included in client programs that wish to contact handle servers.

Caches are used by clients to reduce the load on the other handle servers, particularly the global handle server, G. Resolution of handles using caches is, in general, faster than resolution without caches. The caching server is a shared cache to be used by a group of clients. The architecture also allows a cache to be incorporated within an individual client.

The recommended configuration is for any client, C, to have an assigned cache, C1. This can be integrated into the client or can be caching server shared by several clients. C1, itself, may be connected to a higher order caching server, C2. To avoid resolution involving many steps, the recommended configuration is to have no more than two levels of caches, C1 and C2.

A proxy server 1246 has been developed that acts as a client to the handle system for use with World Wide Web browsers and other clients. The client passes a handle to the proxy server which attempts to resolve it. If the handle can be resolved into one or more URLs, a URL is returned to the client.

The proxy server is configured as a separate server to be used by a group of clients. The recommended configuration is that every organization that wishes to use the handle system should provide both a caching and proxy server for its community.

A proxy server has been developed in consultation with the National Center for Supercomputing Applications, the developer of Mosaic, but is intended to work with other clients that support proxies. Mosaic will be configured to use the proxy when a handle is specified in place of a URL. The proxy server will be supported by future releases of Mosaic. It is also compatible with the earlier proxy server developed by CERN.

We now describe how a client, C, resolves any handle, h. Note that (a) each handle server can be implemented as one or more server computers; (b) checks are required to prevent looping through indirect handles; (c) the client may not have access permissions for all local handle servers; (d) the client request may ask for all the data in a handle record or data of specified types only; (e) because the local handle servers are independently managed, the client may encounter inconsistent data or unacceptably poor response from a server.

If the client, C, is not attached to any caching server, it uses the following steps to resolve a handle, h.

1. C sends a query to G.

If the handle record for h is stored in G, G resolves h.

Otherwise, G returns the address of P, the primary handle server of naming authority, n.

2. If h is not yet resolved, C sends h to P.

If h is stored in P and C has the correct access permissions, P resolves h.

Otherwise, if there is an indirect handle to another handle server, M, which stores h, P sends the client the address of M.

3. If h is not yet resolved, the client, C, sends h to M.

If the client has the correct access permissions, M resolves h. (If C does not have permission, it should try other handle servers that hold the handle.)

If the client, C, is connected to a cache, C1, resolution of h follows these steps:

1. The client, C, asks C1 to resolve h.

If the handle record of h is in the cache, the handle record is returned to C.

2. Otherwise, if the identity of P, the primary handle server of naming authority n, is stored in C1, C1 resolves the handle following steps 2 and 3 above in the description of resolution without caching.

3. If the handle has not been resolved, and C1 is connected to a higher cache, C2, C1 asks C2 to resolve both h and P, and pass the results to C1 to be saved in C1's cache.

If h and P are not in C2's cache, the request is passed to the next higher cache, until the handle is resolved until the highest cache is reached. (The recommended configuration is to have no more than two levels of cache.)

4. If there is no higher cache, then the cache sends a request to G asking for the resolution of h and P. The resolution algorithm then continues as in the description of resolution without caching.

The handle server system is intended to be a means of universal basic access to registered digital objects. In the worst case, a user can present a handle to a handle server and be advised of some repository which an authorized party has asserted contains the digital object designated by the handle. The handle server is not meant to be the only, or even primary, means, to locate repositories. Primary access may be provided locally and also by value-added service providers, likely in a variety of different and possibly incompatible ways. Users interacting with such services may not encounter handles; and such services may interact with repositories via RAP or via protocols that do not involve handles.

Handle servers provide a number of services, three of which are RESOLVE, INSERT, and DELETE. A party that is authorized to insert, delete and otherwise change handle entries for a particular naming authority is called a handle administrator. A naming authority will

generally designate one or more repositories to act as handle administrators on its behalf. This designation will be made known by the naming authority to the handle server system.

RESOLVE

A handle is sent to a handle server to locate network addresses of repositories containing that object. The handle is first mapped to locate the handle server from the handle directory server table but is not otherwise interpreted. One can also supply a handle to a separate system, which invokes the above procedures to find the stated object. Local handle servers may use any technique to do the mapping. The handle servers maintained as part of the infrastructure map the handles by hashing them.

To resolve a handle, a handle server receives as input a handle and returns some or all of the fields of typed data in the corresponding handle record. The client can request that all data fields in the handle record be returned or only those fields that contain data of a given type.

No guarantee is made that the identified repositories will provide the designated object. Rather, the user is assured only that the specified repositories are where authorized maintainers of repository services have indicated particular digital objects reside.

Since a handle is just a unique string, it can be mapped to an actual repository by any of several mechanisms, including a mechanism that attempts to interpret the string. Repository names are not actual network addresses; they must first be mapped to network locations. The method for accomplishing these mappings is not specified. The handle service is one available means for both kinds of mappings; it would specify at least the location of the interface that supports the RAP

protocol for a given repository. There may also be a need to explicitly provide a country identifier for repositories, naming authorities and/or originators. For the present, however, country identifiers are be omitted.

When a repository is identified by a handle server, it will be most efficient to map the handle directly into the network address (or addresses) of the repository. This mapping avoids having to do a double lookup from repository name to repository location. However, if the location of the repository were to change, the handle server would have to be notified so it could make the corresponding changes. It is possible that certain repository names may resolve to broadcast addresses to locate specific machines. This might be the case where a single repository consists of multiple machines on a local area network at a given site. The handle administrator may determine whether to store IP addresses or domain names or other information in the handle server. The entries are typed and therefore one or more of the above information types may be provided by the administrator for retention in the handle server.

INSERT (DELETE)

Information associating handles with network services are inserted into (deleted from) the handle server system by the handle administrator or other parties authorized by it. Such authorized parties include repositories of record. The repository of record is presumed to make known to the handle server system that it contains (or no longer contains) a particular digital object some reasonable time after the digital object is deposited in (withdrawn from) it. Similarly, the repository of record would make known to the handle server system the identity of other repositories which it authorizes to store a given digital object. The handle server system may perform certain administrative

functions upon receipt of unauthorized requests. In addition, some form of reporting may be desirable to insure that entities that misbehave can be detected.

The handle server system is intended as a safety net of information about where digital objects reside. There will no doubt be other, valuable services that provide information to users about the location of digital objects in repositories.

We do not require repositories to provide a description of their contents. Repositories may not house coherent collections, and hence, querying or searching a repository may be a service appropriate only to the repository administrator, not to a user. Presumably, such capabilities will exist in the form of value-added services. It is such services, rather than repositories per se, that users would interrogate to identify digital objects of a certain nature. Such services may, of course, be offered by repositories themselves, especially in the case when one is intended to house a coherent collection. However, such a server is not a requirement of a well-behaved repository.

In one example, the handle server directory 59 holds a table 149 which associates hash ranges 150 with domain names of handle servers 58 (Figure 7).

Obtaining Pointers from a Handle

Given a handle, the following steps, shown in Figure 8, are followed to obtain a set of pointers associated with the handle.

In a first step 170, a client system downloads the table that associates hash ranges with handle server domain names from the handle server directory for future use. The client also can omit this step if it has previously stored the table; frequent changes in the table may necessitate doing this every time. In a later step 172, assume the system obtains a handle for which

pointers are desired. The system then generates the hash code for the handle using a predetermined hashing algorithm (step 174) and consults the hash range/handle-server-domain-name table to determine the domain name of the appropriate handle server (step 176). The system subsequently sends the handle to the handle server as part of a request pointer information UDP packet (step 178).

The handle server then returns its response to the requesting system. If the handle server found the pointers, a list of pointers is returned (step 180). This could include pointers to use one or more repositories and one or more RMS's. If the handle was sent to the wrong handle server, it returns a not-responsible-for-handle message (step 182). In this case, the client system should download the hash range/handle-server-domain-name table from the handle server directory again and attempt the mapping again. The requester will determine how many times to try before giving up (and this same approach is used in other similar situations described below).

If the request was sent to the correct handle server, but the requested handle could not be found, the handle server returns a handle-not-found message (step 184).

Overview of Application for Rights Registration

There are two mechanisms used to register rights: an applicant may apply for a rights registration on an object which is located on his own system 42 or on an object which has been stored in a repository 36.

In order to submit and process a rights registration application the following general steps (described in more detail later) must occur.

First, as seen in Figure 9, the rights registration application is created, and the application

and the associated object are submitted to the registration system. The steps required to perform this depend on the location of the digital object. In registering an object which is located on the applicant's own system, the applicant first makes the object available to his own system (if it was created somewhere else) (step 60). The applicant then runs a rights registration program in a step 62, and he fills in a rights registration application template. The application and the associated object are electronically mailed (as a PEM message) to the registration system (step 64), which performs simple syntactic checking on the application (step 66), and verifies that the associated object has not been corrupted (step 68).

If the object has not yet been placed in the repository, the applicant first places the object in the repository (step 70). The applicant then runs the rights registration program, and he fills in the copyright registration application template (step 62). The application and the object's handle are electronically mailed (PEM) to the registration system (step 64), which performs simple syntactic checking on the application (step 66). The registration system then retrieves the object from the repository in a step 72 and verifies that the retrieved associated object has not been corrupted (step 68).

After the registration system has checked the object, it creates an initial Receipt In Progress (RIP) record and sends it to the tracking system (step 74). The tracking system verifies that the account number presented in the record is valid and that sufficient funds exist in the account to process the application (step 76).

The application and the associated object can now be accessed by the rights examiner, by running an

examiner's user interface program on the examiner's workstation (step 78). Once the examiner approves the application, the registration system assigns a registration number, and the system creates the rights registration certificate (step 80). A copy of the certificate is mailed electronically to the rights registrant. An updated RIP record which shows the registration application's final status is subsequently sent to the tracking system (step 82).

Registering an Object not in a Repository

The detailed steps for registering without first depositing a copy in a repository are shown in Figures 10 through 13.

First, the user 42 (the rights applicant) generates a digital signature for the object (step 250) using a private key and makes the object 43 (in one file), digital signature 45 (in a second file), and public key certificate chain 47 (in a third file) available to the UA system 34 (step 252). The UA user supplies rights registration application information 49 by filling out a form on the screen. If the user does not fill in the publication date field, then the object is considered unpublished by the rights registrar. If the field is filled in, then the object is treated like a published work. The UA user digitally signs the rights application information in a step 254.

The UA then sends a PEM/MIME message 202 to the registration system 40. (MIME is a multimedia electronic mail specification to allow for multimedia objects to be handled.) The message contains the object, the user's digital signature 45 over the object, the public key certificate chain 47 for the user, the rights registration application 49 information, a digital signature (not shown) over the rights registration application information, and the UA user's public key

certificate chain (not shown) (step 256). The entire message is signed by the UA user.

The registration system 40 receives the PEM/MIME message. An entry recording the receipt of the message is placed into a log file in a step 258.

The registration system verifies that it accepts rights applications from the distinguished name of the UA user (step 260). If not, it returns a message to the UA user, and the verification failure is recorded in the log file (step 262).

The registration system attempts to validate the digital signature over the entire message in step 264. If validation fails (i.e., the decrypted hash value does not match the computed message hash or one of the certificates in the public key certificate chain has been revoked), a message is returned to the UA user. The validation failure is recorded in the log file (step 262). If the validation succeeds, then an application received message is sent to the UA user (step 266).

The registration system attempts to validate the rights registration information (only simple checks are performed) in step 268. If validation fails, a message is returned to the UA user. The validation failure is recorded in the log file (step 262).

If the object was included in the PEM/MIME message (step 270), the registration system attempts to validate the digital signature over the object (step 272). If validation fails, a message is returned to the UA user. The validation failure is recorded in the log file (step 262).

If the validations of the application information and the object (if it was included in the PEM/MIME message) were successful, then the following are entered in step 274 into the registration system's work in progress database: the application information; the

digital signatures; the public key certificate chains; and the object (if available). The entry into the work in progress database is recorded in the log file.

If the PEM/MIME message did not include the object (step 276), the registration system attempts to retrieve a copy of it in step 278. If the attempt fails, a message is sent to the UA user (step 280). The application information, digital signatures, and public key certificates are removed from the work in progress database. Entries are made in the log file recording the retrieval failure and the removal of the information from the work in progress database in step 282.

If the retrieval attempt succeeds, then the registration system attempts to validate the digital signature over the object in step 284. If validation fails, a message is sent to the UA user (step 280). The application information, digital signatures, and public key certificates are removed from the work in progress database. Entries are made in the log file recording the validation failure and the removals from the work in progress database (step 282).

If the object has been published (the rights user filled in the published date field) (step 286), then the object is placed in the acquisition queue in step 288.

The registration system now prepares an initial Receipt In Progress (RIP) record (step 290). The registration system converts the information located in the title and claimant name fields in the registration request into the title and claimant name fields in the RIP record. The following conversions are performed: title words that are located in a stop word list are deleted and title words that are located in an abbreviated terms list are abbreviated.

A bar-code number (or other identifier) is assigned to the registration request (step 290). A

verify and debit request, which contains the bar-code number (and other RIP record information) is formatted and sent to the tracking system via the File Transfer Protocol (FTP) in step 292.

The tracking system verifies the account (step 294) and debits the requested amount from the account. If the account is not valid, the tracking system will send an invalid account number presented message to the registration system (step 296). If the account is valid, but insufficient funds exist for this transaction (step 298), then the tracking system will send an insufficient funds message to the registration system (step 296). In either error case, the validation failure is recorded in the registration system's log file; and the rights registration application is removed from the works in progress database (step 282). If the object was unpublished, it is deleted from the registration system in step 300. If a published object and registration request is resubmitted, it is possible that a object might be placed in the acquisition queue multiple times. Manual procedures catch the duplicate entries.

If the tracking system 46 (Figure 10) successfully performed the account verification and debit processing, it sends an account is OK message to the registration system in step 302. the tracking system prepares an initial RIP record and places it in it's database. If the object was unpublished, a copy of it is placed into the acquisition queue.

The registration system moves the registration request to the examiner queue database in step 304. The registrar user's workstation 50 (Figure 10) now has access to the registration request. The examiner uses workstation 50 to view the object on the screen, to add his name to the examined by line on the application form and to record the class designation for the rights

registration (step 306). The converted form of the author and title (as stored in the RIP record) are also shown to the examiner.

If the examiner approves the application (step 308), an examination-is-approved message is sent from the workstation to the registration system in a step 310. The registration system assigns a registration number (step 312), and the system creates and digitally signs the rights registration certificate, which includes the registration number and the date on which registration was granted (step 314). The rights registration certificate is sent in a PEM message to the UA user in a step 314. The certificate may be sent directly to the UA or indirectly via the repository. The certificate is archived on the registration system (step 312). The certificate also could be stored on a system that retains the scanned images of the manually created certificates.

If the examination results in the rights registration application being rejected, the examiner uses the workstation to send a rights registration rejection PEM message via the UA to the applicant explaining the rejection (step 318).

If the registration was approved or denied, an updated RIP record is forwarded to the tracking system in a step 320. Once the tracking system has added the record to its database, it sends a RIP-record-update-OK message to the registration system (step 322).

In step 324, the registration system moves the registration request to the cataloging system. The cataloger's workstation 57 (Figure 10) now has access to this registration request.

Using a connection to the cataloging system, the cataloger creates the cataloging information in step 326. When the task is finished, the workstation sends a finished catalog message to the registration system (step

328). The registration system places a registration-application-processing-complete message in the log file (step 330).

Placing an Object into a Repository

Alternatively, the rights holder may choose first to place an object into a repository, as shown in Figures 14 through 17.

In a first step 350, the user 42 makes the object (object) available to the UA 34. The UA then sends a request for a handle to a handle generator system 36 (step 352).

The handle generator system sends a handle to the UA system (udp) in step 354.

The UA sends a PEM message to the rights management system 38 containing the handle, any non-simple terms and conditions for obtaining a copy of the object (which must include free access to the object for the registrar), and the list of distinguished names of those who are allowed to make changes to the information (stored in the RMS) which is associated with the handle (step 356). The PEM message is signed by the UA user.

The RMS verifies that it accepts new submissions from the distinguished name of the UA user in step 358. If not, the RMS sends an invalid-distinguished-name PEM message to the UA user and discards the contents of the received message (step 360).

The RMS validates the digital signature on the received PEM message (step 362). If the validation fails, the RMS sends an invalid-digital-signature PEM to the UA user and discards the contents of the received message (step 360).

The RMS verifies that it does not already have a set of terms and conditions stored for the handle (step 364). If it does, it sends a terms-and-conditions-

already-registered PEM to the UA user and discards the contents of the received message (step 360).

The RMS stores the handle and the associated terms and conditions (step 366) and sends a confirming PEM to the UA user (step 368).

In a step 370, the UA system computes the digital signature over: the object's handle; a date/time group (the nominal date/time of submission of the object to the repository); and the object.

The UA system sends a PEM/MIME message to the repository 36 (Figure 14) containing the object's handle, the submission date/time group, the object (or the information needed to retrieve a copy of the object), the UA user's digital signature over the above, the UA user's public key certificate chain, the simple terms and conditions for the object, if any, and the distinguished name or names of the RMS(s) holding the non-simple terms and conditions for the object, if applicable. The entire message is signed by the UA user (step 372).

The repository verifies that it accepts object submissions from the distinguished name of the UA user in a step 374. If not, it sends an invalid-distinguished-name PEM message to the UA user and discards the received message (step 376).

The repository validates the digital signature over the entire message in step 378. If the validation fails, the repository sends an invalid-digital-signature PEM message to the UA user and discards the received message (step 376).

If the object was not included in the received PEM/MIME message (step 380), the repository attempts to retrieve a copy of the object (e.g., via anonymous FTP) in a step 382. If retrieval fails, the repository sends an object-retrieval-failed PEM message to the UA user and discards the received message (step 376).

The repository validates the UA user's digital signature over the handle, nominal submission date/time group, the object (step 384), and the reasonableness of the submission date/time group (not in the future, not too far in the past) (step 386). If either of these validations fail, the repository sends an invalid-submission PEM to the UA user and discards the received message (step 376).

In step 388, the repository stores the object's handle, the submission date/time group, the object, the UA user's digital signature over the above, the UA user's public key certificate chain, the simple terms and conditions for the object, if any, the distinguished name of RMS, if applicable, and other properties. The repository then computes its own digital signature over the handle, the submission date/time group from the received message and the object (step 390). In step 392, the repository sends a PEM to the UA user containing the handle, the repository's digital signature, and the repository's public key certificate chain.

In step 394, the UA system verifies the repository's digital signature over the handle, date/time group, and object. The UA system then stores the handle, the nominal submission date/time group, the object, the repository's digital signature, and the repository's public key certificate chain (step 396).

The UA system computes the hash of the object's handle using the handle system hashing function (step 398). The UA system then looks up the domain name of the handle server 38 responsible for the handle in its cached copy of the hash value/handle server table (step 400).

In step 402, the UA system sends a PEM to the handle server containing the handle, and one or more pairs of domain name of repository and domain name of the RMS, and a list of distinguished names of persons who are

permitted to change the pairs of domain names associated with the handle. The message is signed by the UA user.

The handle server receives the PEM message and verifies that it is responsible for the handle in step 404. If not, it sends an invalid-handle-server-selected PEM to the UA user and discards the other information (step 406). If the UA system receives an invalid-handle-server-selected rejection message from the handle server, it downloads a new copy of the hash value/handle server table from the handle server directory 59 (Figure 15) (step 408) and repeats steps 398 through 404.

If the handle server is responsible for the handle submitted by the UA system, it validates the digital signature over the PEM message in step 410. If the validation fails, the handle server sends an invalid-digital-signature PEM message to the UA user and discards the other information (step 412).

The handle server verifies that it accepts submissions from the distinguished name of the UA user in step 414. If not, the handle server sends an invalid-distinguished-name PEM message to the UA user and discards the other information (step 412).

The handle server verifies the syntax of the pairs of domain names submitted with the handle in step 416. If it detects any errors, it sends an invalid-handle-submission-record syntax PEM message to the UA user and discards the other information (step 412).

The handle server stores the handle, the pairs of domain names, and the list of distinguished names (step 418) and sends a PEM acceptance message to the UA user (step 420).

Registering an Object Already in a Repository

After the object has been deposited, an application to register may be submitted (Figures 18 through 22).

The user (the rights applicant) 42 first generates a digital signature for the object (step 450) and makes the digital signature (in a file), and public key certificate chain (in a second file) available to the UA system 34 (step 452).

The UA user supplies the rights registration application information by filling out a form on the screen in step 454. This includes the handle 203 for the object already stored in a repository. Any object stored in a repository is considered published by the rights registrar. Therefore, the publication date field must be entered in the application form. The UA user digitally signs the rights application information.

In step 456, the UA system sends a PEM/MIME message to the registration system 40 containing the object's handle, the user's digital signature over the object, the public key certificate chain for the user, the rights registration application information, the digital signature over the rights registration application information, and the UA user's public key certificate chain. The entire message is signed by the UA user.

The registration system receives the PEM message. An entry recording the receipt of the message is placed into a log file in step 458. The registration system then verifies that it accepts rights applications from the distinguished name of the UA user (step 460). If not, it returns an unknown-account PEM to the UA user, and the verification failure is recorded in the log file (step 462).

The registration system attempts to validate the digital signature over the entire message in step 464. If validation fails (i.e., the decrypted hash value does not match the computed message hash or one of the certificates in the public key certificate chain has been

revoked), a received-corrupted-application PEM is returned to the UA user. The validation failure is recorded in the log file in step 462.

If the validation succeeds, then an application-received PEM is sent to the UA user in step 466.

The registration system attempts to validate the rights registration information (only simple checks are performed) in step 468. If validation fails, a rights-application-is-formatted-incorrectly PEM is returned to the UA user. The validation failure is recorded in the log file (step 462).

If the validation of the application information was successful, then the following are entered into the registration system's work in progress database: the application information, the digital signatures, and the public key certificate chains. The entry into the work in progress database is recorded in the log file in step 470.

The registration system hashes the object's handle in step 472. It uses this hash to perform a table lookup in the hash code/handle server table (step 474), which was previously obtained from the handle server directory. The registration system then sends a request-for-pointer-information UDP packet to a handle server 58 (Figure 18) in step 476.

In step 478, the handle server verifies that the handle falls within the set of handles for which hash values it is responsible. If it is not in this set, the handle server sends an invalid-handle-server-selected response UDP packet to the registration system (step 480).

If the registration system receives an invalid-handle-server-selected response UDP packet, it refreshes its hash code/handle server table from the handle server

directory (step 482), and the registration system repeats steps 472 and 474.

If the handle server is responsible for the handle, it verifies that the handle is present in its database in step 484. If not, it sends a handle-not-found response UDP packet to the registration system (step 486).

If the registration system receives a handle-not-found response UDP packet, it returns a requested-object-is-unavailable PEM message to the UA user (step 488), and the handle lookup failure is recorded in the log file. The registration system removes the entry for the registration request from the work in progress database in step 490.

If the handle server has the handle in its database, it returns the pointers associated with the handle in a UDP packet to the registration system in step 492.

For each pointer returned by the handle server, the registration system tries to obtain a copy of the object. If a copy is successfully obtained from one repository 36 (Figure 18), then the rest of the pointers are ignored. If the registration system cannot obtain the object from any of the repositories, the registration system returns an unable-to-obtain-a-copy-of-the-object PEM to the UA user (step 494). The failure to retrieve the object is recorded in the registration system's log file, and the rights registration entry is removed from the work in progress database (step 496).

If a pointer does not indicate that RMS 38 (Figure 18) negotiation is required, the registration system ignores the object pointer. If a pointer does indicate that RMS negotiation is required (step 498), the registration system attempts to obtain the object via the

RMS. First, in step 500, the registration system connects to the RMS.

The RMS returns a random-value tag to the registration system in step 502. In step 504, the registration system sends the following information to the RMS: the object's handle, the registrar's digital signature over the RMS generated random-value tag, the registrar's public key certificate chain, the domain name and the port number which will be used by the registration system to receive the object.

The RMS validates the digital signature over the random-value tag in step 506. If the signature is not correct, the RMS sends an invalid-random-value-tag response to the registration system in step 494. The registration system logs this error and removes the rights registration information from the work in progress database (step 496).

The RMS verifies in step 508 that the registration system meets the terms and conditions for the object. If the registration system does not meet the terms and conditions, a requester-unauthorized-rejection response is returned to the registration system (step 494). The registration system logs this error and removes the rights registration information from the work-in-progress database (step 496).

The RMS connects to the repository in step 510, and the repository returns a random-value tag to the RMS (step 512).

The RMS sends the following information to the repository in step 514: the object's handle; the RMS digital signature over the repository generated random-value tag; the RMS public key certificate chain; and the domain name and the port number which are used by the registration system to receive the object.

The repository verifies the digital signature of the RMS over the random-value tag in step 516. If the signature is not correct, the repository sends an invalid-random-value-tag response to the RMS (step 518). The RMS logs the error and sends a remote-RMS-error-invalid-random-value-tag error to the registration system in step 520. The registration system then logs this error and removes the rights registration information from the work in progress database (step 522).

In step 524, the repository verifies that the RMS is allowed to request object transfers for the object. If the transfer is not allowed, the repository sends an invalid-RMS response to the RMS (step 518), which forwards the response to the registration system (step 520). The registration system logs the error in its log file, and the rights registration information is removed from the work in progress database (step 522).

The repository sends a object-retrieval-is-allowed response to the RMS (step 526), and the repository disconnects from the RMS (step 528).

The RMS forwards the object-retrieval-is-allowed response to the registration system (step 530), and the RMS disconnects from the registration system (step 532).

The repository connects to the address/port specified in the original request, and it transmits to the registration system the object's handle and the object, signed by the repository in step 534. The repository then sends a object-has-been-delivered confirmation to the RMS (step 536).

The registration system validates the user's digital signature over the object in step 538. If validation fails, an invalid-object-digital-signature-presented PEM message is returned to the UA user in step 540. In step 542, the validation failure is recorded in

the log file, and the rights registration is removed from the works in progress database.

Steps 286 et seq. (Figure 11) are then followed. The registration system prepares an initial receipt in progress (RIP) record (step 290). The registration system converts the information located in the title and claimant name fields in the registration request into the title and claimant name fields in the RIP record. The following conversions are performed: title words that are located in a stop word list are deleted and title words that are located in an abbreviated terms list are abbreviated.

The object is placed into the work in progress database. A bar-code number is assigned to the registration request (step 290). A verify-and-debit request, which contains the bar-code number (and other RIP record information) is formatted and sent to the tracking system in step 292.

The tracking system verifies the account and debits the requested amount from the account in step 294. If the account is not valid, the tracking system will send an invalid-account-number presented message to the registration system (step 296). If the account is valid, but insufficient funds exist for this transaction (step 298), then the tracking system will send an insufficient-funds message to the registration system (step 296). In either error case, the validation failure is recorded in the registration system's log file; the rights registration is removed from the works in progress database (step 282).

If the tracking system successfully performed the account verification and debit processing, it sends a account-is-OK message to the registration system in step 302. the tracking system prepares an initial RIP record and places it in its database.

The registration system then moves the registration request to the examiner queue database in step 304. The examiner's workstation now has access to this registration request. The examiner uses the workstation 50 (Figure 18) to view the object on the screen, to add his name to the examined by line on the application form and to record the class designation for the rights registration (step 306). The converted form of the author and title (as stored in the RIP record) are also shown to the examiner.

If the examiner approves the application in step 308, an examination-is-approved message is sent from the workstation to the registration system (step 310). The registration system assigns a registration number (step 312), and the system creates and digitally signs the rights registration certificate, which includes the registration number and the date on which registration was granted (step 314). The rights registration certificate" is sent in a PEM message to the UA user in step 316. The certificate is archived on the registration system.

If the examination results in the rights registration application being rejected, the examiner uses the workstation to send a rights-registration-rejection PEM message to the applicant explaining the rejection (step 318).

If the registration was approved or denied, an updated RIP record is forwarded to the tracking system in step 320. Once the tracking system has added the record to its database, it sends a RIP-record-update-OK message to the registration system (step 322).

The registration system moves the registration request to the catalog queue database in step 324. The cataloger's workstation 57 (Figure 19) now has access to this registration request. Using a telnet window

connected to the cataloging system, the cataloger creates the cataloging information (step 326). When he is finished, the workstation sends a finished catalog message to the registration system in a step 328. In step 330, the registration system places a registration-application-processing-complete message in the log file.

Once the registrar has completed its work, the object itself may be purged from the files of the registrar because the digital signature and the existence of the full object at a repository are sufficient to assure that a valid copy of the object may be obtained at any time. This significantly reduces the storage requirements at the registrar.

Software Organization

The following software packages run on workstation 42:

MH w/PEM and MIME extensions	MH is a full featured user agent for handling Internet mail. Rather then being a single comprehensive program, MH consists of a collection of fairly simple single-purpose programs to send, receive, save, and retrieve messages. MH is extensible, other user agents may be layered on top of the MH executables. The MIME extensions provide multiple part multiple body type message capabilities (e.g., for multimedia mail).
PEM administrative tools	These tools are used to generate private and public keys and user certificates.

The following executables run on the rights user's workstation 42:

submit_registration	This tool is used to create and submit a rights registration application.
install_ipms	This tool will install the MH/PEM and submit_registration tools on the rights user's workstation.

The registration and recordation system (RRS) must perform the following activities: the RRS must provide the user interface (as an X-windows client) for rights office personnel to view, edit, approve, reject or defer rights registration applications; the RRS must provide the user interface (as an X-windows client) for rights office personnel to view digital objects; the RRS must support electronic mail transmission and reception; the RRS must maintain several queues of the rights registration application as it passes through the various states of reception, examining and approval/disapproval; until the repository is completed, the RRS must save all of the digital objects received (as a temporary repository; until another storage is facility is created/found, the RRS must retain all of the registration certificates that have been generated.

The following software packages run on the UA host:

MH w/PEM and MIME extensions	MH is a full featured user agent for handling internet mail. Rather then being a single comprehensive program, MH consists of a collection of fairly simple single-purpose programs to send, receive, save, and retrieve messages. MH is extensible, other user agents may be layered on top of the MH executables.

PEM administrative tools	These tools are used to generate private and public keys and user certificates.

The following executables run on the rights user's workstation:

Program/Daemon	**Performs**
receive_application	When **sendmail** receives a message addressed to "submit_registration", it will pass the message to **receive_application**, which will perform the initial verifications on the message.
retrieve_object	If the object was not included in the original message, this program attempts to retrieve the object. This program is executed periodically by **cron**. This program is also responsible for performing time-out functions (for retrieving the object).
prepare_init_RIP_record	This program, which is started by **receive_application** or **retrieve_object** is used to create and queue the initial RIP record, which will be sent to the tracking system.
xmit_files_to_the tracking system	This program, started by **cron**, is used to send already formatted files to the tracking system.

get_files_from_the tracking system	This program, started by **cron**, is used to retrieve response files from the tracking system.
process_init_RIP_response	If **get_files_from_the tracking system** receives an initial RIP record response, it invokes this program to handle the response from the tracking system.
view_application	This user application is invoked by the Examiner to view, edit, accept or reject the rights application. This program also displays the digital objects to the Examiner. The Cataloger may also use this program to view the application and associated digital object.
application_queue_server	This is the "back-end" process that manages application/object requests received from user programs (i.e. **view_application**.)
send_resp_to_applicant	This program, which is invoked by **view_application**, is used to send the application approval and certificate or the application rejection to the rights applicant.

update_RIP_record	This program, which is invoked by **view_application**, is used to create an updated RIP record, which will be transmitted to the tracking system, using **xmit_files_to_the tracking system.**
process_update_RIP_resp	If **get_files_from_the tracking system** receives an updated RIP record response, it invokes this program to handle the response from the tracking system.
install_rrs	This program is used to install the additional configuration files and software required for the RRS system.

retrieve_object
prepare_init_RIP_record
xmit_files_to_the tracking system
get_files_from_the tracking system
process_init_RIP_response
view_application
application_queue_server
send_resp_to_applicant
update_RIP_record
process_update_RIP_resp
install_rrs

Obtaining a Digital Object from a Repository

This section describes how a user may obtain an account and retrieve digital objects from repositories.

Before a user can retrieve any objects for which payment is required, the user must first establish an account with a payment server system 702 on the network (Figure 25). This system will be used to create new accounts, debit and credit user accounts, and interface with one or more credit service centers 704. Payment servers have the following attributes:

Payment servers must be qualified; it must be possible to verify that a payment server is valid. This may be accomplished by establishing payment server distinguished names; if a signed message is received from a server with a payment server distinguished name, then the payment server is valid.

Payment servers may charge users for establishing accounts.

Users may request server information (including establishing account charges) from a server before attempting to set up a new account.

The following steps (Figure 26) illustrate how a user can establish a new account with a payment server. A user must have a certificate and a valid credit card number in order to establish an account.

The user (or his software agent) formats (706) a setup-new-account message containing the following:

The user's credit card number or other credit information;

Other identifying information, such as a street address, phone number;

Requested credit amount;

A list of valid signatures (either public key certificates and their associated certificate chains or distinguished names) for people allowed to charge to the account.

Optional category of use (e.g. this account is used to retrieve video objects only.)

Optional time limit (e.g. this account will be valid until December 31, 1995.) The payment server will normally keep an account active as long as a minimum line of credit is available.

The setup-new-account message is digitally signed by the person establishing the account, and the signed message is sent (708) to the payment server with the above information.

The payment server verifies the signature on the received message (710). If the signature is invalid, the payment server sends an invalid-signature message to the user's system (712). Optionally, it may identify a maximum allowed credit limit.

If the signature is valid, using standard electronic credit card checking protocols or other methods as appropriate, the payment server electronically verifies the credit card number or other credit information, and requested credit line with a credit card service center or other credit authority (714).

If the credit card number or other credit information is not valid (718), the payment server will send an invalid-credit-card message to the user's system (720).

If the requested credit limit is too high, the payment server will send a requested-credit-limit-is-too-high message to the user's system.

The payment server will verify that the other authorized user's identities are valid (722). If any are invalid, an invalid-authorized-user-specified message is sent (724) to the user's system.

The payment server assigns an account number to the user (726) and stores the account information in a database for later use.

The payment server formats a new-account-response message (728) containing the following:

Account Number
Credit Limit Amount
Time Limit
Categories of Use
List of authorized users (public key certificates plus the certificate chains.)
The requesting system or user's public key certificate chain, which will be used to verify the requestor's identity. Other less efficient methods can also be used, e.g. the payment server could be given sufficient information (the distinguished name) about the user to obtain the certificate chain from another database.

The payment server signs the formatted message and sends it to the user's system. Optionally, the user may be charged a fee for establishing this account and for maintaining it.

The user's system encrypts and stores (730) the received signed message. This account data will be submitted with any activity that may be billed.

Retrieving from a Repository (Simple Terms and Conditions)

Once an account is established, the user may retrieve an object from the repository by the following steps (Figures 25 and 27).

The system requesting the digital object obtains (740) the hash code/handle server table from the handle server directory 59. This is done during the system's initialization.

A user (or more likely, his software agent) obtains a handle 743 for an object (742). The handle may be obtained as part of a result of a bibliographic search or be provided by some other electronic means such as an electronic reference list in another object, or by scanning a barcoded sequence on paper. The system that is retrieving the digital object is referred to as the requesting system 745.

Once the handle is obtained, the system that retrieves the object "hashes" the object's handle and uses this hashed value to perform a table lookup in the hash code/handle server table 744.

The requesting system sends a request-for-pointer-information UDP packet 748 to the handle server. One or more pointers, once returned, identifies the network location of the one or more repositories (if one is associated with the object) and one or more rights management system, if one is associated with the object. This strategy assures a random distribution of handle server requests among many handle servers distributed on a network without a central nodal point in the system (for reliability).

The handle server verifies that the handle falls within the set of handles for whose hash values it is responsible 750.

If it is not in this set, due to some dynamic system change or error condition, the handle server sends an invalid-handle-server-selected response UDP packet to the requestor 752.

If the requesting system receives an invalid-handle-server-selected response UDP packet, it refreshes its hash code/handle server table from the handle server directory, and the requesting system repeats prior steps. This will typically be needed only if the table has changed between the time the table was downloaded and the actual request was made.

If the handle server is responsible for the handle, it verifies that the handle is present in its database 756. If not, it sends a handle-not-found response UDP packet to the requesting system 758.

If the requesting system receives a handle-not-found response UDP packet, it informs (760) the user that it is unable to retrieve the object.

An object may be stored in several repositories. Multiple pointers to these repositories may be returned to the requesting system. For each pointer returned by the handle server, the requesting system uses the pointer to attempt to obtain a copy of the digital object 762. If a copy is successfully obtained from one repository, the rest of the pointers will generally be ignored. If the requesting system cannot obtain the object from any of the repositories, it informs the user that it is unable to retrieve the object 764.

For retrieval purposes, the requesting system establishes a connection to the repository 766,

which takes the form of a small set of transactions.

The repository may examine the calling network address or the requesting system in order to determine if the repository is being inundated with requests from one system. If the repository determines that it is being bombarded, the repository may disconnect from the requesting system and refuse to accept additional requests for a period of time 768.

Normally, however, the repository returns a random-value tag to the requesting system 770. A flag indicating if payment is required to obtain "Terms and Conditions" is included.

The requesting system needs the object's "Terms and Conditions" before the object can be retrieved. The requesting system signs and sends the following request-terms-and-conditions message 772 to the repository:

the object's handle;

the requesting system or user's digital signature over the repository generated random-value tag;

the requesting system or user's public key certificate chain, which will be used to verify the requestor's identity. Other less efficient methods can also be used, e.g. the repository could be given sufficient information (the distinguished name) about the user to obtain the certificate chain from another database. This is needed in the event the repository needs to bill for providing the Terms and Conditions;

a unique tag, assigned by the requesting system;

account information, previously signed by the payment server.

The repository verifies the digital signature of the requestor over the repository generated random-value tag 774. If the signature is not correct, the repository sends an invalid-random-value-tag response to the requesting system. The requesting system should log this error.

The repository verifies the payment server's signature over the account information 778. If the signature is not correct, the repository sends an invalid-account-information response to the requesting system. The requesting system should log this error.

The repository retrieves the Terms and Conditions associated with the specified handle 790. If no object is associated with the handle, the repository sends an object-not-found message to the requesting system. The requesting system should log this error.

Otherwise, the repository signs the "Terms and Condition" message and sends 792 it to the requesting system, including:

The objectized list of terms/conditions/rights, along with the charge associated with each object and a status flag showing if the term/condition/right is mandatory;

The user-assigned unique key, which was received in the request-terms-and-conditions message;

Either the original random-value tag or possible a new random-value tag, generated by the repository. This is to avoid play back

protection in the event the object identified by the handle is retrieved later.

The requesting system verifies the repository's signature over the received "Terms and Conditions" message 794. If the signature is invalid, the error is logged.

The user selects the terms and conditions desired 796, including the number of terms (e.g., A user may buy the right to make 5 copies of the object or to perform it ten times). The requesting system uses this information to create the retrieve-object message, including:

the object's handle 798;

the repository generated random value tag;

a list of the accepted "Terms and Conditions", including the quantity of each, where applicable;

the user's account information, which was originally signed by the payment server;

the requesting system or user's public key certificate chain, which will be used to verify the requestor's identity. Other less efficient methods can also be used, e.g. the repository could be given sufficient information (the distinguished name) about the user to obtain the certificate chain from another database.

the domain name and the port number which are used by the requesting system to receive the object.

limitations, if any, on the object by the requesting system (e.g. maximum object size it can receive)

The entire message is signed by the requestor. This is similar to signing a credit card slip.

The repository verifies the digital signature of the requestor over the random-value tag 800. If the signature is not correct, the repository sends an invalid-random-value-tag response to the requesting system 802. The requesting system should log this error.

The repository establishes a connection to the payment server, 804.

The payment server returns a random-value tag to the repository 806.

The repository formats a debit-account message 808, including:

The retrieve-object message, as received by the repository and signed by the requestor;

The random value tag received from the payment server;

The repository's public key certificate chain, which will be used to verify the repository's identity. Other less efficient methods can also be used, e.g. the payment server could be given sufficient information (the distinguished name) about the user to obtain the certificate chain from another database.

The repository signs the retrieve-object and random-value portion of the message. The repository sends the debit-account message to the payment server system.

The payment server system validates the repository's signature over the debit-account message 810. If the signature is invalid, the payment server logs the error and sends a invalid-vendor-signature message to the repository.

The payment server system then validates the requestor's signature over the contained retrieve-

object message 812. If the signature is invalid, an invalid-requestor-signature message is sent to the repository.

The payment server validates the account information sent to it and verifies that the account is valid. If the requestor is not a valid user of the account, a invalid-user-for-account message is sent to the repository, and the payment server logs the event.

Otherwise, the payment server, using already existing electronic credit verification methods, verifies that the amount may be charged to the account 816.

If the credit check is not successful, the appropriate error message (e.g. "Credit Line is insufficient", "Credit Card has Expired") is logged and sent to the repository.

Otherwise an account-has-been-debited message is signed by the payment server and sent to the repository 818.

The repository connects to the address/port specified in the request, and it transmits 820 to the requesting system:

the object's handle;
the total amount debited from the account;
the object, signed by the repository;
portions of the relevant terms and conditions, if appropriate.

Retrieving Under Non-Simple Terms and Conditions

The following steps are followed for retrieving an object under non-simple terms and conditions.

If the user does not know the current terms and conditions associated with the object, steps 740 through 794 (Figures 27 and 28) are first performed. If the user determines that the terms and conditions returned by the

repository are not appropriate by themselves, then additional negotiations with the RMS associated with the digital object are required.

If a user already knows that negotiations are required with an RMS, but the RMS associated with the digital object is not yet known, then the user's system must perform steps 740 through 764 (Figure 27).

Otherwise, referring to Figure 29, the requesting system establishes a connection to the RMS 830.

The RMS returns a random-value tag to the requesting system 832.

The requesting system sends the following information to the RMS:

the object's handle;

the requestor's digital signature over the RMS generated random-value tag;

the requestor's public key certificate chain;

the domain name and the port number which will be used by the requesting system to receive the object;

a random value tag, assigned by the requesting system;

the accounting data previously signed by the payment server.

The RMS validates the digital signature over the signed random-value tag 836. If the signature is not correct, the RMS sends an invalid-random-value-tag response to the requesting system. The requesting system logs this error.

The repository verifies the payment server's signature over the account information 838. If the signature is not correct, the repository sends an invalid-account-information response to the requesting system. The requesting system should log this error.

The RMS enters into a mixed initiative dialog 840 with the user to determine what terms and conditions are mutually acceptable, if any. This may also entail human interaction.

The RMS connects to the repository 842, and the repository returns a random-value tag to the RMS 844.

The RMS sends 846 the following information to the repository:

the object's handle;

the RMS's digital signature over the repository generated random-value tag;

the RMS public key certificate chain;

the domain name and the port number which are used by the requesting system to receive the object;

the account information, previously signed by the payment server.

The repository verifies the digital signature of the RMS over the random-value tag 848. If the signature is not correct, the repository sends an invalid-random-value-tag response to the RMS. The RMS logs the error and sends a remote-RMS-error-invalid-random-value-tag error to the requesting system. The requesting system logs this error.

The repository verifies that the RMS is allowed to request object transfers for the object. If the transfer is not allowed, the repository sends an "invalid RMS" response to the RMS, which forwards the response to the requesting system. The requesting system logs the error in its log file.

The repository establishes a connection to the payment server 850.

The payment server returns a random-value tag to the repository 852.

The repository formats a debit-account message 854, including:

The retrieve-object message, as received by the repository and signed by the requestor;

The random value tag received from the payment server;

The repository's public key certificate chain, which will be used to verify the repository's identity. Other less efficient methods can also be used, e.g. the payment server could be given sufficient information (the distinguished name) about the user to obtain the certificate chain from another database.

The repository signs the retrieve-object and random-value portion of the message.

The repository sends the debit-Account message to the payment server system.

The payment server system validates the repository's signature over the debit-account message. If the signature is invalid, the payment server logs the error and sends a invalid-vendor-signature-message to the repository.

The payment server system then validates the requestor's signature over the contained retrieve-object message. If the signature is invalid, an invalid-requestor-signature message is sent to the repository.

The payment server validates the account information sent to it and verifies that the account is valid. If the requestor is not a valid user of the account, a invalid-user-for-account message is sent to the repository, and the payment server logs the event.

Otherwise, the payment server, using already existing electronic credit verification, verifies that the amount may be charged to the credit card associated with the account 860.

If the credit check is not successful, the appropriate error message (e.g. "Credit Line is insufficient", "Credit Card has Expired") is logged and sent to the repository.

Otherwise an account-has-been-debited message is signed by the payment server and sent to the repository 862.

The repository sends 864 a object-retrieval-is-allowed response to the RMS, and the repository disconnects from the RMS.

The RMS forwards 866 the object-retrieval-is-allowed response to the requesting system, and the RMS disconnects from the system.

The repository connects to the address/port specified in the request, and it transmits to the requesting system 868:

the object's handle;

the total amount debited from the account;

the object, signed by the repository.

The repository sends a object-has-been-delivered confirmation to the RMS 870.

All of the transactions tracked and recorded in the above system could be used to feed an automated accounting system for a variety of purposes.

Retrieving Registration Information

The public access system will be based on a commercial DBMS. Queries to this system will be performed using standard database techniques via a direct connection or over a network.

Other embodiments are within the scope of the following claims.

What is claimed is:

1. A method of managing digital objects in a network, each of the digital objects comprising a set of sequences of digits and having an associated identifier which is unique across the network, the method comprising

storing the digital objects at locations accessible in the network using a storage technique which renders the digital objects secure against unauthorized access,

storing pointer information which associates each digital object identifier with a pointer indicating the location of the stored digital object in the network, and

for each of the digital objects, storing, separately from the digital object, validation information sufficient to permit a determination whether a purported instance of a digital object is identical to the original instance.

2. The method of claim 1 further comprising

permitting an authorized user to have access to the validation information, using the digital object identifier, to determine whether a purported instance of a digital object is identical to the original instance.

3. The method of claim 1 wherein the validation information comprises a digital signature over the digital object.

4. A method of managing reference information about digital objects in a network, each of the digital objects comprising a set of sequences of digits and having an associated identifier which is unique across the network, the method comprising

storing the digital objects,

storing reference information for each of the digital objects, and

storing validation information for each of the digital objects which is substantially smaller in size than the corresponding digital object and which enables a determination of whether a purported instance of a digital object is identical to the original instance.

5. The method of claim 4 further comprising

permitting authorized users to have access to the reference information using the unique identifier.

6. The method of claim 4 wherein the reference information comprises information concerning at least one of the following: registration of rights in digital objects; accesses to and uses of digital objects; the terms and conditions for access and use of digital objects; the ownership and licensing of rights to digital objects; links between different digital objects.

7. A method of storing digital objects in a network, each of the digital objects comprising a set of sequences of digits, the method comprising

generating an identifier for each of the digital objects which is unique across the network,

storing the digital objects in the network,

storing pointer information that associates each identifier of a digital object with the location of the digital object in the network,

generating verification information for each of the digital objects, the verification information being sufficient to determine whether a purported instance of the digital object is identical to the original instance, and

storing the verification information separately from the digital object.

8. The method of claim 7 wherein the pointer versus identifier information is stored in multiple servers on the network, and the identifiers are generated in a manner to distribute the pointer versus unique identifier information relatively evenly among the servers.

9. The method of claim 8 wherein the distribution of pointer versus unique identifiers to the multiple servers is based on a hashing algorithm.

10. A method for enabling users of a network to access digital objects stored in the network, each of the digital objects comprising a set of sequences of digits and having an associated identifier which is unique across the network, the method comprising

providing multiple pointer servers each of which accepts identifiers of a subset of the digital objects and returns corresponding pointers to the locations of the digital objects in the network, and

providing a directory server which accepts identifiers of any of the digital objects and returns the locations of the pointer servers which accept those identifiers.

11. A method of applying for registration of rights in digital objects comprising

storing the digital objects in a network,

generating validation information for each of the digital objects sufficient to determine whether a purported instance of a digital object is identical to the original,

generating a unique identifier for each of the digital objects,

associating with each of the unique identifiers a pointer to the location of the digital object in the network, and

submitting to a registering authority, an application for registration of rights including the validation information and the unique identifier.

12. A method of enabling holders of rights in digital objects to control terms and conditions under which they are accessed by users in a network, comprising

storing the digital objects in the network in a manner that permits only authorized access,

storing, in the network, information about terms and conditions for access to each digital object,

making the information about terms and conditions available to a user in connection with a request for access to a digital object,

enabling the user to indicate assent to the terms and conditions, and

permitting access to the user only upon the user indicating assent to the terms and conditions.

13. A method of enabling holders of rights in digital objects to control terms under which rights in the digital objects may be granted to others, comprising

storing, in the network, terms and conditions for licensing rights,

providing information on terms and conditions pertaining to works or other information or material that the digital object may be based on or incorporate,

making the terms and conditions available to potential rights holders and users, as appropriate, upon request via the network,

enabling the potential rights holder and the current rights holder to interact via the network to reach agreement on terms and conditions for grant of rights,

storing, in a recordation server on the network, information identifying grants of rights for digital objects on the network.

14. A method to permit a user to comply with terms and conditions of access to digital objects stored in a network, each of the digital objects comprising a set of sequences of digits and having an associated identifier which is unique across the network, the method comprising

storing in the network information which associates with each of the unique identifiers, a pointer to a rights management system including a terms and conditions server containing terms and conditions,

providing to the user in response to presentation of a unique identifier the pointer to the terms and conditions server,

providing to the user in response to presentation of the pointer, terms and conditions information,

enabling the user to indicate assent to the terms and conditions,

in response to the assent, permitting the user to access the digital object including performance of the object.

15. A method for maintaining a record of information concerning digital objects stored on a network, each of the digital objects comprising a set of digits and having an associated identifier which is unique across the network, the method comprising

storing the digital objects on the network in a manner that restricts unauthorized access to and transactions associated with the digital objects,

providing a reference service on the network, separate from the storage of the digital objects, for recording information about accesses to and transactions associated with the digital objects,

recording in the reference service information about accesses to and transactions associated with the digital objects, and

permitting access to the records of the reference service to authorized users.

16. A method for managing registration of claims to rights in digital objects and any works or other information or material that the object may be based on or incorporate, comprising

storing, in a repository which is accessible on a wide area network, copies of the digital objects, in a manner that enables only authorized accesses to the digital objects and permits verification that the stored digital objects have not been subjected to unauthorized alteration,

at an information and reference server which is accessible on the network at a different network address from the repository, providing registration services including receipt via the network of registration requests and delivery via the network of registration certifications, and

accessing, from the repository via the network, the objects for use in providing the registration services.

17. The method of claim 16 further comprising

enabling owners of rights in digital objects to deposit copies of the digital objects in the repository, via the network.

18. The method of claim 17 further comprising

providing a service, accessible on the network, for generating a unique handle for each digital object.

19. The method of claim 18 wherein

the handle for a digital object is unique both across the network and over time.

20. The method of claim 18 further comprising providing a service, accessible on the network, for generating the handle and locating the pointer associated with the handle for a digital object.

21. The method of claim 18 wherein the handle is used to obtain a pointer to the network location of an accessible copy of the digital object.

22. The method of claim 18 wherein the handle comprises a pointer to the network location of information concerning obtaining authorization to use the digital object.

23. The method of claim 18 wherein the service is provided at multiple different locations on the network.

24. The method of claim 20 wherein the service is provided at multiple different locations on the network.

25. The method of claim 18 wherein the handles comprise character strings associated with the servers which generated them.

26. The method of claim 21 further comprising providing a service, accessible on the network, for providing the pointer in response to a handle.

27. The method of claim 26 wherein there are multiple servers providing the service, each serving a portion of the handle space.

28. The method of claim 18 wherein there are multiple handle generation servers that may generate handles independently.

29. The method of claim 16 further comprising storing information concerning terms and conditions for access to and use of the digital objects.

30. The method of claim 29 wherein information concerning simple terms and conditions is stored in the repository.

31. The method of claim 16 wherein additional information concerning non-simple terms is held in a rights management system.

32. The method of claim 18 wherein each of the handles may be used to obtain one or more pointers to a location or locations on the network where a copy of the digital object to which the handle is assigned is accessible.

33. The method of claim 32 wherein each of the handles may be used to obtain one or more pointers to one or more rights management system in which information concerning non-simple terms is held and where rights negotiation may be carried out.

34. The method of claim 18 wherein hash values are computed on the handles and the hash values are distributed among multiple handle servers, each handle server having a table which associates handles with pointers.

35. The method of claim 16 further comprising responding to requests, received via the network, for copies of the stored digital objects.

36. The method of claim 35 further comprising determining whether the requests for copies are authorized.

37. The method of claim 16 further comprising providing multiple repositories.

38. A method for providing a repository for use in network based regulation of claims in rights in digital objects comprising

storing copies of the digital objects in a repository accessible on the network, the copies being stored in a secure manner that precludes other than authorized access and that permits subsequent verification that there have been no unauthorized changes to the objects,

providing handles for the digital objects, each handle being unique across the network and over time, each handle including information sufficient to locate a copy of the digital object on the network, and

in connection with actions pertaining to regulation of claims in rights in the digital objects, using the handles to obtain authorized access to the digital objects.

39. The method of claim 38 wherein the actions include registration of claims in the rights.

40. The method of claim 39 wherein the actions include obtaining copies of the digital objects in exchange for compensation.

41. A network-based method for managing compensation for licensing of rights and other operations in digital objects, comprising

storing, in a recordation system available to authorized access on the network, information identifying the ownership of rights in digital objects,

receiving, at a rights management system available on the network, requests for rights in digital objects were the terms and conditions have not been stipulated in the properties record, and

in response to the requests for rights, issuing, from the rights management system to the recordation system via the network, requests to record information or transfers of rights in and other information pertaining to the digital objects and in works or other information or material on which the object may be based or incorporate.

42. The method of claim 41 wherein the rights comprise exclusive rights.

43. The method of claim 41 further comprising recording the transfer of rights in the recordation system in a manner which is secure against alteration.

44. The method of claim 41 wherein the request for transfer of rights is associated with a commitment to compensate the owner of the rights.

45. A method for compensating owners of rights in digital objects stored in a network for access to the digital objects by users via the network, comprising

storing on the network information associated with the digital objects and identifying the terms and conditions on which a user may have access to the digital objects via the network,

in connection with a request by a user for access to a digital object, fetching and providing to the user the terms and conditions, and

construing an action taken by the user in connection with requesting access to the digital object as agreement with the terms, and charging the user accordingly.

46. A method for managing handles for digital objects in a computer network comprising

including in the handle an indication of a local naming authority having control over generation of a subset of all global generated handles, and

including in the handle a string which is locally unique with respect to digital objects for which generation of handles are controlled by the local naming authority.

47. A method for managing generation of handles for digital objects in a computer network comprising

maintaining local naming authorities that control generation of handles for digital objects, the handles being a subset of all of the handles generated globally, and

maintaining a global naming authority that controls the naming of the local naming authorities.

48. A method for managing handles for digital objects in a computer network comprising

managing some of the handles to be globally publicly accessible, and

managing some of the handles to be only locally and privately accessible.

49. A method of managing access to digital objects in repositories comprising

managing deposit of a digital object by accepting and storing the digital object and arranging for the generation and storage of an associated handle for the object, and

managing access to the digital object by a accepting and receiving a service request which includes a handle.

50. A system of managing digital objects in a network comprising

a system of repositories which accept, store, and make disseminations of digital objects and portions of digital objects in response to requests received from any arbitrary location in the network,

a system of handle servers which provide services in connection with handles for digital objects stored in the repositories,

a system of naming authorities which controls generation of handles on a global and local basis to assure locally unique and globally unique handles for digital objects.

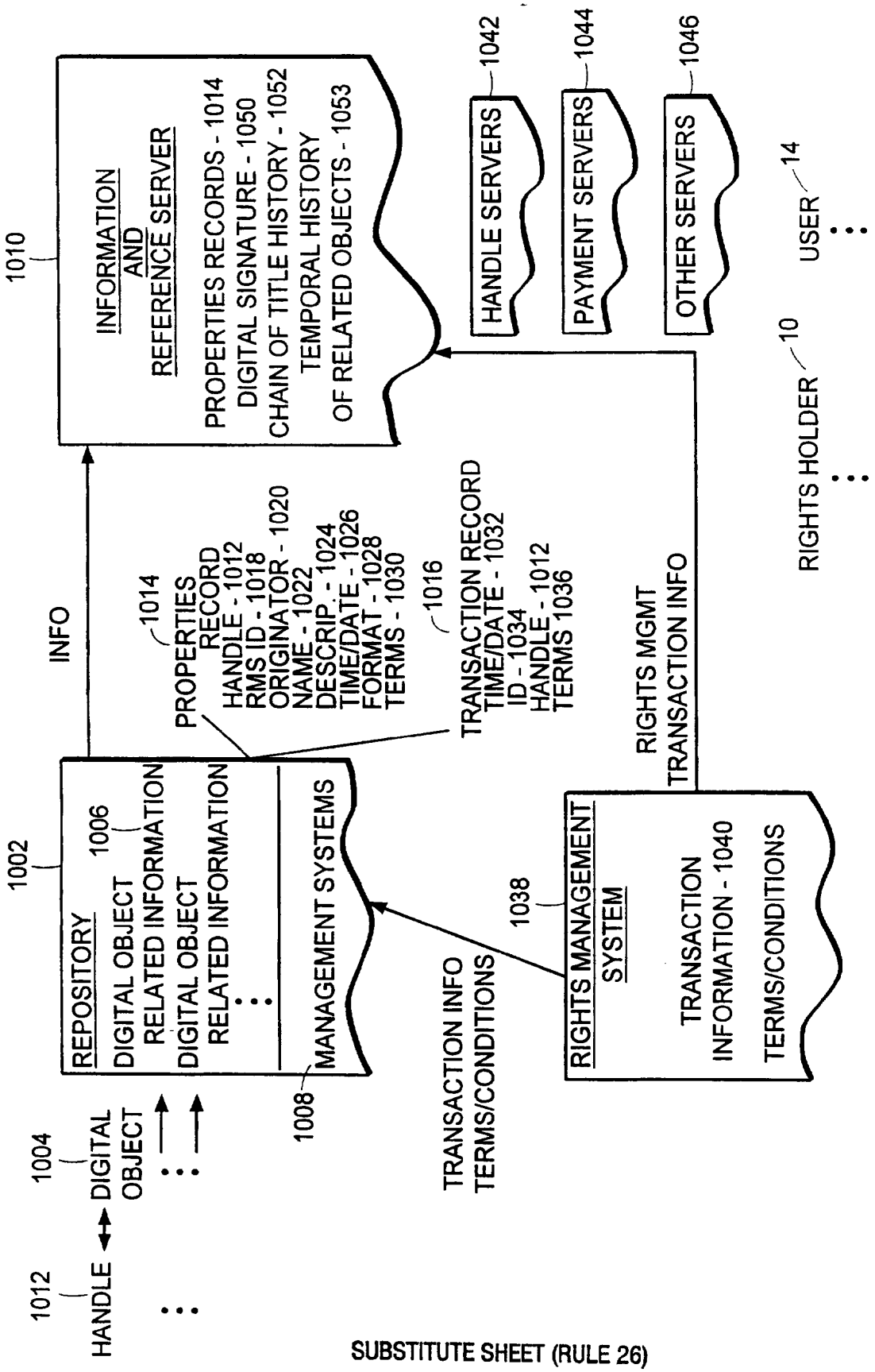
1012
HANDLE
1004
DIGITAL OBJECT
1002
REPOSITORY
1006
DIGITAL OBJECT
RELATED INFORMATION
DIGITAL OBJECT
RELATED INFORMATION
MANAGEMENT SYSTEMS
1008
INFO
1010
INFORMATION AND REFERENCE SERVER
PROPERTIES RECORDS - 1014
DIGITAL SIGNATURE - 1050
CHAIN OF TITLE HISTORY - 1052
TEMPORAL HISTORY
OF RELATED OBJECTS - 1053
1014
PROPERTIES RECORD
HANDLE - 1012
RMS ID - 1018
ORIGINATOR - 1020
NAME - 1022
DESCRIP. - 1024
TIME/DATE - 1026
FORMAT - 1028
TERMS - 1030
1016
TRANSACTION RECORD
TIME/DATE - 1032
ID - 1034
HANDLE - 1012
TERMS 1036
RIGHTS MGMT TRANSACTION INFO
TRANSACTION INFO
TERMS/CONDITIONS
1038
RIGHTS MANAGEMENT SYSTEM
TRANSACTION INFORMATION - 1040
TERMS/CONDITIONS
HANDLE SERVERS
1042
PAYMENT SERVERS
1044
OTHER SERVERS
1046
RIGHTS HOLDER
10
USER
14

FIG. 1

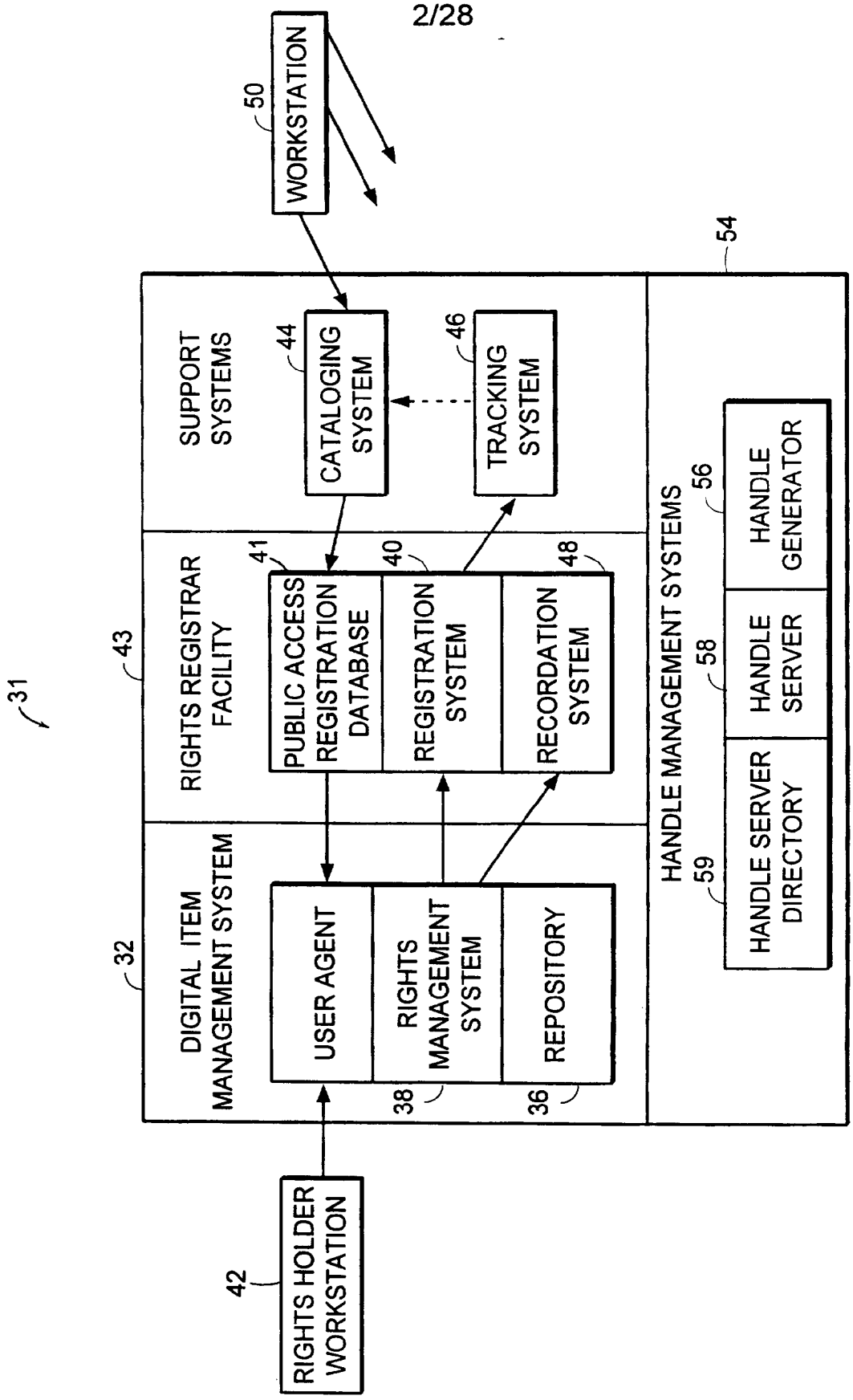
WORKSTATION
50
54
SUPPORT SYSTEMS
CATALOGING SYSTEM
44
TRACKING SYSTEM
46
HANDLE MANAGEMENT SYSTEMS
56
HANDLE GENERATOR
58
HANDLE SERVER
59
HANDLE SERVER DIRECTORY
31
43
RIGHTS REGISTRAR FACILITY
41
PUBLIC ACCESS REGISTRATION DATABASE
40
REGISTRATION SYSTEM
48
RECORDATION SYSTEM
32
DIGITAL ITEM MANAGEMENT SYSTEM
USER AGENT
RIGHTS MANAGEMENT SYSTEM
38
REPOSITORY
36
42
RIGHTS HOLDER WORKSTATION

FIG. 2

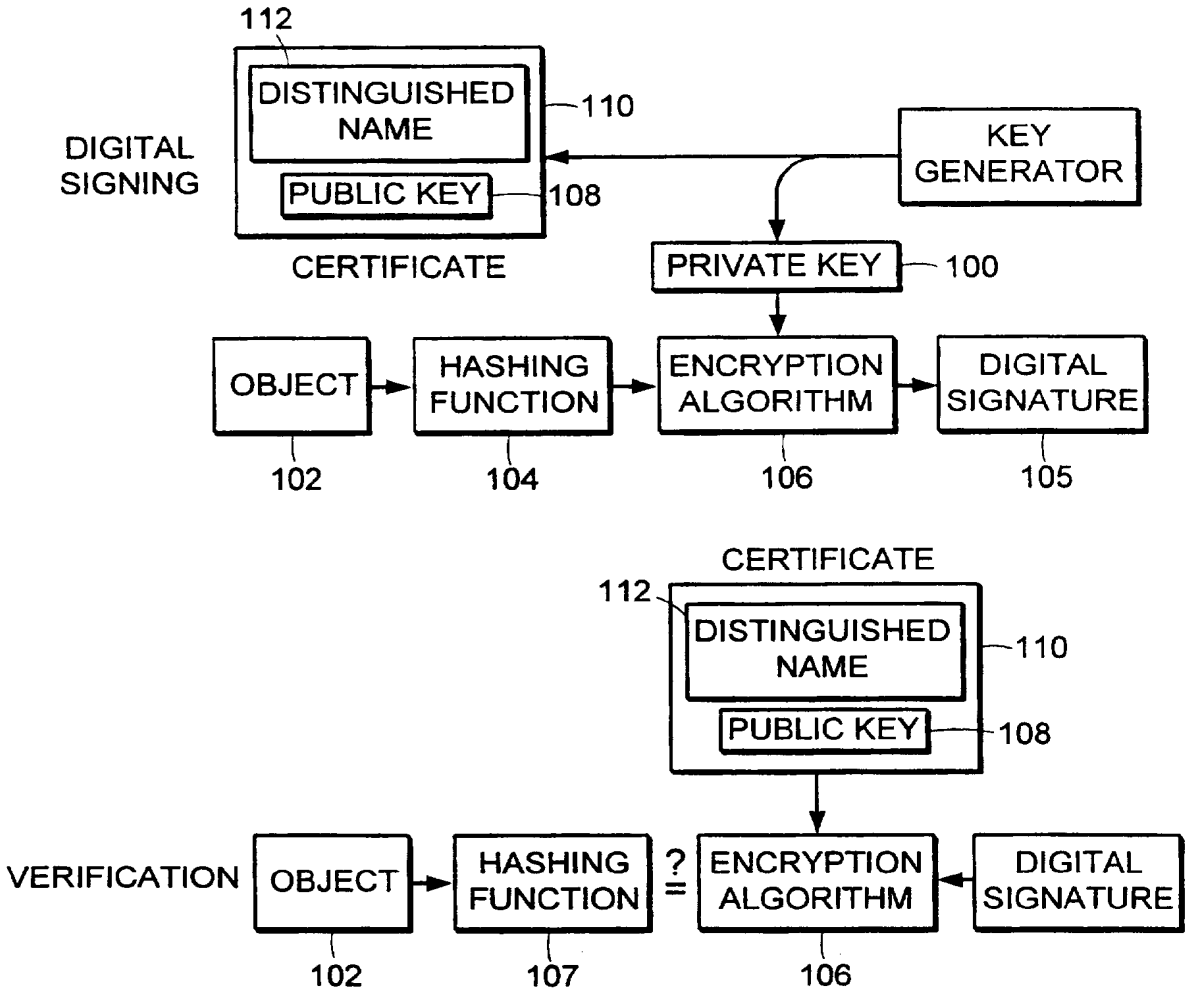

FIG. 3

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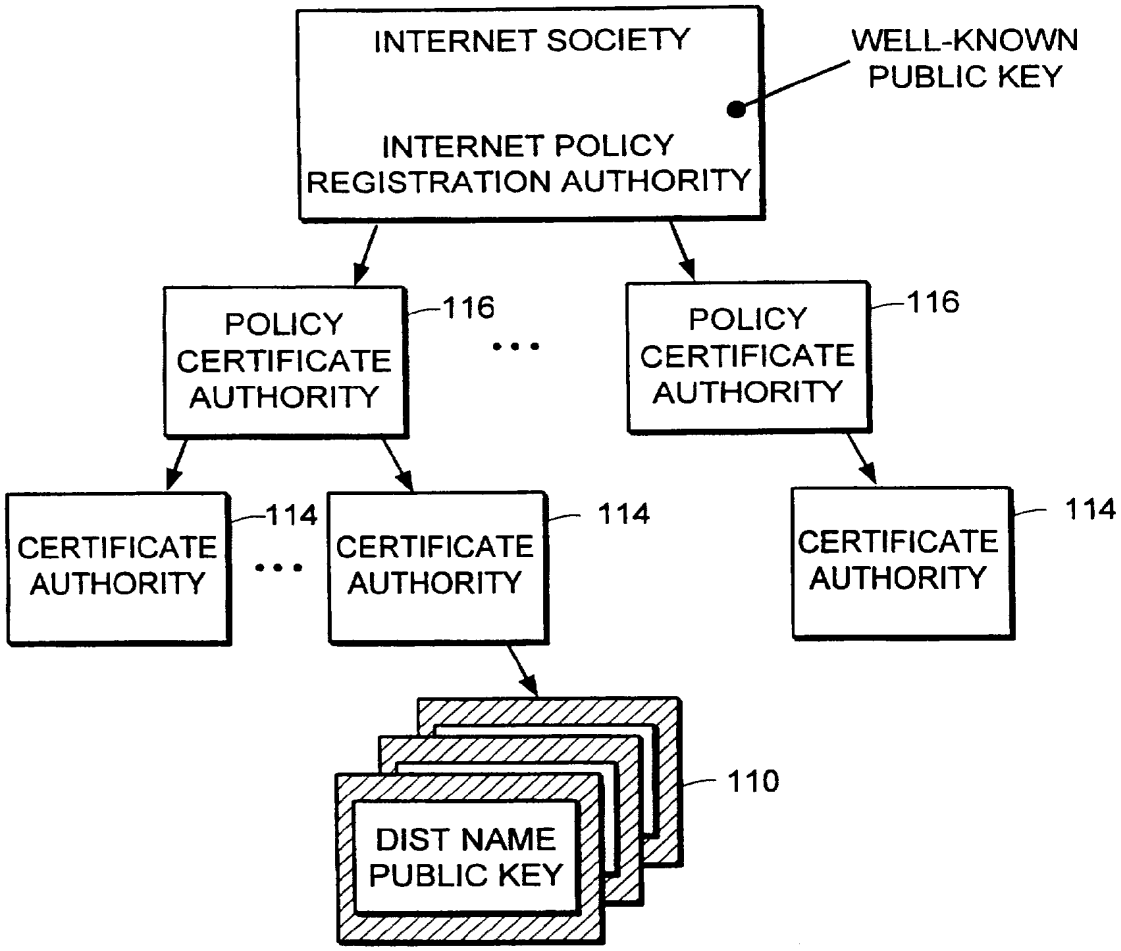
INTERNET SOCIETY
INTERNET POLICY REGISTRATION AUTHORITY
WELL-KNOWN PUBLIC KEY
POLICY CERTIFICATE AUTHORITY
116
POLICY CERTIFICATE AUTHORITY
116
CERTIFICATE AUTHORITY
114
CERTIFICATE AUTHORITY
114
CERTIFICATE AUTHORITY
114
DIST NAME PUBLIC KEY
110

FIG. 4

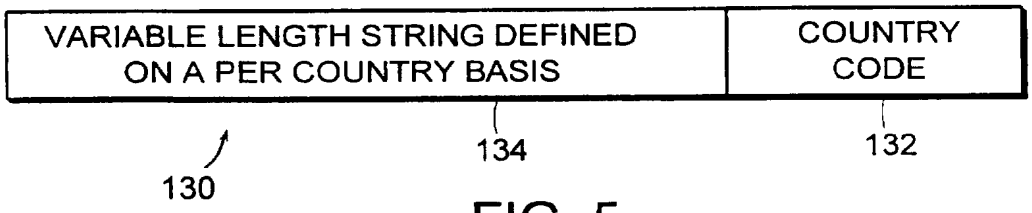

FIG. 5

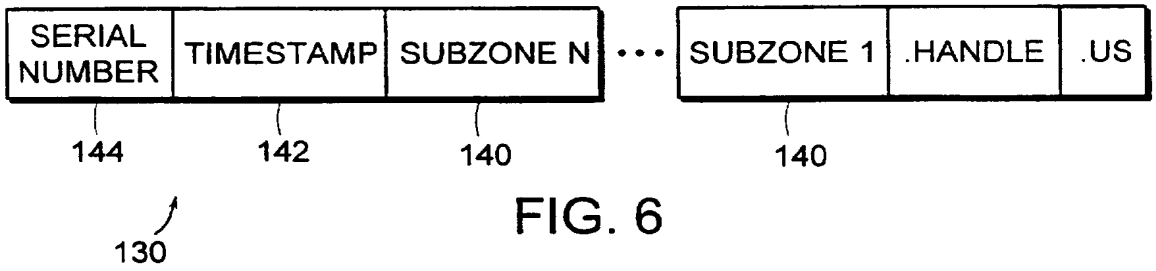

FIG. 6

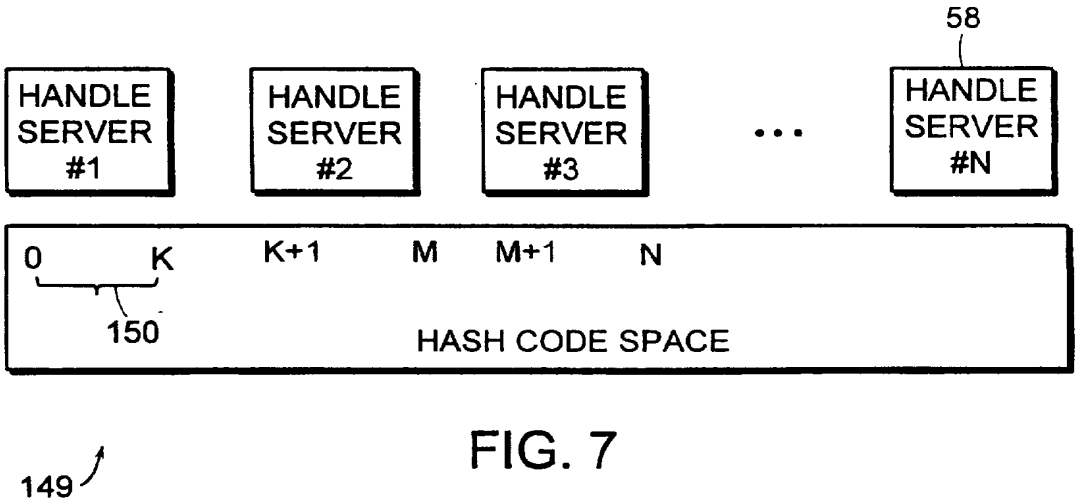

FIG. 7

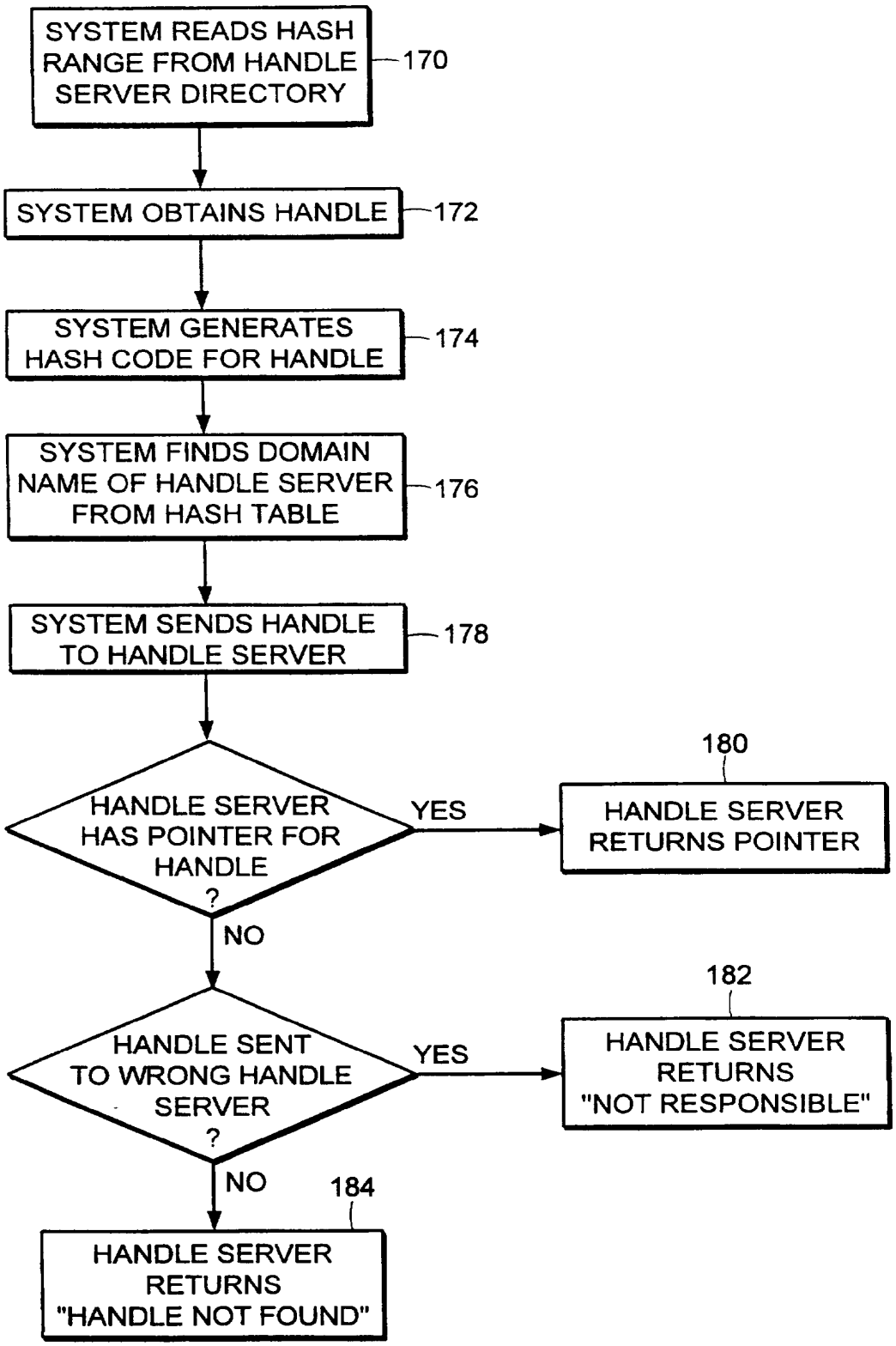
SYSTEM READS HASH RANGE FROM HANDLE SERVER DIRECTORY
170
SYSTEM OBTAINS HANDLE
172
SYSTEM GENERATES HASH CODE FOR HANDLE
174
SYSTEM FINDS DOMAIN NAME OF HANDLE SERVER FROM HASH TABLE
176
SYSTEM SENDS HANDLE TO HANDLE SERVER
178
HANDLE SERVER HAS POINTER FOR HANDLE ?
YES
180
HANDLE SERVER RETURNS POINTER
NO
HANDLE SENT TO WRONG HANDLE SERVER ?
YES
182
HANDLE SERVER RETURNS "NOT RESPONSIBLE"
NO
184
HANDLE SERVER RETURNS "HANDLE NOT FOUND"

FIG. 8

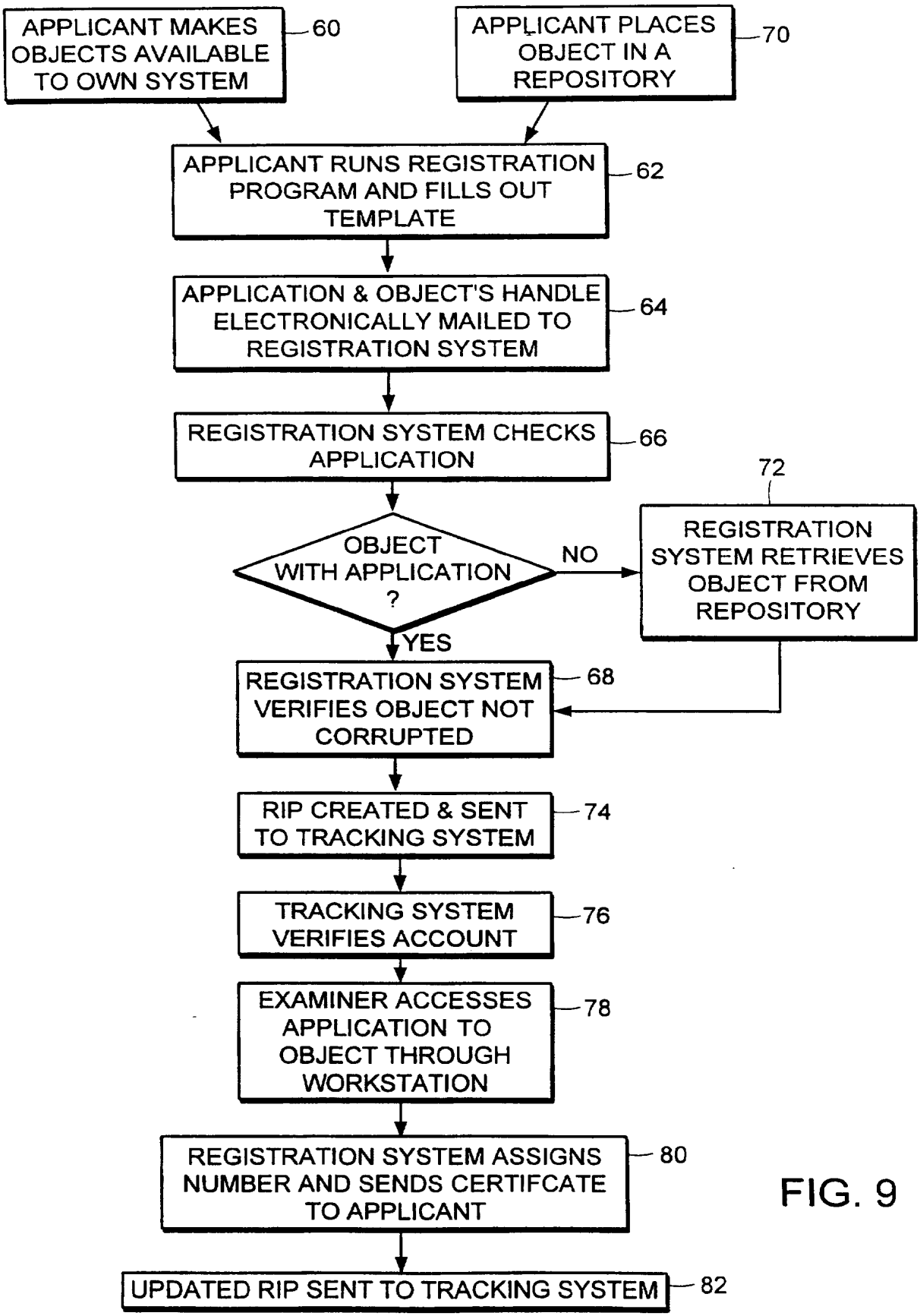

FIG. 9

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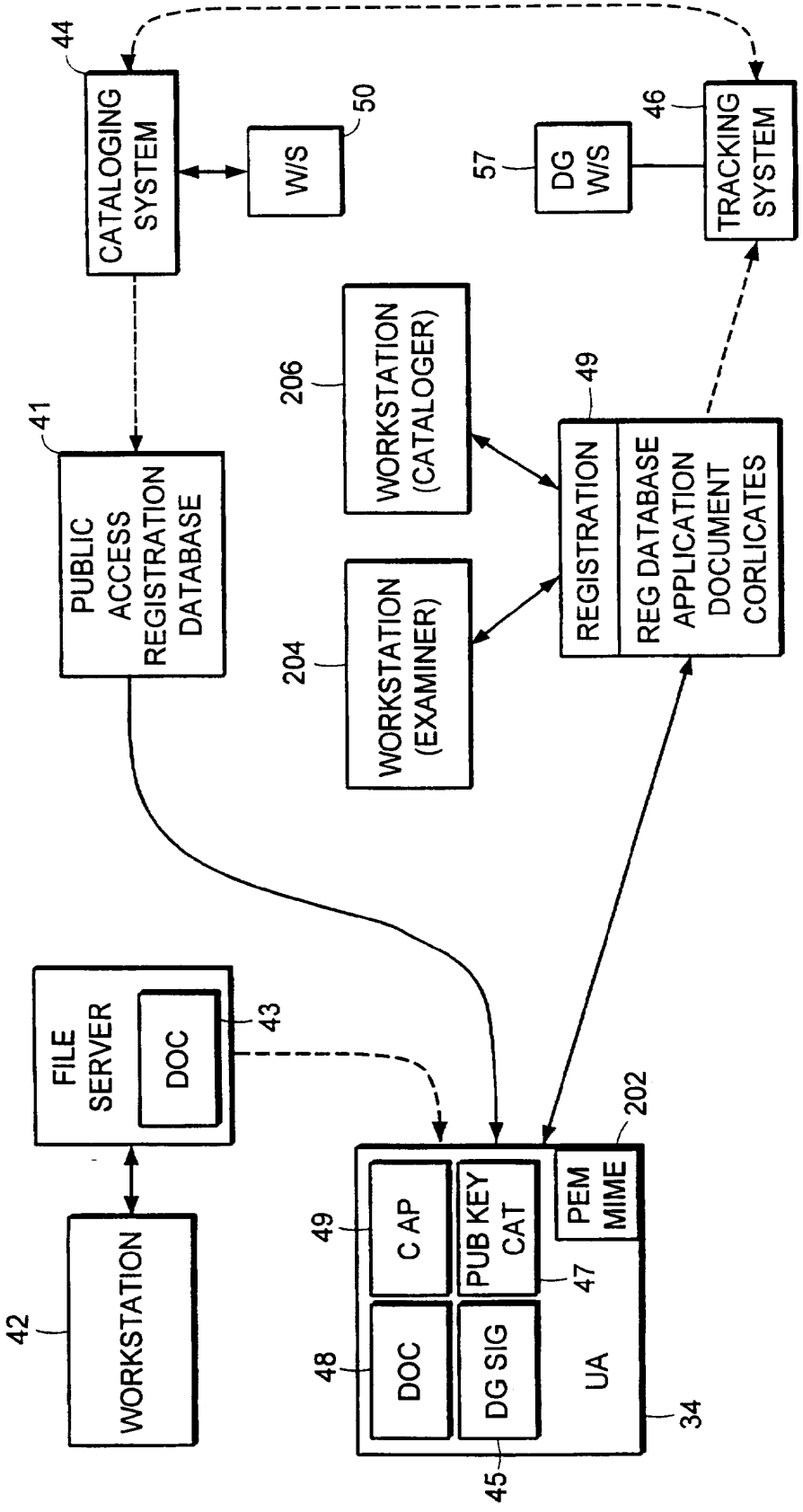
44
CATALOGING SYSTEM
W/S
50
57
DG W/S
46
TRACKING SYSTEM
206
WORKSTATION (CATALOGER)
49
41
PUBLIC ACCESS REGISTRATION DATABASE
REGISTRATION
REG DATABASE APPLICATION DOCUMENT CORLICATES
204
WORKSTATION (EXAMINER)
FILE SERVER
DOC
43
202
PEM MIME
49
C AP
PUB KEY CAT
47
48
DOC
DG SIG
UA
34
45
42
WORKSTATION

FIG. 10

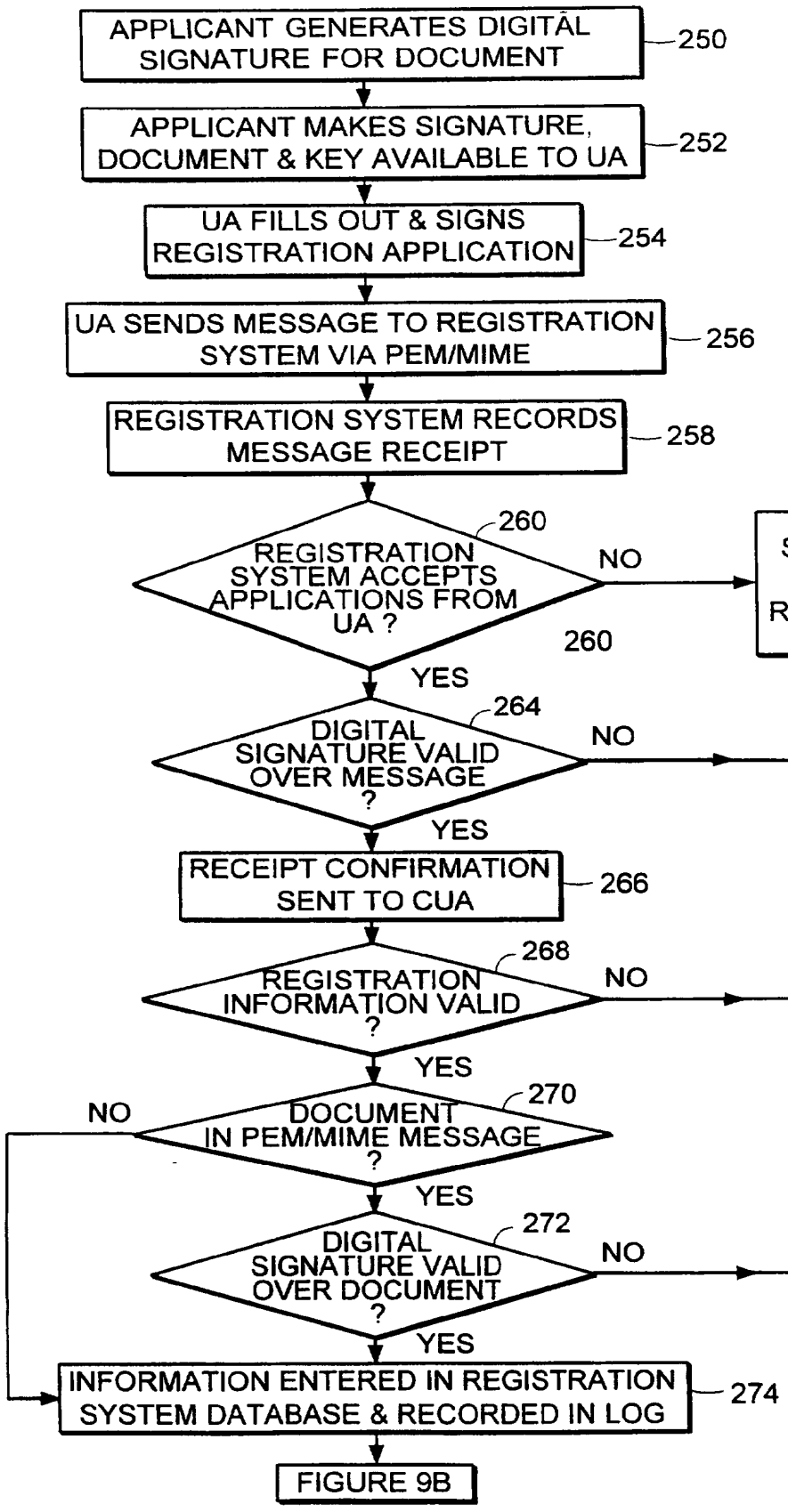
APPLICANT GENERATES DIGITAL SIGNATURE FOR DOCUMENT
250
APPLICANT MAKES SIGNATURE, DOCUMENT & KEY AVAILABLE TO UA
252
UA FILLS OUT & SIGNS REGISTRATION APPLICATION
254
UA SENDS MESSAGE TO REGISTRATION SYSTEM VIA PEM/MIME
256
REGISTRATION SYSTEM RECORDS MESSAGE RECEIPT
258
262
260
REGISTRATION SYSTEM ACCEPTS APPLICATIONS FROM UA ?
NO
SEND MESSAGE TO UA & RECORD FAILURE
260
YES
264
DIGITAL SIGNATURE VALID OVER MESSAGE ?
NO
YES
RECEIPT CONFIRMATION SENT TO CUA
266
268
REGISTRATION INFORMATION VALID ?
NO
YES
NO
270
DOCUMENT IN PEM/MIME MESSAGE ?
YES
272
DIGITAL SIGNATURE VALID OVER DOCUMENT ?
NO
YES
INFORMATION ENTERED IN REGISTRATION SYSTEM DATABASE & RECORDED IN LOG
274
FIGURE 9B

FIG. 11A

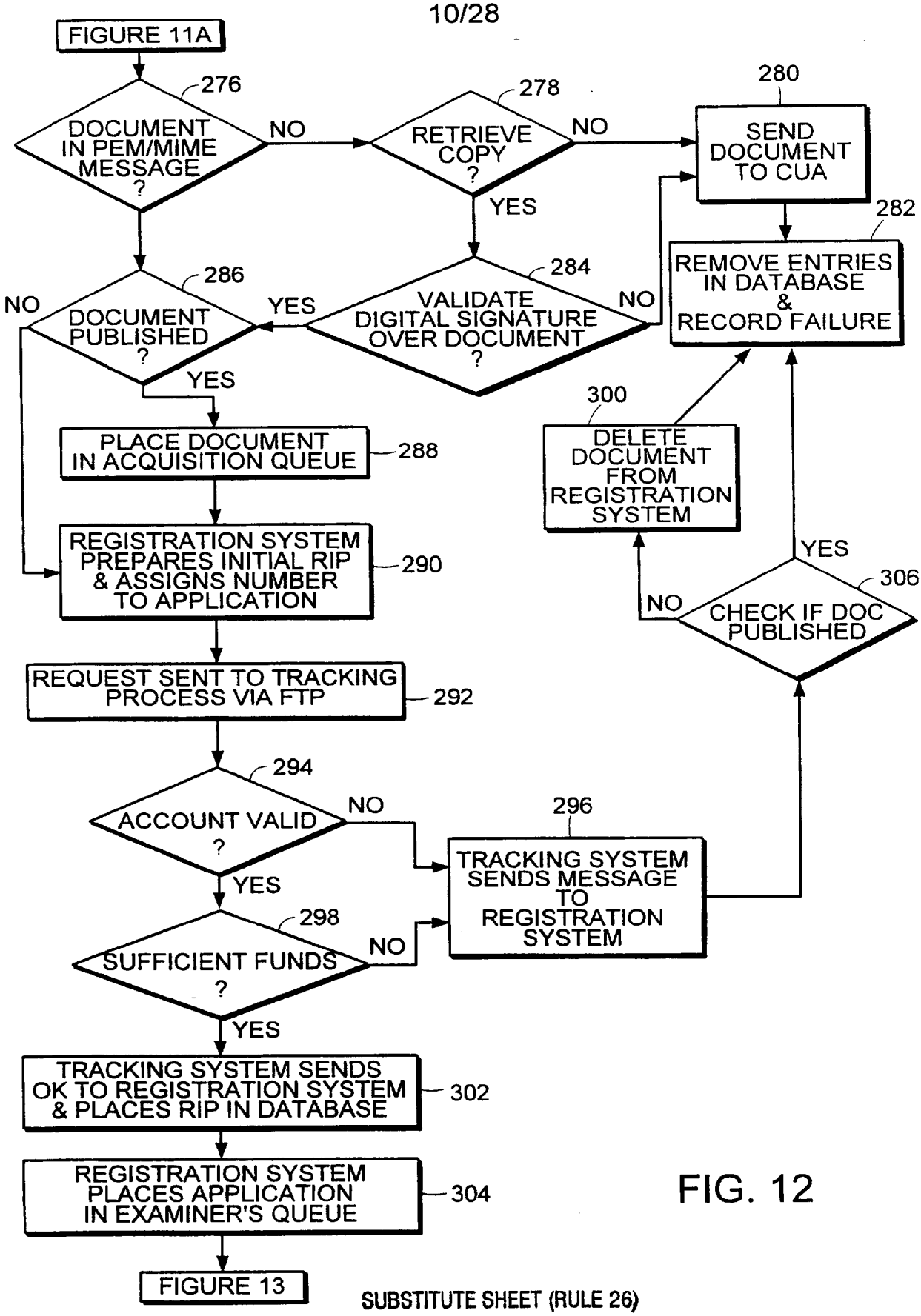
FIGURE 11A
276
DOCUMENT IN PEM/MIME MESSAGE ?
NO
278
RETRIEVE COPY ?
NO
280
SEND DOCUMENT TO CUA
YES
282
REMOVE ENTRIES IN DATABASE & RECORD FAILURE
284
VALIDATE DIGITAL SIGNATURE OVER DOCUMENT ?
NO
YES
286
DOCUMENT PUBLISHED ?
NO
YES
PLACE DOCUMENT IN ACQUISITION QUEUE
288
REGISTRATION SYSTEM PREPARES INITIAL RIP & ASSIGNS NUMBER TO APPLICATION
290
300
DELETE DOCUMENT FROM REGISTRATION SYSTEM
YES
306
NO
CHECK IF DOC PUBLISHED
REQUEST SENT TO TRACKING PROCESS VIA FTP
292
294
ACCOUNT VALID ?
NO
296
TRACKING SYSTEM SENDS MESSAGE TO REGISTRATION SYSTEM
YES
298
SUFFICIENT FUNDS ?
NO
YES
TRACKING SYSTEM SENDS OK TO REGISTRATION SYSTEM & PLACES RIP IN DATABASE
302
REGISTRATION SYSTEM PLACES APPLICATION IN EXAMINER'S QUEUE
304
FIGURE 13

FIG. 12

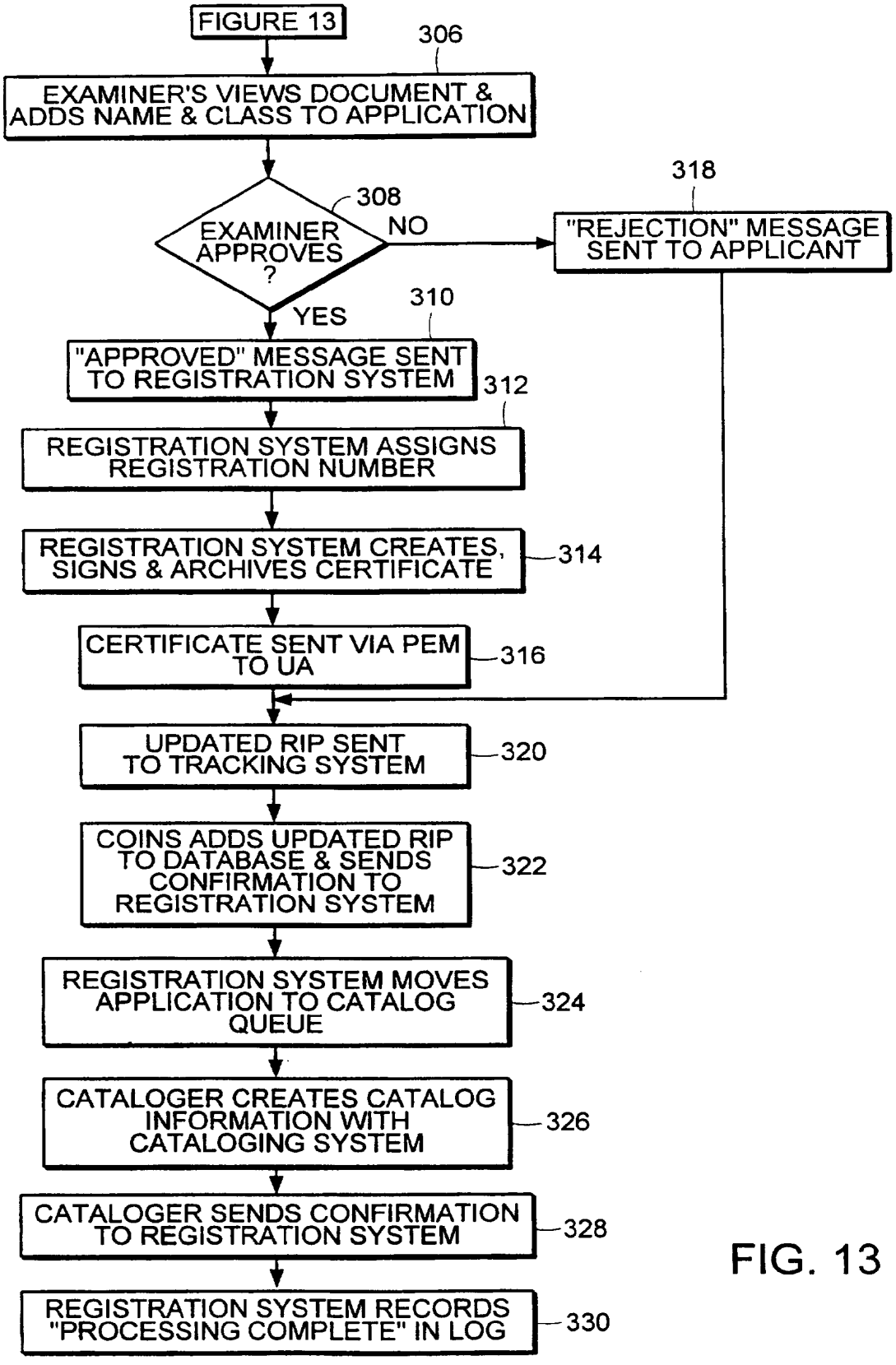
FIGURE 13
306
EXAMINER'S VIEWS DOCUMENT & ADDS NAME & CLASS TO APPLICATION
308
EXAMINER APPROVES ?
NO
318
"REJECTION" MESSAGE SENT TO APPLICANT
YES
310
"APPROVED" MESSAGE SENT TO REGISTRATION SYSTEM
312
REGISTRATION SYSTEM ASSIGNS REGISTRATION NUMBER
REGISTRATION SYSTEM CREATES, SIGNS & ARCHIVES CERTIFICATE
314
CERTIFICATE SENT VIA PEM TO UA
316
UPDATED RIP SENT TO TRACKING SYSTEM
320
COINS ADDS UPDATED RIP TO DATABASE & SENDS CONFIRMATION TO REGISTRATION SYSTEM
322
REGISTRATION SYSTEM MOVES APPLICATION TO CATALOG QUEUE
324
CATALOGER CREATES CATALOG INFORMATION WITH CATALOGING SYSTEM
326
CATALOGER SENDS CONFIRMATION TO REGISTRATION SYSTEM
328
REGISTRATION SYSTEM RECORDS "PROCESSING COMPLETE" IN LOG
330

FIG. 13

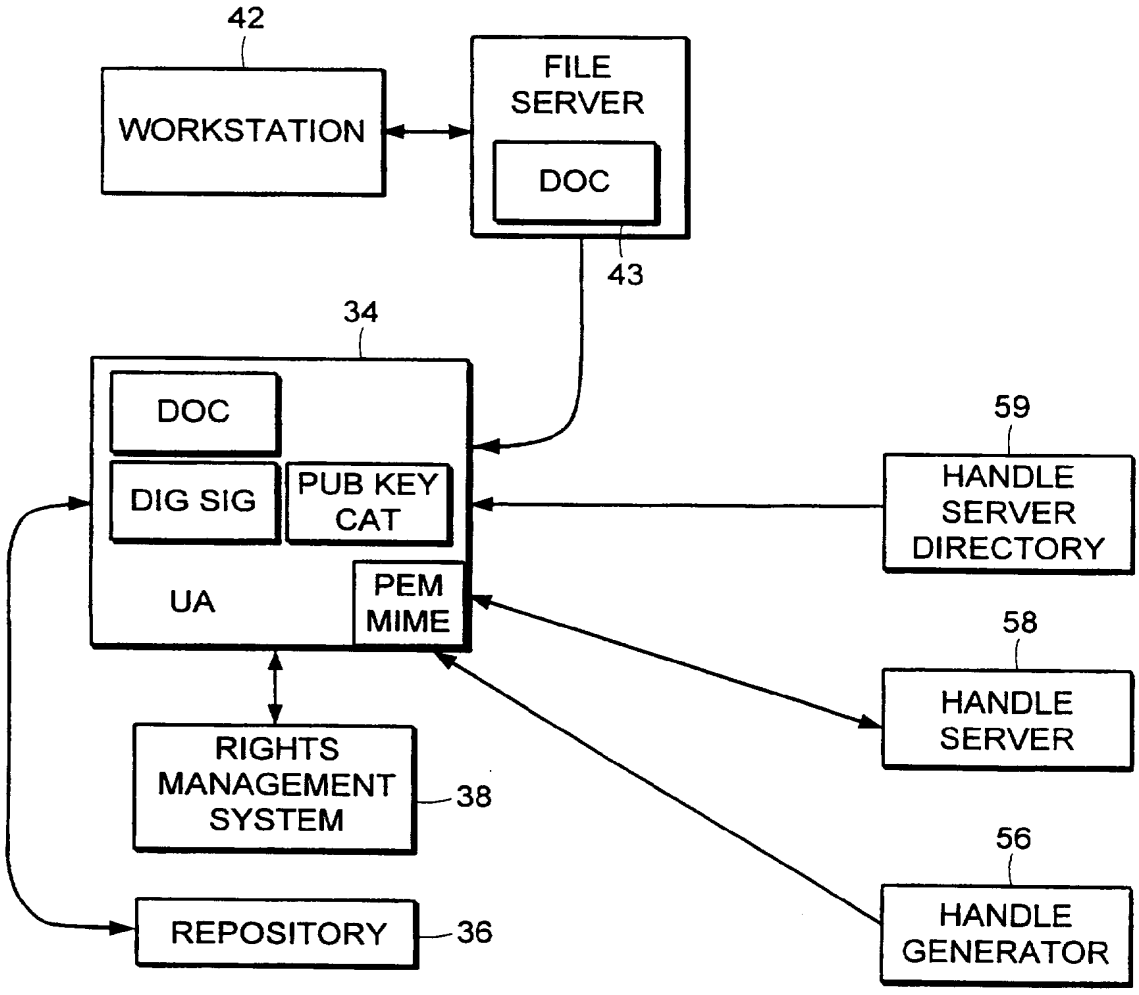
42
WORKSTATION
FILE SERVER
DOC
43
34
DOC
DIG SIG
PUB KEY CAT
UA
PEM MIME
59
HANDLE SERVER DIRECTORY
58
HANDLE SERVER
RIGHTS MANAGEMENT SYSTEM
38
56
HANDLE GENERATOR
REPOSITORY
36

FIG. 14

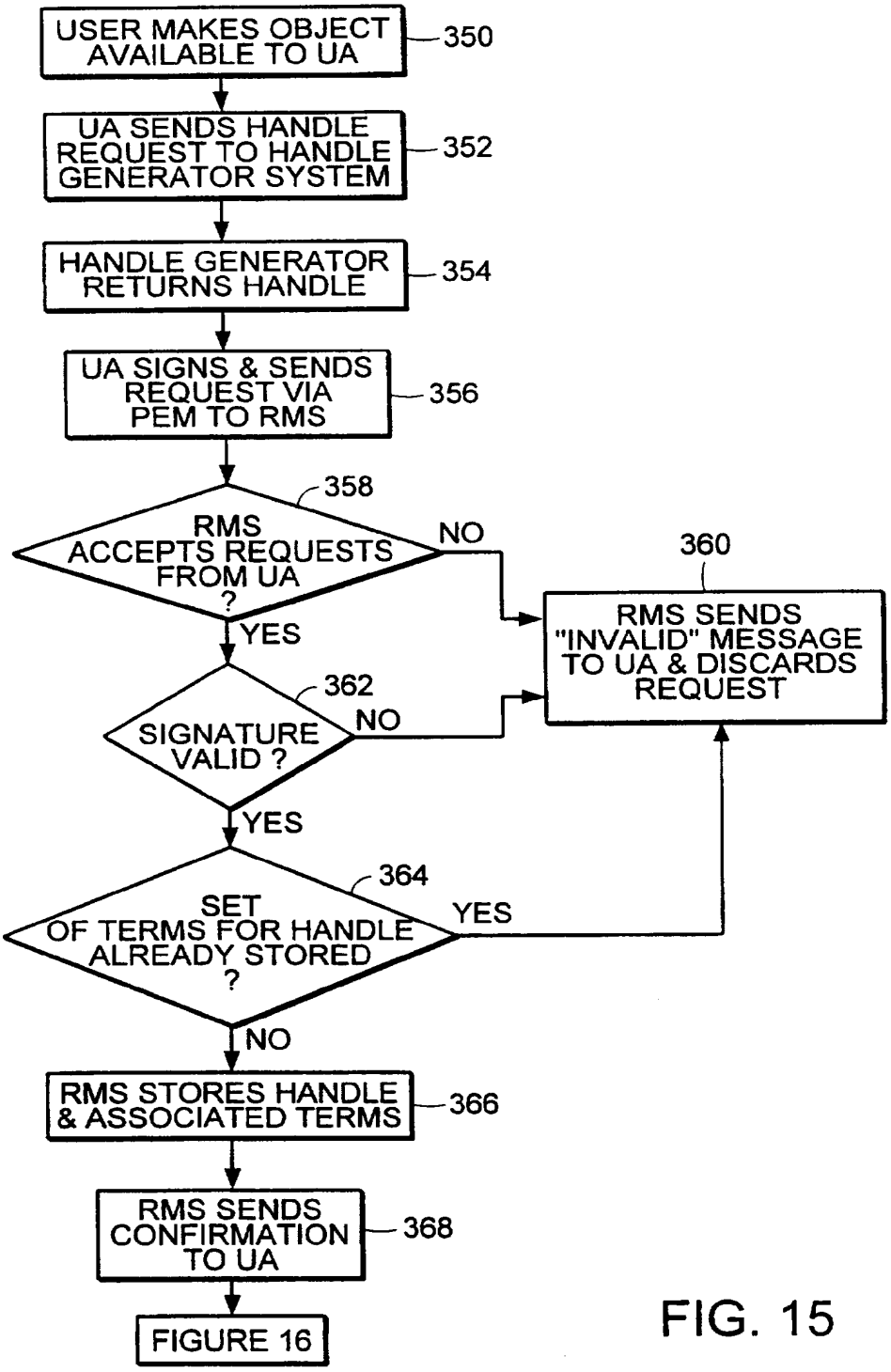
USER MAKES OBJECT AVAILABLE TO UA
350
UA SENDS HANDLE REQUEST TO HANDLE GENERATOR SYSTEM
352
HANDLE GENERATOR RETURNS HANDLE
354
UA SIGNS & SENDS REQUEST VIA PEM TO RMS
356
358
RMS ACCEPTS REQUESTS FROM UA ?
NO
YES
360
RMS SENDS "INVALID" MESSAGE TO UA & DISCARDS REQUEST
362
SIGNATURE VALID ?
NO
YES
364
SET OF TERMS FOR HANDLE ALREADY STORED ?
YES
NO
RMS STORES HANDLE & ASSOCIATED TERMS
366
RMS SENDS CONFIRMATION TO UA
368
FIGURE 16

FIG. 15

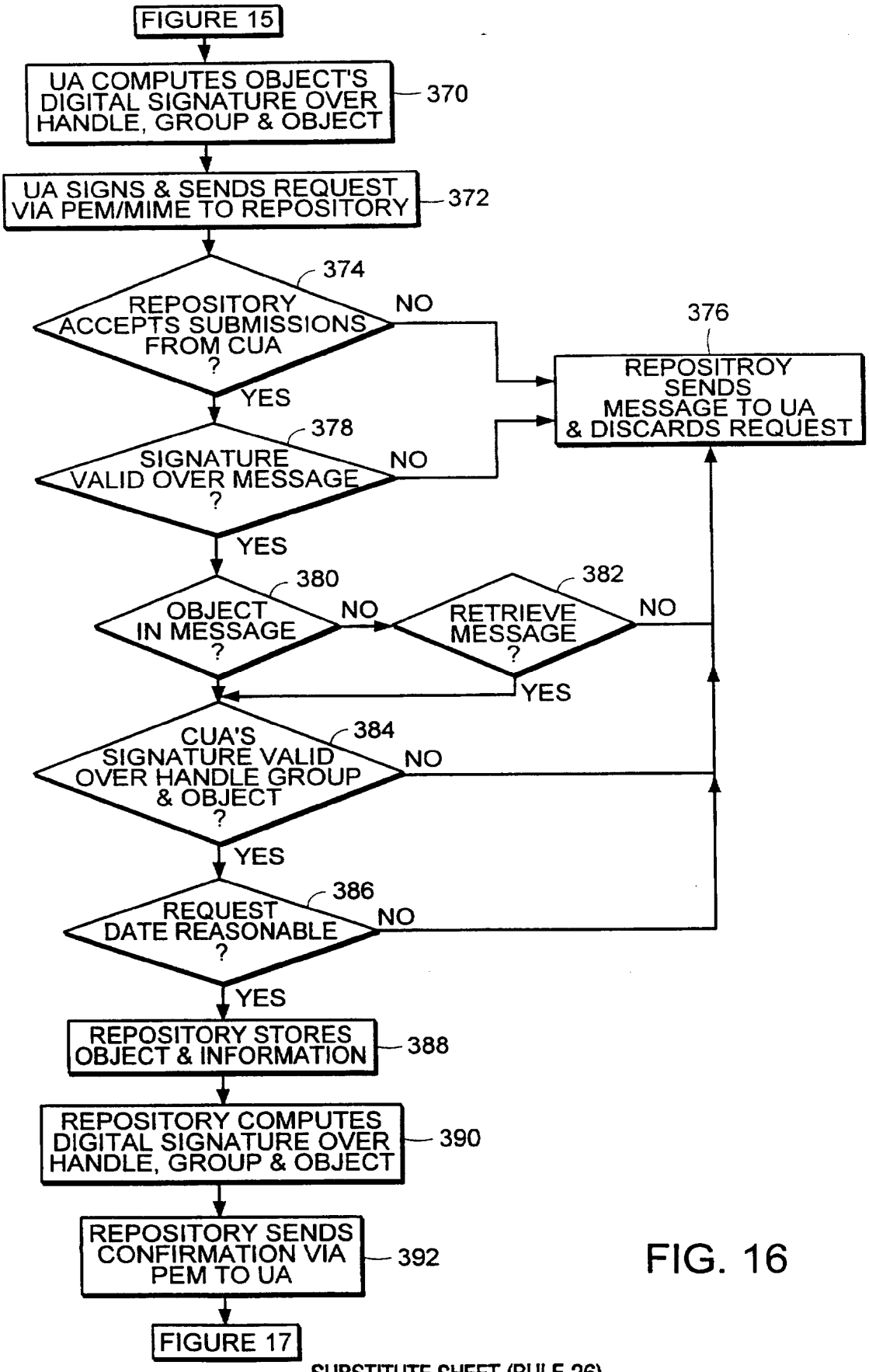

FIG. 16

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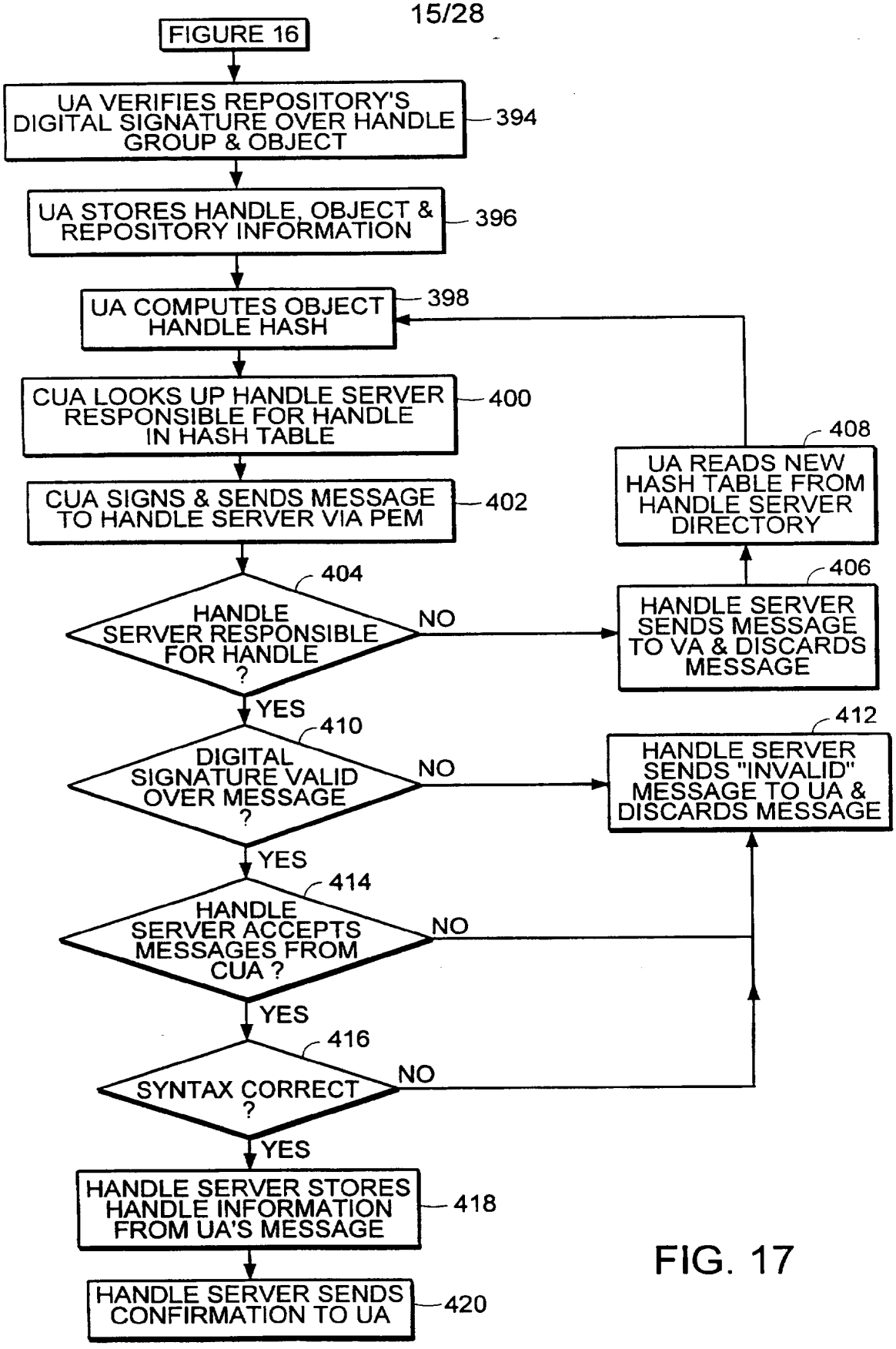
FIGURE 16
UA VERIFIES REPOSITORY'S DIGITAL SIGNATURE OVER HANDLE GROUP & OBJECT
394
UA STORES HANDLE, OBJECT & REPOSITORY INFORMATION
396
UA COMPUTES OBJECT HANDLE HASH
398
CUA LOOKS UP HANDLE SERVER RESPONSIBLE FOR HANDLE IN HASH TABLE
400
CUA SIGNS & SENDS MESSAGE TO HANDLE SERVER VIA PEM
402
404
HANDLE SERVER RESPONSIBLE FOR HANDLE ?
NO
YES
406
HANDLE SERVER SENDS MESSAGE TO VA & DISCARDS MESSAGE
408
UA READS NEW HASH TABLE FROM HANDLE SERVER DIRECTORY
410
DIGITAL SIGNATURE VALID OVER MESSAGE ?
NO
YES
412
HANDLE SERVER SENDS "INVALID" MESSAGE TO UA & DISCARDS MESSAGE
414
HANDLE SERVER ACCEPTS MESSAGES FROM CUA ?
NO
YES
416
SYNTAX CORRECT ?
NO
YES
HANDLE SERVER STORES HANDLE INFORMATION FROM UA'S MESSAGE
418
HANDLE SERVER SENDS CONFIRMATION TO UA
420

FIG. 17

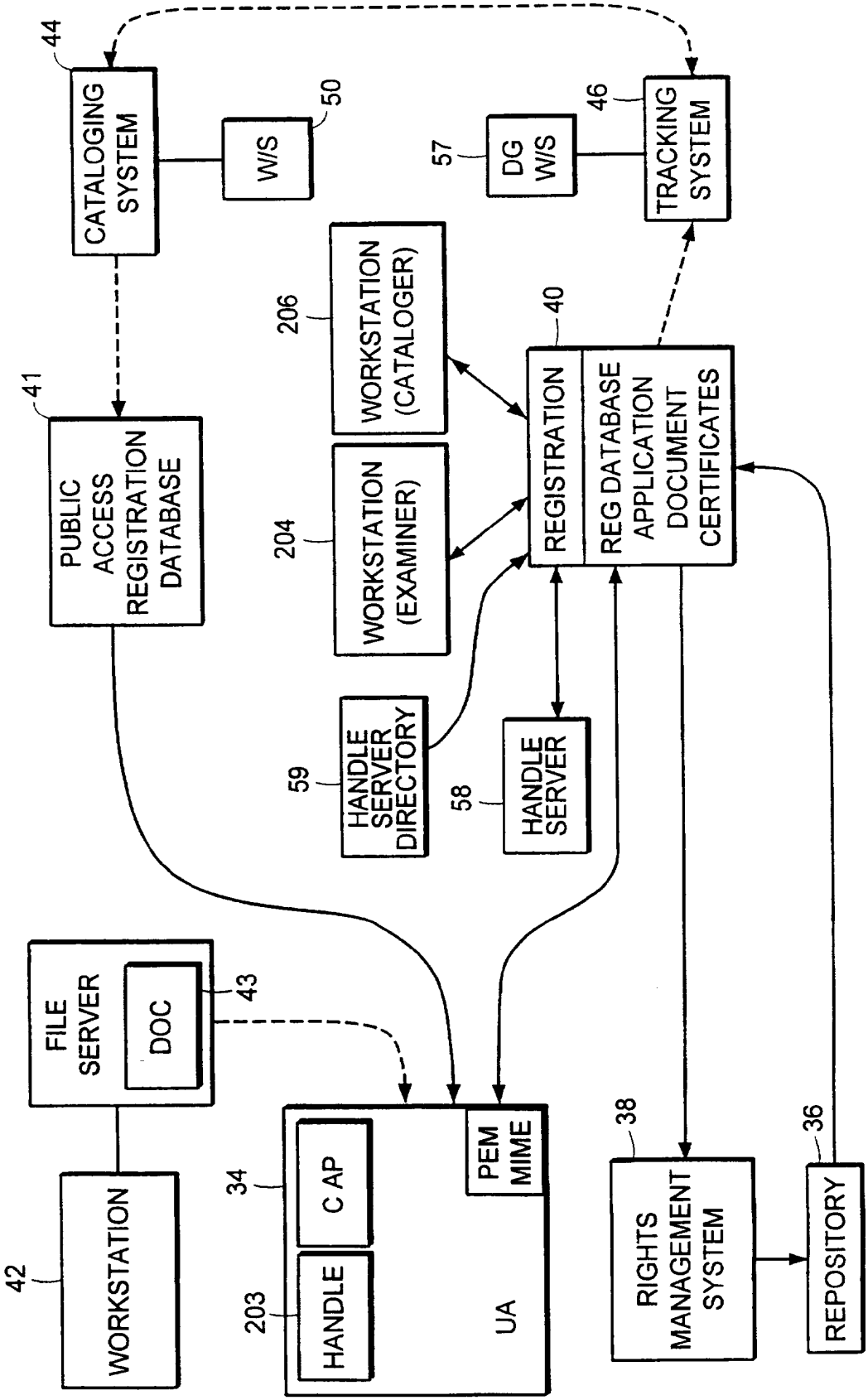
44
CATALOGING SYSTEM
50
W/S
57
DG W/S
46
TRACKING SYSTEM
206
WORKSTATION (CATALOGER)
40
REGISTRATION
REG DATABASE
APPLICATION
DOCUMENT
CERTIFICATES
41
PUBLIC ACCESS REGISTRATION DATABASE
204
WORKSTATION (EXAMINER)
59
HANDLE SERVER DIRECTORY
58
HANDLE SERVER
FILE SERVER
DOC
43
42
WORKSTATION
34
C AP
PEM MIME
203
HANDLE
UA
38
RIGHTS MANAGEMENT SYSTEM
36
REPOSITORY

FIG. 18

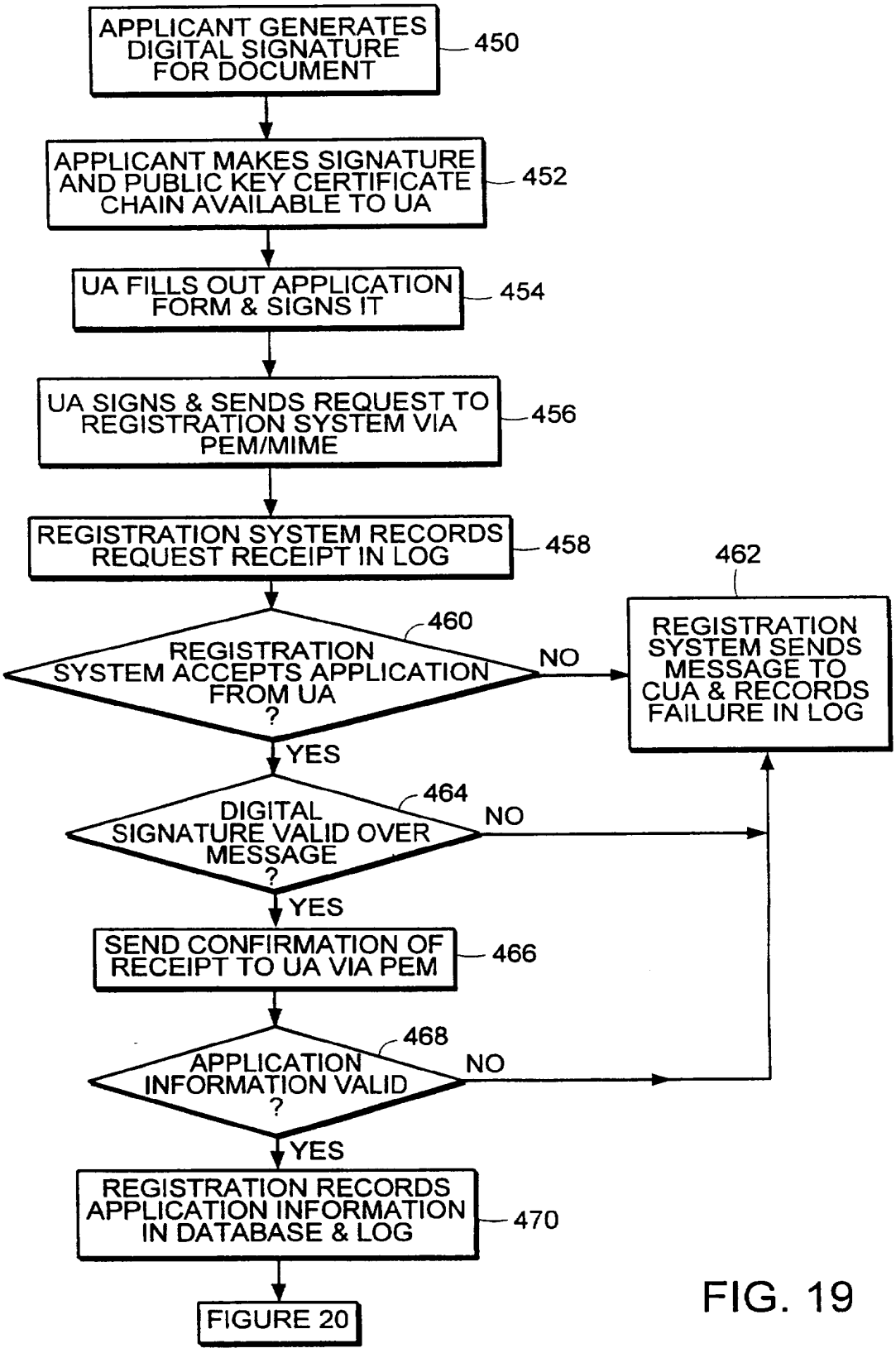
APPLICANT GENERATES DIGITAL SIGNATURE FOR DOCUMENT
450
APPLICANT MAKES SIGNATURE AND PUBLIC KEY CERTIFICATE CHAIN AVAILABLE TO UA
452
UA FILLS OUT APPLICATION FORM & SIGNS IT
454
UA SIGNS & SENDS REQUEST TO REGISTRATION SYSTEM VIA PEM/MIME
456
REGISTRATION SYSTEM RECORDS REQUEST RECEIPT IN LOG
458
462
REGISTRATION SYSTEM ACCEPTS APPLICATION FROM UA ?
460
NO
REGISTRATION SYSTEM SENDS MESSAGE TO CUA & RECORDS FAILURE IN LOG
YES
DIGITAL SIGNATURE VALID OVER MESSAGE ?
464
NO
YES
SEND CONFIRMATION OF RECEIPT TO UA VIA PEM
466
APPLICATION INFORMATION VALID ?
468
NO
YES
REGISTRATION RECORDS APPLICATION INFORMATION IN DATABASE & LOG
470
FIGURE 20

FIG. 19

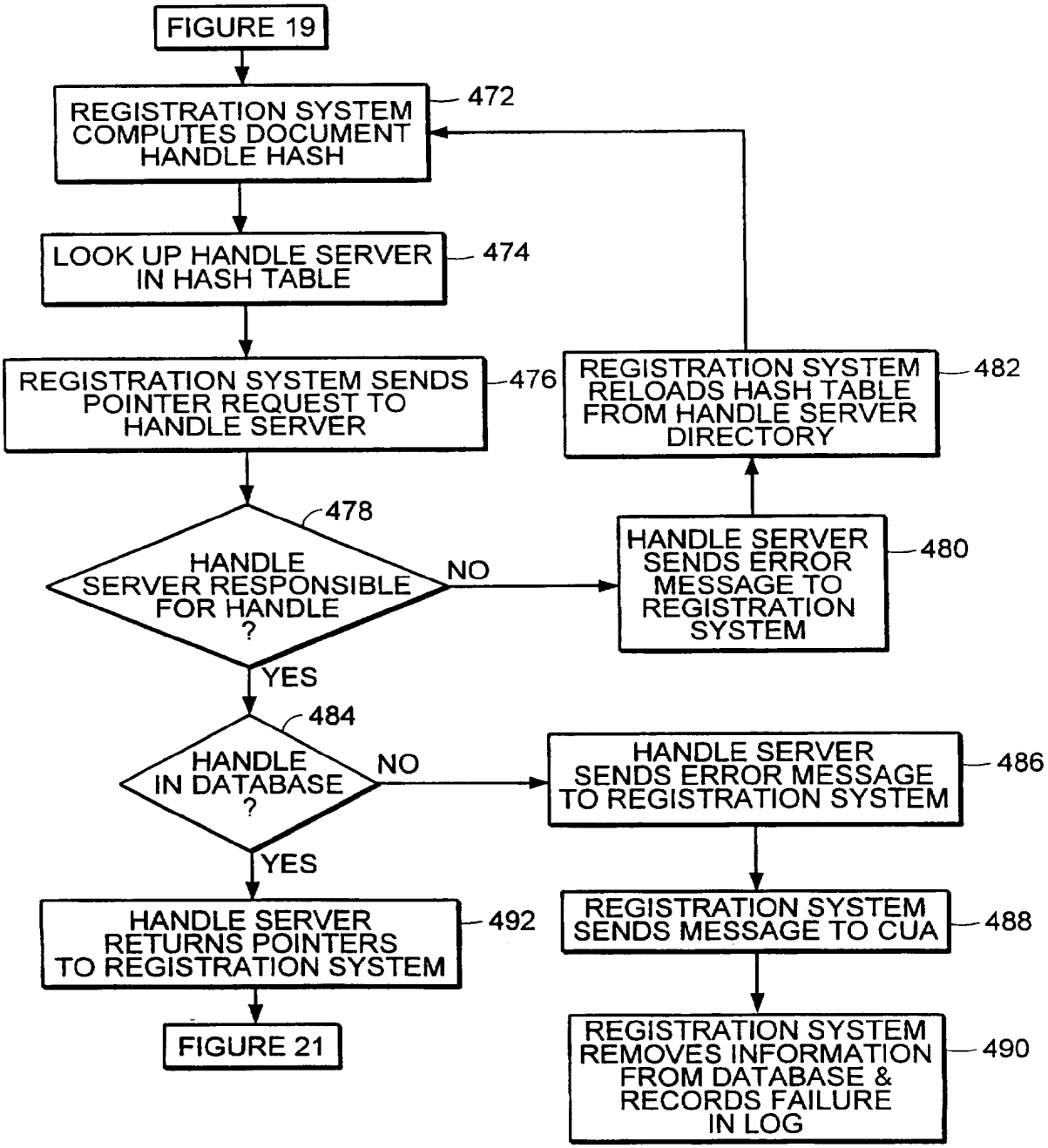
FIGURE 19
REGISTRATION SYSTEM COMPUTES DOCUMENT HANDLE HASH
472
LOOK UP HANDLE SERVER IN HASH TABLE
474
REGISTRATION SYSTEM SENDS POINTER REQUEST TO HANDLE SERVER
476
HANDLE SERVER RESPONSIBLE FOR HANDLE ?
478
NO
HANDLE SERVER SENDS ERROR MESSAGE TO REGISTRATION SYSTEM
480
REGISTRATION SYSTEM RELOADS HASH TABLE FROM HANDLE SERVER DIRECTORY
482
YES
HANDLE IN DATABASE ?
484
NO
HANDLE SERVER SENDS ERROR MESSAGE TO REGISTRATION SYSTEM
486
YES
HANDLE SERVER RETURNS POINTERS TO REGISTRATION SYSTEM
492
REGISTRATION SYSTEM SENDS MESSAGE TO CUA
488
FIGURE 21
REGISTRATION SYSTEM REMOVES INFORMATION FROM DATABASE & RECORDS FAILURE IN LOG
490

FIG. 20

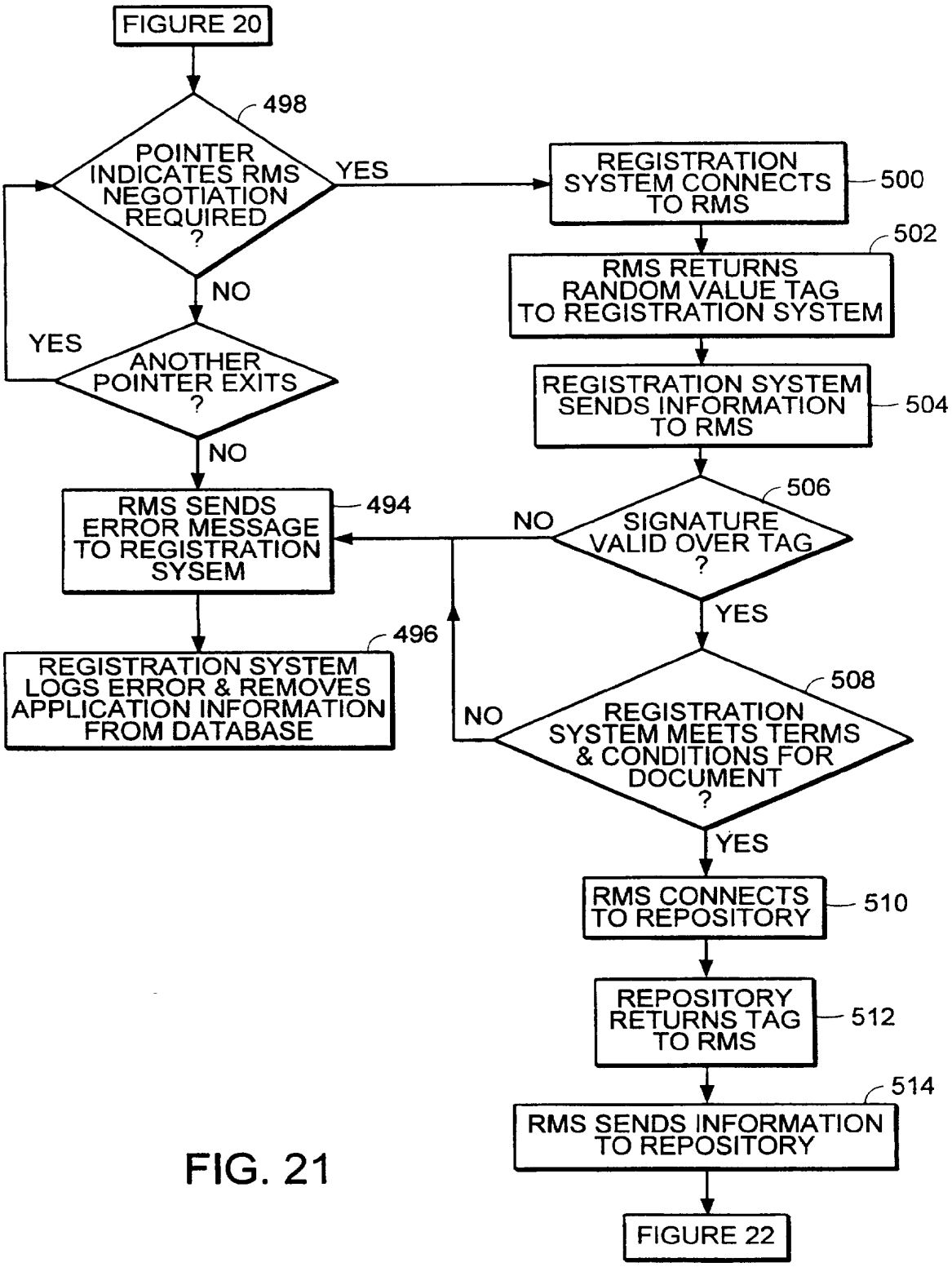
FIGURE 20
498
POINTER INDICATES RMS NEGOTIATION REQUIRED ?
YES
NO
YES
ANOTHER POINTER EXITS ?
NO
RMS SENDS ERROR MESSAGE TO REGISTRATION SYSEM
494
REGISTRATION SYSTEM LOGS ERROR & REMOVES APPLICATION INFORMATION FROM DATABASE
496
REGISTRATION SYSTEM CONNECTS TO RMS
500
RMS RETURNS RANDOM VALUE TAG TO REGISTRATION SYSTEM
502
REGISTRATION SYSTEM SENDS INFORMATION TO RMS
504
SIGNATURE VALID OVER TAG ?
506
NO
YES
REGISTRATION SYSTEM MEETS TERMS & CONDITIONS FOR DOCUMENT ?
508
NO
YES
RMS CONNECTS TO REPOSITORY
510
REPOSITORY RETURNS TAG TO RMS
512
RMS SENDS INFORMATION TO REPOSITORY
514
FIGURE 22

FIG. 21

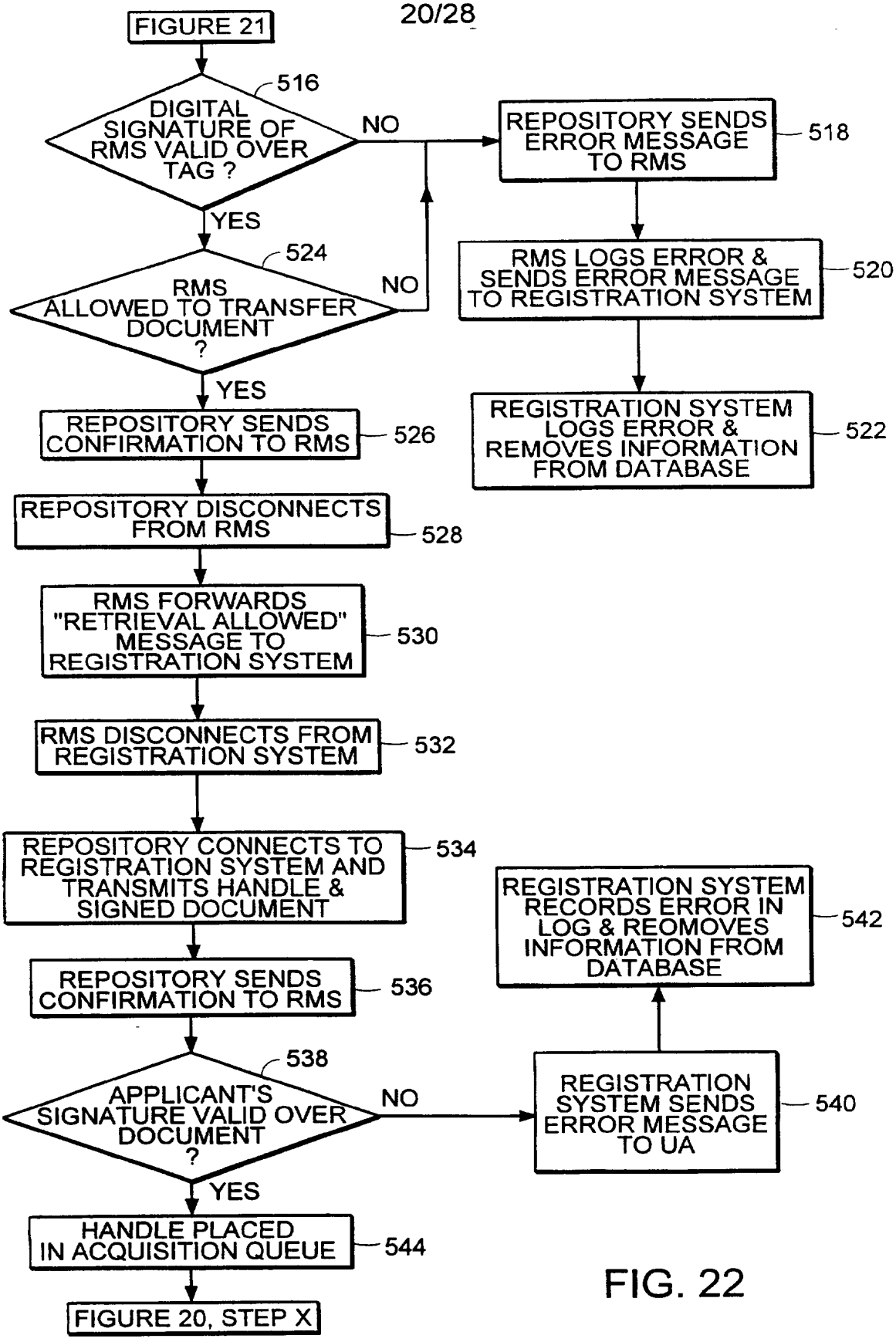
FIGURE 21
516
DIGITAL SIGNATURE OF RMS VALID OVER TAG ?
NO
REPOSITORY SENDS ERROR MESSAGE TO RMS
518
YES
524
RMS ALLOWED TO TRANSFER DOCUMENT ?
NO
RMS LOGS ERROR & SENDS ERROR MESSAGE TO REGISTRATION SYSTEM
520
YES
REPOSITORY SENDS CONFIRMATION TO RMS
526
REGISTRATION SYSTEM LOGS ERROR & REMOVES INFORMATION FROM DATABASE
522
REPOSITORY DISCONNECTS FROM RMS
528
RMS FORWARDS "RETRIEVAL ALLOWED" MESSAGE TO REGISTRATION SYSTEM
530
RMS DISCONNECTS FROM REGISTRATION SYSTEM
532
REPOSITORY CONNECTS TO REGISTRATION SYSTEM AND TRANSMITS HANDLE & SIGNED DOCUMENT
534
REGISTRATION SYSTEM RECORDS ERROR IN LOG & REOMOVES INFORMATION FROM DATABASE
542
REPOSITORY SENDS CONFIRMATION TO RMS
536
538
APPLICANT'S SIGNATURE VALID OVER DOCUMENT ?
NO
REGISTRATION SYSTEM SENDS ERROR MESSAGE TO UA
540
YES
HANDLE PLACED IN ACQUISITION QUEUE
544
FIGURE 20, STEP X

FIG. 22

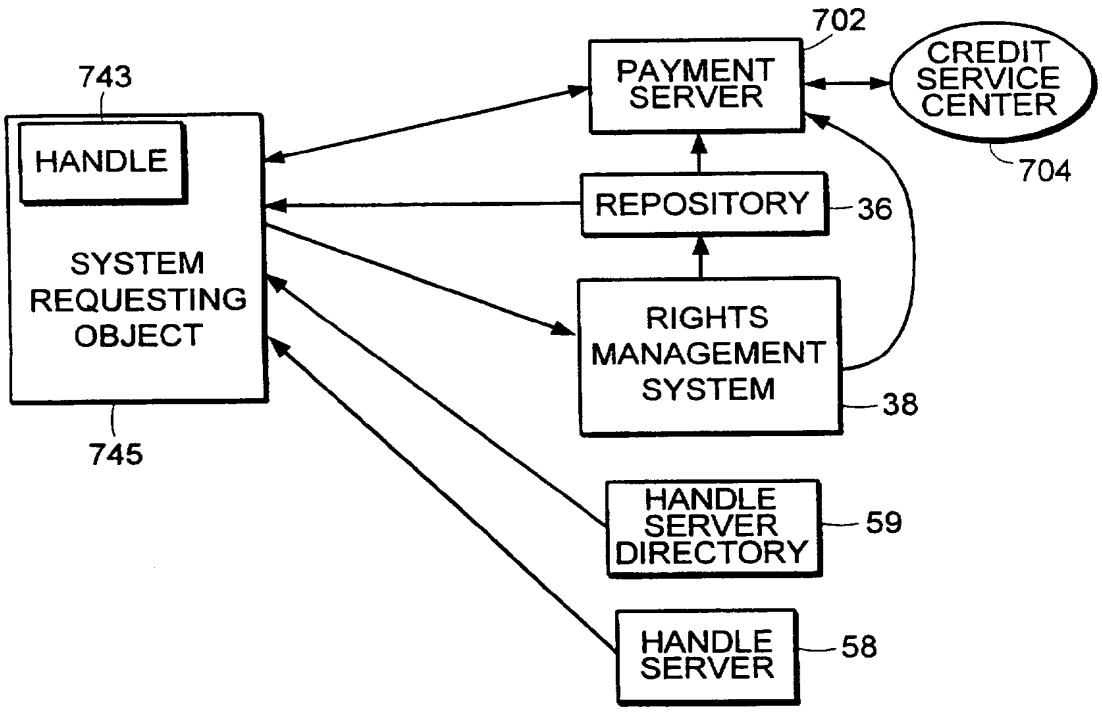
743
HANDLE
SYSTEM REQUESTING OBJECT
745
PAYMENT SERVER
702
CREDIT SERVICE CENTER
704
REPOSITORY
36
RIGHTS MANAGEMENT SYSTEM
38
HANDLE SERVER DIRECTORY
59
HANDLE SERVER
58

FIG. 23

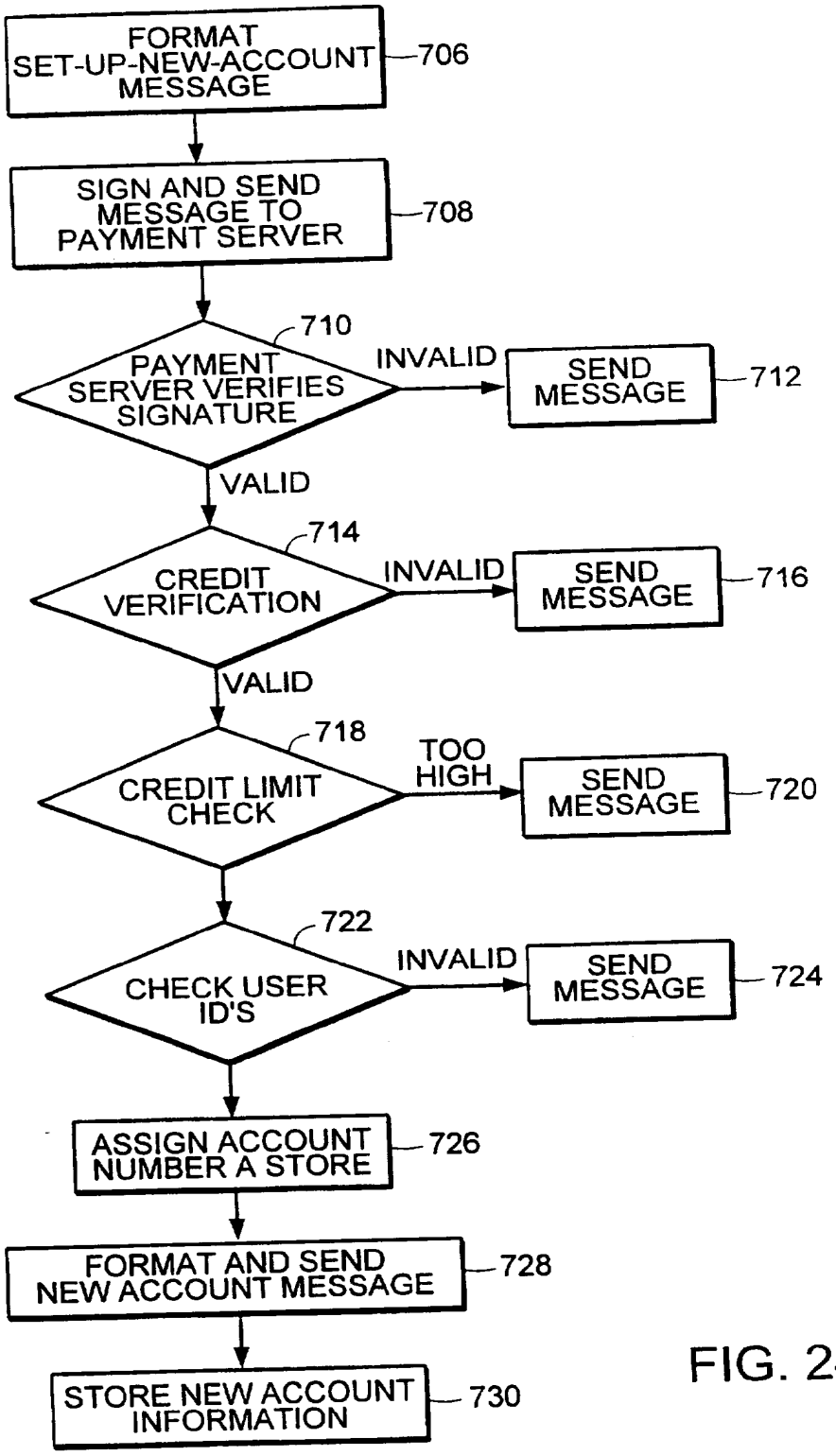
FORMAT SET-UP-NEW-ACCOUNT MESSAGE
706
SIGN AND SEND MESSAGE TO PAYMENT SERVER
708
710
PAYMENT SERVER VERIFIES SIGNATURE
INVALID
SEND MESSAGE
712
VALID
714
CREDIT VERIFICATION
INVALID
SEND MESSAGE
716
VALID
718
CREDIT LIMIT CHECK
TOO HIGH
SEND MESSAGE
720
722
CHECK USER ID'S
INVALID
SEND MESSAGE
724
ASSIGN ACCOUNT NUMBER A STORE
726
FORMAT AND SEND NEW ACCOUNT MESSAGE
728
STORE NEW ACCOUNT INFORMATION
730

FIG. 24

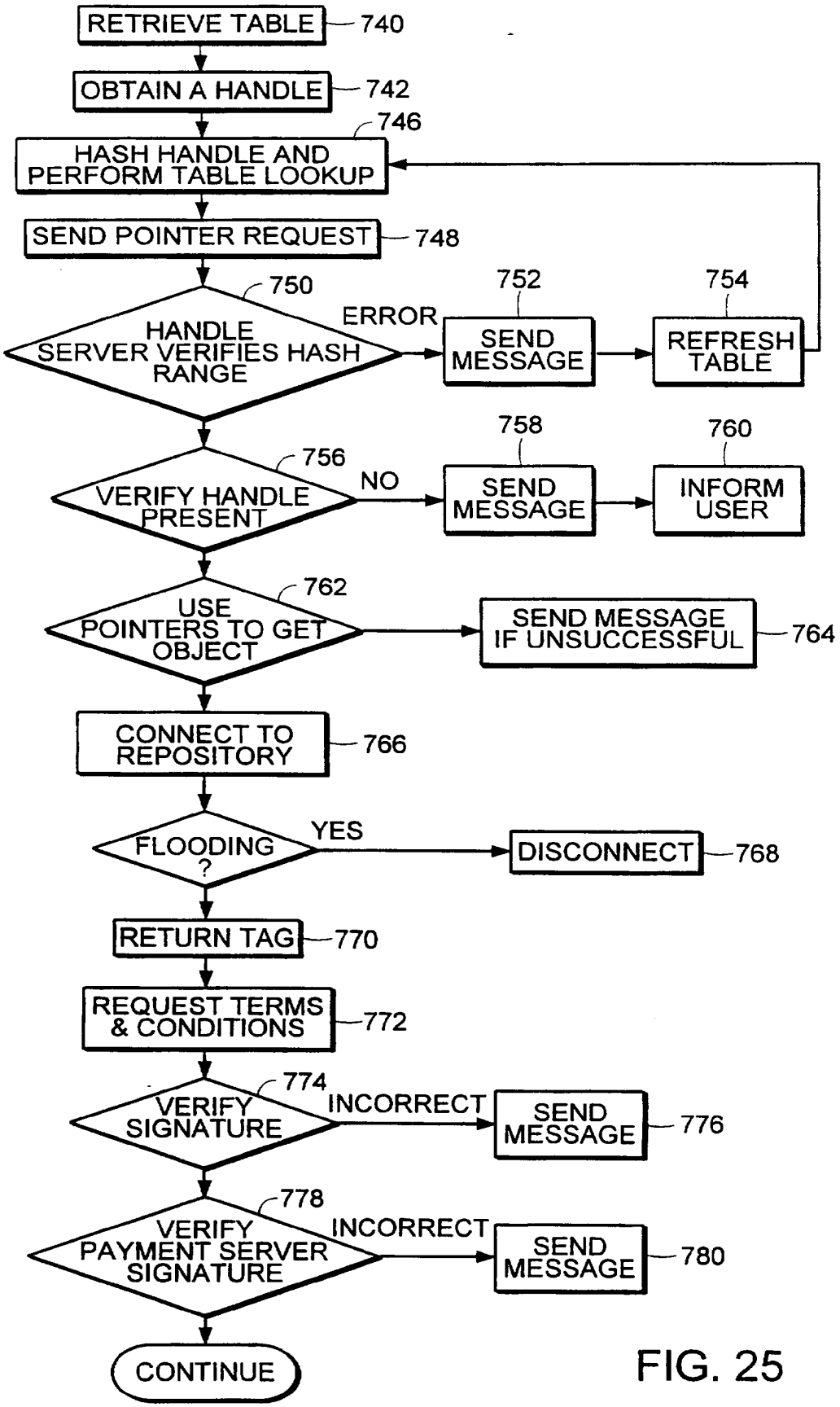

FIG. 25

GOOG-1002-Page 502 of 841

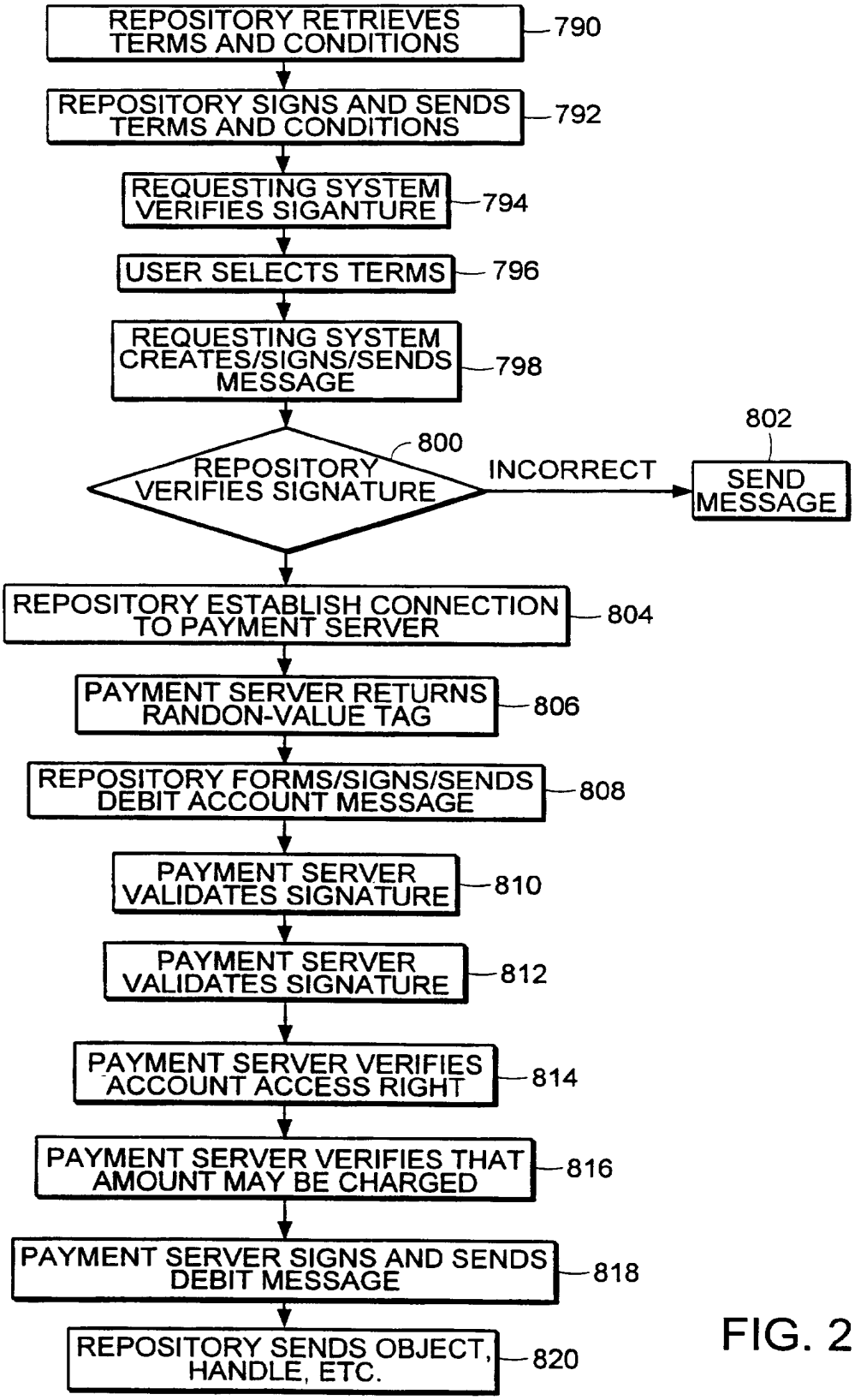
REPOSITORY RETRIEVES TERMS AND CONDITIONS
790
REPOSITORY SIGNS AND SENDS TERMS AND CONDITIONS
792
REQUESTING SYSTEM VERIFIES SIGANTURE
794
USER SELECTS TERMS
796
REQUESTING SYSTEM CREATES/SIGNS/SENDS MESSAGE
798
800
REPOSITORY VERIFIES SIGNATURE
INCORRECT
802
SEND MESSAGE
REPOSITORY ESTABLISH CONNECTION TO PAYMENT SERVER
804
PAYMENT SERVER RETURNS RANDON-VALUE TAG
806
REPOSITORY FORMS/SIGNS/SENDS DEBIT ACCOUNT MESSAGE
808
PAYMENT SERVER VALIDATES SIGNATURE
810
PAYMENT SERVER VALIDATES SIGNATURE
812
PAYMENT SERVER VERIFIES ACCOUNT ACCESS RIGHT
814
PAYMENT SERVER VERIFIES THAT AMOUNT MAY BE CHARGED
816
PAYMENT SERVER SIGNS AND SENDS DEBIT MESSAGE
818
REPOSITORY SENDS OBJECT, HANDLE, ETC.
820

FIG. 26

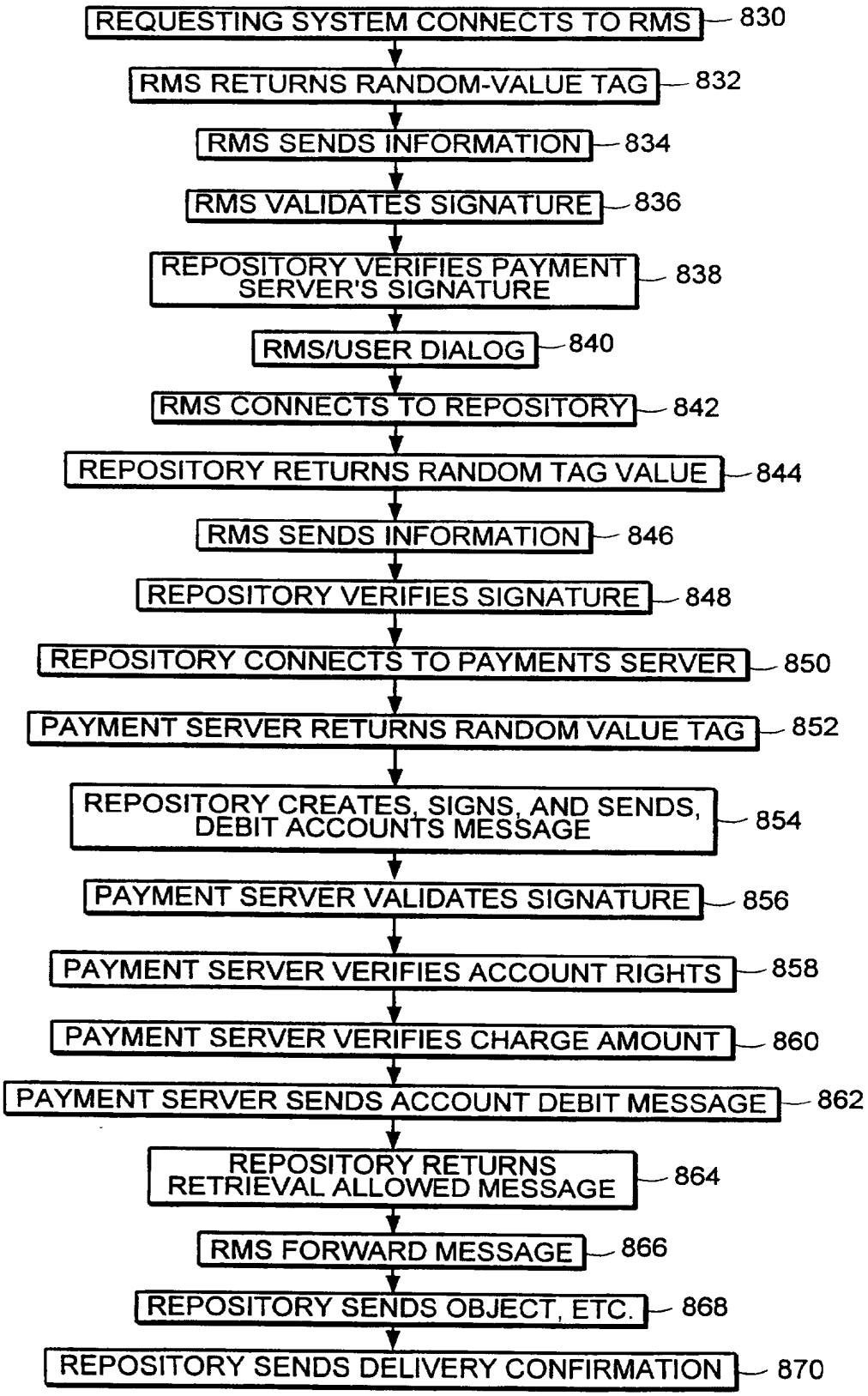
REQUESTING SYSTEM CONNECTS TO RMS
830
RMS RETURNS RANDOM-VALUE TAG
832
RMS SENDS INFORMATION
834
RMS VALIDATES SIGNATURE
836
REPOSITORY VERIFIES PAYMENT SERVER'S SIGNATURE
838
RMS/USER DIALOG
840
RMS CONNECTS TO REPOSITORY
842
REPOSITORY RETURNS RANDOM TAG VALUE
844
RMS SENDS INFORMATION
846
REPOSITORY VERIFIES SIGNATURE
848
REPOSITORY CONNECTS TO PAYMENTS SERVER
850
PAYMENT SERVER RETURNS RANDOM VALUE TAG
852
REPOSITORY CREATES, SIGNS, AND SENDS, DEBIT ACCOUNTS MESSAGE
854
PAYMENT SERVER VALIDATES SIGNATURE
856
PAYMENT SERVER VERIFIES ACCOUNT RIGHTS
858
PAYMENT SERVER VERIFIES CHARGE AMOUNT
860
PAYMENT SERVER SENDS ACCOUNT DEBIT MESSAGE
862
REPOSITORY RETURNS RETRIEVAL ALLOWED MESSAGE
864
RMS FORWARD MESSAGE
866
REPOSITORY SENDS OBJECT, ETC.
868
REPOSITORY SENDS DELIVERY CONFIRMATION
870

FIG. 27

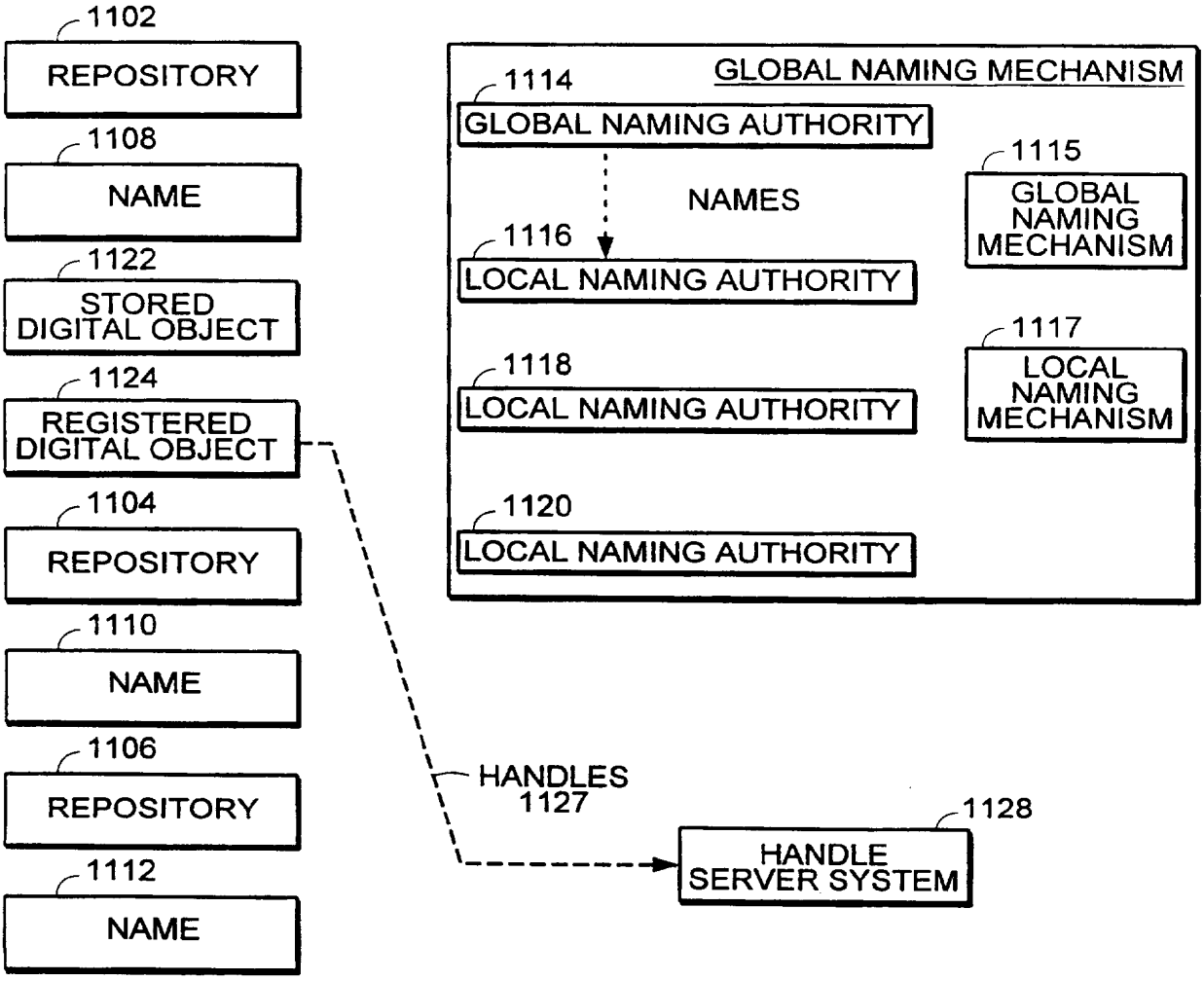
1102
REPOSITORY
1108
NAME
1122
STORED DIGITAL OBJECT
1124
REGISTERED DIGITAL OBJECT
1104
REPOSITORY
1110
NAME
1106
REPOSITORY
1112
NAME
HANDLES 1127
GLOBAL NAMING MECHANISM
1114
GLOBAL NAMING AUTHORITY
NAMES
1115
GLOBAL NAMING MECHANISM
1116
LOCAL NAMING AUTHORITY
1117
LOCAL NAMING MECHANISM
1118
LOCAL NAMING AUTHORITY
1120
LOCAL NAMING AUTHORITY
1128
HANDLE SERVER SYSTEM

FIG. 28

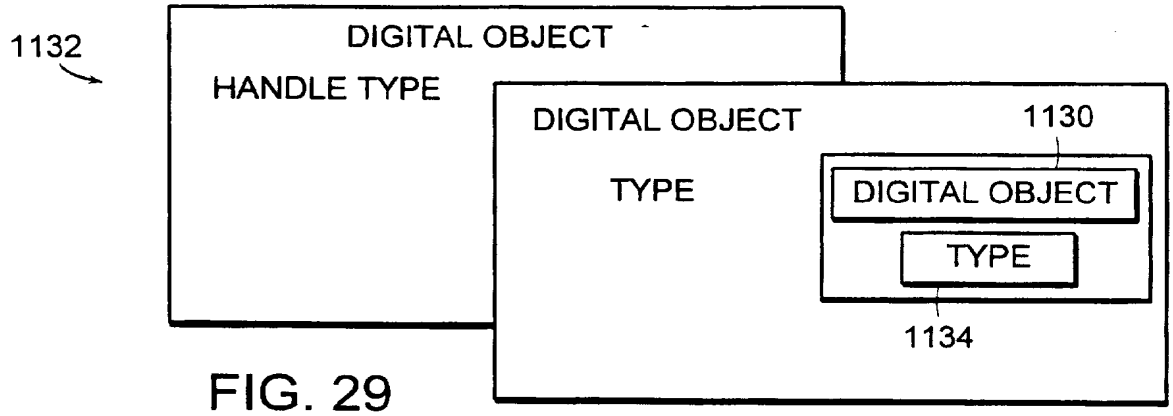

FIG. 29

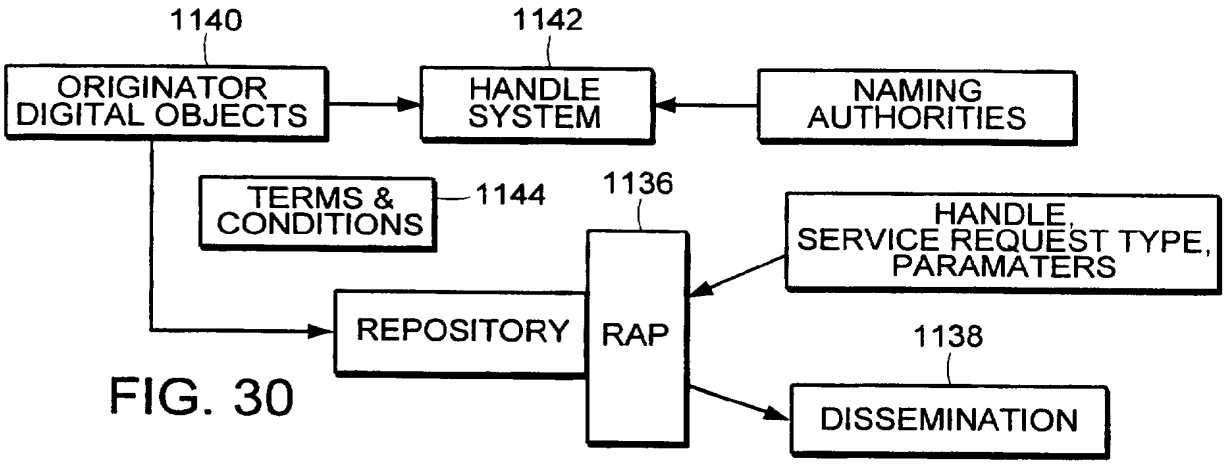

FIG. 30

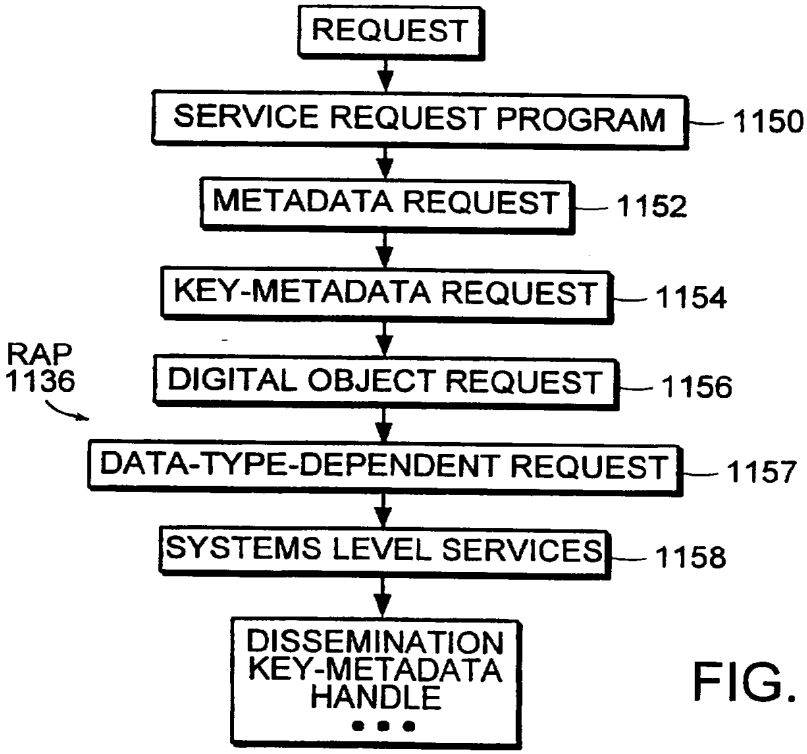

FIG. 31

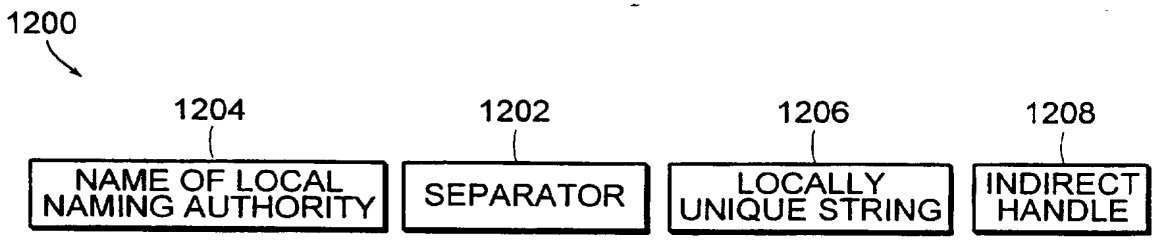

FIG. 32

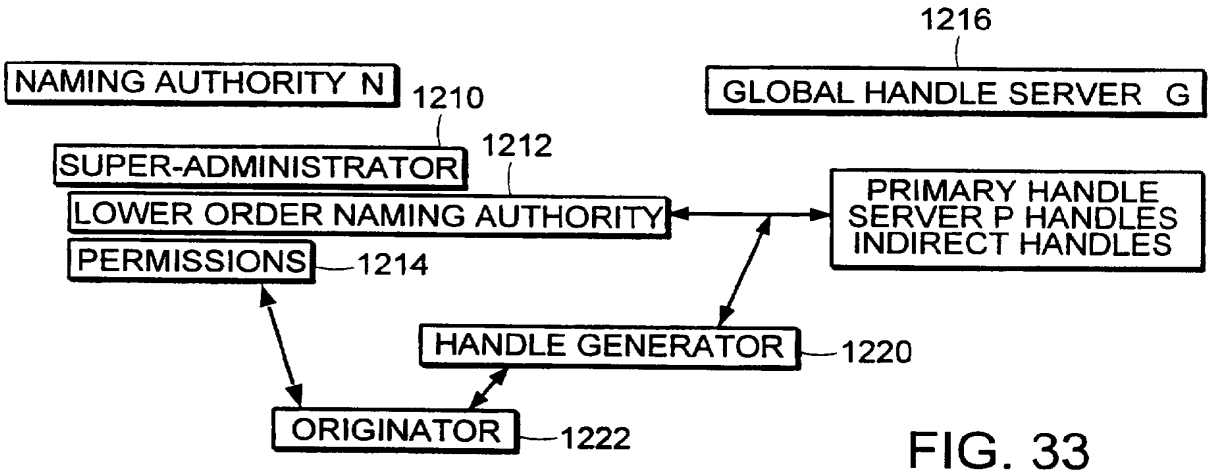

FIG. 33

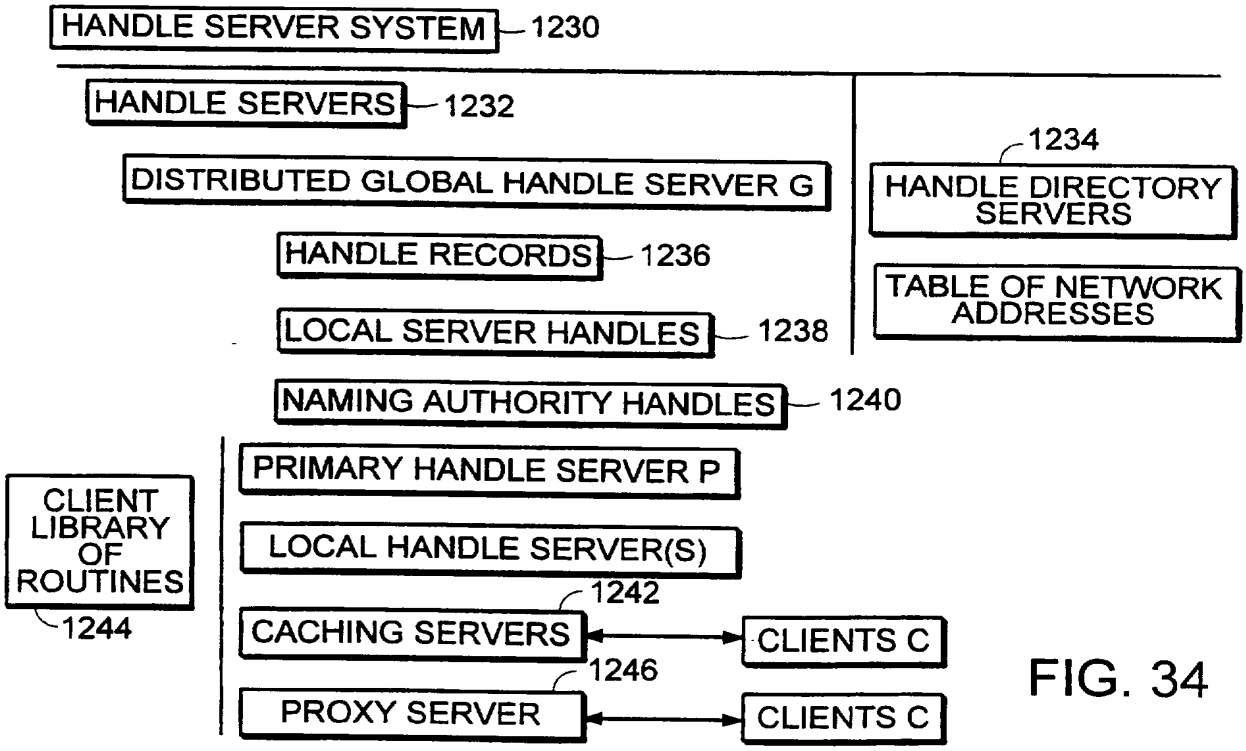

FIG. 34

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US97/07834

A. CLASSIFICATION OF SUBJECT MATTER

IPC(6) :G06F 13/00
US CL :395/610, 616, 677; 380/4, 25

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)

U.S. : 395/616, 610, 677; 380/4, 25

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

None

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

APS

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5,260,999 A (WYMAN) 09 November 1993, col. 1, lines 27-60, col. 2, lines 35-52, col. 11, lines 3-30, col. 21, lines 22-45, col. 36, line 64 - col. 37 line 23, and Abstract	1-7, 12-18, 36-40
Y	US 5,321,841 A (EAST et al) 14 June 1994, col. 1, lines 26-30, col. 1, line 66 - col. 2, line 3, col. 4, line 1-23, col. 22, line 58 - col. 23, line 4, col. 32, lines 11-63, col. 33, lines 33-42, col. 34, lines 8-17, and col. 36, lines 3-54.	2-3, 5, 8-10, 19-35, 41-50

[X] Further documents are listed in the continuation of Box C. [ ] 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

"E" earlier document 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 understand 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

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
21 JULY 1997	31 OCT 1997
Name and mailing address of the ISA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. (703) 305-3230	Authorized officer THOMAS LEE Telephone No. (703) 305-9717

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

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US97/07834

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 5,491,817 A (GOPAL et al) 13 February 1996, col. 1, lines 37-55, col. 2, lines 23-31, and col. 8, lines 6-67.	1, 4, 7-28, 32-38, 46-50
Y	US 5,222,134 A (WAITE et al) 22 June 1993, col. 2, lines 13-44, col. 5, lines 17-22. and Abstract.	1, 6, 11-16, 29-31, 39-45

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

(12) UK Patent Application (19) GB (11) 2 294 132 (13) A

(43) Date of A Publication 17.04.1996

(21) Application No 9420383.3

(22) Date of Filing 10.10.1994

(51) INT CL[6]
G06F 17/30 13/38

(52) UK CL (Edition O)
G4A AMX AUDB

(56) Documents Cited
GB 2277176 A GB 2227585 A EP 0600457 A2
EP 0278472 A2 US 5230048 A US 4825354 A

(58) Field of Search
UK CL (Edition M) G4A AMX AUDB
INT CL[5] G06F 13/38 15/40

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Paul Andrew Johnson

(74) Agent and/or Address for Service
Alex E Rees
GEC Patent Department, Waterhouse Lane, CHELMSFORD, Essex, CM1 2QX, United Kingdom

(54) Data communication network

(57) To minimise traffic over an expensive transmission link (6), data obtained from an information provider (1, 2) in response to a request by a user (11, 12) is semi-permanently stored in the cache memory (10) of a node (8) local to the users whence it can be supplied to another user. When a user (11) requests data, its local node (8) checks its directory to see if the data is held by itself or by another node (38, Fig. 2). Only if neither node has it, is the data obtained from an information provider (1) via the expensive line 6, the information then becoming stored in the node's cache memory (10) as well as being supplied to the user who requested it. The directories of any other nodes are updated accordingly to inform them that fresh data is available. Transaction information for chargeable data may be exchanged between nodes and between nodes and information providers. An electronic funds transfer message may accompany the request for data.

Nodes may cooperate to cache data (28, 38 in Fig. 2). Node 8 may charge users 11, 12 on behalf of information providers 1, 2, so that the users need not have an account with the information provider.

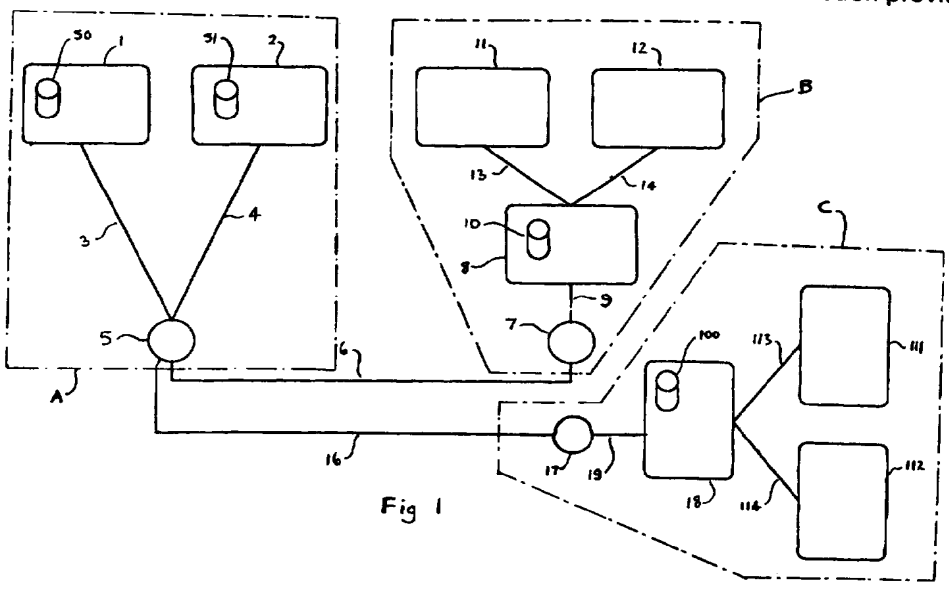

Fig 1

GB 2 294 132 A

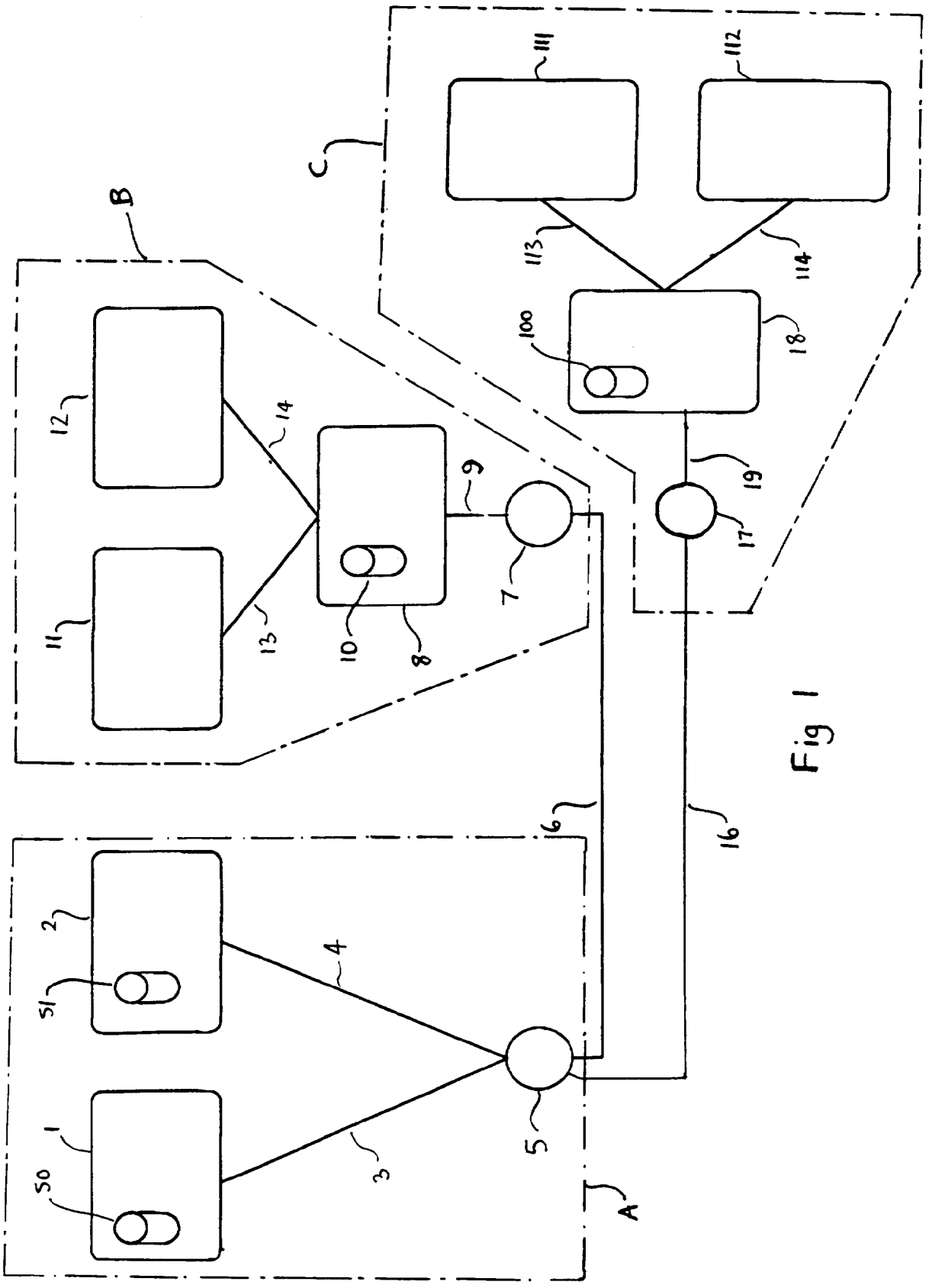

Fig 1

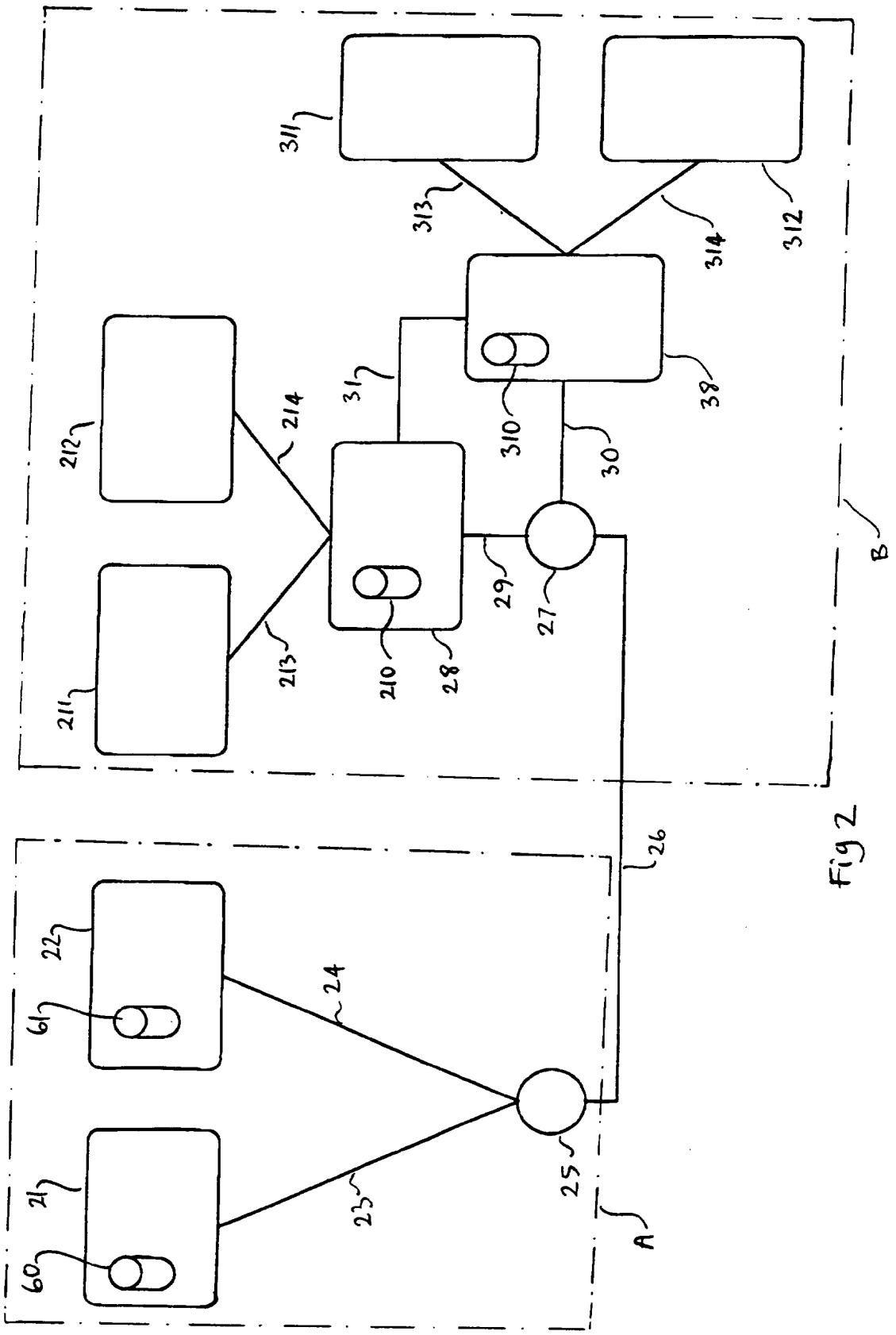
311
313
312
314
38
310
30
212
214
31
211
213
210
28
29
27
B
22
61
24
21
60
23
25
26
A

Fig 2

Data Communication Networks

This invention relates to data communication networks.

There are many different types of data communications networks. Some networks make no charge for any data which is accessed by a user. An example of such a network is the World-Wide Web, commonly known as "The Web", which utilises the Internet. In general, users of the Web only pay a connection charge which allows them unlimited access to the Web, information being available from information providers at no extra cost. To reduce loading on long distance transmission links, it has latterly been the practice to provide "cache sites", otherwise known as "proxy servers". A proxy server comprises a cache store in which more frequently-used data is stored. This avoids the need to repetitively send the same data over long distance links.

Other networks make a charge for information provided. In order to access the data held by these networks it is in general necessary to register with the data provider and pay a subscription fee before any data can be obtained, in addition a fee may be charged for each record accessed. While this may be satisfactory for regular users, it can be inconvenient for the occasional user, who needs to register in advance, and for the data provider, who may find it uneconomic to provide billing for an occasional user.

This invention arose from an attempt to provide an improved data communications network.

A first aspect of the invention provides a communications network for providing communication between at least one provider of data and a plurality of users, the network comprising a plurality of nodes, each node being arranged to receive a request for data from a user and to supply a copy

of the data requested to that user, at least one first node comprising memory means arranged to store, in a semi-permanent manner, a copy of data requested by a user, at least one node comprising index means arranged to store information indicating the contents of its own memory means and at least part of the contents of the memory means of at least one other node, and means for providing communication between the nodes and the at least one provider of data.

A second aspect of the invention provides a communications network for providing communication between at least one provider of data and a plurality of users, the network comprising a node arranged to receive requests for data from said users,

the node comprising memory means arranged to store, in a semi-permanent manner, a copy of data requested by a user, and index means arranged to store an indication of the contents of the memory means,

request processing means arranged to process a request for data from a user, the request being accompanied by an authorisation to pay for the data requested, the request processing means being arranged to:

supply the user with the requested data from the memory means and transfer the authorisation to pay to the provider of the data requested, in the event of data requested being present in the memory means; and

in the event of the data requested not being present in the memory means, obtain the data requested from a provider of data, store that data in the memory means, update its index, supply the user with the data requested, and transfer the authorisation to pay to the provider of that data.

Embodiments of the invention will now be described by way of non-limiting example only, with reference to the drawings in which:

Figure 1 shows a first data communications network in accordance with the invention; and

Figure 2 shows a second data communications network in accordance with the invention.

Referring now to Fig 1, a plurality of information providers (IPs) 1,2 in region A are coupled via respective relatively inexpensive communications links 3,4 to a first packet switching exchange 5 which is coupled via a relatively expensive communications link 6 to a second packet switching exchange 7 in region B. A proxy server 8 is coupled to the second packet switching exchange 7 via inexpensive communications lines 9. First and second users 11,12 are coupled to the first proxy server 8 via respective inexpensive lines 13,14. Proxy server 8 has a cache store 10 in region C. Similarly a second relatively expensive link 16 couples the first exchange 5 in region A to a third exchange 17 in region C. A second proxy server 18 having a cache memory 100 is coupled to the third exchange 17 via an inexpensive link 19. Third and fourth users 111,112 are coupled to the second proxy server 18 via inexpensive lines 113,114.

The precise nature of regions A,B and C is not important. Regions A,B and C may be any regions connected via relatively expensive communications links. They may for example comprise different states, different regions within a single state, or different companies or organisations.

A proxy server stores a subset of all the information available on the network. When a network user requests an

item of data, which for convenience will be referred to as a page of information, the system operates as follows:

Say user 11 requests a page of information. This request is transmitted to its associated proxy server 8.

Proxy server 8 checks its store 10. If it has the page then it returns it to the user.

If the proxy server does not have the page then it forwards the request to the IP identified in the request. Say the page is available from IP1. IP1 then transmits the page to proxy server 8.

Proxy server 8 then forwards the page to user 11, and also places a copy of the page in its own store 10.

Once the store 10 is full, the proxy server throws away the least-recently-used pages to make room for new pages and sends messages to the other proxy servers to update their directories accordingly.

Each page may be tagged with an expiry date, so that updated information can be fetched automatically.

Updating and replacement of lesser-used pages can be implemented using a Least-Recently Used (LRU) algorithm. The LRU algorithm is a simple algorithm that gives good results under a wide range of conditions. It performs best when a few pages are very popular, but the timing of the page requests is otherwise random. Many data communication networks are found to exhibit this behaviour.

In theory a region may only require a single proxy server, since two or more proxy servers will duplicate work and hence raise the bandwidth on the relatively expensive link.

However a free market may demand that there be multiple proxy servers, and that the number and nature of the proxy servers be able to change over time.

Fig 2 illustrates in simplified form what will be termed a federated caching scheme. First and second vendors of information (information providers) 21,22 in region A have information stored in respective data banks 60,61. The information providers (IP's) are coupled to a first packet router 25 via relatively inexpensive links 23,24. The first packet router 25 is coupled via a relatively expensive link 26 to a second packet router 27 in region B. First and second proxy servers 28, 38 having respective cache stores 210,310 are coupled to the second packet router 27 via respective relatively inexpensive links 29,30 and to each other via link 31. First and second users 211, 212 are coupled to the first proxy server 28 via inexpensive links 213,214. Third and fourth users 311, 312 are coupled to the second proxy server 38 via inexpensive links 313,314.

Only two proxy servers have been shown for simplicity, but in practice as many as necessary may be provided, each being in communication with the others either directly or via other proxy servers or the packet router 27. The collection of proxy servers comprises a "federated cache".

In the present embodiment, each proxy server keeps a directory which contains a list of all the files which are stored by that proxy server, and a list of files held by other proxy servers of the federation. A request from a user is processed as follows.

A user 211 sends a request for information to the first proxy server 28. The proxy server consults its directory. If it holds the information requested, it sends the information to the user 211. It also generates data recording the

transaction as will be described later. The transaction then terminates.

If the first proxy server does not itself hold the information but can locate the information in the second proxy server 38, it forwards the request to the second proxy server 38. The second proxy server 38 sends the information to the first proxy server, which forwards it to the first user 211. However, the first proxy server 38 does not in general keep a copy of the information. Data recording the transaction details are generated. The transaction data may include details of the payment (if any) to be made by the first proxy server 28 to the second proxy server 38 for supplying the information, the charges being such as to promote equitable distribution of operating costs between the proxy servers. The transaction then terminates.

If the first proxy server is unable to locate a copy of the information in its directory, then it forwards the request to the source of information indicated by the first user 211 via the packet router and the expensive link 26. Say the information is held by the first IP 21. IP 21 then sends the information from its store 60 to the first proxy server 28. The proxy server forwards it to the first user 211.

In this instance the first proxy server does keep a copy of the information in its cache store 210. As well as generating data recording the transaction, it broadcasts a message to the other proxy servers in the federation that it now has a copy of that information. The transaction then terminates.

Thus the federation of caches can behave as a single proxy server for the purposes of reducing the bandwidth requirements of the expensive communications link 26, but can function as separate caches for the purposes of competing on

cost and quality.

It was mentioned above that the first proxy server does not in general keep a copy of data which is held by another proxy server. This would for example be the case where the cost to the first proxy server of obtaining the data from another proxy server was less than the cost of keeping that data. If the cost of obtaining the data from another proxy server was sufficiently high, or the data was subject to sufficient usage, it could well become more economical for the first proxy server to keep a copy of the data itself rather than obtaining it from another proxy server each time it was needed.

As was mentioned above, data recording the transaction is generated during operation.

A proxy server must ensure that payment reaches the original IP. Furthermore, the IP must be able to ensure that all the payment due is in fact reaching him. However, it is desirable for the IP not to be able to associate an arbitrary purchase with any particular person, lest this break anonymity.

For a non-federated cache of the type shown in Fig 1, the problem may be solved as follows.

The user sends an electronic payment to the proxy server with the request. Conveniently, payment consists of electronic funds transfer between bank accounts, or may consist of electronic messages exchanged between smartcards, for example the Mondex system. Mondex is a trademark of the National Westminster Bank PLC.

The proxy server generates a unique transaction number. If the proxy server does not hold the information, the payment

is forwarded to the IP with the request and the transaction number. The information is forwarded to the user, along with the transaction number.

If the proxy server does hold the information then the following parts of the transaction are sent to the IP:

the amount paid;
the transaction number; and
the payment.

Thus the identity of the user is not conveyed to the IP and anonymity is preserved.

The payment operation may be delayed in order to batch up many payments, the relevant information being stored temporarily and processed en masse at a convenient time.

In a federated cache as shown in Fig 2 the payment accompanies the request until it reaches a site which actually holds the requested information. The transaction number is augmented with the name of the proxy server which fulfilled the request. Otherwise the system works as above.

For example, if user 211 requests information which is not held by proxy server 28, but which is held by proxy server 38, then proxy server 38 will be credited with the payment.

This allows the IPs to carry out spot checks by purchasing information through a proxy server (possibly via a third party to avoid detection) and then checking that the list of transactions sent by the proxy server do indeed include the test transactions.

In the present embodiment, when a first proxy server receives a request from a client, it assigns a unique code to that request, and transmits that request code to the client.

In the case that the first proxy server can fulfil the request, it transmits the request code to the appropriate IP, along with other accounting information such as the value of each request and an instruction to pay the IP for the information which has been provided to the client.

In the case that the first proxy server can locate the requested page on a second proxy server, then the first proxy server will forward the request code and payment instruction to the second proxy server along with the request. The second proxy server will then fulfil the request as described earlier, and forward the request code and other information as described in the first case to the IP.

In the case that the first proxy server cannot locate the requested page in any of the other proxy servers, it will forward the request, request code and payment to the appropriate IP.

In all cases the protocol for forwarding of payment instructions will include a non-repudiatable message acknowledging receipt to be sent from the payee to the payer. This message is known as a "digital receipt". The proxy servers will store these receipts for a predetermined time for inspection by the relevant IPs, and may then delete them.

The proxy servers may chose to batch up the data and payment which is to be sent to the IPs in order to reduce the cost of data transmission and money transfers.

The client transmits its copy of the request code to the IP. The IP can then check that the request code provided by the client is present in the list provided by the proxy servers. If the request code is absent, or the value given for the request is not the same as the value given for that request in the list, then the IP may reasonably conclude that one of

the proxy servers is behaving dishonestly. Inspection of the digital receipts stored by the various proxy servers will allow the IP to determine which proxy server this is.

In order to verify that Inter-Proxy payments are being made, a proxy server transmits to a client a "probe" request which names a non-existent page of information, and also transmits to a second proxy server an index update corresponding to this probe request. The client then transmits this probe request to the second proxy server, and the original proxy server monitors the request it receives in order to determine if the second proxy server correctly forwards the request to the original proxy server. If the original proxy server receives the probe request in a form which appears to have come from a client, then it may conclude that the second proxy server is behaving dishonestly.

In addition a proxy server can provide additional anonymity to users. In a commercial network in accordance with the invention there may be many small IPs, and some of them may attempt to gain information on their customers for illegal or unethical purposes such as blackmail or public disclosure. A crooked IP could record the network address of a client, and then find the user with that address. Since a network address identifies a particular machine, and a machine might be used by only one person, it would be possible to identify the person who had bought a particular piece of information. However if the client is purchasing information via a proxy server, the IP is denied the network address of the customer. The IP can only discover this information with the co-operation of the customer.

A crooked cache could behave in a similar way to a crooked IP, but there will be only a few proxy servers in a federation, so each will have a long-term interest in protecting the anonymity of their clients in order to avoid

bad publicity.

A number of modifications are possible within the scope of the invention.

In the embodiment of Figure 2, when any proxy server stores data in its cache memory, it broadcasts that fact to all the other proxy servers in the federation. However, it is not essential for the proxy servers to behave in this way under all circumstances, and the exchange of information need not be wholly reciprocal. In a modification of the network shown in Figure 2, the first proxy server 28 always informs the second proxy server 38 of the contents of its store 210, whereas the second proxy server 38 does not necessarily always inform the first proxy server 28 of the contents of its store 310. This arrangement allows the second proxy server 38 to store data of a sensitive or confidential nature, which data is only made available to authorised users associated with proxy server 38.

In a further modification all the proxy servers in a federated cache behave in this manner, each witholding the existence of at least some of the data which it is storing from at least some of the other proxy servers.

Further, certain data held by a proxy server may be selectively available to some proxy servers of the federation but not to others.

The embodiments have been described with reference to data for which a charge has been made. Networks in accordance with the invention may equally well be used to convey data for which no charge is made either in addition to or instead of chargeable data.

In addition to, or as an alternative to, tagging pages with

an expiry date, means may be provided to allow an IP to broadcast a message to the proxy servers indicating that a particular page is now out of date. The proxy server or servers holding that page may then update the expiry date associated with that page, or else delete the page concerned from their cache memory as appropriate, the page being restored when the next request for it is received from a user.

Alternatively, out-of-date records may simply be deleted in response to instructions broadcast from the IPs. This can avoid the need for proxy servers to store expiry dates as such.

Further, at least some of the data held by a proxy server may be kept in permanently stored form. For example, data kept by a proxy server may include or consist entirely of reference works such as encyclopedias stored in read-only memory such as CD-ROM. To the user or another proxy server, the proxy server will behave just like any other proxy server.

At least some of the proxy servers may hold information which does not appear in the directories of the other proxy servers, but which is nonetheless available if requested. The network is then provided with a request broadcast facility whereby, if a proxy server cannot find a page in its own directory or directories of which it has copies, then it broadcasts a request to the other members of the federation. Only if no positive response is received does it send the request to an IP.

In another modification, the LRU algorithm may be replaced by an algorithm which attempts to predict which pages will be popular in the near future. For instance, some pages may be very popular during weekends, but not during weekdays. Under these circumstances the LRU algorithm may cause these pages

to be stored for most of the week, deleted on Friday and then refetched on Saturday. A more complex algorithm may take this into account when selecting pages for deletion.

In a further modification, a predictive algorithm fetches pages before they are requested. If the expensive link is much slower than the links from the proxy server to the customer then this will avoid delaying the first client while the page is transmitted from the IP.

Claims

1. A communications network for providing communication between at least one provider of data and a plurality of users, the network comprising a plurality of nodes, each node being arranged to receive a request for data from a user and to supply a copy of the data requested to that user, at least one first node comprising memory means arranged to store, in a semi-permanent manner, a copy of data requested by a user, at least one node comprising index means arranged to store information indicating the contents of its own memory means and at least part of the contents of the memory means of at least one other node, and means for providing communication between the nodes and the at least one provider of data.

2. A communications network as claimed in Claim 1 in which at least one node comprises data which is not included in the index means of at least one other node.

3. A communications network as claimed in Claim 1 or 2 in which the at least one first node comprises request processing means for processing a request for data from a user coupled thereto, the request processing means comprising means to consult the index of the node,

means to supply data from the memory means of the node if the data requested is present therein,

means to obtain the data from the memory means of another node if the data is held by that node,

means to obtain the data from a provider of data if the data is not held by any node, and

means to store in a semi-permanent manner, the data

requested by the user in the memory means of the node if that data was not previously stored therein and to update the index means of the node.

4. A communications network as claimed in Claim 3, further comprising means to update the index means of at least one further node to indicate the presence and location of the newly-stored data.

5. A communication network as claimed in Claim 3 or 4 in which the data requested by the user is stored in a semi-permanent manner only if that data is not already present in the memory means of another node.

6. A communications network as claimed in any one of Claims 3, 4 or 5, in which the request for data comprises authorisation to pay for the data requested, in which the request processing means comprises means to transfer the authorisation to the provider of the data.

7. A communications network as claimed in Claim 6, in which the request processing means comprises means to temporarily store the authorisation to pay.

8. A communications network as claimed in Claim 6 or 7 in which the request processing means comprises means to forward the authorisation to pay to the node providing the data when the data is provided from another node.

9. A communications network as claimed in any preceding claim, in which the at least one first node comprises means for determining the usage of each item of data stored in its own memory means, and means for selectively erasing lesser used data.

10. A communications network as claimed in any preceding

claim, comprising means to cause an item of semi-permanently stored data to be deleted when it is no longer valid.

11. A communications network for providing communication between at least one provider of data and a plurality of users, the network comprising a node arranged to receive requests for data from said users,

the node comprising memory means arranged to store, in a semi-permanent manner, a copy of data requested by a user, and index means arranged to store an indication of the contents of the memory means,

request processing means arranged to process a request for data from a user, the request being accompanied by an authorisation to pay for the data requested, the request processing means being arranged to;

supply the user with the requested data from the memory means and transfer the authorisation to pay to the provider of the data requested in the event of data requested being present in the memory means; and

in the event of the data requested not being present in the memory means, obtain the data requested from a provider of data, store that data in the memory means, update its index, supply the user with the data requested, and transfer the authorisation to pay to the provider of that data.

12. A data communication network substantially as described with reference to Figure 1 or Figure 2 of the drawings.

17

Patents Act 1977
Examiner's report to the Comptroller under Section 17
(The Search report)

Application number
GB 9420383.3

Relevant Technical Fields

(i) UK Cl (Ed.M) G4A AMX, AUDB

(ii) Int Cl (Ed.5) G06F 13/38, 15/40

Search Examiner
PAUL NICHOLLS

Date of completion of Search
13 DECEMBER 1994

Databases (see below)
(i) UK Patent Office collections of GB, EP, WO and US patent specifications.

(ii)

Documents considered relevant following a search in respect of Claims :-
1-10

Categories of documents

X: Document indicating lack of novelty or of inventive step.

Y: Document indicating lack of inventive step if combined with one or more other documents of the same category.

A: Document indicating technological background and/or state of the art.

P: Document published on or after the declared priority date but before the filing date of the present application.

E: Patent document published on or after, but with priority date earlier than, the filing date of the present application.

&: Member of the same patent family; corresponding document.

Category	Identity of document and relevant passages		Relevant to claim(s)
X	GB 2277176 A	(FUJITSU) whole document	1 at least
X	GB 2227585 A	(HITACHI) whole document	"
X	EP 0600457 A2	(IBM) whole document	"
X	EP 0278472 A2	(IBM) whole document	"
X	US 5230048 A	(MOY) whole document	"
X	US 4825354 A	(AGRAWAL AND EZZAT) whole document	"

Databases: The UK Patent Office database comprises classified collections of GB, EP, WO and US patent specifications as outlined periodically in the Official Journal (Patents). The on-line databases considered for search are also listed periodically in the Official Journal (Patents).

Electronic Patent Application Fee Transmittal

Application Number:	11980687
Filing Date:	31-Oct-2007
Title of Invention:	Controlling access to data in a data processing system
First Named Inventor/Applicant Name:	David A. Farber
Filer:	Brian Siritzky
Attorney Docket Number:	2618-0017

Filed as Large Entity

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Claims in excess of 20	1202	40	52	2080
Independent claims in excess of 3	1201	6	220	1320
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Miscellaneous:				
Request for continued examination	1801	1	810	810
		Total in USD ($)		**4210**

Electronic Acknowledgement Receipt

EFS ID:	7443343
Application Number:	11980687
International Application Number:	
Confirmation Number:	6761
Title of Invention:	Controlling access to data in a data processing system
First Named Inventor/Applicant Name:	David A. Farber
Customer Number:	75948
Filer:	Brian Siritzky
Filer Authorized By:	
Attorney Docket Number:	2618-0017
Receipt Date:	19-APR-2010
Filing Date:	31-OCT-2007
Time Stamp:	17:41:22
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$4210
RAM confirmation Number	4394
Deposit Account	501860
Authorized User	

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

Charge any Additional Fees required under 37 C.F.R. Section 1.16 (National application filing, search, and examination fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and processing fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Information Disclosure Statement (IDS) Filed (SB/08)	PA_1449_with_RCE_04_19_2010.pdf	707275 b16b56bb42a40dcca56d8ec0ff169559ad0f6420	no	4
Warnings:					
Information:					
This is not an USPTO supplied IDS fillable form					
2	Request for Continued Examination (RCE)	2618_0017_RCE_request_03_30_2010_sb0030e_fill.pdf	769303 954b16c0ae93b179fb76310a7bfa7f5bcd0bbaac	no	3
Warnings:					
Information:					
3	Transmittal Letter	PA_IDS_with_RCE_04_19_2010.pdf	314802 67714dbd761c63bdd578c21742520bb00a4da1bb	no	6
Warnings:					
Information:					
4		2618_0017_PA_Amendment_with_RCE_04_17_2010.pdf	352930 50089214a130d1579f5063d6156a6ec9d3146583	yes	37

Multipart Description/PDF files in .zip description

Document Description	Start	End
Amendment Submitted/Entered with Filing of CPA/RCE	1	1
Specification	2	9
Claims	10	29
Applicant Arguments/Remarks Made in an Amendment	30	34
Applicant summary of interview with examiner	35	36
Applicant Arguments/Remarks Made in an Amendment	37	37

Warnings:					
Information:					
5	NPL Documents	NP0005.pdf	1311741 6a8fa4b9fc9a53e0c6384a286e422846d276b31e	no	10
Warnings:					

Information:					
6	NPL Documents	NP0001.pdf	1195818 42e396c180c28a3164af4f9aa0f1d6534fca3909	no	8
Warnings:					
Information:					
7	NPL Documents	NP0002.pdf	144371 e86c10dc325d6777ecf7eb02c113157d9e324677	no	12
Warnings:					
Information:					
8	NPL Documents	NP0000.pdf	4923848 476b5d17552605fad694b23501be3fed0f77b297	no	10
Warnings:					
Information:					
9	NPL Documents	NP0003.pdf	79614 c6d96caff862ea3fb2c213e74c295239cb3397d0	no	20
Warnings:					
Information:					
10	Foreign Reference	F0001.pdf	4964100 e1a7d50ed2990b12f40e2c74ea7b96f52dab10ec	no	129
Warnings:					
Information:					
11	Foreign Reference	F0000.pdf	750254 a4e17dea2779b0e926a71bce4d2b9ec9ae23ea3d	no	20
Warnings:					
Information:					
12	NPL Documents	NP0004.pdf	462551 aae379c2de2447cc27830b7ca9248ac6a7a763f1	no	19
Warnings:					
Information:					
13	Fee Worksheet (PTO-875)	fee-info.pdf	33300 6d5bbc24978ded9b5344d0b9bf74a91298d1b60a	no	2
Warnings:					
Information:					
			Total Files Size (in bytes):	16009907	

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.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT FORM PTO-1449 (modified) Sheet 1 of 4		
	Application No.	11/980,687
	Filing Date	October 31, 2007
	First Named Inventor	FARBER, David
	Group Art Unit	2432
	Examiner Name	LEMMA, SAMSON B.
	Attorney Docket No.	2618-0017
	Confirmation No.	6761

U.S. PATENT DOCUMENTS				
Examiner Initials*	Cite No.	Document No.	Publication/ Issue Date	Name of Patentee or Applicant of Cited Document
	1-1	US-5491817	February 1996	Gopal et al.
	1-2	US-5581764	December 1996	Fitzgerald et al.
	1-3	US-5600834	February 1997	Howard
	1-4	US-5630067	1997/05	Kindell et al.
	1-5	US-5694596	December 1997	Campbell
	1-6	US-5701316	December 1997	Alferness et al.
	1-7	US-5710922	January 1998	Alley et al.
	1-8	US-5757915	May 1998	Aucsmith et al.
	1-9	US-5907619	May 1999	Davis
	1-10	US-5991414	November 1999	Garay et al.
	1-11	US-6135646	2000/10/24	Kahn et al.
	1-12			
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	1-25			
	1-26			

Examiner Signature		Date Considered	

*Examiner: Initial if reference was considered, whether or not citation is in conformance with MPEP 609. Draw a line through citation if not in conformance and not considered. Include a copy of this form with next communication to applicant.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT FORM PTO-1449 (modified) Sheet 2 of 4		
	Application No.	11/980,687
	Filing Date	October 31, 2007
	First Named Inventor	FARBER, David
	Group Art Unit	2432
	Examiner Name	LEMMA, SAMSON B.
	Attorney Docket No.	2618-0017
	Confirmation No.	6761

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No.	Document No.	Publication Date	Name of Patentee or Applicant of Cited Document	Notes
	2-1	GB 2294132 A	1996/04/17	Johnson	
	2-2	WO 97/43717	1997/11/20	Kahn	
	2-3				
	2-4				
	2-5				
	2-6				
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	2-26				

Examiner Signature		Date Considered	

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT FORM PTO-1449 (modified) Sheet 3 of 4		
	Application No.	11/980,687
	Filing Date	October 31, 2007
	First Named Inventor	FARBER, David
	Group Art Unit	2432
	Examiner Name	LEMMA, SAMSON B.
	Attorney Docket No.	2618-0017
	Confirmation No.	6761

NON-PATENT REFERENCES

Examiner Initials*	Cite No.	Non-patent Reference bibliographic information, where available	Notes
	3-1	FOWLER, et al. "A User-Level Replicated File System," AT&T Bell Laboratories Technical Memorandum 0112670-930414-05, April 1993, and USENIX 1993 Summer Conference Proceedings, Cincinnati, OH, June 1993.	
	3-2	GREENE, D., et al., "Multi-Index Hashing for Information Retrieval", Nov. 20-22, 1994, Proceedings, 35th Annual Symp on Foundations of Computer Science, IEEE, pgs. 722 - 731.	
	3-3	HIRANO, et al, "Extendible hashing for concurrent insertions and retrievals," in Proc 4th Euromicro Workshop on Parallel and Distributed Processing, 1996 (PDP '96), Jan. 24, 1996 to Jan. 26, 1996, pgs. 235 – 242, Braga , Portugal.	
	3-4	PRENEEL et al., "The Cryptographic Hash Function RIPEMD-160", appeared in CryptoBytes RSA Laboratories, vol. 3, no. 2, pp. 9-14, Fall, 1997 (also Bosselaers et al., "The RIPEMD-160 Cryptographic Hash Function", Jan. 1997, Dr. Dobb's Journal, pp. 24-28)	
	3-5	PRUSKER et al., "The Siphon: Managing Distant Replicated Repositories" Nov. 8-9, 1990, Proc. Management of Replicated Data IEEE.	
	3-6	Reply to Examination Report, Munich, Nov. 18, 2009, in Application No. EP 96 910 762.2 [19 pgs.]	
	3-7	RICH, K. et al, "Hobgoblin: A File and Directory Auditor", Sep. 30-Oct. 3, 1991, Lisa V., San Diego, CA.	

Examiner Signature		Date Considered	

*Examiner: Initial if reference was considered, whether or not citation is in conformance with MPEP 609. Draw a line through citation if not in conformance and not considered. Include a copy of this form with next communication to applicant. Notes: If identified, the following is provided: EA = English Abstract, T = Translation, PT = Partial Translation, SOR = Statement of Relevancy, PF = Patent Family.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT FORM PTO-1449 (modified) Sheet 4 of 4		
	Application No.	11/980,687
	Filing Date	October 31, 2007
	First Named Inventor	FARBER, David
	Group Art Unit	2432
	Examiner Name	LEMMA, SAMSON B.
	Attorney Docket No.	2618-0017
	Confirmation No.	6761

NON-PATENT REFERENCES

Examiner Initials*	Cite No.	Non-patent Reference bibliographic information, where available	Notes
	4-1	U.S. Reexam Control No. 90/010,260 - 2010-04-08 PTO Notice of Intent to Issue Ex Parte Reexamination Certificate	
	4-2	USPTO Final Office Action in U.S. Appln. No. 10/742,972, 12/22/2009.	
	4-3	USPTO, Advisory Action, 03/23/2010, in U.S. Appln. No. 11/980,679.	
	4-4	USPTO, Final Office Action in U.S. Reexam Control No. 90/010,260, January 29, 2010.	
	4-5	USPTO, Final Office Action mailed 01/12/2010 in U.S. Appln. No. 11/980,679.	
	4-6		
	4-7		

Examiner Signature		Date Considered	

*Examiner: Initial if reference was considered, whether or not citation is in conformance with MPEP 609. Draw a line through citation if not in conformance and not considered. Include a copy of this form with next communication to applicant. Notes: If identified, the following is provided: EA = English Abstract, T = Translation, PT = Partial Translation, SOR = Statement of Relevancy, PF = Patent Family.

PTO/SB/06 (07-06)
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PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number	Filing Date	☐ To be Mailed
11/980,687	10/31/2007	

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY ☐ RATE ($)	SMALL ENTITY ☐ FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	71 minus 20 =	*	X $ =		OR	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	10 minus 3 =	*	X $ =			X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $250 ($125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT 04/19/2010	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE ($)	SMALL ENTITY ADDITIONAL FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	* 71	Minus	** 25	=	X $ =		OR	X $ =	
Independent (37 CFR 1.16(h))	* 10	Minus	***4	=	X $ =		OR	X $ =	
☐ Application Size Fee (37 CFR 1.16(s))									
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
					TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

AMENDMENT	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)		RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =		OR	X $ =	
Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =		OR	X $ =	
☐ Application Size Fee (37 CFR 1.16(s))									
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
					TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

Legal Instrument Examiner:
/PEGGY YARBOROUGH/

This collection of information is required by 37 CFR 1.16. 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 12 minutes 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.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

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PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number	Filing Date	☐ To be Mailed
11/980,687	10/31/2007	

APPLICATION AS FILED – PART I

	(Column 1)	(Column 2)	SMALL ENTITY ☐		OR	OTHER THAN SMALL ENTITY	
FOR	NUMBER FILED	NUMBER EXTRA	RATE ($)	FEE ($)		RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	71 minus 20 =	*	X $ =		OR	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	10 minus 3 =	*	X $ =			X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $250 ($125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT	04/19/2010	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE ($)	ADDITIONAL FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 71	Minus	** 25	=	X $ =		OR	X $ =	
	Independent (37 CFR 1.16(h))	* 10	Minus	***4	=	X $ =		OR	X $ =	
	☐ Application Size Fee (37 CFR 1.16(s))									
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

AMENDMENT		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =		OR	X $ =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =		OR	X $ =	
	☐ Application Size Fee (37 CFR 1.16(s))									
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

Legal Instrument Examiner:
/PEGGY YARBOROUGH/

This collection of information is required by 37 CFR 1.16. 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 12 minutes 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.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Interview Summary	Application No.	Applicant(s)	
	11/980,687	FARBER ET AL.	
	Examiner	Art Unit	
	Samson B. Lemma	2432	

All participants (applicant, applicant's representative, PTO personnel):

(1) *Samson Lemma*. (3)_____.

(2) *Brian Siritzky Ph.D. Registration No. 37497*. (4)_____.

Date of Interview: *17 March 2010*.

Type: a)☐ Telephonic b)☐ Video Conference
c)☒ Personal [copy given to: 1)☐ applicant 2)☐ applicant's representative]

Exhibit shown or demonstration conducted: d)☐ Yes e)☒ No.
If Yes, brief description: _____.

Claim(s) discussed: *1,20,21 and 24*.

Identification of prior art discussed: _____.

Agreement with respect to the claims f)☒ was reached. g)☐ was not reached. h)☐ N/A.

Substance of Interview including description of the general nature of what was agreed to if an agreement was reached, or any other comments: *See Continuation Sheet*.

(A fuller description, if necessary, and a copy of the amendments which the examiner agreed would render the claims allowable, if available, must be attached. Also, where no copy of the amendments that would render the claims allowable is available, a summary thereof must be attached.)

THE FORMAL WRITTEN REPLY TO THE LAST OFFICE ACTION MUST INCLUDE THE SUBSTANCE OF THE INTERVIEW. (See MPEP Section 713.04). If a reply to the last Office action has already been filed, APPLICANT IS GIVEN A NON-EXTENDABLE PERIOD OF THE LONGER OF ONE MONTH OR THIRTY DAYS FROM THIS INTERVIEW DATE, OR THE MAILING DATE OF THIS INTERVIEW SUMMARY FORM, WHICHEVER IS LATER, TO FILE A STATEMENT OF THE SUBSTANCE OF THE INTERVIEW. See Summary of Record of Interview requirements on reverse side or on attached sheet.

/Samson B Lemma/ Examiner, Art Unit 2432	

Summary of Record of Interview Requirements

Manual of Patent Examining Procedure (MPEP), Section 713.04, Substance of Interview Must be Made of Record
A complete written statement as to the substance of any face-to-face, video conference, or telephone interview with regard to an application must be made of record in the application whether or not an agreement with the examiner was reached at the interview.

Title 37 Code of Federal Regulations (CFR) § 1.133 Interviews
Paragraph (b)

In every instance where reconsideration is requested in view of an interview with an examiner, a complete written statement of the reasons presented at the interview as warranting favorable action must be filed by the applicant. An interview does not remove the necessity for reply to Office action as specified in §§ 1.111, 1.135. (35 U.S.C. 132)

37 CFR §1.2 Business to be transacted in writing.
All business with the Patent or Trademark Office should be transacted in writing. The personal attendance of applicants or their attorneys or agents at the Patent and Trademark Office is unnecessary. The action of the Patent and Trademark Office will be based exclusively on the written record in the Office. No attention will be paid to any alleged oral promise, stipulation, or understanding in relation to which there is disagreement or doubt.

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The action of the Patent and Trademark Office cannot be based exclusively on the written record in the Office if that record is itself incomplete through the failure to record the substance of interviews.

It is the responsibility of the applicant or the attorney or agent to make the substance of an interview of record in the application file, unless the examiner indicates he or she will do so. It is the examiner's responsibility to see that such a record is made and to correct material inaccuracies which bear directly on the question of patentability.

Examiners must complete an Interview Summary Form for each interview held where a matter of substance has been discussed during the interview by checking the appropriate boxes and filling in the blanks. Discussions regarding only procedural matters, directed solely to restriction requirements for which interview recordation is otherwise provided for in Section 812.01 of the Manual of Patent Examining Procedure, or pointing out typographical errors or unreadable script in Office actions or the like, are excluded from the interview recordation procedures below. Where the substance of an interview is completely recorded in an Examiners Amendment, no separate Interview Summary Record is required.

The Interview Summary Form shall be given an appropriate Paper No., placed in the right hand portion of the file, and listed on the "Contents" section of the file wrapper. In a personal interview, a duplicate of the Form is given to the applicant (or attorney or agent) at the conclusion of the interview. In the case of a telephone or video-conference interview, the copy is mailed to the applicant's correspondence address either with or prior to the next official communication. If additional correspondence from the examiner is not likely before an allowance or if other circumstances dictate, the Form should be mailed promptly after the interview rather than with the next official communication.

The Form provides for recordation of the following information:
- Application Number (Series Code and Serial Number)
- Name of applicant
- Name of examiner
- Date of interview
- Type of interview (telephonic, video-conference, or personal)
- Name of participant(s) (applicant, attorney or agent, examiner, other PTO personnel, etc.)
- An indication whether or not an exhibit was shown or a demonstration conducted
- An identification of the specific prior art discussed
- An indication whether an agreement was reached and if so, a description of the general nature of the agreement (may be by attachment of a copy of amendments or claims agreed as being allowable). Note: Agreement as to allowability is tentative and does not restrict further action by the examiner to the contrary.
- The signature of the examiner who conducted the interview (if Form is not an attachment to a signed Office action)

It is desirable that the examiner orally remind the applicant of his or her obligation to record the substance of the interview of each case. It should be noted, however, that the Interview Summary Form will not normally be considered a complete and proper recordation of the interview unless it includes, or is supplemented by the applicant or the examiner to include, all of the applicable items required below concerning the substance of the interview.

A complete and proper recordation of the substance of any interview should include at least the following applicable items:

1) A brief description of the nature of any exhibit shown or any demonstration conducted,
2) an identification of the claims discussed,
3) an identification of the specific prior art discussed,
4) an identification of the principal proposed amendments of a substantive nature discussed, unless these are already described on the Interview Summary Form completed by the Examiner,
5) a brief identification of the general thrust of the principal arguments presented to the examiner,
   (The identification of arguments need not be lengthy or elaborate. A verbatim or highly detailed description of the arguments is not required. The identification of the arguments is sufficient if the general nature or thrust of the principal arguments made to the examiner can be understood in the context of the application file. Of course, the applicant may desire to emphasize and fully describe those arguments which he or she feels were or might be persuasive to the examiner.)
6) a general indication of any other pertinent matters discussed, and
7) if appropriate, the general results or outcome of the interview unless already described in the Interview Summary Form completed by the examiner.

Examiners are expected to carefully review the applicant's record of the substance of an interview. If the record is not complete and accurate, the examiner will give the applicant an extendable one month time period to correct the record.

Examiner to Check for Accuracy

If the claims are allowable for other reasons of record, the examiner should send a letter setting forth the examiner's version of the statement attributed to him or her. If the record is complete and accurate, the examiner should place the indication, "Interview Record OK" on the paper recording the substance of the interview along with the date and the examiner's initials.

Continuation of Substance of Interview including description of the general nature of what was agreed to if an agreement was reached, or any other comments: Applicant's represenative Brain Sintzky registration No. 37,497 and examiner have discussed at least the independent claims 1, 20, 21 and 24. Applicant's rep. and examiner agreed to amend the independent claims in such a way that the limitation "Name" is specificly defined in the claim itself. Applicant's rep. Submitted a proposed amendment and the limitation "name" is defined in the claims. In view of the proposed amendent and the discussion made at the interview both parties have agreed the claim limitation that would overcome the ground of rejection and possibly make the application allowable. Furthermore a discussion and agreement was made to amend the claims to overcome the potential 101 rejection. Applicant's represenative is going to file an RCE. Examiner has finally noted that further search and consideration would be conducted and approval from SPE is required before the application is finally allowed..

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Facsimile Cover Sheet

To: Examiner LEMMA, S. B.
United States Patent &
Trademark Office

Facsimile: 571 273-3806
Phone: 571 272.3806

From: **Brian Siritzky, Ph.D.**

Date: March 15, 2010

Number of pages (including this page): 2

Regarding:	U.S. Application No. 11/980,687
Attachment(s):	Proposed clarifications
Message:	Examiner Lemma: Here are some **proposals** for discussion at our interview on Wednesday this week. Please do NOT ENTER any claim amendments. I look forward to meeting you on Wednesday 03/17/2010 at 1 PM to discuss. Please confirm receipt. Please telephone me with any questions, concerns, etc. (703.894.6405). Thank you. Sincerely, Brian Siritzky, Reg. No. 37,497

CONFIDENTIALITY NOTICE
The documents accompanying this facsimile transmission contain information which may be confidential and/or legally privileged. This information is only intended for the use of the individual or entity named above. **IF YOU ARE NOT THE NAMED RECIPIENT, YOU ARE HEREBY NOTIFIED THAT ANY DISCLOSURE, COPYING, DISTRIBUTION OR TAKING OF THIS INFORMATION FOR ANY USE WHATSOEVER IS STRICTLY PROHIBITED.** If you have received this facsimile in error, please immediately contact us by telephone to arrange for return of the original documents to us.

FOR DISCUSSION ONLY – DO NOT ENTER

Application Serial No.: 11/980,687 Examiner: LEMMA, S. B.

Here, for discussion, are some possible clarifications of the "name":

... wherein the name is based, at least in part, on a function of the data which comprise the contents of the data item, ...

... wherein *two identical data items will have the same name*, ...

... wherein the name is based on *all of the data* in the data item, ...

... wherein the name of the data item will change if the contents of the data item change, ...

PAGE 2/2 * RCVD AT 3/15/2010 12:11:46 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-5/38 * DNIS:2733806 * CSID:7038946430 * DURATION (mm-ss):00-50
GOOG-1002-Page 546 of 841

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/980,687	10/31/2007	David A. Farber	2618-0017	6761

75948 7590 03/05/2010

DAVIDSON BERQUIST JACKSON & GOWDEY, LLP
ATTN: BRIAN SIRITZKY, Ph.D.
4300 WILSON BLVD., 7TH FLOOR
ARLINGTON, VA 22203

EXAMINER	
LEMMA, SAMSON B	
ART UNIT	PAPER NUMBER
2432	

MAIL DATE	DELIVERY MODE
03/05/2010	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.

Office Action Summary	Application No.	Applicant(s)	
	11/980,687	FARBER ET AL.	
	Examiner	Art Unit	
	Samson B. Lemma	2432	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 December 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-25* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-25* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This office action is in reply to an amendment filed on 12/11/2009. Claims 1-25 are pending.

2. The amendment made to independent claim 20 overcomes the objection set forth in the previous office action. Thus the objection provided to independent claim 20 is withdrawn.

3. The information disclosure statements (IDS) submitted on have been considered.

Response to Arguments

4. Applicant's argument filed on December 11, 2009 with respect to claims 1-25 have been fully considered but they are not persuasive.
Referring to the independent claims 1, 20, 21 and 24, applicant's representative argued that, the combination of the references on the record namely Blickenstaff in view of Orita, does not disclose the following limitations.
"the name being based at least in part on the data which comprise the contents of the data item; and (b) determining, based at least in part on said name, whether or not access to the data item is authorized"
Examiner disagrees with the above argument.
Examiner counters that a careful reading of reference in particular the secondary reference on the record Orita reveals that the feature argued

by the applicant's representative is indeed still taught by the reference/s on the record.

Examiner would like to point out that, Orita discloses the following on the abstract.

"**When a specified file access is requested** after the execution of the user program, **whether execution of the file access is permitted or not is determined according to access protection information.** The access protection information is information having access types **and file contents defined by the environment profile information."**

From what is recited above it is clear that the permission is determined based on the access protection information. Furthermore this access protection information have not only access types but also file contents. Thus the file content itself is one of the components in the access protection information that would be used for determining whether or not access is permitted.

In view of the above understanding such file content since it comprises of the content of the file it meets the limitation recited as " the name being based at least in part on the data which comprise the contents of the data item; and (b) determining, based at least in part on said name, whether or not access to the data item is authorized"

In view of this understanding, unlike, applicant's argument, each and every limitation of the independent claim is disclosed by the reference on the record. Furthermore In response to applicant's arguments against the references individually, Examiner would like to point out that one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references namely Blickenstaff in view of Orita. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

As indicated above, each and every limitation recited in independent claim is still disclosed by the reference on the record. Therefore the rejection is maintained.

Applicant's representative is encouraged to call the office and discuss how the broad limitation such as "name" recited in each independent claim be amended or elaborated to make the application distinct from the combination of the reference on the record.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said

subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. **Claims 1-10 and 13-25** are rejected under 35 U.S.C. 103(a) as being unpatentable over Blickenstaff et al (hereinafter referred to as **Blickenstaff**), U.S. Patent No. 5,537,585 (filed on Feb 25, 1994) in view of Yukio Orita (hereinafter referred to as **Orita)** U.S. Patent No. 5, 163,147 (Date of Patent: Nov 10,1992)

7. **As per independent claim 1, Blickenstaff discloses a method, in a system which includes a network of computers** *[See at least column 4, lines 23-28 and figure "1/local area network", ref. Num " 21, 22 and 42" and column 1, lines 6-8, "this invention relates to data communication networks, such as local area networks, that function to interconnect a plurality of data processors"] (Note: as it is disclosed on column 4, lines 26-28, "processors, shown on figure 1, are either personal computers, work stations or mini-computers")* **the method comprising:**

- **(a) obtaining a name for a data item, the name being included in a request for the data item** *[Figure 8, ref. Num "801-803" and column 13, lines 34-46,], ("4. File management scheme, including access methods. For example, DOS data files are named with a 1-8 byte name and a 0-3 byte extent, which are delimited by a "." (nnnnnnnn.xxx). The directory architecture is illustrated in FIG. 13 and takes the form of a hierarchical tree of directory names. The root is typically a volume, from which a number of directories branch. Each directory includes other directories*

and/or data files. A full data file name is represented by concatenating all the directory tree structure components from the root to the particular data file, with components being delimited by " ". An example of such a data file name using this convention is " vol\dir1\ dir3\ filename.ext".) **and**

Blickenstaff further discloses,

based on said name, determine the location of the file and providing the requesting computer obtain the requested file from its own storage device or from the different server, distinct from the requesting computer. *[See figure 8, and Column 5, lines 38-57]*

Blickenstaff does not explicitly disclose

- **the name being based at least in part on the data which comprise the contents of the data item; and (b) determining, based at least in part on said name, whether or not access to the data item is authorized.**

However, in the same field of endeavor **Orita at least on its abstract discloses the following which meets the above limitation.**

"**When a specified file access is requested** after the execution of the user program, **whether execution of the file access is permitted or not is determined according to access protection information.** The access protection information is information having access types **and file contents defined by the environment profile information."**

It would have been obvious to one having ordinary skill in the art, at the time the invention was made, to combine the feature such as **the name being based at least in part on the data which comprise the contents of the data item; and determining, based at least in part on said name, whether or not access to the data item is authorized** as per teachings of **Orita** into the method of accessing of the file using the file name as taught by **Blickenstaff** in order provide a more secure access control and accurately/expeditiously retrieve requested file/s.

8. **As per independent claim 20, Blickenstaff discloses a method comprising: controlling distribution of licensed content** *(column 5, lines 28-35, see "migration of files")* **from a first computer** *[Figure 1, ref. 41 and 43 or storage server processor 51]* **to a requesting computer** *[Figure 1, ref. Num "21" and "22"]* **in response to a request for the content from said requesting computer,** *[See figure 8, and Column 5, lines 38-57]*

the request including at least a name of the data file, *[Figure 8, ref. Num "801-803" and column 13, lines 34-46,], ("4. File management scheme, including access methods. For example, DOS data files are named with a 1-8 byte name and a 0-3 byte extent, which are delimited by a "." (nnnnnnnn.xxx). The directory architecture is illustrated in FIG. 13 and takes the form of a hierarchical tree of directory names. The root is typically a volume, from which a number of directories branch. Each directory includes other directories and/or data files. A full data file name*

is represented by concatenating all the directory tree structure components from the root to the particular data file, with components being delimited by " ". An example of such a data file name using this convention is " vol\dir1\ dir3\ filename.ext".)

Blickenstaff further discloses,

based on said name, determine the location of the file and providing the requesting computer obtain the requested file from its own storage device or from the different server, distinct from the requesting computer. *[See figure 8, and Column 5, lines 38-57]*

Blickenstaff does not explicitly disclose the limitation recited as, the name having been determined using at least a function of the data comprising the data item, permitting the content to be provided to the requesting computer if the content is authorized or licensed.

However, in the same field of endeavor Orita at least on its abstract discloses the following which meets the above limitation.

"**When a specified file access is requested** after the execution of the user program, **whether execution of the file access is permitted or not is determined according to access protection information.** The access protection information is information having access types **and file contents defined by the environment profile information."**

It would have been obvious to one having ordinary skill in the art, at the time the invention was made, to combine the feature such as the name having been determined using at least a function of the data comprising the data item, permitting the content to be provided to the requesting computer if the content is authorized or licensed as per teachings of **Orita** into the method of accessing of the file using the file name as taught by **Blickenstaff** in order provide a more secure access control and accurately/expeditiously retrieve requested file/s.

9. **As per independent claim 21, Blickenstaff discloses a method comprising:**

(a) obtaining a list of names, one for each of a plurality of data items, wherein, for each of the data items *[Figure 8, ref. Num "801-803" and column 13, lines 34-46,], ("4. File management scheme, including access methods. For example, DOS data files are named with a 1-8 byte name and a 0-3 byte extent, which are delimited by a "." (nnnnnnnn.xxx). The directory architecture is illustrated in FIG. 13 and takes the form of a hierarchical tree of directory names. The root is typically a volume, from which a number of directories branch. Each directory includes other directories and/or data files. A full data file name is represented by concatenating all the directory tree structure components from the root to the particular data file, with components being delimited by " ". An example of such a data file name using this convention is " vol\dir1\ dir3\ filename.ext".)* **,**

(b) receiving, from a requestor, an identifier for a requested data item [*Figure 8, ref. Num "801-803" and column 13, lines 34-46,***],**

Blickenstaff further discloses,

based on said name, determine the location of the file and providing the requesting computer obtain the requested file from its own storage device or from the different server, distinct from the requesting computer. *[See figure 8, and Column 5, lines 38-57]*

Blickenstaff does not explicitly disclose the limitation recited as,

the corresponding name for that data item was determined as a function of the contents of the data item; said identifier having been determined based at least in part on the contents of the requested data item; (c) determining, based at least in part on said identifier for said requested data item, and using said list of names, whether the requestor may access the requested data item; and (d) based on said determining, if it is determined that requestor may not access the requested data item, denying access to the requested data item.

However, in the same field of endeavor **Orita** at least on its abstract discloses the following which meets the above limitation.

"**When a specified file access is requested** after the execution of the user program, **whether execution of the file access is permitted or not is determined according to access protection information.** The access protection information is information having access types **and file contents defined by the environment profile information."**

It would have been obvious to one having ordinary skill in the art, at the time the invention was made, to combine the feature such as the name having been determined using at least a function of the data comprising the data item, permitting or denying the content to be provided to the requesting computer as per teachings of **Orita** into the method of accessing of the file using the file name as taught by **Blickenstaff** in order provide a more secure access control and accurately/expeditiously retrieve requested file/s.

10. **As per independent claim 24,** limitations recited in independent claim 24 is similar/equivalent to that of the limitations recited in independent claim 21, thus the claim is rejected for the same reasons/rationale as that of independent claim 21.

11. **As per dependent claim 2, the combination of Blickenstaff and Orita** discloses **the method as applied to claims above. Furthermore Orita discloses the method further comprising: (c) based at least in part on said determining, denying access to the data item when it is determined that access to the data item is not authorized.** [See abstract] *(On abstract the following has been disclosed. "When a specified*

file access is requested after the execution of the user program, whether execution of the file access is permitted or not is determined according to access protection information. The access protection information is information having access types and file contents defined by the environment profile information."

12. **As per dependent claim 3, the combination of Blickenstaff and Orita discloses the method as applied to claims above. Furthermore Orita discloses the method wherein the request is received from a particular requestor, and wherein said step (b) of determining comprises: determining whether or not the particular requestor is authorized.** [See abstract] *(On abstract the following has been disclosed. "When a specified file access is requested after the execution of the user program, whether execution of the file access is permitted or not is determined according to access protection information. The access protection information is information having access types and file contents defined by the environment profile information."*

13. **As per dependent claim 4, the combination of Blickenstaff and Orita discloses the method as applied to claims above. Furthermore Orita discloses the method further comprising: if it is determined that the particular requestor is not authorized, denying the particular requestor's request for the data item.** [See abstract] *(On abstract the following has been disclosed. "When a specified file access is requested after the execution of the user program, whether execution of the file access is permitted or not is determined according to access protection*

information. The access protection information is information having access types and file contents defined by the environment profile information."

14. **As per dependent claim 5, the combination of Blickenstaff and Orita discloses the method as applied to claims above. Furthermore Orita discloses the method wherein said step (b) of determining whether or not the data item is authorized comprises determining whether or not the name is contained in a database comprising a plurality of identifiers.** *[See figure 1 and abstract, See also Blickenstaff, figure 1]*

15. **As per dependent claim 6, the combination of Blickenstaff and Orita discloses the method as applied to claims above. Furthermore Orita discloses the method wherein the name for the data item is based on a function of the data which comprise the contents of the data file, and wherein the plurality of identifiers in the database are identifiers of licensed content items, and wherein the identifier of each licensed content item is based at least in part on the function of the data comprising the licensed content item.** *[See figure 1 and abstract, See also Blickenstaff, figure 1]*

16. **As per dependent claim 7, the combination of Blickenstaff and Orita discloses the method as applied to claims above. Furthermore Blickenstaff discloses the method further comprising: (d) collecting information regarding the data item.** *[See figure 1 and figure 8]*

17. **As per dependent claim 8, the combination of Blickenstaff and Orita discloses the method as applied to claims above. Furthermore**

Blickenstaff discloses the method, wherein the information collected includes at least one of: (a) information about which data items have been stored on a computer; (b) information about the content of the data item, (c) information about the owner of the data item, (d) information about the type of data item, (e) information about the contextual name of the data item, (f) information about whether the data item was copied; (g) the name of the data item; (h) information about an identity of the requestor; (i) a timestamp; (j) information about whether the data item was created; and (k) information about whether the data item was read. *[See figure 1 and figure 8]*

18. **<u>As per dependent claim 9, the combination of</u> Blickenstaff and Orita discloses the method as applied to claims above. Furthermore Blickenstaff discloses the method, wherein at least some of the information collected is maintained for accounting or billing purposes.** *(It is implicit that such secondary storage system provided, as shown on figure 1, ref. Num "51" and "52", which maintains/stores a collection of files to the users as shown on figure 1, ref. Num "21" and "22", could be used by the owner of the storage server/s shown on figure 1, in order to provide storage services for the users by charging them for the provided storage services)*

19. **<u>As per dependent claim 10, the combination of</u> Blickenstaff and Orita discloses the method as applied to claims above. Furthermore Blickenstaff discloses the method, further comprising: (d) tracking**

identities of data items requested. *[See at least figure 8, ref. Num "801-803"]*

20. **<u>As per dependent claims 13 and 22, the combination of</u> Blickenstaff and Orita discloses the method as applied to claims above. Furthermore Blickenstaff discloses the method, wherein the name is a True Name.** *[Figure 8, ref. Num "801-803" and column 13, lines 34-46,]*

21. **<u>As per dependent claim 14, the combination of</u> Blickenstaff and Orita discloses the method as applied to claims above. Furthermore Blickenstaff discloses the method, wherein a data item may comprise a file, a portion of a file, a page in memory, a digital message, a digital image, a video signal or an audio signal.** *[Figure 1, ref. Num "801-803"]*

22. **<u>As per dependent claims 15 and 23, the combination of</u> Blickenstaff and Orita discloses the method as applied to claims above. Furthermore Blickenstaff discloses the method, wherein at least some computers make up part of a peer-to-peer network of computers.** *(See at least column 4, lines 23-28 and figure "1/local area network", ref. Num " 21, 22 and 42" and column 1, lines 6-8, "this invention relates to data communication networks, such as local area networks, that function to interconnect a plurality of data processors"] (Note: as it is disclosed on column 4, lines 26-28, "processors, shown on figure 1, are either personal computers, work stations or mini-computers")*

23. **As per dependent claim 16, the combination of Blickenstaff and Orita discloses the method as applied to claims above. Furthermore Orita discloses the method, further comprising: (c) authorizing access to the data item when it is determined that the data item is authorized.** [See abstract] *(On abstract the following has been disclosed. "When a specified file access is requested after the execution of the user program, whether execution of the file access is permitted or not is determined according to access protection information. The access protection information is information having access types and file contents defined by the environment profile information."*

24. **As per dependent claim 17, the combination of Blickenstaff and Orita discloses the method as applied to claims above. Furthermore Blickenstaff discloses the method, wherein the authorized access permits copying of the data item from at least one of the plurality of computers.** *[Figure 8, ref. Num "809" and Column 5, lines 38-57]*

25. **As per dependent claim 18,** limitations recited in dependent claim 18 is similar/equivalent to that of the limitations recited in independent claim 20, thus the claim is rejected for the same reasons/rationale as that of independent claim 20.

26. **As per dependent claim 19, the combination of Blickenstaff and Orita discloses the method as applied to claims above. Furthermore Orita discloses the method, if it is determined that said data item is authorized, access to the data item is authorized** *[See abstract]* **from**

more than one of the plurality of computers*[See Blickenstaff, figure 1 and figure 8]*

27. **As per dependent claim 25, the combination of Blickenstaff and Orita discloses the method as applied to claims above. Furthermore Blickenstaff discloses the method, further comprising: in response to said request: (iv) allowing the data file to be delivered to the requesting computer if the data file is authorized.** *[See figure 8, and Column 5, lines 38-57,see also Orita's abstract how the authorization is determined, such as based on the content of the file]*

28. **Dependent claims 11-12** are rejected under 35 U.S.C. 103(a) as being unpatentable over Blickenstaff et al (hereinafter referred to as **Blickenstaff**), U.S. Patent No. 5,537,585 (filed on Feb 25, 1994) in view of Yukio Orita (hereinafter referred to as **Orita)** U.S. Patent No. 5, 163,147 (Date of Patent: Nov 10, 1992) further in view of Gramlich et al (hereinafter referred to as **Gramlich**), U.S. Patent No. 5,202,982 (date of Patent: 04/13/1993) (submitted/cited/listed with/in IDS)

29. **As per dependent claims 11 and 12, Blickenstaff discloses a method, in a system which includes a network of computers** *[See at least column 4, lines 23-28 and figure "1/local area network", ref. Num " 21, 22 and 42" and column 1, lines 6-8, "this invention relates to data communication networks, such as local area networks, that function to interconnect a plurality of data processors"] (Note: as it is disclosed on*

column 4, lines 26-28, "processors, shown on figure 1, are either personal computers, work stations or mini-computers") **the method comprising:**

- **(a) obtaining a name for a data item, the name being included in a request for the data item** *[Figure 8, ref. Num "801-803" and column 13, lines 34-46,], ("4. File management scheme, including access methods. For example, DOS data files are named with a 1-8 byte name and a 0-3 byte extent, which are delimited by a "." (nnnnnnnn.xxx). The directory architecture is illustrated in FIG. 13 and takes the form of a hierarchical tree of directory names. The root is typically a volume, from which a number of directories branch. Each directory includes other directories and/or data files. A full data file name is represented by concatenating all the directory tree structure components from the root to the particular data file, with components being delimited by " ". An example of such a data file name using this convention is " vol\dir1\ dir3\ filename.ext".)* **and**

Blickenstaff further discloses,

based on said name, determine the location of the file and providing the requesting computer obtain the requested file from its own storage device or from the different server, distinct from the requesting computer. *[See figure 8, and Column 5, lines 38-57]*

Blickenstaff does not explicitly disclose

- **the name being based at least in part on the data which comprise the contents of the data item; and (b) determining, based**

at least in part on said name, whether or not access to the data item is authorized.

However, in the same field of endeavor **Orita at least on its abstract discloses the following which meets the above limitation.**

"**When a specified file access is requested** after the execution of the user program, **whether execution of the file access is permitted or not is determined according to access protection information.** The access protection information is information having access types **and file contents defined by the environment profile information."**

It would have been obvious to one having ordinary skill in the art, at the time the invention was made, to combine the feature such as **the name being based at least in part on the data which comprise the contents of the data item; and determining, based at least in part on said name, whether or not access to the data item is authorized** as per teachings of **Orita** into the method of accessing of the file using the file name as taught by **Blickenstaff** in order provide a more secure access control and accurately/expeditiously retrieve requested file/s.

The combination of Blickenstaff and Orita does not explicitly discloses the limitation recited as,

wherein the name is based, at least in part, on a function of the data which comprise the contents of the data item, and wherein the function is a message digest function or a hash function and wherein the function is selected from the functions: MD4, MD5, and SHA.

However, in the same field of endeavor **Gramlich at least on its abstract and column 2, lines 52-55, discloses the following which meets the above limitation.**

"In the method and apparatus of the present invention a file to be added to the database is given a unique name that is dependent upon the contents of the file such that, when the contents of the source file changes, the name of the database component file to be added to the database also changes. Conversely, if two files of the same name have the same information contained therein, the same file name will be generated and the duplication of information in the database is prevented by providing a simple test that checks for the existence of the name of the database file before the generation and addition of the new file to the database. If the file name exists in the database, information is already contained in the database and the file is not generated and added to the database information. **Preferably the name of the file is generated by computing a hash value from the contents of the file concatenating the hash value to the name of the source file**."

It would have been obvious to one having ordinary skill in the art, at the time the invention was made, to add the feature such as the name is based, at least in part, on a function of the data which comprise the contents of the data item, and wherein the function is a message digest function or a hash function as per teachings of **Gramlich** into the method as taught by **the combination of Blickenstaff and Orita, in order to provide efficient system that saves resources by avoiding**

duplication of storage of files having the same content. [See Gramlich column 2, lines 36-51]

Conclusion

30. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

a. US Publication No. 2005/0010792 A1, to Carpentier et al discloses Systems wherein representing a number of assets on an originating computer begins with selecting the assets to be represented. Cryptographic hash asset identifiers are generated; each of the asset identifiers is computed using the contents of a particular asset. The asset identifier is a content-based or content-addressable asset name for the asset and is location independent. An asset list is generated that includes the asset identifiers computed from the assets. A cryptographic hash asset list identifier is generated that is computed from the asset list. The asset list identifier is stored for later retrieval. The assets selected are also stored for safekeeping either locally or on a computer network. In the event of loss of the files from the originating computer, the asset list identifier is retrieved. Using the asset list identifier, the original asset list is found and retrieved from its safe location. The asset identifiers from the retrieved asset list are used to find and retrieve the individual assets from their backup locations. The assets are verified by recomputing the cryptographic hash asset identifier for each asset retrieved and comparing it to the asset identifier from the asset list. The MD5 algorithm is used for the cryptographic hash function. Assets are

retrieved using a multicast protocol. A series of importer programs searches for assets to retrieve in progressively more remote locations. Assets are retrieved whole or in segments. [See at least the abstract]

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Samson B Lemma whose telephone number is 571-272-3806. The examiner can normally be reached on Monday-Friday (8:00 am---4: 30 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, BARRON JR GILBERTO can be reached on 571-272-3799. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system.

/Samson B Lemma/
Examiner, Art Unit 2432

/Jung Kim/
Primary Examiner, AU 2432

Notice of References Cited	Application/Control No. 11/980,687	Applicant(s)/Patent Under Reexamination FARBER ET AL.	
	Examiner Samson B. Lemma	Art Unit 2432	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-2005/0010792	01-2005	Carpentier et al.	713/193
	B	US-			
	C	US-			
	D	US-			
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	11980687	FARBER ET AL.
	Examiner	Art Unit
	Samson B Lemma	2432

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	05/10/2009	02/20/2010							
	1	✓	✓							
	2	✓	✓							
	3	✓	✓							
	4	✓	✓							
	5	✓	✓							
	6	✓	✓							
	7	✓	✓							
	8	✓	✓							
	9	✓	✓							
	10	✓	✓							
	11	✓	✓							
	12	✓	✓							
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	15	✓	✓							
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	23	✓	✓							
	24	✓	✓							
	25	✓	✓							

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	11980687	FARBER ET AL.
	Examiner	Art Unit
	Samson B Lemma	2432

SEARCHED

Class	Subclass	Date	Examiner
726	28	02/20/2010	SL
713	181	02/20/2010	SL

SEARCH NOTES

Search Notes	Date	Examiner
713/$, 726/$ (With text Search)	02/20/2010	SL
EAST (See attached)	02/20/2010	SL
NPL (IEEE, ACM DIGITAL LIBRARY, GOOGLE, CITESEER)	02/20/2010	SL
Inventor's name Search	02/20/2010	SL

INTERFERENCE SEARCH

Class	Subclass	Date	Examiner

INFORMATION DISCLOSURE STATEMENT BY APPLICANT FORM PTO-1449 (modified) Sheet 1 of 17		
	Application No.	11/980,687
	Filing Date	October 31, 2007
	First Named Inventor	David A. FARBER et al.
	Group Art Unit	2166 2432
	Examiner Name	~~Unassigned~~ Samson Lemma
	Attorney Docket No.	2618-0017
	Confirmation No.	6761

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.	Document No.	Publication/ Issue Date	Name of Patentee or Applicant of Cited Document
/S.L./	1-1	US-2004-0139097	July 2004	Farber et al.
	1-2	US-2005-0114296-A1	May 2005	Farber et al.
	1-3	US-3668647	June 1972	Evangelisti et al.
	1-4	US-4215402	July 1980	Mitchell et al.
	1-5	US-4290105	September 1981	Cichelli et al.
	1-6	US-4376299	March 1983	Rivest
	1-7	US-4405829	September 1983	Rivest et al.
	1-8	US-4412285	October 1983	Neches et al.
	1-9	US-4414624	November 1983	Summer, Jr. et al.
	1-10	US-4441155	April 1984	Fletcher et al.
	1-11	US-4464713	August 1984	Benhase et al.
	1-12	US-4490782	December 1984	Dixon et al.
	1-13	US-4571700	February 1986	Emry, Jr. et al.
	1-14	US-4577293	March 1986	Matick et al.
	1-15	US-4642793	February 1987	Meaden
	1-16	US-4675810	June 1987	Gruner et al.
	1-17	US-4691299	September 1987	Rivest et al.
	1-18	US-4725945	February 1988	Kronstadt et al.
	1-19	US-4773039	September 1988	Zamora
	1-20	US-4887235	December 1989	Holloway et al.
	1-21	US-4888681	December 1989	Barnes et al.
	1-22	US-4922414	May 1990	Holloway et al.
	1-23	US-4922417	May 1990	Churm et al.
	1-24	US-4972367	November 1990	Burke
	1-25	US-5007658	April 1991	Bendert et al.
/S.L./	1-26	US-5025421	June 1991	Cho

Examiner Signature	/Samson Lemma/	Date Considered	02/27/2010

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ALL REFERENCES CONSIDERED EXCEPT WH... ...IED THROUGH. /S.L./

INFORMATION DISCLOSURE STATEMENT BY APPLICANT FORM PTO-1449 (modified)	Application No.	11/980,687
	Filing Date	October 31, 2007
	First Named Inventor	FARBER, David
	Group Art Unit	2432
	Examiner Name	LEMMA, SAMSON B.
	Attorney Docket No.	2618-0017
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U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.	Document No.	Publication/ Issue Date	Name of Patentee or Applicant of Cited Document
	1-1	US-2002/0082999	27-Jun-02	Lee, Cheol-Woong ; et al.
	1-2	US-2002-0052884	2001/11/15	Farber et al.
	1-3	US-2003/0078888	24-Apr-03	Lee, Cheol-Woong ; et al.
	1-4	US-2003/0078889	24-Apr-03	Lee, Cheol-Woong ; et al.
	1-5	US-2003/0095660	22-May-03	Lee, Chang Young ; et al.
	1-6	US-2007-0185848	2007/03/15	Farber et al.
	1-7	US-2008-0065635	2007/10/31	Farber et al.
	1-8	US-2008-0066191	2007/10/31	Farber et al.
	1-9	US-2008-0071855	2007/10/31	Farber et al.
	1-10	US-2008-0082551	2007/10/31	Farber et al.
	1-11	US-3835260	Sept. 10, 1974	Prescher, et al.
	1-12	US-4096568	Jun. 20, 1978	Bennett et al.
	1-13	US-4221003	Sep. 2, 1980	Chang et al.
	1-14	US-4558413	Dec. 10, 1985	Schmidt et al.
	1-15	US-4821184	Apr. 11, 1989	Clancy et al.
	1-16	US-4914586	April 3, 1990	Swinehart, et al.
	1-17	US-4949302	1990/08	Arnold, et al.
	1-18	US-5014192	May-07-91	Mansfield et al.
	1-19	US-5047918	Sep. 10, 1991	Schwartz et al.
	1-20	US-5084815	1992/01	Mazzario, Andrea M.
	1-21	US-5117351	May 6, 1992	Miller
	1-22	US-5182799	Jan. 26, 1993	Tamura et al.
	1-23	US-5199073	Mar. 30, 1993	Scott
	1-24	US-5204897	Apr. 20, 1993	Wyman
	1-25	US-5204958	Apr. 20, 1993	Cheng et al.
	1-26	US-5204966	Apr. 20, 1993	Wittenberg et al.

Examiner Signature	/Samson Lemma/	Date Considered	02/27/2010

*Examiner: Initial if reference was considered, whether or not citation is in conformance with MPEP 609. Draw a line through citation if not in conformance and not considered. Include a copy of this form with next communication to applicant.

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT FORM PTO-1449 (modified)	Application No.	11/980,687
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	First Named Inventor	FARBER, David
	Group Art Unit	2432
	Examiner Name	LEMMA, SAMSON B.
	Attorney Docket No.	2618-0017
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U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.	Document No.	Publication/ Issue Date	Name of Patentee or Applicant of Cited Document
	2-1	US-5247620	Sep. 21, 1993	Fukuzawa et al.
	2-2	US-5260999	Nov. 9, 1993	Wyman
	2-3	US-5276869	Jan. 4, 1994	Forrest et al.
	2-4	US-5287514	Feb. 15, 1994	Gram
	2-5	US-5297279	Mar. 22, 1994	Bannon et al.
	2-6	US-5317693	May 31, 1994	Cuenod et al.
	2-7	US-5347653	Sep. 13, 1994	Flynn et al.
	2-8	US-5357440	Oct. 18, 1994	Talbott, et al.
	2-9	US-5359523	Oct. 25, 1994	Talbott, et al.
	2-10	US-5361356	Nov. 1, 1994	Clark, et al.
	2-11	US-5371897	Dec. 6, 1994	Brown et al.
	2-12	US-5394555	Feb. 28, 1995	Hunter et al.
	2-13	US-5403639	Apr. 4, 1995	Belsan et al.
	2-14	US-5438508	Aug. 1, 1995	Wyman
	2-15	US-5442343	Aug. 15, 1995	Cato, et al.
	2-16	US-5454039	Sept. 26, 1995	Coppersmith, et al.
	2-17	US-5465365	Nov. 7, 1995	Winterbottom
	2-18	US-5467471	Nov. 14, 1995	Bader
	2-19	US-5475826	Dec. 12, 1995	Fischer
	2-20	US-5499294	1996/03/12	Friedman
	2-21	US-5504879	Apr. 2, 1996	Eisenberg et al.
	2-22	US-5537585	Jul-16-96	Blickenstaff et al.
	2-23	US-5568181	Oct-22-96	Greenwood et al.
	2-24	US-5583995	1996/12	Gardner et al.
	2-25	US-5588147	1996/12	Neeman et al.
	2-26	US-5604803	Feb. 18, 1997	Aziz

Examiner Signature	/Samson Lemma/	Date Considered	02/27/2010

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U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.	Document No.	Publication/ Issue Date	Name of Patentee or Applicant of Cited Document
	3-1	US-5604892	Feb. 18, 1997	Nuttall et al.
	3-2	US-5632031	May 20, 1997	Velissaropoulos, et al.
	3-3	US-5677952	Oct. 14, 1997	Blakley, III, et al.
	3-4	US-5678038	Oct. 14, 1997	Dockter et al.
	3-5	US-5724425	Mar. 3, 1998	Chang et al.
	3-6	US-5724552	1998/03	Taoda, Masami
	3-7	US-5745879	Apr. 28, 1998	Wyman
	3-8	US-5826049	Oct. 20, 1998	Ogata, et al.
	3-9	US-5864683	Jan. 26, 1999	Boebert et al.
	3-10	US-6732180	04-May-04	Hale, et al.
	3-11			
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Examiner Signature	/Samson Lemma/	Date Considered	02/27/2010

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT FORM PTO-1449 (modified)	Application No.	11/980,687
	Filing Date	October 31, 2007
	First Named Inventor	FARBER, David
	Group Art Unit	2432
	Examiner Name	LEMMA, SAMSON B.
	Attorney Docket No.	2618-0017
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FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No.	Document No.	Publication Date	Name of Patentee or Applicant of Cited Document	Notes
	4-1	EP 0 268 069 A2	May 25, 1988	IBM	
	4-2	EP 0 315 425	May 10, 1989	XEROX	
	4-3	EP 0 558 945 A2	Sep. 8, 1993	IBM	
	4-4	EP 0 566 967 A2	Oct. 27, 1993	IBM	
	4-5	EP 0 654 920 A2	May 24, 1995	Fischer	
	4-6	EP 0 658 022 A2	June 14, 1995	IBM	
	4-7	EP 0631 226 A1	Dec. 28, 1994	IBM	
	4-8	JP 06187384 A2	July 8, 1994	Texas Instruments Inc.	
	4-9	JP 06348558 A	Dec. 22, 1994	Toshiba Corp.	
	4-10	JP 2-127755	May 16, 1990	Digital Equip Corp.	
	4-11	JP 63-106048	May 11, 1988	NEC Corp.	
	4-12	JP 63-273961	Nov. 11, 1988	NEC Corp.	
	4-13	JP-59058564	1984/04/04	KOICHI, Iikura	
	4-14	WO 92/20021	Nov. 12, 1992	DEC	
	4-15	WO 94/06087	Mar. 17, 1994	Nuttall	
	4-16	WO 94/20913	Sept. 15, 1994	Bader	
	4-17	WO 95/01599	Jan. 12, 1995	Woodhill	
	4-18				
	4-19				
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	4-22				
	4-23				
	4-24				
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Examiner Signature	/Samson Lemma/	Date Considered	02/27/2010

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	Application No.	11/980,687
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	First Named Inventor	FARBER, David
	Group Art Unit	2432
	Examiner Name	LEMMA, SAMSON B.
	Attorney Docket No.	2618-0017
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NON-PATENT REFERENCES

Examiner Initials*	Cite No.	Non-patent Reference bibliographic information, where available	Notes
	5-1	[Proposed] Order Regarding Construction of Terms, filed Mar. 29, 2007 in C.D. Cal. case no. CV 06-5086 SJO (Ex) [9 pgs.]	
	5-2	Analysis of Plaintiffs' Claim Chart for the '280 Patent As Against Defendant Media Sentry, Inc. 11 pages	
	5-3	Analysis of Plaintiffs' Claim Chart for the '791 Patent As Against Defendant Media Sentry, Inc. (11916.001.0150.a) pp. 1-48	
	5-4	Analysis of Plaintiffs' Claim Chart for the '791 Patent As Against Defendant Overpeer pp. 1-40	
	5-5	BARBARA, D., et al., "Exploiting symmetries for low-cost comparison of file copies," 8th Int'l Conf. on Distributed Computing Systems, June 1988, pgs. 471-479, San Jose, CA.	
	5-6	CAMPBELL, M., "The Design of Text Signatures for Text Retrieval Systems," Tech. Report, Sept. 5, 1994, Deakin University, School of Computing & Math., Geelong, Australia.	
	5-7	CHANG, W. W. et al., "A signature access method for the Starburst database system," in Proc. 15th Int'l Conf. on Very Large Data Bases (Amsterdam, The Netherlands), pgs. 145-153.	

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NON-PATENT REFERENCES

Examiner Initials*	Cite No.	Non-patent Reference bibliographic information, where available	Notes
	6-1	Changes to March 23, 2007 Deposition of Robert B. K. Dewar, in C.D. Cal. case no. CV 06-5086 SJO (Ex) [3 pgs + cover letter.]	
	6-2	Communication from EPO in European Application No. 96 910 762.2 - 1225 dated May 8, 2009 [4 pgs.]	
	6-3	Communication pursuant to Article 96(2) EPC from EPO (Examination Report), Jan. 17, 2007, in Application No. EP 96 910 762.2 -1225 [1 pg. with 5 pg. annex].	
	6-4	Complaint for Patent Infringement, Permanent Injunction and Damages, Aug. 8, 2006, in C.D. Cal. case no. CV 06-5086 SJO (Ex) [11 pgs.]	
	6-5	Complaint for Patent Infringement, Permanent Injunction and Damages, filed 09/21/2007 in C.D. Cal. Case No. CV 07-06161 VBF (PLAx) [10 pgs.]	
	6-6	Declaration of Charles S. Baker in Support of Defendant Lime Wire's Motion to Stay Pending Reexamination of Patent and Request for Extension of Deadlines, Aug. 29, 2008, in C.D. Cal. Case No. CV 07-06161 VBF (PLAx) [2 pgs.]	
	6-7	Defendant Lime Wire, LLC's First Amended Answer, Affirmative Defenses and Counterclaims, October 2, 2008, C.D. Cal. case No. 07-06161 VBF (PLAx) [13 pgs.]	

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	Examiner Name	LEMMA, SAMSON B.
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NON-PATENT REFERENCES

Examiner Initials*	Cite No.	Non-patent Reference bibliographic information, where available	Notes
	7-1	Defendant Lime Wire, LLC's Second Amended Answer, Affirmative Defenses and Counterclaims, October 27, 2008, from C.D. Cal. case No. 07-06161 VBF (PLAx) [13 pgs.]	
	7-2	Defendant Michael Weiss's Answer to Plaintiff's Complaint for Patent Infringement, Permanent Injunction and Damages; Demand for Jury Trial, Sept. 15, 2006, case no. CV 06-5086 SJO (Ex) [10 pgs.]	
	7-3	Defendant Recording Industry Association of America's Amended Notice of Motion and Motion for Partial Summary Judgment on Plaintiffs' Claims for Patent Infringement and Inducing Patent Infringement; Memorandum of Points and Authorities, May 22, 2006, redacted, original confidential, filed under seal, in C.D. Cal. case no. CV 04-7456 JFW (CTx) [19 pgs]	
	7-4	Defendant Recording Industry Association of America's and Mediasentry, Inc.'s Notice of Motion and Motion for Partial Summary Judgment Based on Implied License or, In the Alternative, Based on Patent Misuse and Unclean Hands, May 22, 2006, Redacted, in C.D. Cal. case no. CV 04-7456 JFW (CTx) [21 pgs.]	
	7-5	Defendant Recording Industry Association of America's and Mediasentry, Inc's Notice of Motion and Motion for Partial Summary Judgment Based on Implied License or, In the Alternative, Based on Patent Misuse and Unclean Hands, May 8, 2006, in C.D. Cal. case no. CV 04-7456 JFW (CTx) [20 pgs.]	
	7-6	Defendant StreamCast Networks Inc.'s Answer to Plaintiff's Complaint for Patent Infringement, Permanent Injunction and Damages; Demand for Jury Trial, Sept. 5, 2006, C.D. Cal. case no. CV 06-5086 SJO (Ex) [10 pgs.]	
	7-7	Defendants' Amended Preliminary Claim Constructions [Patent Rule 4-2], filed Feb. 7, 2007 in C.D. Cal. case no. CV 06-5086 SJO (Ex) [10 pgs.]	

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	Application No.	11/980,687
	Filing Date	October 31, 2007
	First Named Inventor	FARBER, David
	Group Art Unit	2432
	Examiner Name	LEMMA, SAMSON B.
	Attorney Docket No.	2618-0017
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NON-PATENT REFERENCES

Examiner Initials*	Cite No.	Non-patent Reference bibliographic information, where available	Notes
	8-1	Defendant's Second Amended Preliminary Claim Constructions [Patent Rule 4-2], filed Feb. 9, 2007 in C.D. Cal. case no. CV 06-5086 SJO (Ex) [10 pgs.]	
	8-2	DEWAR, Rebuttal Expert Report of Robert B.K. Dewar, in C.D. Cal. case no. CV 04 -7456 JFW (CTx), April 10, 2006 [87 pgs].	
	8-3	FALOUTSOS, C. "Access methods for text," ACM Comput. Surv. 17, 1 (Mar. 1985), 49-74.	
	8-4	FALOUTSOS, C. et al., "Description and performance analysis of signature file methods for office filing," ACM Trans. Inf. Syst. 5, 3 (Jul. 1987), 237-257.	
	8-5	FALOUTSOS, C. et al., "Signature files: an access method for documents and its analytical performance evaluation," ACM Trans. Inf. Syst. 2, 4 (Oct. 1984), 267-288.	
	8-6	Federal Information Processing Standards (FIPS) Publication 180-1; Secure Hash Standard, April 17, 1995 [17 pgs.]	
	8-7	FEIGENBAUM, J. et al., "Cryptographic protection of databases and software," in Distributed Computing and Cryptography: Proc. DIMACS Workshop, April, 1991, pgs 161-172, American Mathematical Society, Boston, Mass.	

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	Application No.	11/980,687
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	First Named Inventor	FARBER, David
	Group Art Unit	2432
	Examiner Name	LEMMA, SAMSON B.
	Attorney Docket No.	2618-0017
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NON-PATENT REFERENCES

Examiner Initials*	Cite No.	Non-patent Reference bibliographic information, where available	Notes
	9-1	First Amended Answer of Defendant Mediasentry to Second Amended Complaint and Counterclaim, April 24, 2006, in C.D. Cal. case no. CV 04-7456 JFW (CTx) [29 pgs.]	
	9-2	First Amended Answer of Defendant RIAA to Second Amended Complaint and Counterclaim, April 24, 2006, in C.D. Cal. Case no. CV 04-7456 JFW (CTx) [27 pgs.]	
	9-3	First Amended Complaint for Patent Infringement, Permanent Injunction and Damages, filed 09/08/2008 in C.D. Cal. Case No. CV 07-06161 VBF (PLAx) [10 pgs.]	
	9-4	HARRISON, M. C., "Implementation of the substring test by hashing," Commun. ACM 14, 12 (Dec. 1971), 777-779.	
	9-5	IEEE, The Authoritative Dictionary of IEEE Standards Terms, 7th ed., Copyright 2000, pgs. 107, 176, 209, 240, 241, 432, 468, 505, 506, 682, 1016, 1113, 1266, and 1267.	
	9-6	ISHIKAWA, Y., et al., "Evaluation of signature files as set access facilities in OODBs," In Proc. of the 1993 ACM SIGMOD Inter. Conf. on Management of Data (Washington, D.C., U.S., May, 1993). P. Buneman & S. Jajodia, Eds. SIGMOD '93. ACM, NY, NY, 247-256.	
	9-7	Joint Claim Construction and Prehearing Statement, N.D. Cal. Rule 4-3, Feb. 12, 2007, in C.D. Cal. case no. CV 06-5086 SJO (Ex) [20 pgs.]	

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	Application No.	11/980,687
	Filing Date	October 31, 2007
	First Named Inventor	FARBER, David
	Group Art Unit	2432
	Examiner Name	LEMMA, SAMSON B.
	Attorney Docket No.	2618-0017
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NON-PATENT REFERENCES

Examiner Initials*	Cite No.	Non-patent Reference bibliographic information, where available	Notes
	10-1	KARP, R. M. and Rabin, M. O., "Efficient randomized pattern-matching algorithms," IBM J. Res. Dev. 31, 2 (Mar. 1987), 249-260.	
	10-2	List of Asserted Claims and Infringement Chart for Each Asserted Claim, July 28, 2008, in C.D. Cal. Case No. CV 07-06161 VBF (PLAx) [31 pgs.]	
	10-3	MCGREGOR D. R. and MARIANI, J. A. "Fingerprinting - A technique for file identification and maintenance," SOFTWARE: PRACTICE AND EXPERIENCE, vol. 12, no. 12, December 1982 (1982-12), pages 1165-1166	
	10-4	Notice of Interested Parties, filed 09/21/2007 in C.D. Cal. Case No. CV 07-06161 VBF (PLAx) [2 pgs.]	
	10-5	Notice of Motion and Motion of Defendant Lime Wire to Stay Litigation Pending Reexamination of Patent and Request for Extension of Deadlines, Sept. 22, 2008, C.D. Cal. Case No. CV 07-06161 VBF (PLAx) [11 pgs.]	
	10-6	Notice of Related Cases, filed 09/21/2007 in C.D. Cal. Case No. CV 07-06161 VBF (PLAx) [2 pgs.]	
	10-7	Office Action from PTO in U.S. Appln. No. 11/980,679, May 6, 2009.	

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	First Named Inventor	FARBER, David
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NON-PATENT REFERENCES

Examiner Initials*	Cite No.	Non-patent Reference bibliographic information, where available	Notes
	11-1	PANAGOPOULOS, G., et al., "Bit-sliced signature files for very large text databases on a parallel machine architecture," In Proc. of the 4th Inter. Conf. on Extending Database Technology (EDBT), Cambridge, U.K., March 1994, pgs. 379 – 392 (Proc. LNCS 779 Springer 1994, ISBN 3-540-57818-8) [14 pgs.]	
	11-2	Patent Abstract, " Management System for Plural Versions," Pub. No. 63273961 A, published Nov. 11, 1988, NEC Corp.	
	11-3	Patent Abstracts of Japan, "Data Processor," Appln. No. 05135620, filed June 7, 1993, Toshiba Corp.	
	11-4	Plaintiff Kinetech, Inc.'s Responses to Defendant Mediasentry's First set of Interrogatories, May 1, 2006, in C.D. Cal. Case no. CV 04-7456 JFW (CTx) [14 pgs.]	
	11-5	Plaintiff-Counterclaim Defendant Altnet, Inc.'s Supplemental Responses to Defendant-Counterclaim Plaintiff Overpeer Inc.'s First Set of Interrogatories, March 8, 2006, redacted, in C.D. Cal. case no. CV 04-7456 JFW (CTx) [24 pgs.]	
	11-6	Plaintiff-Counterclaim Defendant Brilliant Digital Entertainment, Inc.'s Supplemental Responses to Defendant-Counterclaim Plaintiff Overpeer Inc.'s First Set of Interrogatories, March 8, 2006, redacted, in C.D. Cal. case no. CV 04-7456 JFW (CTx) [24 pgs.]	
	11-7	Plaintiff-Counterclaim Defendant Kinetech, Inc.'s Supplemental Responses to Defendant-Counterclaim Plaintiff Overpeer Inc.'s First Set of Interrogatories March 8, 2006, redacted, in C.D. Cal. case no. CV 04-7456 JFW (CTx) [24 pgs.]	

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	Application No.	11/980,687
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	First Named Inventor	FARBER, David
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	Examiner Name	LEMMA, SAMSON B.
	Attorney Docket No.	2618-0017
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NON-PATENT REFERENCES

Examiner Initials*	Cite No.	Non-patent Reference bibliographic information, where available	Notes
	12-1	Plaintiffs Altnet, Inc., Brilliant Digital, Inc., and Kinetech, Inc.'s Responses to Defendant Recording Industry Association of America's First Set of Requests for Admissions, Jan. 6, 2006, in C.D. Cal. case no. CV 04-7456 JFW (CTx) [26 pgs.]	
	12-2	Plaintiffs' Claim Construction Opening Brief and Exhibits A-D, F, G; May 7, 2007, in C.D. Cal. case no. CV 06-5086 SJO (Ex) [112 pgs.]	
	12-3	Plaintiffs' Preliminary Claim Constructions and Extrinsic Evidence, Feb. 6, 2006, in case CV 06-5086 SJO (Ex) [20 pgs.]	
	12-4	Plaintiff's Reply to Defendant Mediasentry's Counterclaims in its Answer to the Second Amended Complaint, May 1, 2006, in C.D. Cal. Case no. CV 04-7456 JFW (CTx) [11 pgs.]	
	12-5	Plaintiff's Reply to Defendant RIAA's Counterclaims in its Answer to the Second Amended Complaint, May 1, 2006, in C.D. Cal. case no. CV 04-7456 JFW (CTx) [11 pgs.]	
	12-6	Plaintiffs' Reply To Defendants' Claim Construction Brief, filed April 23, 2007 in C.D. Cal. case no. CV 06-5086 ODW (Ex) [15 pgs.]	
	12-7	Reply to Examination Report, Jul. 19, 2007, in Application No. EP 96 910 762.2 - 1225 [7 pgs.]	

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	Application No.	11/980,687
	Filing Date	October 31, 2007
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	Attorney Docket No.	2618-0017
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Examiner Initials*	Cite No.	Non-patent Reference bibliographic information, where available	Notes
	13-1	RESPONSE TO NON-FINAL OFFICE ACTION filed May 19, 2009 in Application Serial No.: 11/017,650 [19 pgs.]	
	13-2	RIVEST, R., RFC 1320, "The MD4 Message-Digest Algorithm," April 1992.	
	13-3	SACKS-DAVIS, R., et al., "Multikey access methods based on superimposed coding techniques," ACM Trans. Database Syst. 12, 4 (Nov. 1987), 655-696.	
	13-4	SIEGEL, A., et al., "Deceit: a Flexible Distributed File System," Proc. Workshop on the Management of Replicated Data, Houston, TX, pp.15-17, 8-9 Nov 1990.	
	13-5	SIEGEL, A., et al., "Deceit: a Flexible Distributed File System," Technical Report, TR89-1042, Cornell University, Nov. 1989.	
	13-6	Stipulation and Proposed order to (1) Amend the Complaint, (2) Amend pretrial Schedule, and (3) Withdraw Motion to Stay, filed 09/08/2008 in C.D. Cal. Case No. CV 07-06161 VBF (PLAx) [6 pgs.]	
	13-7	Streamcast Networks Inc.'s Supplemental Responses to Certain of Plaintiffs' First Set of Interrogatories, Apr. 16, 2007, in C.D. Cal. case no. CV 06-5086 SJO (Ex) [61 pgs.]	

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	Application No.	11/980,687
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	Examiner Name	LEMMA, SAMSON B.
	Attorney Docket No.	2618-0017
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NON-PATENT REFERENCES

Examiner Initials*	Cite No.	Non-patent Reference bibliographic information, where available	Notes
	14-1	StreamCast's Brief Re Claim Construction, Apr. 12, 2007, in C.D. Cal. case no. CV 06-5086 SJO (Ex) [11 pgs.]	
	14-2	Transcript of Deposition of David Farber, Feb. 16, 2006, in C.D. Cal. case no. CV 04-7456 JFW (CTx) [94 pgs.]	
	14-3	Transcript of Deposition of Robert B. K. Dewar, March 23, 2007, in C.D. Cal. case no. CV 06-5086 SJO (Ex) [61 pgs.]	
	14-4	Transcript of Deposition of Ronald Lachman, Feb. 1, 2006, C.D. Cal. case no. CV 04-7456 JFW (CTx) [96 pgs.]	
	14-5		
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	Attorney Docket No.	2618-0017
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U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.	Document No.	Publication/ Issue Date	Name of Patentee or Applicant of Cited Document
/S.L./	1-1	US-5581615 A	12-1996	Stern, Jacques
/S.L./	1-2	US-5757913 A	05-1998	Bellare et al.
/S.L./	1-3	US-5940504 A	08-1999	Griswold, Gary N.
	1-4			
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*Examiner: Initial if reference was considered, whether or not citation is in conformance with MPEP 609. Draw a line through citation if not in conformance and not considered. Include a copy of this form with next communication to applicant.

ALL REFERENCES CONSIDERED EXCEPT WH[illegible]IED THROUGH. /S.L./

INFORMATION DISCLOSURE STATEMENT BY APPLICANT FORM PTO-1449 (modified) Sheet 2 of 2		
	Application No.	11/980,687
	Filing Date	October 31, 2007
	First Named Inventor	FARBER, David
	Group Art Unit	2432
	Examiner Name	LEMMA, SAMSON B.
	Attorney Docket No.	2618-0017
	Confirmation No.	6761

NON-PATENT REFERENCES

Examiner Initials*	Cite No.	Non-patent Reference bibliographic information, where available	Notes
/S.L./	2-1	USPTO, Final Office Action mailed 08/18/2009 in U.S. Appln. No. 11/017,650.	
/S.L./	2-2	USPTO, Final Office Action mailed 09/30/2009 in U.S. Appln. No. 11/724,232.	
/S.L./	2-3	USPTO, Non-Final Office action mailed 06/18/2009 in Reexam No. 90/010,260.	
	2-4		
	2-5		
	2-6		
	2-7		

Examiner Signature	/Samson Lemma/	Date Considered	02/27/2010

*Examiner: Initial if reference was considered, whether or not citation is in conformance with MPEP 609. Draw a line through citation if not in conformance and not considered. Include a copy of this form with next communication to applicant. Notes: If identified, the following is provided: EA = English Abtract, T = Translation, PF = Patent Family.

ALL REFERENCES CONSIDERED EXCEPT WH... ...IED THROUGH. /S.L./

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re PATENT APPLICATION OF:		Attorney Docket:	2618-0017
FARBER, David et al.		Group Art Unit:	2432
Application Serial No.:	11/980,687	Examiner:	LEMMA, S. B.
Application Filing Date:	October 31, 2007	Confirmation No.:	6761
Title:	**CONTROLLING ACCESS TO DATA IN A DATA PROCESSING SYSTEM**	Date:	December 11, 2009

AMENDMENT / RESPONSE

via EFS-Web
Hon. Commissioner of Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

This Amendment is being filed in response to the non-final Office Action mailed 06/15/2009. Please amend this application as follows:

Amendments to the claims begin on page 2 below.

Remarks begin on page 8 below.

An *Information Disclosure Statement* is being filed herewith, along with the required fee.

A *Petition for Extension of Time* is being filed herewith, along with the required fee.

IN THE CLAIMS

Please amend the claims as follows. This listing of claims will replace all prior versions and listings of claims in the application.

1. (Original) A method, in a system which includes a network of computers, the method comprising:

(a) obtaining a name for a data item, the name being included in a request for the data item, and the name being based at least in part on the data which comprise the contents of the data item; and

(b) determining, based at least in part on said name, whether or not access to the data item is authorized.

2. (Original) A method as recited in claim 1 further comprising:

(c) based at least in part on said determining, denying access to the data item when it is determined that access to the data item is not authorized.

3. (Original) A method as recited in claim 1 wherein the request is received from a particular requestor, and wherein said step (b) of determining comprises: determining whether or not the particular requestor is authorized.

4. (Original) A method as recited in claim 3 further comprising:

if it is determined that the particular requestor is not authorized, denying the particular requestor's request for the data item.

5. (Original) A method as recited in claim 1 wherein said step (b) of determining whether or not the data item is authorized comprises determining whether or not the name is contained in a database comprising a plurality of identifiers.

6. (Currently amended) A method as recited in claim 5 **[[**19**]]** wherein the name for the data item is based on a function of the data which comprise the contents of the data file, and wherein the plurality of identifiers in the database are identifiers of licensed content items, and wherein the identifier of each licensed content item is based at least in part on the function of the data comprising the licensed content item.

7. (Original) A method as recited in claim 1 further comprising:

(d) collecting information regarding the data item.

8. (Original) A method as recited in claim 7, wherein the information collected includes at least one of: (a) information about which data items have been stored on a computer; (b) information about the content of the data item, (c) information about the owner of the data item, (d) information about the type of data item, (e) information about the contextual name of the data item, (f) information about whether the data item was copied; (g) the name of the data item; (h) information about an identity of the requestor; (i) a timestamp; (j) information about whether the data item was created; and (k) information about whether the data item was read.

9. (Original) A method as recited in claim 8 wherein at least some of the information collected is maintained for accounting or billing purposes.

10. (Original) A method as recited in claim 1 further comprising:

(d) tracking identities of data items requested.

11. (Original) A method as recited in claim 1 wherein the name is based, at least in part, on a function of the data which comprise the contents of the data item, and wherein the function is a message digest function or a hash function.

12. (Original) A method as recited in claim 1 wherein the name is based, at least in part, on a function of the data which comprise the contents of the data item, and wherein the function is selected from the functions: MD4, MD5, and SHA.

13. (Original) A method as recited in claim 1 wherein the name is a True Name.

14. (Original) A method as recited in claim 1 wherein a data item may comprise a file, a portion of a file, a page in memory, a digital message, a digital image, a video signal or an audio signal.

15. (Original) A method as recited in claim 1 wherein at least some computers make up part of a peer-to-peer network of computers.

16. (Original) A method as recited in claim 1 further comprising:

(c) authorizing access to the data item when it is determined that the data item is authorized.

17. (Original) A method as recited in claim 16 wherein the authorized access permits copying of the data item from at least one of the plurality of computers.

18. (Original) A method as recited in claim 16 wherein the name is received at a first computer and wherein, if it is determined that said data item is authorized, access to the data item is authorized from at least one of said plurality of computers distinct from the first computer.

19. (Original) A method as recited in claim 16 wherein, if it is determined that said data item is authorized, access to the data item is authorized from more than one of the plurality of computers.

20. (Currently amended) A method comprising:

controlling distribution of licensed content from a first computer to a requesting computer, **[[**by**]]** in response to a request for the content from said requesting computer, the request including at least a name of the data file, the

name having been determined using at least a function of the data comprising the data item, ~~permiting~~ permitting the content to be provided to the requesting computer if the content is authorized or licensed.

21. (Original) A method comprising:

(a) obtaining a list of names, one for each of a plurality of data items, wherein, for each of the data items, the corresponding name for that data item was determined as a function of the contents of the data item;

(b) receiving, from a requestor, an identifier for a requested data item, said identifier having been determined based at least in part on the contents of the requested data item;

(c) determining, based at least in part on said identifier for said requested data item, and using said list of names, whether the requestor may access the requested data item; and

(d) based on said determining, if it is determined that requestor may not access the requested data item, denying access to the requested data item.

22. (Original) A method as recited in claim 21 wherein the list of names comprises a list of True Names of authorized data items and wherein the identifier of the requested data item is a True Name of the requested data item.

23. (Original) A method as recited in claim 21 wherein at least some of said computers make up part of a peer-to-peer network of computers.

24. (Original) A method comprising:

(a) receiving at a first computer, from a requesting computer, a request for a data file, said request including a name for the data file, the name having been determined using at least a function of the data in the data file, wherein the data used by the function to determine the name comprises the contents of the data file; and

(b) in response to said request:

(i) causing the name of the data file to be compared to a plurality of values;

(ii) determining if access to the data file is authorized or unauthorized based on whether the name matches at least one of said plurality of values, and

(iii) based on said determining in step (i), not allowing the data file to be delivered to the requesting computer if it is determined that access to the data file is not authorized.

25. (Original) A method as recited in claim 24 further comprising:

in response to said request:

(iv) allowing the data file to be delivered to the requesting computer if the data file is authorized.

REMARKS

Reconsideration and allowance of this application are respectfully requested.

By this Amendment, claim 20 has been amended to correct an informality noted by the Examiner and claim 6 has been amended to correct its dependency. No new matter has been added by these amendments.

Claims 1-25 are pending in this application.

The Examiner objected to claim 20 for an informality. In view of the above amendment to claim 20, withdrawal of this objection is respectfully requested.

THE INFORMATION DISCLOSURE STATEMENT (IDS) OF 12/26/2007

On 12/26/2007 Applicant submitted an IDS which included 17 sheets of listed references (form 1449). With the Office Action of June 15, 2009, the Examiner only returned 16 sheets (pgs. 2-17), without the first page of the Form 1449. A copy of page 1 of the Form 1449 is submitted herewith.

It is respectfully requested that the information / reference listed on the attached PTO-1449 be expressly considered during the prosecution of this application, and that the reference(s) be made of record therein and appear among the "References Cited" on any patent to issue therefrom.

The submission of any document herewith, which is not a statutory bar, is not intended that any such document constitutes prior art against any of the claims of the present application or is considered to be material to patentability as defined in 37 C.F.R. § 1.56(b). Applicants do not waive any rights to take any action which would be appropriate to antedate or otherwise remove as a competent reference against the claims of the present application.

THE §103 REJECTIONS

The Examiner rejected 1-10 and 13-25 under 35 U.S.C. §103(a) as being unpatentable over Blickenstaff et al, U.S. Patent No. 5,537,585 (hereinafter Blickenstaff) in view of Orita, U.S. Patent No. 5, 163,147 (hereinafter Orita). The grounds for this rejection are respectfully traversed.

As recited in independent **claim 1**, this invention is a method, operable in a system which includes a network of computers. The method includes the step of: "obtaining **a name** for a data item, **the name** being included in a request for the data item, and **the name** being based at least in part on the data which comprise the contents of the data item." The method further includes the step of "determining, based at least in part on **said name**, whether or not access to the data item is authorized."

The first (or "obtaining") step has, *inter alia*, two requirements:

1. The "name" must be "included in a request for the data item," and

2 Then same "name" must be "based at least in part on the data which comprise the contents of the data item."

Blickenstaff uses an ordinary user-provided file name (*e.g.*, a DOS 1-8 byte name with a 0-3 byte extension. *Blickenstaff*, col. 13, lines 34 *et seq.*). To the extent that Blickenstaff provides any example of a name for a data item, be uses a name such as "vol\dir1\dir3\filename.ext" (as shown by the Examiner at pg. 4 of the Office Action). But Blickenstaff has no notion of using a name derived from or based in any way on the actual content of the data item, as required by claim 1 and its dependents.

And the Examiner acknowledges (at pgs. 4-5 of the Office Action) that Blickenstaff does not disclose "the name being based at least in part on the data

which comprise the contents of the data item; and (b) determining, based at least in part on said name, whether or not access to the data item is authorized."

However, the Examiner then asserts (*Id.* at 5) that: "Orita at least on its abstract discloses the following which meets the above limitation."

Applicant respectfully submits, however, that Orita does not teach or in any way suggest using a name for a data item "based at least in part on the data which comprise the contents of the data item." All that Orita states (and only in the Abstract), is:

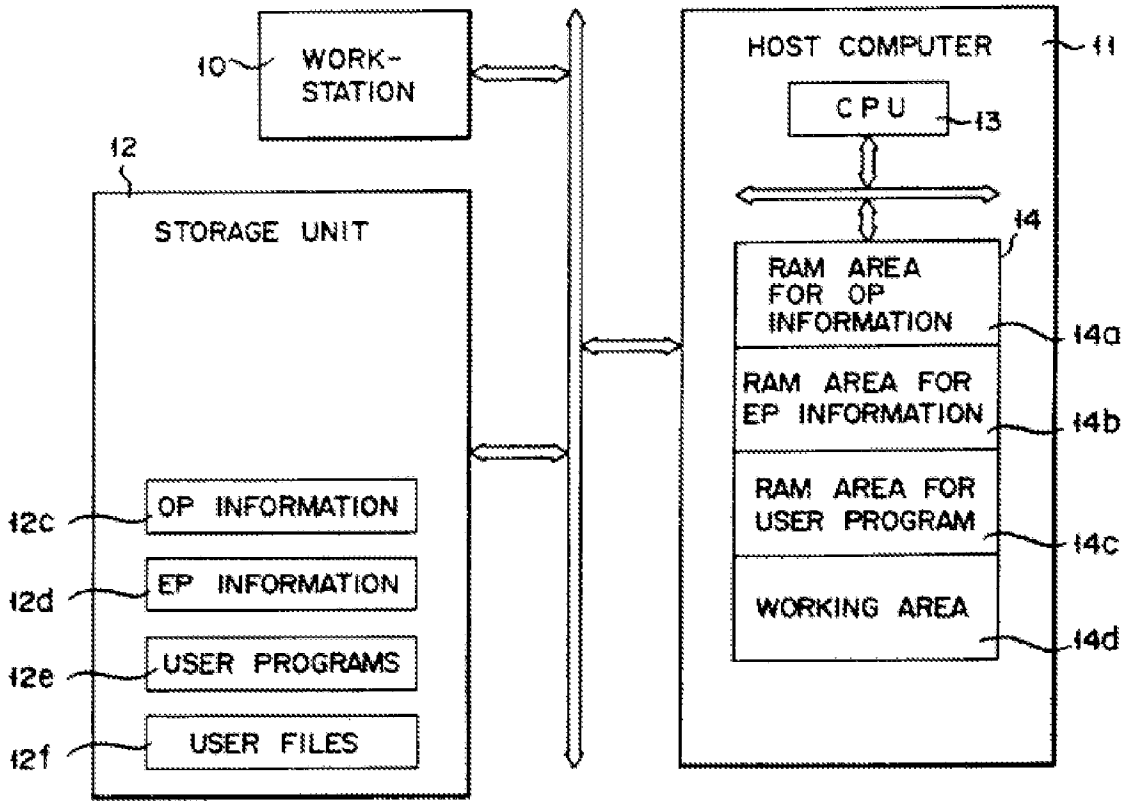
> When a specified file access is requested after the execution of the user program, whether execution of the file access is permitted or not is determined according to access protection information. The access protection information is information having access types and file contents defined by the environment profile information.

To the extent that Orita uses the contents of any file to control access, it is the contents of the so-called "EP Information" file, but not the contents of the file that is to be accessed. Orita describes the so-called "EP Information" used to control access. See, *e.g.*, *Orita* Fig. 5 and col. 3, lines 56 *et seq.*:

> As is shown in FIG. 5, the EP information 12d includes the following items: an EP information file name; an EP password; an EP authority level; an activable user program name; access file names; and a file password. The EP information file name is used as identification data when an EP information file stored in the operator profile is accessed or when an EP information file input by the operator is accessed. The EP password is entered by the operator along with the name of an EP information file, and is used for checking whether the access to the EP information file is allowed or prohibited. The EP authority level is a level determined for the EP information. The EP authority level is compared with the authority level of the operator profile, so as to determine whether the access to the EP information file is allowed or prohibited. Even if an EP information file name having a high authority level is mistakenly recorded in the operator profile with respect to a low-authority-level user, the EP authority level prevents access to the EP information file of the high authority level. The activable user file name indicates a user program which can be activated. One user program is stored in one EP information

> file, and a user which is entitled to access the EP information file can open the user program stored in the EP information file. The access file names indicate user programs which can be accessed from the activable user program. The maximal number of access file names which can be designated by a user is 600. The file password is required for accessing a file since the file contains a password, along with the data indicating the access type. Since, in the present invention, the file password is recorded in the EP information file beforehand, a user need not be informed of the file password, so that the security of the file is ensured.

Thus, as shown in Orita's Figure 1 (reproduced below), the file "EP Information" 12d is used to control access by the user programs 12e to the user files 12f. But there is nothing in Orita to suggest that the name of any of the files is based in any way on the contents of any of the files.



Orita states that the file contents of the *access protection information* is defined by the *environment profile information*. But Orita does not state, as the

Examiner would have it, that the a name of a data item is based in any way on the contents of that data item, and that **the name** is used to determine, whether or not access to the data item is authorized.

Accordingly, no proposed combination of Blickenstaff with Orita would produce the invention, as claimed, in which a name for a data item, the name being "based at least in part on the data which comprise the contents of the data item," is used to "determine[] …whether or not access to the data item is authorized."

For at least these reasons, claim 1 and its dependents are patentable over Blickenstaff in view of Orita.

Similar arguments apply to claims **20, 21, and 24** and their dependents.

Claims 2-19 depend from claim 1 and are therefore patentable over Blickenstaff in view of Orita for the reasons given above.

Further as to **claim 5**, the Examiner's entire basis for rejection of this claim consists of the statement "See figure 1 and abstract, See also Blickenstaff, figure 1".

Claim 5 recites a method as recited in claim 1 "wherein said step (b) of determining whether or not the data item is authorized comprises determining whether or not the name is contained in a database comprising a plurality of identifiers." As noted above, neither Blickenstaff nor Orita has any disclosure of a "name" as claimed, "the name being based at least in part on the data which comprise the contents of the data item." Furthermore, neither Blickenstaff nor Orita teaches or in any way suggests a "database comprising a plurality of identifiers", or using such a database to determine whether or not the data item is authorized.

For at least these additional reasons, claim 5 is further patentable over Blickenstaff in view of Orita.

Claim 6 depends from claim 5 and recites a method "wherein the name for the data item is based on a function of the data which comprise the contents of the data file, and wherein the plurality of identifiers in the database are identifiers of licensed content items, and wherein the identifier of each licensed content item is based at least in part on the function of the data comprising the licensed content item." The Examiner's entire basis for rejection of claim 6 consists of the statement "See figure 1 and abstract, See also Blickenstaff, figure 1".

Since neither Blickenstaff nor Orita has any database of identifiers, they do not and cannot teach or in any way suggest a method, as claimed, "wherein the plurality of identifiers in the database are identifiers of licensed content items, and wherein the identifier of each licensed content item is based at least in part on the function of the data comprising the licensed content item."

For at least these additional reasons, claim 6 is further patentable over Blickenstaff in view of Orita.

Claim 7 recites a method as in claim 1 further comprising: collecting information regarding the data item. And **claim 8** recites a method as in claim 7 "wherein the information collected includes at least one of: (a) information about which data items have been stored on a computer; (b) information about the content of the data item, (c) information about the owner of the data item, (d) information about the type of data item, (e) information about the contextual name of the data item, (f) information about whether the data item was copied; (g) the name of the data item; (h) information about an identity of the requestor; (i) a timestamp; (j) information about whether the data item was created; and (k) information about whether the data item was read."

The Examiner's entire basis for rejection of these claims consists of the statement "See figure 1 and figure 8".

Applicant respectfully submits that neither Blickenstaff nor Orita teaches or in any way suggests the claimed collection of information.

For at least these additional reasons, **claims 7 and 8** are further patentable over Blickenstaff in view of Orita.

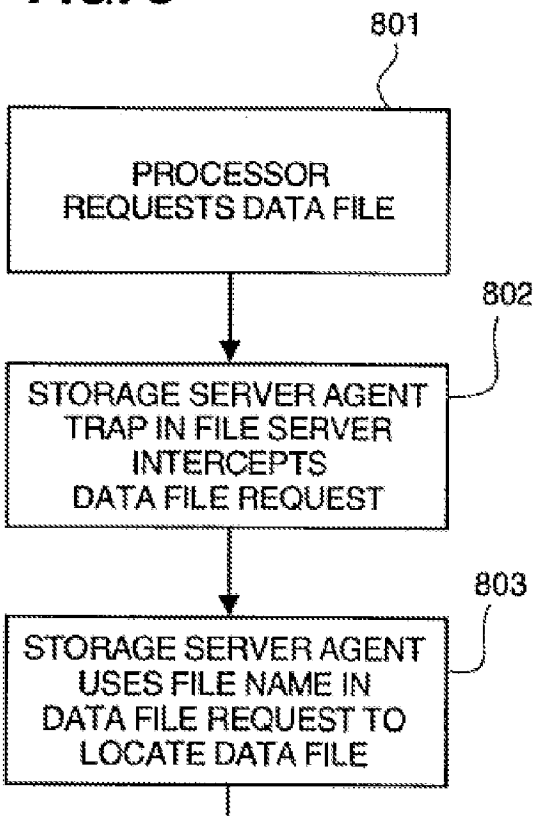
Claim 9 recites a method as in claim 8 " wherein at least some of the information collected is maintained for accounting or billing purposes." No such feature is taught or suggested by Blickenstaff or Orita. The Examiner points to a secondary storage system in Blickenstaff's figure 1 and states that such storage "could be used by the owner of the storage server/ s shown on figure 1, in order to provide storage services for the users by charging them for the provided storage services." *Office Action*, pg. 13. The Examiner has not, however, shown any teaching or even suggestion that the structure could or would be so used. It is not sufficient for the Examiner to simply point to a memory or storage device and state that it could be used to perform the invention.

For at least these additional reasons, **claim 9** is further patentable over Blickenstaff in view of Orita.

Claim 10 recites a method as in claim 1 further comprising: "tracking identities of data items requested." No such feature is taught or suggested by Blickenstaff or Orita. The Examiner's sole basis for rejecting this claim is the statement "See at least figure 8, ref Num "801 - 803"" (Applicant assumes that this citation is to Blickenstaff.)

The cited portions of Blickenstaff's Figure 8 (reproduced in part below) neither teach nor in any way suggest "tracking identities of data items requested," as claimed.

FIG. 8



For at least these additional reasons, **claim 10** is further patentable over Blickenstaff in view of Orita.

Claims 13 and 22 use the inventors' defined term "True Name". E.g., claim 13 recites that "the name is a True Name," and claim 22 recites that "the list of names comprises a list of True Names of authorized data items."

The inventors' term "True Name" is defined in the application as filed, *e.g.*, at ¶0053 ("the terms "True Name", "data identity" and "data identifier" refer to the substantially unique data identifier for a particular data item."; See also ¶¶0085 *et seq.* describing the calculation of a True Name in a preferred embodiment).

Blickenstaff does not describe a True Name, as that term is defined by the inventors. The naming scheme described by Blickenstaff is nothing more than the

DOS naming scheme, and names in that scheme are not substantially unique identifiers.

In view of the above, withdrawal of this rejection under §103 is respectfully requested.

In his concluding remarks, the Examiner commented on US Patent No. 5,742,807 (hereinafter "the '807 patent"). Applicant notes that the '807 patent is not prior art to the present application. The '807 patent was filed after the April 11, 1995 priority date of this application.

RELATED APPLICATIONS

The Examiner's attention has previously been directed to co-pending U.S. Patent Applications which are directed to related technical subject matter. The attached Form PTO-1449 (modified) lists, *inter alia*, office actions issued in applications 11/017,650 and 11/724,232. As these patent applications are stored electronically at the PTO, no copies are being provided herewith. If the Examiner requires copies of any of these applications or any additional information regarding any of the documents cited herein, the Examiner is respectfully requested to contact the undersigned at the number provided.

CONCLUSION

Applicant respectfully submits that this application is in condition for allowance, and an early action allowing the claims is earnestly solicited.

Should the Examiner believe that a telephone call will resolve any outstanding issues in this case, he is invited to telephone the undersigned at the number provided.

CHARGE STATEMENT: Deposit Account No. 501860, order no. **2618-0017**.
The Commissioner is hereby authorized to charge any fee specifically authorized hereafter, or any missing or insufficient fee(s) filed, or asserted to be filed, or which should have been filed herewith or concerning any paper filed hereafter, and which may be required under Rules 16-18 (missing or insufficiencies only) now or hereafter relative to this application and the resulting Official Document under Rule 20, or credit any overpayment, to our Accounting/Order Nos. shown above, for which purpose a duplicate copy of this sheet is attached **This CHARGE STATEMENT does not authorize charge of the issue fee until/unless an issue fee transmittal sheet is filed.**

CUSTOMER NUMBER

75948

Respectfully submitted,

/Brian Siritzky/Reg. No. 37,497

By:_____

Brian Siritzky, Ph.D.
Registration No.: 37,497

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4300 Wilson Blvd., 7th Floor,
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Electronic Patent Application Fee Transmittal

Application Number:	11980687
Filing Date:	31-Oct-2007
Title of Invention:	Controlling access to data in a data processing system
First Named Inventor/Applicant Name:	David A. Farber
Filer:	Brian Siritzky
Attorney Docket Number:	2618-0017

Filed as Large Entity

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Extension - 3 months with $0 paid	1253	1	10	1110

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
Submission- Information Disclosure Stmt	1806	1	180	180
		Total in USD ($)		**1290**

Electronic Acknowledgement Receipt

EFS ID:	6583405
Application Number:	11980687
International Application Number:	
Confirmation Number:	6761
Title of Invention:	Controlling access to data in a data processing system
First Named Inventor/Applicant Name:	David A. Farber
Customer Number:	75948
Filer:	Brian Siritzky
Filer Authorized By:	
Attorney Docket Number:	2618-0017
Receipt Date:	11-DEC-2009
Filing Date:	31-OCT-2007
Time Stamp:	10:45:25
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$1290
RAM confirmation Number	7147
Deposit Account	501860
Authorized User	

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

Charge any Additional Fees required under 37 C.F.R. Section 1.16 (National application filing, search, and examination fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and i processing fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Extension of Time	PA_EOT_3_months_12_09.pdf	177823 4e3e4eb2fe50a04b860fa43a5d3da5e64f175faf	no	1
Warnings:					
Information:					
2	Information Disclosure Statement (IDS) Filed (SB/08)	20091207140754544.pdf	190576 e1d5d718cb3c6a07a3967ee04d4757774a120186	no	1
Warnings:					
Information:					
This is not an USPTO supplied IDS fillable form					
3	Information Disclosure Statement (IDS) Filed (SB/08)	PA_IDS_1449_12_07_09.pdf	65219 2aee50e8e74ea69deff42b604e198f8ff0554c8c	no	2
Warnings:					
Information:					
This is not an USPTO supplied IDS fillable form					
4	Transmittal Letter	PA_IDS_12_07_09.pdf	196485 b9bfa7aa97d8b64714615eb175b332e0df156c41	no	2
Warnings:					
Information:					
5		2618_0017_PA_Response_12_11.pdf	335021 09c385735136d79a31d2681e9c74672d4ff6e613	yes	17

Multipart Description/PDF files in .zip description

Document Description	Start	End
Amendment/Req. Reconsideration-After Non-Final Reject	1	1
Claims	2	7
Applicant Arguments/Remarks Made in an Amendment	8	17

Warnings:					
Information:					
6	Fee Worksheet (PTO-875)	fee-info.pdf	31906 c5d84d4fac71c3d307bf6c6f45e0fe647bd41f3e	no	2
Warnings:					

Information:	
Total Files Size (in bytes):	997030

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.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re PATENT APPLICATION OF:		Attorney Docket:	2618-0017
FARBER, David et al.		Group Art Unit:	2432
Application Serial No.:	**11/980,687**	Examiner:	LEMMA, S. B.
Application Filing Date:	October 31, 2007	Confirmation No.:	6761
Title:	**CONTROLLING ACCESS TO DATA IN A DATA PROCESSING SYSTEM**	Date:	December 8, 2009

PETITION FOR EXTENSION OF TIME

via EFS-Web

Hon. Commissioner of Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Petition is hereby made to extend the original due date to cover the date this response/paper is filed for which the requisite fee is $ 1110.:

Please charge the present and any missing or inadequate fee for this petition to our Deposit Account No.501860, Our Order No. 2618-0015.

CHARGE STATEMENT: Deposit Account No. 501860, order no. **2618-0017**.
The Commissioner is hereby authorized to charge any fee specifically authorized hereafter, or any missing or insufficient fee(s) filed, or asserted to be filed, or which should have been filed herewith or concerning any paper filed hereafter, and which may be required under Rules 16-18 (missing or insufficiencies only) now or hereafter relative to this application and the resulting Official Document under Rule 20, or credit any overpayment, to our Accounting/Order Nos. shown above, for which purpose a duplicate copy of this sheet is attached **This CHARGE STATEMENT does not authorize charge of the issue fee until/unless an issue fee transmittal sheet is filed.**

Davidson Berquist Jackson & Gowdey LLP
4300 Wilson Blvd., 7th Floor, Arlington, Virginia 22203
Main: (703) 894-6400
FAX: (703) 894-6430

/Brian Siritzky/Reg. No. 37,497

By: _____

Atty: Brian Siritzky, Ph.D., Reg. No.: 37,497

INFORMATION DISCLOSURE STATEMENT BY APPLICANT FORM PTO-1449 (modified) Sheet 1 of 17		
	Application No.	11/980,687
	Filing Date	October 31, 2007
	First Named Inventor	David A. FARBER et al.
	Group Art Unit	2166
	Examiner Name	Unassigned
	Attorney Docket No.	2618-0017
	Confirmation No.	6761

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.	Document No.	Publication/ Issue Date	Name of Patentee or Applicant of Cited Document
	1-1	US-2004-0139097	July 2004	Farber et al.
	1-2	US-2005-0114296-A1	May 2005	Farber et al.
	1-3	US-3668647	June 1972	Evangelisti et al.
	1-4	US-4215402	July 1980	Mitchell et al.
	1-5	US-4290105	September 1981	Cichelli et al.
	1-6	US-4376299	March 1983	Rivest
	1-7	US-4405829	September 1983	Rivest et al.
	1-8	US-4412285	October 1983	Neches et al.
	1-9	US-4414624	November 1983	Summer, Jr. et al.
	1-10	US-4441155	April 1984	Fletcher et al.
	1-11	US-4464713	August 1984	Benhase et al.
	1-12	US-4490782	December 1984	Dixon et al.
	1-13	US-4571700	February 1986	Emry, Jr. et al.
	1-14	US-4577293	March 1986	Matick et al.
	1-15	US-4642793	February 1987	Meaden
	1-16	US-4675810	June 1987	Gruner et al.
	1-17	US-4691299	September 1987	Rivest et al.
	1-18	US-4725945	February 1988	Kronstadt et al.
	1-19	US-4773039	September 1988	Zamora
	1-20	US-4887235	December 1989	Holloway et al.
	1-21	US-4888681	December 1989	Barnes et al.
	1-22	US-4922414	May 1990	Holloway et al.
	1-23	US-4922417	May 1990	Churm et al.
	1-24	US-4972367	November 1990	Burke
	1-25	US-5007658	April 1991	Bendert et al.
	1-26	US-5025421	June 1991	Cho

Examiner Signature		Date Considered	

*Examiner: Initial if reference was considered, whether or not citation is in conformance with MPEP 609. Draw a line through citation if not in conformance and not considered. Include a copy of this form with next communication to applicant.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT FORM PTO-1449 (modified) Sheet 1 of 2		
	Application No.	11/980,687
	Filing Date	October 31, 2007
	First Named Inventor	FARBER, David
	Group Art Unit	2432
	Examiner Name	LEMMA, SAMSON B.
	Attorney Docket No.	2618-0017
	Confirmation No.	6761

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.	Document No.	Publication/ Issue Date	Name of Patentee or Applicant of Cited Document
	1-1	US-5581615 A	12-1996	Stern, Jacques
	1-2	US-5757913 A	05-1998	Bellare et al.
	1-3	US-5940504 A	08-1999	Griswold, Gary N.
	1-4			
	1-5			
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	1-10			
	1-11			
	1-12			
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	1-19			
	1-20			
	1-21			
	1-22			
	1-23			
	1-24			
	1-25			
	1-26			

Examiner Signature		Date Considered	

*Examiner: Initial if reference was considered, whether or not citation is in conformance with MPEP 609. Draw a line through citation if not in conformance and not considered. Include a copy of this form with next communication to applicant.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT FORM PTO-1449 (modified) Sheet 2 of 2		
	Application No.	11/980,687
	Filing Date	October 31, 2007
	First Named Inventor	FARBER, David
	Group Art Unit	2432
	Examiner Name	LEMMA, SAMSON B.
	Attorney Docket No.	2618-0017
	Confirmation No.	6761

NON-PATENT REFERENCES

Examiner Initials*	Cite No.	Non-patent Reference bibliographic information, where available	Notes
	2-1	USPTO, Final Office Action mailed 08/18/2009 in U.S. Appln. No. 11/017,650.	
	2-2	USPTO, Final Office Action mailed 09/30/2009 in U.S. Appln. No. 11/724,232.	
	2-3	USPTO, Non-Final Office action mailed 06/18/2009 in Reexam No. 90/010,260.	
	2-4		
	2-5		
	2-6		
	2-7		

Examiner Signature		Date Considered	

*Examiner: Initial if reference was considered, whether or not citation is in conformance with MPEP 609. Draw a line through citation if not in conformance and not considered. Include a copy of this form with next communication to applicant. Notes: If identified, the following is provided: EA = English Abtract, T = Translation, PF = Patent Family.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re PATENT APPLICATION OF:	Attorney Docket: 2618-0017
FARBER, David et al.	Group Art Unit: 2432
Application Serial No.: 11/980,687	Examiner: LEMMA, Samson B.
Application Filing Date: October 31, 2007	Confirmation No.: 6761
Title: **CONTROLLING ACCESS TO DATA IN A DATA PROCESSING SYSTEM**	Date: December 7, 2009

INFORMATION DISCLOSURE STATEMENT

Hon. Commissioner of Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Pursuant to 37 C.F.R. § 1.56, the attention of the Patent and Trademark Office is hereby directed to the reference(s) listed on the attached PTO-1449. One copy of each non-U.S. Patent reference is attached. It is respectfully requested that the information be expressly considered during the prosecution of this application, and that the reference(s) be made of record therein and appear among the "References Cited" on any patent to issue therefrom.

The submission of any document herewith, which is not a statutory bar, is not intended that any such document constitutes prior art against any of the claims of the present application or is considered to be material to patentability as defined in 37 C.F.R. § 1.56(b). Applicants do not waive any rights to take any action which would be appropriate to antedate or otherwise remove as a competent reference against the claims of the present application.

This Information Disclosure Statement is being filed within three (3) months of the U.S. filing date OR before the mailing date of a first Office Action on the merits. No certification or fee is required.

The Examiner's attention is again directed to the following co-pending U.S. Patent Applications which are directed to related technical subject matter. The

Examiner is respectfully requested to consider the cited application and the art cited therein during examination.

This IDS cites office actions from related applications. As these patent applications are stored electronically at the PTO, no copies are being provided herewith. If the Examiner requires copies of any of these applications or any additional information regarding any of the documents cited herein, the Examiner is respectfully requested to contact the undersigned at the number provided.

This IDS is intended to be in full compliance with the rules, but should the Examiner find any part of its requirement content to have been omitted, prompt notice to that effect is earnestly solicited, along with additional time under Rule 97(f), to enable Applicant to comply fully.

CHARGE STATEMENT: Deposit Account No. 501860, order no. **2618-0017**.

The Commissioner is hereby authorized to charge any fee specifically authorized hereafter, or any missing or insufficient fee(s) filed, or asserted to be filed, or which should have been filed herewith or concerning any paper filed hereafter, and which may be required under Rules 16-18 (missing or insufficiencies only) now or hereafter relative to this application and the resulting Official Document under Rule 20, or credit any overpayment, to our Accounting/Order Nos. shown above, for which purpose a duplicate copy of this sheet is attached

This CHARGE STATEMENT does not authorize charge of the issue fee until/unless an issue fee transmittal sheet is filed.

CUSTOMER NUMBER

75948

Davidson Berquist Jackson & Gowdey LLP
4300 Wilson Blvd., 7th Floor,
Arlington Virginia 22203
Main: (703) 894-6400 • FAX: (703) 894-6430

Respectfully submitted,

/Brian Siritzky/Reg. No. 37,497

By:_____

Brian Siritzky, Ph.D.
Registration No.: 37,497

PTO/SB/06 (07-06)
Approved for use through 1/31/2007. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number	Filing Date	☐ To be Mailed
11/980,687	10/31/2007	

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY ☐ RATE ($)	SMALL ENTITY FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	25 minus 20 =	* 5	X $ =		OR	X $50 =	250
INDEPENDENT CLAIMS (37 CFR 1.16(h))	4 minus 3 =	* 1	X $ =			X $210 =	210
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $250 ($125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL			TOTAL	460

APPLICATION AS AMENDED – PART II

AMENDMENT 12/11/2009	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE ($)	SMALL ENTITY ADDITIONAL FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	* 25	Minus	** 25	= 0	X $ =		OR	X $52=	0
Independent (37 CFR 1.16(h))	* 4	Minus	***4	= 0	X $ =		OR	X $220=	0
☐ Application Size Fee (37 CFR 1.16(s))									
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
					TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	0

AMENDMENT	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)		RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =		OR	X $ =	
Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =		OR	X $ =	
☐ Application Size Fee (37 CFR 1.16(s))									
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
					TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

Legal Instrument Examiner:
/GERALDINE STANLEY/

This collection of information is required by 37 CFR 1.16. 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 12 minutes 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.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

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

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
11/980,687	10/31/2007	David A. Farber	2618-0017

CONFIRMATION NO. 6761

POA ACCEPTANCE LETTER

75948
DAVIDSON BERQUIST JACKSON & GOWDEY, LLP
ATTN: BRIAN SIRITZKY, Ph.D.
4300 WILSON BLVD., 7TH FLOOR
ARLINGTON, VA 22203

OC000000037014486

Date Mailed: 07/24/2009

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 10/03/2008.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.

/sleutchit/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

POWER OF ATTORNEY, CORRESPONDENCE ADDRESS AND REVOCATION OF PRIOR POWERS

Hon. Commissioner of Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Revocation: I hereby revoke all previous powers of attorney given in the application identified in the attached statement under 37 CFR 3.73(b).

Power of Attorney: I hereby appoint the practitioners associated with customer number **75948**, individually and collectively, as attorney(s) or agent(s) to represent the undersigned before the United States Patent and Trademark Office (USPTO) in connection with any and all patent applications assigned only to the undersigned according to the USPTO assignment records or assignment documents attached to this form in accordance with 37 CFR 3.73(b).

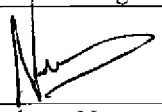
I authorize Davidson Berquist Jackson & Gowdey, LLP to delete names/numbers of persons no longer with the Firm and to act and rely on instructions from and communicate directly with the entity who first sent this case to them and by whom I hereby declare that I have consented after full disclosure to be represented unless/until I instruct Davidson Berquist Jackson & Gowdey, LLP in writing to the contrary.

Correspondence Address: Please recognize or change the correspondence address for the application identified in the attached statement under 37 CFR 3.73(b) to the address associated with Customer Number **75948**.

Assignee Name and Address:

Kinetech, Inc.
14011 Ventura Boulevard, Suite 501
Sherman Oaks, California 91423

A copy of this form, together with a statement under 37 CFR 3.73(b) (Form PTO/SB/96 or equivalent) is required to be filed in each application in which this form is used. The statement under 37 CFR 3.73(b) may be completed by one of the practitioners appointed in this form if the appointed practitioner is authorized to act on behalf of the assignee, and must identify the application in which this Power of Attorney is to be filed.

SIGNATURE of Assignee of Record The individual whose signature and title is supplied below is authorized to act on behalf of the assignee			
Signature		Date	3/13/08
Name	Anthony Neumann	Telephone	(818) 386-2120
Title	VP, Business Development		

STATEMENT UNDER 37 CFR 3.73(B)

Applicant / Patent Owner: Kinetech, Inc. Docket No. 2618-0017

Application No. / Patent No. 11/980,687 Filed / Issued Date: October 31, 2007

Entitled: **CONTROLLING ACCESS TO DATA IN A DATA PROCESSING SYSTEM**

Assignee: Kinetech, Inc. A corporation

(Name of assignee) (Type of Assignee: corporation, partnership, university, government agency, etc.)

States that it is:

1. ☐ the assignee of the entire right, title, and interest; or
2. ☒ an assignee of less than the entire right, title and interest.
   (The extent (by percentage) of its ownership interest is 50%)

in the patent application / patent identified above by virtue of either:

A. ☐ An assignment from the inventor(s) of the patent application / patent identified above. The assignment was recorded in the United States Patent and Trademark Office at Reel , Frame , or for which a copy thereof is attached.

OR

B. ☒ A chain of title from the inventor(s), of the patent application / patent identified above, to the current assignee shown below:

1.	From: INVENTORS To: Kinetech, Inc. The document was recorded in the United States Patent and Trademark Office at Reel 009873 Frame 0463.
2.	From: Kinetech, Inc. To: Digital Island, Inc. (Assignment of 50% ownership interest) The document was recorded in the United States Patent and Trademark Office at Reel 011217 Frame 0958.
3.	From: Kinetech, Inc. To: Digital Island, Inc. The document was recorded in the United States Patent and Trademark Office at Reel 013295 Frame 0327.

☒ Additional documents in the chain of title are listed on a supplemental sheet.

☐ Copies of assignments or other documents in the chain of title are attached.

As required by 37 CFR 3.73(b)(1)(i), the documentary evidence of the chain of title from the original owner to the assignee was, or concurrently is being, submitted for recordation pursuant to 37 CFR 3.11.

[Note: A separate copy (*i.e.,* a true copy of the original assignment document(s)) must be submitted to Assignment Division in accordance with 37 CFR Part 3, if the assignment is to be recorded in the records of the USPTO. See MPEP 302.08]

The undersigned (whose title is supplied below) is authorized to act on behalf of the assignee.

/Brian Siritzky/Reg. No. 37,497 July 19, 2009

Signature Date

Brian Siritzky 703-894-6400

Printed or Typed Name Telephone Number

Title: Attorney, Registration No. 37497

Form 37 CFR 3.73(b) continuation sheet for Appln. No. 11/980,687

4.	From: Digital Island, Inc. To: Cable & Wireless Internet Services, Inc. The document was recorded in the United States Patent and Trademark Office at Reel 013296 Frame 0239.
5	From: Cable & Wireless Internet Services, Inc. To: Savvis Asset Holdings, Inc. The document was recorded in the United States Patent and Trademark Office at Reel 015766 Frame 0429.
6	From: Cable & Wireless Internet Services, Inc. To: Savvis Asset Holdings, Inc. The document was recorded in the United States Patent and Trademark Office at Reel 015991 Frame 0869.
7	From: Savvis Asset Holdings, Inc. To: Savvis, Inc. The document was recorded in the United States Patent and Trademark Office at Reel 015766 Frame 0651.
8	From: Savvis Asset Holdings, Inc. To: Savvis, Inc. The document was recorded in the United States Patent and Trademark Office at Reel 016686 Frame 0882.
9	From: Savvis, Inc. To: Savvis Communications Corporation The document was recorded in the United States Patent and Trademark Office at Reel 016004 Frame 0209.
10	From: Savvis Communications Corporation To: Mount Shasta Acquisition LLC The document was recorded in the United States Patent and Trademark Office at Reel 018847 Frame 0065.
11	From: Mount Shasta Acquisition LLC To: Level 3 Communications, LLC The document was recorded in the United States Patent and Trademark Office at Reel 018847 Frame 0077.

Electronic Acknowledgement Receipt

EFS ID:	5728395
Application Number:	11980687
International Application Number:	
Confirmation Number:	6761
Title of Invention:	Controlling access to data in a data processing system
First Named Inventor/Applicant Name:	David A. Farber
Customer Number:	42624
Filer:	Brian Siritzky
Filer Authorized By:	
Attorney Docket Number:	2618-0017
Receipt Date:	19-JUL-2009
Filing Date:	31-OCT-2007
Time Stamp:	14:09:19
Application Type:	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	Power of Attorney	General_POA_for_USPTO_75948.pdf	39009 f636f37482ed189dab98e8f4c291765efca2588a	no	1

Warnings:	
Information:	

2	Assignee showing of ownership per 37 CFR 3.73(b).	Stmt_Under_37_CFR_3_73_b.pdf	197870 051db57a16cfd10908563e2dcf1132d76f5d74cd	no	2

Warnings:	
Information:	
Total Files Size (in bytes):	236879

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.