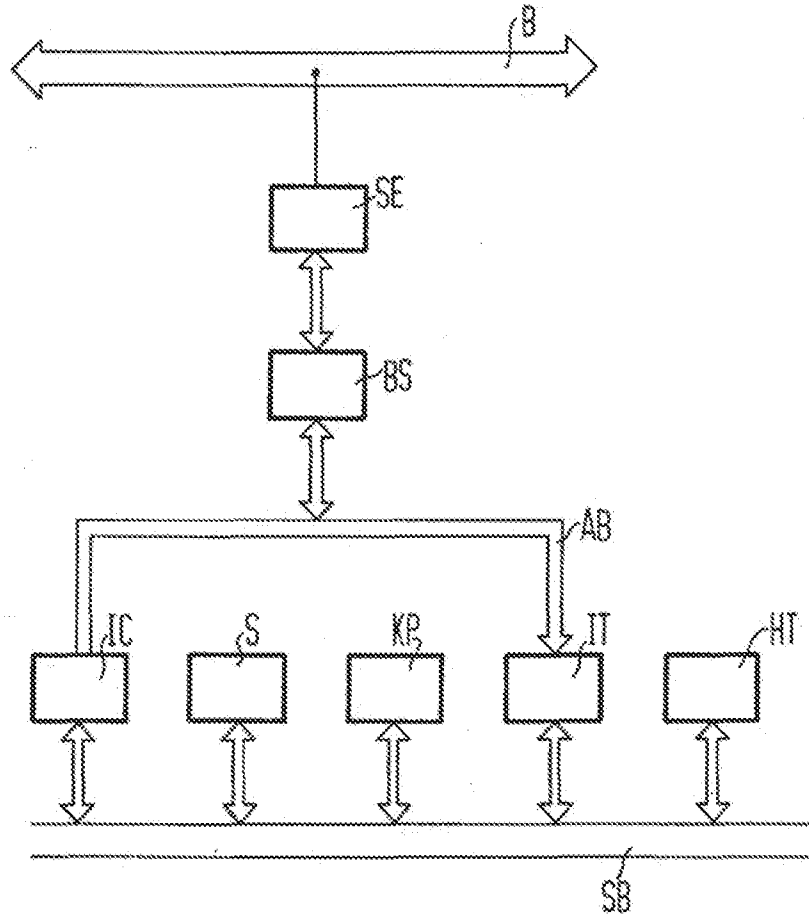
FIG 2



ORIGINAL INSPECTED

708 844/279

FIG 3



ORIGINAL UNFILED

<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b> ( Not for submission under 37 CFR 1.99)	Application Number		12910706	
	Filing Date		2010-10-22	
	First Named Inventor	Payne		
	Art Unit		2451	
	Examiner Name	BACHHEAN TIV		
	Attorney Docket Number		71855/10-351	

U.S.PATENTS						Remove
Examiner Initial*	Cite No	Patent Number	Kind Code <sup>1</sup>	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1					

If you wish to add additional U.S. Patent citation information please click the Add button. Add

U.S.PATENT APPLICATION PUBLICATIONS						Remove
Examiner Initial*	Cite No	Publication Number	Kind Code <sup>1</sup>	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1					

If you wish to add additional U.S. Published Application citation information please click the Add button. Add

FOREIGN PATENT DOCUMENTS								Remove
Examiner Initial*	Cite No	Foreign Document Number <sup>3</sup>	Country Code <sup>2</sup> j	Kind Code <sup>4</sup>	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T <sup>5</sup>
	1							<input type="checkbox"/>

If you wish to add additional Foreign Patent Document citation information please click the Add button Add

NON-PATENT LITERATURE DOCUMENTS				Remove
Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.		T <sup>5</sup>

**INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT**  
( Not for submission under 37 CFR 1.99)

Application Number	12910706
Filing Date	2010-10-22
First Named Inventor	Payne
Art Unit	2451
Examiner Name	BACHHEAN TIV
Attorney Docket Number	71855/10-351

1	Computing Services – Carnegie Mellon, About Wireless Andrew (2000)	<input type="checkbox"/>
2	Computing Services – Carnegie Mellon, Wireless Andrew (2000)	<input type="checkbox"/>
3	Computing Services – Carnegie Mellon Wireless Andrew, Research Partners (2000)	<input type="checkbox"/>
4	Computing Services – Carnegie Mellon Wireless Andrew, People (2000)	<input type="checkbox"/>
5	Computing Services – Carnegie Mellon Wireless Andrew, Download the Supported Drivers (2000)	<input type="checkbox"/>
6	Computing Services – Carnegie Mellon Wireless Andrew, Documentation and Support (2000)	<input type="checkbox"/>
7	Computing Services – Carnegie Mellon Online Documentation, Wireless Andrew Frequently Asked Questions – A Computing Services Publication, 10/26/1999	<input type="checkbox"/>
8	CatScan – The Scanning-Optimized Database Software for the Palm Computing Platform webpage (2000)	<input type="checkbox"/>
9	Franklin Chen et al., Using Handheld Devices for Tests in Classes (2000)	<input type="checkbox"/>
10	ePQA – The e-Commerce PQA Enhancer from Stevens Creek Software – Winner of the Best PQA Award at PalmSource '99 (Palm Developers Conference) webpage	<input type="checkbox"/>
11	TechTalk Transcript, Wireless Networking Directions with Charles “Chuck” Bartel, Carnegie Mellon University, 10/21/1999	<input type="checkbox"/>

**INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT**  
( Not for submission under 37 CFR 1.99)

Application Number		12910706
Filing Date		2010-10-22
First Named Inventor	Payne	
Art Unit		2451
Examiner Name	BACHHEAN TIV	
Attorney Docket Number	71855/10-351	

12	Alex Hills, Wireless Andrew, vol. 36 IEEE Spectrum (1999)	<input type="checkbox"/>
13	Alex Hills, TechTalk Transcript - Directions in Wireless Networking, 02/25/1999	<input type="checkbox"/>
14	Carnegie Mellon Plans Four-Fold Expansion to Its High-Speed Wireless Network (2000)	<input type="checkbox"/>
15	Rachel K. Sobel, CMU campus makes another advance in the computing world – it goes wireless, PG News 11/29/1999	<input type="checkbox"/>
16	Mark Houser, CMU to become wireless campus, Tribune Review, 3/9/2001	<input type="checkbox"/>
17	On Hand – Inventory and Asset Tracking Software for the Palm Computing Platform (1999)	<input type="checkbox"/>
18	Stevens Creek Software – Software for the Palm Computing Platform, 09/06/2012	<input type="checkbox"/>
19	Take An Order! (1998-2000)	<input type="checkbox"/>
20	Steven R. Lawson and Robert E. Manning, Evaluating Multiple Dimensions of Visitors' Tradeoffs Between Access and Crowding at Arches National Park Using Indifference Curve Analysis; (Article from the Proceedings of the 2000 Northeastern Recreation Research Symposium, April 2000, U.S. Department of Agriculture, Forest Service, Northeastern Forest Experiment Station)	<input type="checkbox"/>
21	John Weisberg and Jay Beaman, Effective Survey Automation, Published in Proceedings of the 2000 Northeastern Recreation Research Symposium, April 2000, U.S. Department of Agriculture, Forest Service, Northeastern Forest Experiment Station; (Article from the Proceedings of the 2000 Northeastern Recreation Research Symposium, April 2000, U.S. Department of Agriculture, Forest Service, Northeastern Forest Experiment Station)	<input type="checkbox"/>
22	Amy L. Sheaffer et al., Weighting Issues in Recreation Research and in Identifying Support for Resource Conservation Management Alternatives; (Article from the Proceedings of the 2000 Northeastern Recreation Research Symposium, April 2000, U.S. Department of Agriculture, Forest Service, Northeastern Forest Experiment Station)	<input type="checkbox"/>

Unified Patents

Exhibit 1002

Page 2246 of 2584



**INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT**  
( Not for submission under 37 CFR 1.99)

Application Number	12910706
Filing Date	2010-10-22
First Named Inventor	Payne
Art Unit	2451
Examiner Name	BACHHEAN TIV
Attorney Docket Number	71855/10-351

23	Kirk Sinclair and Barbara A Knuth, Intervention for the Collaborative Use of Geographic Information Systems by Private Forest Landowners: A Meaning Centered Perspective; (Article from the Proceedings of the 2000 Northeastern Recreation Research Symposium, April 2000, U.S. Department of Agriculture, Forest Service, Northeastern Forest Experiment Station)	<input type="checkbox"/>
24	Benjamin Wang et al., Estimating Social Carrying Capacity Through Computer Simulation Modeling: An Application to Arches National Park, Utah; (Article from the Proceedings of the 2000 Northeastern Recreation Research Symposium, April 2000, U.S. Department of Agriculture, Forest Service, Northeastern Forest Experiment Station)	<input type="checkbox"/>
25	Andrew Hill, Jay Beaman, and Joseph O'Leary, Does the Suggestion That Respondents Recall Events Chronologically Significantly Influence the Data Collected?; (Article from the Proceedings of the 2000 Northeastern Recreation Research Symposium, April 2000, U.S. Department of Agriculture, Forest Service, Northeastern Forest Experiment Station)	<input type="checkbox"/>
26	Gloria Sanders et al., Importance-Performance Analysis: An Application to Michigan's Natural Resources (Article from the Proceedings of the 2000 Northeastern Recreation Research Symposium, April 2000, U.S. Department of Agriculture, Forest Service, Northeastern Forest Experiment Station)	<input type="checkbox"/>
27	Ray Rischpater, Was the SpringPort Wireless Ethernet Module worth the wait? 07/01/2001	<input type="checkbox"/>
28	Shawn Barnett, Omnisky Minstrel S – The service just gets better and better, Pen Computing (2001)	<input type="checkbox"/>
29	Shawn Barnett, Visor Phone – Phone and PDA merge into one, Pen Computing (2001)	<input type="checkbox"/>
30	Alberto H.F. Laender and Berthier A. Riveiro-Neto, A Brief Survey of Web Data Extraction Tools (June 2002)	<input type="checkbox"/>
31	Ryan M. Donahue, Palmques: A Palm Os Questionnaire System With Database Connectivity (2002)	<input type="checkbox"/>
32	Richard C. Waters, Time Synchronization In Spline, Mitsubishi Electric Research Laboratories, (1996)	<input type="checkbox"/>
33	Questionnaire Tokenization (encryption systems)	<input type="checkbox"/>

**INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT**  
( Not for submission under 37 CFR 1.99)

Application Number	12910706
Filing Date	2010-10-22
First Named Inventor	Payne
Art Unit	2451
Examiner Name	BACHHEAN TIV
Attorney Docket Number	71855/10-351

34	Manish Malik, MDC: A Mobile Data Collection System for Pocket PC, (2002)	<input type="checkbox"/>
35	Sawako-Eeva Hayashi, Development Of Mobile Tokens Handling Application: Applying The User-Centered Design Approach, (2001)	<input type="checkbox"/>
36	Karen Brannen, Intelligent Use of Metadata in the Questionnaire Design Process (June 2001)	<input type="checkbox"/>
37	S.M. Nausser et al., Using Personal Digital Assistants To Collect Survey Data, (1996)	<input type="checkbox"/>
38	Stuart Speedie et al., PDA Support for Outpatient Clinical Clerkships: Mobile Computing for Medical Education, Amia Inc, (2001)	<input type="checkbox"/>
39	Elske Ammenwerth et al., Mobile information and communication tools in the hospital, vol. 57 International Journal of Medical Informatics, (2000)	<input type="checkbox"/>
40	Stephen Jenkins and Tony Solomondes, Connecting Bits and Pieces: Context Tokens in Survey Design	<input type="checkbox"/>
41	M.R. Tribhuvan and Shabana Pirzade, Ensuring Data Storage Security in Cloud Computing through Two-Way Handshake Based on Token Management, IEEE Computer Society (2010)	<input type="checkbox"/>
42	Robert C. Goldstein and Christian Wagner, Database Management With Sequence Trees And Tokens, vol. 9 IEEE Transactions on Knowledge and Data Engineering (1997)	<input type="checkbox"/>
43	Paul Lettieri and Mani B. Srivastava, Advances in Wireless Terminals, IEEE Personal Communications (1999)	<input type="checkbox"/>
44	Christoffer Anderson and Patrik Svensson, Mobile Internet – An industry-wide paradigm shift?, vol. 4 Ericsson Review (1999)	<input type="checkbox"/>

<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b> ( Not for submission under 37 CFR 1.99)	Application Number	12910706
	Filing Date	2010-10-22
	First Named Inventor	Payne
	Art Unit	2451
	Examiner Name	BACHHEAN TIV
	Attorney Docket Number	71855/10-351

45	Steve Ardagh-Walter, Mobile Data In Transport & Distribution: A Practical Guide For Professional User, vol. 1 Supply Chain Practice (1999)	<input type="checkbox"/>
46	AvantGo 4.0	<input type="checkbox"/>
47	Avant Go - Administrator Guide for AvantGo M-Business Server, Version 4.2 (2001)	<input type="checkbox"/>
48	Peter Brusilovsky and Philip Miller, Course Delivery Systems for the Virtual University (2001)	<input type="checkbox"/>
49	CSI MobileLink Overview, Business Solutions (2001)	<input type="checkbox"/>

If you wish to add additional non-patent literature document citation information please click the Add button **Add**

**EXAMINER SIGNATURE**

Examiner Signature		Date Considered	
--------------------	--	-----------------	--

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>1</sup> See Kind Codes of USPTO Patent Documents at [www.USPTO.GOV](http://www.USPTO.GOV) or MPEP 901.04. <sup>2</sup> Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). <sup>3</sup> For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. <sup>4</sup> Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. <sup>5</sup> Applicant is to place a check mark here if English language translation is attached.

<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b> ( Not for submission under 37 CFR 1.99)	Application Number	12910706
	Filing Date	2010-10-22
	First Named Inventor	Payne
	Art Unit	2451
	Examiner Name	BACHHEAN TIV
	Attorney Docket Number	71855/10-351

**CERTIFICATION STATEMENT**

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

**OR**

That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

See attached certification statement.

The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

A certification statement is not submitted herewith.

**SIGNATURE**

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/scott r. zingerman/	Date (YYYY-MM-DD)	2013-02-12
Name/Print	Scott R. Zingerman	Registration Number	35422

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. **DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

## Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

## Electronic Patent Application Fee Transmittal

<b>Application Number:</b>	12910706
<b>Filing Date:</b>	22-Oct-2010
<b>Title of Invention:</b>	SYSTEM AND METHOD FOR DATA MANAGEMENT
<b>First Named Inventor/Applicant Name:</b>	J. David Payne
<b>Filer:</b>	Scott R. Zingerman/Jamie Robinson
<b>Attorney Docket Number:</b>	71855/10-351

Filed as Small Entity

### Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
<b>Basic Filing:</b>				
<b>Pages:</b>				
<b>Claims:</b>				
<b>Miscellaneous-Filing:</b>				
<b>Petition:</b>				
<b>Patent-Appeals-and-Interference:</b>				
<b>Post-Allowance-and-Post-Issuance:</b>				

**Extension-of-Time:**

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
<b>Miscellaneous:</b>				
Submission- Information Disclosure Stmt	1806	1	180	180
<b>Total in USD (\$)</b>				<b>180</b>

## Electronic Acknowledgement Receipt

<b>EFS ID:</b>	14934313
<b>Application Number:</b>	12910706
<b>International Application Number:</b>	
<b>Confirmation Number:</b>	8703
<b>Title of Invention:</b>	SYSTEM AND METHOD FOR DATA MANAGEMENT
<b>First Named Inventor/Applicant Name:</b>	J. David Payne
<b>Customer Number:</b>	22206
<b>Filer:</b>	Scott R. Zingerman/Jamie Robinson
<b>Filer Authorized By:</b>	Scott R. Zingerman
<b>Attorney Docket Number:</b>	71855/10-351
<b>Receipt Date:</b>	12-FEB-2013
<b>Filing Date:</b>	22-OCT-2010
<b>Time Stamp:</b>	10:16:54
<b>Application Type:</b>	Utility under 35 USC 111(a)

### Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	\$180
RAM confirmation Number	8951
Deposit Account	
Authorized User	

### File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi-Part (.zip)	Pages (if appl.)



1	Non Patent Literature	ComputingServices_CarnegieMellon_AboutWirelessAndrew.pdf	999194 100f542933a05e4e2c1f4bab2ed3f120ec2ef9bb	no	5
<b>Warnings:</b>					
<b>Information:</b>					
2	Non Patent Literature	ComputingServices_CarnegieMellonWirelessAndrew.pdf	285374 b6c4e320901931d4a0045728cb37c64dcb2f4dcb	no	2
<b>Warnings:</b>					
<b>Information:</b>					
3	Non Patent Literature	ComputingServices_CarnegieMellonWirelessAndrewResearchPartners.pdf	94350 135986cce838a48c953b17c5dfcaa474ffff90c3	no	1
<b>Warnings:</b>					
<b>Information:</b>					
4	Non Patent Literature	ComputingServices_CarnegieMellonWireslessAndrewPeople.pdf	78812 431ad25daaae0c0cd3c81a3905e3fa725c5b7cf0	no	1
<b>Warnings:</b>					
<b>Information:</b>					
5	Non Patent Literature	ComputingServices_CarnegieMellonWirelessAndrewDownloadTheSupportedDrivers.pdf	437769 d946e6ee28d87f35040240501bf248e83e4563b9	no	3
<b>Warnings:</b>					
<b>Information:</b>					
6	Non Patent Literature	ComputingServices_CarnegieMellonWirelessAndrewDocumentationAndSupport.pdf	104759 eb5d314cb94de58ac4c81f37f631ae2430c40fed	no	1
<b>Warnings:</b>					
<b>Information:</b>					
7	Non Patent Literature	ComputingServices_CarnegieMellonOnlineDocumentation.pdf	784245 d32de14720b613e10413ad7d5cd1a0e3bc064da8	no	4
<b>Warnings:</b>					
<b>Information:</b>					
8	Non Patent Literature	CatScan_TheScanning-OptimizedDatabaseSoftware.pdf	631455 be95d71b32358ec926836be9faf0010b0b2a7ec2	no	4
<b>Warnings:</b>					
<b>Information:</b>					
9	Non Patent Literature	FranklinChenEtAl_UsingHandheldDevicesForTestsInClasses.pdf	7072862 15098219f367a7bb6b43804f8421f9e9fef551e4	no	39
<b>Warnings:</b>					
<b>Information:</b>					

10	Non Patent Literature	ePQA_Thee-CommercePQAEnhancerFromStevensCreekSoftware.pdf	439719 2420015c312a51c789840af92ee4ad6fb6aa680f	no	3
<b>Warnings:</b>					
<b>Information:</b>					
11	Non Patent Literature	TechTalkTranscriptWirelessNetworkingDirectionsWithCharlesBartel.pdf	4609860 3d33ecbb9cb9131b9b24e344901f5fe6f7a568cd	no	20
<b>Warnings:</b>					
<b>Information:</b>					
12	Non Patent Literature	AlexHillsWirelessAndrewVol36IEEESpectrum.pdf	1864920 e128ecbd33249246c64dc4be660af14cc769a3d3	no	9
<b>Warnings:</b>					
<b>Information:</b>					
13	Non Patent Literature	AlexHillsTechTalkTranscriptDirectionsInWirelessNetworking.pdf	3943561 76c645445254b2ee6871f01b51b54c8455cc8669d	no	18
<b>Warnings:</b>					
<b>Information:</b>					
14	Non Patent Literature	CarnegieMellonPlansFour-FoldExpansionToltsHigh-SpeedWirelessNetwork.pdf	241224 c52daac1697a814725278ec792c26e0c8ff6cf7	no	1
<b>Warnings:</b>					
<b>Information:</b>					
15	Non Patent Literature	RachelKSobel_CMUCampusMakesAnotherAdvance.pdf	647043 8b59958e13328d9f05e876218f23aea4fb8f9370	no	4
<b>Warnings:</b>					
<b>Information:</b>					
16	Non Patent Literature	MarkHouser_CMUToBecomeWirelessCampus.pdf	650181 b1f6783b09938edd75f7de47e6e2b5c1b7bb611e	no	4
<b>Warnings:</b>					
<b>Information:</b>					
17	Non Patent Literature	OnHandInventoryAndAssetTrackingSoftwareForthePalmComputingPlatform.pdf	553367 b67c59746d49b4c8773eb5f344d734ed5b3baa39	no	3
<b>Warnings:</b>					
<b>Information:</b>					
18	Non Patent Literature	StevensCreekSoftware_SoftwareForthePalmComputingPlatform.pdf	523122 11aedcb3bb6f3a1e5d3a7470414660d9eb11a221	no	3
<b>Warnings:</b>					
<b>Information:</b>					

19	Non Patent Literature	TakeAnOrder.pdf	643536 f7c9aa6963ffa341e0c417c9ee6c3ee5bec7b2a	no	4
<b>Warnings:</b>					
<b>Information:</b>					
20	Non Patent Literature	StevenRLawsonAndRobertEManning_EvaluatingMultipleDimensions.pdf	1975541 ee0d71278f0b0d0013c093741b5eeb095ed742cc	no	9
<b>Warnings:</b>					
<b>Information:</b>					
21	Non Patent Literature	JohnWeisbergAndJayBeamanEffectiveSurveyAutomation.pdf	2050127 903fba31985724bea5612bd39783775a355efcfe	no	7
<b>Warnings:</b>					
<b>Information:</b>					
22	Non Patent Literature	AmyLSheafferEtAl_WeightingsIssuesInRecreationResearch.pdf	317923 586ebb4882a2266f4469b45a186ac43f427de8b9	no	4
<b>Warnings:</b>					
<b>Information:</b>					
23	Non Patent Literature	KirkSinclairAndBarbaraAKnuth_InterventionForTheCollaborative.pdf	1864743 982aa88e8d8796e19bf70137df17d6ab227dfc0b	no	6
<b>Warnings:</b>					
<b>Information:</b>					
24	Non Patent Literature	BenjaminWangEtAl_EstimatingSocialCarryingCapacity.pdf	1734678 8aaa03b29bed155fe888445becf90c3baa39b688	no	8
<b>Warnings:</b>					
<b>Information:</b>					
25	Non Patent Literature	AndrewHillEtAl_DoesTheSuggestionThatRespondentsRecall.pdf	1029625 249f25e0fc857fdc5ceced8903dd27d7a092eab7	no	5
<b>Warnings:</b>					
<b>Information:</b>					
26	Non Patent Literature	GloriaSandersEtAl_Importance-PerformanceAnalysis.pdf	996966 88fb66af1b8f4b75e6770f7cb688e7dc434b496	no	4
<b>Warnings:</b>					
<b>Information:</b>					
27	Non Patent Literature	RayRischpater_WasTheSpringPortWirelessEthernet.pdf	2503132 1900f8ff6488c0ba7ae5dc239c9a2f73ff5aed70	no	21
<b>Warnings:</b>					
<b>Information:</b>					

28	Non Patent Literature	ShawnBarnett_OmniskyMinstre IS.pdf	397108 70791243a22a353b3348b8cd131131ce5c7 399bb	no	2
<b>Warnings:</b>					
<b>Information:</b>					
29	Non Patent Literature	ShawnBarnett_VisorPhone.pdf	1619956 2b8d768a0d05a209ac7e5cde285026f9c53 c10eb	no	7
<b>Warnings:</b>					
<b>Information:</b>					
30	Non Patent Literature	AlbertoHFLaenderAndBerthier ARiveiroNeto_ABriefSurveyOfW eb.pdf	2758564 dc6a21e167ff50b39889d911e0354f855d9c 6f68	no	10
<b>Warnings:</b>					
<b>Information:</b>					
31	Non Patent Literature	RyanMDonahue_Palmques_AP almOsQuestionnaireSystem.pdf	10323507 469bb234100809456be79fa85e6368fd6b7 cdfbb	no	79
<b>Warnings:</b>					
<b>Information:</b>					
32	Non Patent Literature	RichardCWaters_TimeSynchron izationInSpline.pdf	3373394 99a5ea6f23e159a5be6873e52d2eacha9a4 1e620	no	17
<b>Warnings:</b>					
<b>Information:</b>					
33	Non Patent Literature	QuesionnaireTokenization.pdf	562519 35425fa5fbc8b76d05e75279cea5898804 e09b6	no	3
<b>Warnings:</b>					
<b>Information:</b>					
34	Non Patent Literature	ManishMalik_MDC_AMobileDa taCollectionSystemforPocketPC .pdf	7049831 2d314b90150f37dfb92a9ee34f3ac5a3825e 61a3	no	61
<b>Warnings:</b>					
<b>Information:</b>					
35	Non Patent Literature	Sawako- EevaHayashi_DevelopmentOf MobileTokensHandlingApplicat ion_Applying.pdf	13460143 b6f12ab6e36c2fa7f65cb9fc25ff122df7ec6e 81	no	78
<b>Warnings:</b>					
<b>Information:</b>					
36	Non Patent Literature	KarenBrannen_IntelligentUseO fMetadata.pdf	1327514 d93c6a9ff53d3f389d9d99ce2e13ddf271bc e230	no	8
<b>Warnings:</b>					
<b>Information:</b>					

37	Non Patent Literature	SMNausserEtAl_UsingPersonalDigitalAssistants.pdf	1633876 07817a9136a602ded653e601c6ad646fa7d5f6ef	no	6
<b>Warnings:</b>					
<b>Information:</b>					
38	Non Patent Literature	StuartSpeedieEtAl_PDASupportForOutpatientClinicalClerkships.pdf	1635033 2dd582e98af14f5e1215901fe98a00d930a7429a	no	5
<b>Warnings:</b>					
<b>Information:</b>					
39	Non Patent Literature	ElskeAmmenwerthEtAlMobileInformationAndCommunication.pdf	4403814 0724aa88a0d628a57ee9f51c5da62b2d4f3004a1	no	20
<b>Warnings:</b>					
<b>Information:</b>					
40	Non Patent Literature	StephenJenkinsAndTonySolomondes_ConnectingBitsAndPieces.pdf	1730419 594b5229415efb13ba9d31664dd9037f162a72a6	no	11
<b>Warnings:</b>					
<b>Information:</b>					
41	Non Patent Literature	MRTribhuvanAndShabanaPirzade_EnsuringDataStorageSecurity.pdf	864035 e222de02e0ca01f084b6b905a198c9e2991e5efc	no	4
<b>Warnings:</b>					
<b>Information:</b>					
42	Non Patent Literature	RobertCGoldsteinAndChristianWagner_DatabaseManagementWithSequenceTrees.pdf	2206573 f385cce43947842adff059fb96981655661dd6de	no	7
<b>Warnings:</b>					
<b>Information:</b>					
43	Non Patent Literature	PaulLettieriAndManiBSrivastava_AdvancesInWirelessTerminals.pdf	4723932 85f605be3ef1ce4bbeea6eeb03a1464c5f2aeaf1	no	14
<b>Warnings:</b>					
<b>Information:</b>					
44	Non Patent Literature	ChristofferAndersonAndPatrikSvensson_MobileInternet.pdf	1900837 7b7e47a2516b3189dc47fdf9e9c8708eb5a618af	no	8
<b>Warnings:</b>					
<b>Information:</b>					
45	Non Patent Literature	SteveArdagh-Walter_MobileDataInTransportAndDistribution.pdf	2112131 088f0ce085b25e560efc28bae12d9f87211778c5	no	11
<b>Warnings:</b>					
<b>Information:</b>					

46	Non Patent Literature	AvantGo.pdf	165196 f565d12efa6879de4b5b1600ddb00c171136ad5a	no	2
<b>Warnings:</b>					
<b>Information:</b>					
47	Non Patent Literature	AvantGo_AdministratorGuideForAvantGoM-BusinessServer.pdf	17998277 9e3649ac20259189098a298319ec1ac1a51480d4	no	164
<b>Warnings:</b>					
<b>Information:</b>					
48	Non Patent Literature	PeterBrusilovskyAndPhilipMiller_CourseDeliverySystems.pdf	8924951 c27585f3192e9665ebb70a4fb4a64ba91c5a167f	no	29
<b>Warnings:</b>					
<b>Information:</b>					
49	Non Patent Literature	CSIMobileLinkOverview_BusinessSolutions.pdf	2588186 ead7f2a62245eaae4fec711e0b9b842258e56a4f	no	10
<b>Warnings:</b>					
<b>Information:</b>					
50	Information Disclosure Statement (IDS) Form (SB08)	IDS6_02-12-2013.pdf	615007 dff2b33bd6237adfc80ab481421e547b46720a50	no	8
<b>Warnings:</b>					
<b>Information:</b>					
A U.S. Patent Number Citation or a U.S. Publication Number Citation is required in the Information Disclosure Statement (IDS) form for autoloading of data into USPTO systems. You may remove the form to add the required data in order to correct the Informational Message if you are citing U.S. References. If you chose not to include U.S. References, the image of the form will be processed and be made available within the Image File Wrapper (IFW) system. However, no data will be extracted from this form. Any additional data such as Foreign Patent Documents or Non Patent Literature will be manually reviewed and keyed into USPTO systems.					
51	Fee Worksheet (SB06)	fee-info.pdf	30200 19d79380dde4df310cfadb32ecce5b6641d0a0f	no	2
<b>Warnings:</b>					
<b>Information:</b>					
<b>Total Files Size (in bytes):</b>				129483091	

**This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.**

**New Applications Under 35 U.S.C. 111**

**If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.**

**National Stage of an International Application under 35 U.S.C. 371**

**If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.**

**New International Application Filed with the USPTO as a Receiving Office**

**If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.**

<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b> ( Not for submission under 37 CFR 1.99)	Application Number		12910706	
	Filing Date		2010-10-22	
	First Named Inventor	Payne		
	Art Unit		2451	
	Examiner Name	BACHHEAN TIV		
	Attorney Docket Number		71855/10-351	

U.S.PATENTS						Remove
Examiner Initial*	Cite No	Patent Number	Kind Code <sup>1</sup>	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1					

If you wish to add additional U.S. Patent citation information please click the Add button. Add

U.S.PATENT APPLICATION PUBLICATIONS						Remove
Examiner Initial*	Cite No	Publication Number	Kind Code <sup>1</sup>	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1					

If you wish to add additional U.S. Published Application citation information please click the Add button. Add

FOREIGN PATENT DOCUMENTS								Remove
Examiner Initial*	Cite No	Foreign Document Number <sup>3</sup>	Country Code <sup>2</sup> j	Kind Code <sup>4</sup>	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T <sup>5</sup>
	1							<input type="checkbox"/>

If you wish to add additional Foreign Patent Document citation information please click the Add button Add

NON-PATENT LITERATURE DOCUMENTS				Remove
Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.		T <sup>5</sup>



**INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT**  
( Not for submission under 37 CFR 1.99)

Application Number	12910706
Filing Date	2010-10-22
First Named Inventor	Payne
Art Unit	2451
Examiner Name	BACHHEAN TIV
Attorney Docket Number	71855/10-351

1	Casio Soft Launches CSI MobileLink for Merchandising, PR Newswire, 04/01/1999	<input type="checkbox"/>
2	Casio Soft releases new version of MobileLink mobile enterprise solution, TelecomWorldWire, 01/26/2001 Michelle Delio, Casio's Field Force Hardware and Software Solution, CRM News Daily, 06/04/2000	<input type="checkbox"/>
3	Michelle Delio, Casio's Field Force Hardware and Software Solution, CRM News Daily, 06/04/2000	<input type="checkbox"/>
4	Wellington Partners invests in leading mobile entertainment provider, 03/11/2002	<input type="checkbox"/>
5	Michael Coglianesse, Mobile Aleph: A System for Distributed Mobile Applications, (2000)	<input type="checkbox"/>
6	Edith de Leeuw and William Nicholls II, Technological Innovations in Data Collection: Acceptance, Data Quality and Costs', vol. 1 Sociological Research Online (1996)	<input type="checkbox"/>
7	Katherine L. Dix and Jonathan Anderson, Distance No Longer a Barrier: Using the internet as a survey tool in educational research, vol. 1 International Education Journal (2000)	<input type="checkbox"/>
8	Matti Hamalainen et al., Quizcode – A Tool for Online Assessment and Feedback	<input type="checkbox"/>
9	Eric Knorr, Special Report PC World's Enterprise Technology: Real Wireless on the Go (2012)	<input type="checkbox"/>
10	Survey Mate – Survey / Quiz Mate v3.5 (1999)	<input type="checkbox"/>
11	Peggy Salz, Part II: Look Who's Watching (2001)	<input type="checkbox"/>

**INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT**  
( Not for submission under 37 CFR 1.99)

Application Number	12910706
Filing Date	2010-10-22
First Named Inventor	Payne
Art Unit	2451
Examiner Name	BACHHEAN TIV
Attorney Docket Number	71855/10-351

12	Vasja Vehovar et al., Web Surveys: Can The Weighting Solve the Problem?	<input type="checkbox"/>
13	Palm Computing Platform, Web Clipping Developer's Guide (1996-2000)	<input type="checkbox"/>
14	Michael F. Weeks, Computer-Assisted Survey Information Collection: A Review of CASIC Methods and Their Implications for Survey Operations, vol. 8, Journal of Official Statistics pp. 445-465 (1992)	<input type="checkbox"/>
15	What Is CSI MobileLink? (no later than July 2001)	<input type="checkbox"/>
16	William C. Schmidt, World-Wide Web Survey Research Made Easy with WWW Survey Assistant, Software Announcement (1996)	<input type="checkbox"/>
17	William C. Schmidt, World-Wide Web Survey Research: Benefits, Potential Problems, and Solutions, vol. 29, Research Methods, Instruments & Computers pp. 274-279 (1997)	<input type="checkbox"/>
18	Techneos.com / Frequently Asked Questions web page (2000)	<input type="checkbox"/>
19	Techneos.com / Product Index web page (2000)	<input type="checkbox"/>
20	Techneos.com / Support web page (2000)	<input type="checkbox"/>
21	John Prager et al., Answering What-Is Questions by Virtual Annotation	<input type="checkbox"/>
22	Matti Hamalainen, et al., Quizcode – A Tool for Online Assessment and Feedback (2000)	<input type="checkbox"/>

<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b> ( Not for submission under 37 CFR 1.99)	Application Number	12910706
	Filing Date	2010-10-22
	First Named Inventor	Payne
	Art Unit	2451
	Examiner Name	BACHHEAN TIV
	Attorney Docket Number	71855/10-351

23	SurveyMate software documentation (1999)	<input type="checkbox"/>
24	Techneos.com web page (2000)	<input type="checkbox"/>
25	Zatz – Unplugged Living and Loving The Digital Lifestyle – Using AvantGo.com 3.0, 07/01/1999	<input type="checkbox"/>
26	Provisional Patent Application No. 60/262,915, filed 01/19/2001; Kevin James Kelly, Survey Methods for Handheld Computers	<input type="checkbox"/>
27	Provisional Patent Application No. 60/262,916, filed 01/19/2001; Kevin James Kelly, Survey Method for Handling Market Survey With Handheld Computers	<input type="checkbox"/>

If you wish to add additional non-patent literature document citation information please click the Add button **Add**

**EXAMINER SIGNATURE**

Examiner Signature		Date Considered	
--------------------	--	-----------------	--

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>1</sup> See Kind Codes of USPTO Patent Documents at [www.USPTO.GOV](http://www.USPTO.GOV) or MPEP 901.04. <sup>2</sup> Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). <sup>3</sup> For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. <sup>4</sup> Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. <sup>5</sup> Applicant is to place a check mark here if English language translation is attached.

**INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT**  
( Not for submission under 37 CFR 1.99)

Application Number	12910706		
Filing Date	2010-10-22		
First Named Inventor	Payne		
Art Unit	2451		
Examiner Name	BACHHEAN TIV		
Attorney Docket Number	71855/10-351		

**CERTIFICATION STATEMENT**

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

**OR**

That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

- See attached certification statement.
- The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.
- A certification statement is not submitted herewith.

**SIGNATURE**

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/scott r. zingerman/	Date (YYYY-MM-DD)	2013-02-12
Name/Print	Scott R. Zingerman	Registration Number	35422

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. **DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

## Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

## Electronic Acknowledgement Receipt

<b>EFS ID:</b>	14939834
<b>Application Number:</b>	12910706
<b>International Application Number:</b>	
<b>Confirmation Number:</b>	8703
<b>Title of Invention:</b>	SYSTEM AND METHOD FOR DATA MANAGEMENT
<b>First Named Inventor/Applicant Name:</b>	J. David Payne
<b>Customer Number:</b>	22206
<b>Filer:</b>	Scott R. Zingerman/Jamie Robinson
<b>Filer Authorized By:</b>	Scott R. Zingerman
<b>Attorney Docket Number:</b>	71855/10-351
<b>Receipt Date:</b>	12-FEB-2013
<b>Filing Date:</b>	22-OCT-2010
<b>Time Stamp:</b>	15:46:36
<b>Application Type:</b>	Utility under 35 USC 111(a)

### Payment information:

Submitted with Payment	no
------------------------	----

### File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Information Disclosure Statement (IDS) Form (SB08)	IDS7-02-12-2013.pdf	613573 <small>7966dd053a6938a37293493c6b1f146e4d93cb0a</small>	no	6

### Warnings:

Unified Patents

### Information:

Exhibit 1002

A U.S. Patent Number Citation or a U.S. Publication Number Citation is required in the Information Disclosure Statement (IDS) form for autoloading of data into USPTO systems. You may remove the form to add the required data in order to correct the Informational Message if you are citing U.S. References. If you chose not to include U.S. References, the image of the form will be processed and be made available within the Image File Wrapper (IFW) system. However, no data will be extracted from this form. Any additional data such as Foreign Patent Documents or Non Patent Literature will be manually reviewed and keyed into USPTO systems.

2	Non Patent Literature	CasioSoftLaunchesCSIMobileLinkForMerchandising.pdf	1339027 f5df9e5b07b4c6ff38006d962bc795d356b79785	no	8
<b>Warnings:</b>					
<b>Information:</b>					
3	Non Patent Literature	CasioSoftReleasesNewVersionOfMobileLinkMobilEnterpriseSolution.pdf	294124 cd77982fcb6887a382fe839ebcd69467dd0ccb0	no	2
<b>Warnings:</b>					
<b>Information:</b>					
4	Non Patent Literature	MichelleDelio_CasiosFieldForceHardwareAndSoftwareSolution.pdf	1338435 63c770669e50fcfac39c113ecc04a1343485f397	no	4
<b>Warnings:</b>					
<b>Information:</b>					
5	Non Patent Literature	WellingtonPartnersInvestsInLeadingMobileEntertainmentProvider.pdf	285859 e020f0086ef6c45b5c20e32bac778e1251606f0e	no	2
<b>Warnings:</b>					
<b>Information:</b>					
6	Non Patent Literature	MichaelCoglianese_MobileAleph.pdf	5501386 3e74270ba6a334bfa5fb694a587099deea19184a	no	26
<b>Warnings:</b>					
<b>Information:</b>					
7	Non Patent Literature	EdithDeLeeuwAndWilliamNichollsII_TechnologicalInnovations.pdf	5206903 9e16d39ffd1a68c71a1f87c718f5a625192b8753	no	21
<b>Warnings:</b>					
<b>Information:</b>					
8	Non Patent Literature	KatherineLDixAndJonathanAnderson_DistanceNoLongerABARRIER.pdf	2591828 79c2f8aa83876f283a5f0e9babfc89e322ea1433	no	11
<b>Warnings:</b>					
<b>Information:</b>					
9	Non Patent Literature	MattiHamalainenEtAl_QuizCode_AToolForOnlineAssessmentandFeedback.pdf	784829 e456e74bb659833ef18a1c39378cccd8fe55dc4	no	6
<b>Warnings:</b>					
<b>Information:</b>					

10	Non Patent Literature	EricKnorr_SpecialReportPCWorldsEnterpriseTechnology.pdf	1625641 0960c8fc0d038a2d4ec3e36554a6ff20d4214203	no	7
<b>Warnings:</b>					
<b>Information:</b>					
11	Non Patent Literature	SurveyMate-Survey_QuizMatev3-5.pdf	1494120 b4892f85fd35e21bf78be7d822e67e28d3f46a5	no	12
<b>Warnings:</b>					
<b>Information:</b>					
12	Non Patent Literature	PeggySalzPartIIILookWhosWatching.pdf	652186 e9d1afc20e988159377b41685fc3f7631512a756	no	3
<b>Warnings:</b>					
<b>Information:</b>					
13	Non Patent Literature	VasjaVehovarEtAl_WebSurveys_CanTheWeightingSolveTheProblem.pdf	1696790 7e53913e17ec0d88637294f036640e9416258165	no	6
<b>Warnings:</b>					
<b>Information:</b>					
14	Non Patent Literature	PalmComputingPlatform_WebClippingDevelopersGuide.pdf	12782833 43270b633a4681c1bb4d7ced93db6ac78ff3ec2e	no	91
<b>Warnings:</b>					
<b>Information:</b>					
15	Non Patent Literature	MichaelFWeeks_ComputerAssistedSurveyInformationCollection.pdf	5681325 e44a3ddb3b82c269b4d5eb6e3799ec97749801fa	no	21
<b>Warnings:</b>					
<b>Information:</b>					
16	Non Patent Literature	WhatISCSIMobileLink.pdf	1687883 2a7678430c00142c513389a94099a266e9368dd6	no	13
<b>Warnings:</b>					
<b>Information:</b>					
17	Non Patent Literature	WilliamCSchmidtWorld-WideWebSurveyResearchMadeEasy.pdf	725382 b36cd793844ae5b69231b8fe5476d4fda8e2c97c	no	2
<b>Warnings:</b>					
<b>Information:</b>					
18	Non Patent Literature	WilliamCSchmidtWorld-WideWebSurveyResearchBenefitsPotentialProblems.pdf	1873637 4e7edfb3e2bc3f8439eb129bedc76c8b0dff2aad	no	5
<b>Warnings:</b>					
<b>Information:</b>					



19	Non Patent Literature	Techneos-com_FrequentlyAskedQuestionsWebPage.pdf	487545 b95c20fb1e08b2ff2d4a34b32257be98bd3063e4	no	3
<b>Warnings:</b>					
<b>Information:</b>					
20	Non Patent Literature	Techneos-com_ProductIndexWebPage.pdf	120540 bc670045900e6f5aa8b289d8000586d3167bd476	no	1
<b>Warnings:</b>					
<b>Information:</b>					
21	Non Patent Literature	Techneos-com_SupportWebPage.pdf	795565 ae8e956dfd2f0dc0a4e8805fa85c819c803e213	no	5
<b>Warnings:</b>					
<b>Information:</b>					
22	Non Patent Literature	JohnPragerEtAl_AnsweringWhatIsQuestionsByVirtualAnnotation.pdf	1438441 ddb216bfa437052e7366a7d9086e13d43cfeec5c5	no	5
<b>Warnings:</b>					
<b>Information:</b>					
23	Non Patent Literature	MattiHamalainenEtAl_Quizcode_AToolForOnlineAssessment.pdf	785426 3ba94c6f678865da1806fe8c82ac8a7b7b8605e4	no	6
<b>Warnings:</b>					
<b>Information:</b>					
24	Non Patent Literature	SurveyMateSoftwareDocumentation.pdf	198404 de30d4d8d0422caa5222131e2927391c16063fe9	no	12
<b>Warnings:</b>					
<b>Information:</b>					
25	Non Patent Literature	Techneos-comWebPage.pdf	2218573 f277ecc8b6fd920b51db6f3560c90464700958f	no	16
<b>Warnings:</b>					
<b>Information:</b>					
26	Non Patent Literature	Zatz_UnpluggedLivingAndLovingTheDigitalLifestyle.pdf	499955 7b531ac7bd03e8ea35bf5b557641630084c71dfe	no	4
<b>Warnings:</b>					
<b>Information:</b>					
27	Other Reference-Patent or Application Document	ProvisionalPatentApp60262915Filed01-19-2001_KevinJamesKelli.pdf	2786364 820f62813d816e0f2069f243d761b0d4476c6cb6	no	24
<b>Warnings:</b>					
<b>Information:</b>					

28	Other Reference-Patent or Application Document	ProvisionalPatentApp60262916 Filed01-19-2001_KevinJamesKe lly.pdf	2552369  b501cdefe18ced9da0f5fb292db5d3a01af0 e5f6	no	21
----	--	---	---	----	----

**Warnings:**

**Information:**

<b>Total Files Size (in bytes):</b>	58058943
-------------------------------------	----------

**This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.**

**New Applications Under 35 U.S.C. 111**

**If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.**

**National Stage of an International Application under 35 U.S.C. 371**

**If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.**

**New International Application Filed with the USPTO as a Receiving Office**

**If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.**



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

Table with 5 columns: APPLICATION NO., FILING DATE, FIRST NAMED INVENTOR, ATTORNEY DOCKET NO., CONFIRMATION NO.
12/910,706 10/22/2010 J. David Payne 71855/10-351 8703

22206 7590 04/09/2013
FELLERS SNIDER BLANKENSHIP
BAILEY & TIPPENS
THE KENNEDY BUILDING
321 SOUTH BOSTON SUITE 800
TULSA, OK 74103-3318

EXAMINER

TIV, BACKHEAN

ART UNIT PAPER NUMBER

2451

MAIL DATE DELIVERY MODE

04/09/2013

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.



### **DETAILED ACTION**

Claims 1-21, 24-31 are pending. Claims 22, 23 were cancelled. This is a response to the Remarks/Amendments filed on 12/28/12. This action is made **FINAL**.

#### ***Terminal Disclaimer***

The terminal disclaimer filed on 12/28/12 has been reviewed and is accepted. The terminal disclaimer has been recorded.

#### ***Information Disclosure Statement***

The IDS filed on 1/16/13 is acknowledged and considered.

The IDS filed on 2/6/13, 2/11/13, 2/12/13 are acknowledged but were not considered. See *Requirement for Information* below, and a majority of the NPL and Foreign Patents are not legible.

#### ***Requirement for Information***

M.P.E.P section 2004 (Aids to Compliance With Duty of Disclosure) recites the following:

13. It is desirable to avoid the submission of long lists of documents if it can be avoided. Eliminate clearly irrelevant and marginally pertinent cumulative information. If a long list is submitted, highlight those documents which have been specifically brought to applicant's attention and/or are known to be of most significance. See *Penn Yan Boats, Inc. v. Sea Lark Boats, Inc.*, 359 F. Supp. 948, 175 USPQ 260 (S.D. Fla. 1972), *aff 'd*, 479 F.2d 1338, 178 USPQ 577 (5th Cir. 1973), *cert. denied*, 414 U.S. 874 (1974). But cf. *Molins PLC v. Textron Inc.*, 48 F.3d 1172, 33 USPQ2d 1823 (Fed. Cir. 1995).