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(54) Title: PEOPLE-ORIENTED ON-LINE SYSTEM

(57) Abstract: A people-oriented on-line system that creates a virtual world that helps users build groups of special interest and where those groups can be connected into larger communities.

PEOPLE-ORIENTED ON-LINE SYSTEM

Field Of The Invention

This invention is about methods and apparatus to help on-line people live, work and communicate with others better. This invention is also about how to generate, deliver, and collect highly focused information, including paid Web advertisements and polls, to and from these on-line users. In addition, this invention is about business practices to increase and maintain revenue in a very diversified marketplace.

Background Of The Invention

When the World Wide Web ("WWW") was first started, on-line information was scarcer and harder to find. This led to the advent of search engines and the know-how of grouping information on the Web to help on-line users find the information that they want.

As of mid-1999, the traffic on the Internet was doubling every 3 months; on-line users were doubling every 6 months; and on-line hosts were doubling every 9 months. Some estimates suggested that most people in the world would be on-line on or before 2005. With such an unprecedented growth rate, the on-line world is in a state of chaos.

With 2.8 million Web sites and 800 million pages and growing, information is abundant and on-line people no longer have any difficulty coming up with a large list of links of interest upon each search; and this is true even though it is estimated that only 1/6 of the Web sites have been indexed by the best search engines today. It is believed that the real problem today is that there is too much duplicated, out-of-date, irrelevant, inferior, or simply false information present on the Web and it is very time consuming, and sometimes impossible, to find credible and useful information. In other words, information indexing is a tremendous effort and the search engines do not cover most of the Web and, even if they did, they could not distill high quality information from poor quality information. Better ways are needed to deal with the issues.

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From this observation, it is believed that ad-hoc Web surfing days are numbered, and that a new on-line paradigm is needed where on-line users collaborate with other trustworthy users who share common interests, professions, beliefs, and/or other attributes.

In this new paradigm, finding the right information is as simple as finding the right group of people. So the essence of this paradigm shift is that much of the information searching currently conducted with search engines will give way to people (or association) searching.

In terms of finding association, traditionally, there has been a variety of on-line forums and media such as newsgroups, mailing lists, bulletin board systems ("BBS's"), etc. that cater to different groups of people. Most of these media suffer from such common problems as being scattered, isolated, localized, non-scalable, boring, etc. In addition, they also tend to suffer from "too much chaff", i.e., off-topic postings and rants by the clueless, and responses to the same.

A common problem is that the on-line world, like the physical world, is artificially divided into different groups, typically by geographical location, language, culture, etc., and there is no formal channel or mechanism to communicate across these different groups. In other words, it is rather localized, and communication across different groups, even with users of similar interests or natures, does not come naturally. As a result, people must struggle to find other people having similar interests.

The present invention recognizes that these problems and limitations are inherited from the real world, but is adapted to eliminate these limitations from its on-line world.

Mailing lists have limitation of sizes. When the list membership grows, so does the volume of e-mails generated. This can overload subscriber mailboxes. Off-topic messages can also present a heavy burden to those who wish to stay on the main topic of the forum. Thus, it will be appreciated that scalability is a serious issue with mailing lists.

Another problem common to existing systems is that of having some recurring questions asked again and again by newcomers to the systems. Many systems try to lessen this problem by providing archives of past messages. Ideally, users should be able to retrieve past messages based on selected criteria such as identity of the poster, subject, date, words, and sub-words. However,

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in general, the lack of good search mechanisms tends to render existing system archives difficult or impossible to use.

The services, and user interface, of existing systems tend to be relatively non-expressive and boring. Most are text-based and have little or no support for multimedia communications such as embedded graphics, audio and/or video clips, etc.

From a commercial point of view, another common problem is the ineffectiveness of today's information delivery in an on-line system; this is particularly true with respect to Web advertising.

Web advertising has strong potentials. However, few Web sites are able to deliver the right advertisement to the right people at the right time. For instance, the "click-through" rate (i.e., the # of clicks vs. the # of exposures) of Web advertisement in the U.S. is around 0.6%, according to Ilona Nemeth, director of investor relations for DoubleClick. Outside the United States, where Internet use is typically less advanced, click-through rates tend to be even worse.

The inability to determine what the end user is receptive to at any given time leads most Web sites to deliver blind or junk advertisement, which tends to be ineffective. Thus, most users simply use the free services commonly associated with advertising, and effectively ignore any and all ads, since the users have learned through experience that very few of those ads are of interest. Even the better Web sites can generally only deliver ads in categories that are very broad and generic in nature.

With certain tracking and extrapolation methods, some Web advertising agencies claim that the profile and identity of the users can be determined. However, these methods typically involve multi-Web-site user tracking and imprecise extrapolation. In addition, they also raise serious concerns about user privacy.

Current advertising methods, in general, are a waste of the end user's time (e.g., they slow download to the user's machine, require extensive extrapolation algorithms running on the service provider's machines, and cause congestion of precious network bandwidth), as well as a waste of the advertiser's resources.

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Furthermore, marketing, revenue generation and processing can be enormous tasks for an international Web site that tries to cater to very diversified pools of advertisers and sponsors all over the world. For instance, determining the most appropriate vendors suitable for given groups of people in various countries can be an enormous, if not impossible, task.

Objects Of The Invention

Accordingly, one object of the present invention is to create a virtual world to help on-line users find and interact with the right circles of people. This virtual world must be reliable, resourceful, and very adaptable to suit the specific needs and tastes of individual users as well as groups of users. This virtual world must also be responsive to the changes that occur naturally in any social setting.

Another object of the present invention is to provide a non-intrusive and yet highly targeted information delivery system to help effectively collect, as well as present, both free and paid-for information (e.g., advertisements, polls, merchandise, services, etc.) for the right users at the right times.

Yet another object of the present invention is to create a new business method and practice to recruit and match the most appropriate advertisers and sponsors with the right users in an economically and operationally viable way.

Summary Of The Invention

The essence of the present invention is the creation of a virtual world that helps users build groups of special interests that are called virtual circles ("VC"). It also can connect related groups into larger communities. Members in each virtual circle are entrusted and empowered to build their own ideal world.

This virtual world provides many desirable services to both the users and the advertisers and sponsors from all over the world. To the users, each group (or virtual circle) is like a window into a part of their own personal world of interests.

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The invention also relates to the way that information is collected from, and disseminated to, users, the way users interact with each other, and the interactions between other entities in the system.

To alleviate the marketing difficulties associated with bringing together the most appropriate advertisers and sponsors and the most appropriate users from all over the world, the invention also creates new business practices and methods that set up apparatus, guidelines and incentives so as to encourage the users themselves to bring in those financial supporters and revenues.

Brief Description Of The Drawings

These and other objects and features of the present invention will be more fully disclosed or rendered obvious by the following detailed description of the preferred embodiments of the invention, which is to be considered together with the accompanying drawings wherein like numbers refer to like elements, and further wherein:

Fig. 1 is a schematic diagram illustrating a hierarchy of Virtual Circles (VC's);

Fig. 2 is a schematic diagram illustrating the relationship between Virtual Bubbles (VB's) and VC's;

Fig. 3 is a schematic diagram illustrating the general architecture of the system;

Fig. 4 is a is a schematic diagram illustrating creation of a new VC;

Fig. 5 is a schematic diagram illustrating a posting;

Fig. 6 is a schematic diagram illustrating how content is moved from a legacy system to a VC via a gateway;

Fig. 7 is a schematic diagram illustrating how content is tagged as it moves from a legacy system to a VC;

Fig. 8 is a schematic diagram illustrating how content is moved from a VC to various legacy systems;

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Fig. 9 is a schematic diagram illustrating how content is moved from several VC's to a legacy system;

Fig. 10 is a schematic diagram illustrating how content is moved between legacy systems and VC's;

Fig. 11 is a schematic diagram illustrating how passive postings within a VC are matched to a user;

Fig. 12 is a schematic diagram illustrating how passive postings are matched to a user or generated by a user;

Fig. 13 is a schematic diagram illustrating how active postings are crossmatched with users;

Fig. 14 is a schematic diagram illustrating the hierarchy structure of categories;

Fig. 15 is a schematic diagram illustrating that same structure in the context of nodes and levels;

Fig. 16 is a schematic diagram illustrating how nodes may be trimmed;

Fig. 17 is a schematic diagram illustrating trimming of a root node;

Fig. 18 is a schematic diagram illustrating recursive combining; and

Fig. 19 is a schematic diagram illustrating reverse matching.

Detailed Description Of The Preferred Embodiments

The preferred embodiment of this invention is a new type of Web portal that is designed to overcome the aforementioned shortcomings of legacy groupware systems such as mailing lists, newsgroups, BBS's and others. This Web portal utilizes 3 different sets of interfaces, for 3 different types of users - members, administrators, and sponsors.

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1. Virtual Circle, Community, and World

A virtual circle ("VC") is the basic building block of the virtual community. A VC comprises a group of like-minded members, a governing body, a group environment built collectively by these members, and the resources and activities shared among these members.

VC's are organized in a hierarchy according to their degree of specialization. More particularly, referring now to Fig. 1, a plurality of VC's 100 are shown. By way of example but not limitation, there may be a Sports VC 105, a Law VC 110, a Computer VC 115, etc. The Sports VC 105 may in turn sit above an Ice Skating VC 120, a Roller Blading VC 125 and a Basketball VC 130. Similarly, the Law VC 110 may sit above a Civil VC 135 and a Patent VC 140. The Computer VC 115 may sit above a Software VC 145 and a Hardware VC 150; the Software VC 145 may in turn sit above a Software Patent VC 155 and an Educational VC 160. This specialization hierarchy can go on and on, to the extent required by the virtual community.

If desired, the term "sub-community" may be used to describe one or more related VC's that share some common characteristics. For example, in Fig. 1, a Software sub-community 200 is shown.

The users of the system visit one VC of interest, and then move on to the next VC of interest, etc. The combined effect of all these VC's forms a virtual world within which the on-line user's needs can be satisfied.

2. VC Creation and Destruction

VC's can be manually set up during a system planning or review stage, or they can be set up whenever the system operator decides to, or they can be formed by popular demand from the users.

Each VC may have many characteristics. One of these characteristics determines the openness or accessibility of the VC. Most VC's are created as "public", which means they are accessible by everyone - members or not. A private VC is accessible by members only and, in some cases, membership may have to be approved by the governing body of the VC.

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The governing body of a VC moderates and administers the VC's operations. The governing body can be a single designated administrator, a group of administrators, or the entire membership of the VC.

In any existing VC, if a group of members would like to concentrate on a narrower or, in other words, a proper subset of the current focus of the VC, the members petition and/or register to form a new VC dedicated to that narrower focus.

Once the number of users registered for the creation of the new VC reaches a predetermined threshold, that new VC will be created; and those users registered for the creation of the new VC will be informed of its creation and automatically signed up as members of the new VC.

In this case, the original VC is called the "parent" or "base" VC, while the new VC is called the "child" or "derived" VC.

It is common for parent VC to spawn multiple child VC's, and it is possible that a child VC may have multiple parent VC's.

For example, in Fig. 1, the Law VC 110 is further refined into several child VC's such as Civil 135 and Patent 140. Subsequently, additional child VC's might be created, e.g., Criminal, Real Estate, etc. (not shown).

Still looking now at Fig. 1, for the multiple parent case, both Patent and Software VC's 140, 145 combined and derived the Software Patent VC 155, perhaps for the discussion of software patenting issues.

The destruction of VC's is also possible. This can be done manually through petition (for instance, where a duplication is found) or by the system, either automatically or by the decision of the system administrator.

One of the criteria for the destruction of a VC is the lack, or shifting, of interests. If the membership drops under, say, 50 users for 3 months, the VC may be destroyed automatically, and all of the archives and user information associated with that VC may be packaged up and put into a dormant area or simply discarded.

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Another possible reason for the destruction of a VC is where illegal activities have been occurring in that VC and where the governing body has failed to restrain those activities.

The destruction of a VC may not be enforced as long as there is an active child VC underneath it. This is one reason that there may be some inactive intermediate VC's. The other reason that there may be some inactive intermediate VC's is that certain VC's are created in the system planning stage and may not become populated above a certain system threshold quickly, if at all. Under these conditions, the system will have the final say regarding the destruction of those VCs.

3. Sister VC's and Interconnection

The hierarchy of parent and child VC's naturally forms the basis of connection in terms of information flow.

In addition, any VC can form a relationship with other VC's, in much the same way that 2 cities recognize each other as sister cities in human society. This type of horizontal communication complements the vertical one inherited in the parent/child hierarchy discussed above.

Sister VC's typically have some similarities in their main topics, and they may pass relevant information (usually in the form of discussion messages and announcements) to each other, either automatically or manually through the intervention of the governing body.

For example, in Fig. 1, the Ice Skating VC 120 has a sister relationship with the Roller Blading VC 125. If the Ice Skating VC 120 has some important news or findings that may be of interest to the Roller Blading VC 125, this information may be passed over to the Roller Blading VC.

The sister relationship may be established during the system planning stage. It may also be formed via solicitation from, and a consensus vote in, the VC's. The sister relationship is terminated as soon as either VC decides to cease the relationship.

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4. Guests, Registered Users, Members, and Administrators

Registration with the system is not a pre-requisite to using the system. Any on-line user may come and browse through various VC's at will. These users are treated as guests. The minimum requirement for guests, before they can effectively use the system, is to specify their preferred language(s) and geographic area(s) of interest. These 2 parameters may be explicitly declared by the guests, or they may be derived automatically from the entry point (e.g., a specific link) which the guests come from or from their browser and/or system settings.

To explore the potential of the system, guests are encouraged to register with the system so as to become registered users. Registered users have more privileges than guests. For example, a registered user can typically post messages or talk with another user in a certain VC whereas a guest typically cannot.

Registration serves not only to establish the user's identity, but also to set up the user's profile and focus (see Section 5 below). Without profile and focus, or with false information for profile and focus, the system may not serve the user effectively. Falsified profile will create confusions, and incorrect focus will filter out things of interest to the user. For example, if a user is interested in issues happening around Boston and yet sets up a focus as being interested in Paris, all the user will see is information relating to issues in Paris.

To obtain all of the rights associated with a given VC, the registered user must join that VC as a member explicitly. Public VC's (which are the majority of the VC's in the system) do not have any restrictions for membership application and membership is typically granted instantaneously.

Private VC's may have some specific criteria that must be met in order to become a member. The governing body typically establishes these criteria, although the system administrator may also mandate certain criteria for certain types of VC's. For example, VC's with adult content may be required to enforce system-wide rules relating to a minimum age for admission.

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A member typically acquires rights from the time their membership is approved. However, some VC's may not grant full rights to their members until certain criteria have been met (e.g., the member has reached a certain level of credits or has been a member for a predetermined period of time). For example, members in some VC's may not be able to vote or post until they have been granted their membership for 3 days. This practice might help increase the possibility that new members will become familiar with the group and/or its issues before their first posts and/or votes.

Any given VC may also decide to clearly mark the presence of new members, as well as every input from them, so that more seasoned members can easily spot and help the newcomers when the situation warrants it.

It is also possible for the VC to require that users prove their eligibility or worthiness in order to access certain services. For instance, there could be some form of test to gauge the level of readiness or understanding of the potential voters in a poll.

The services provided by any given VC might be guarded, or moderated, by a special group of members called administrators or group administrators. Administrators are typically elected periodically from the existing membership. There may be VC-specific rules, or by-laws, governing the election and recall of administrators. The system administrator may help in the enforcement of those specific by-laws.

Members may be expelled, and barred from rejoining, certain VC's due to repetitive misbehavior such as abuse of the system and/or other members. Expulsion should, of course, be considered and exercised with great caution by the governing body. Registered users may also be denied service by the system administrator for similar reasons.

5. Profile. Focus, and Action

In the system, most postings (i.e., posts, poll, and advertisement) have one or more characteristics collectively called profile. Profile specifies what that entity is. Common

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characteristics of a profile may include source of origin, language(s) capability, specified geographical areas, level of expertise/knowledge, etc.

In contrast to other entities, members may have multiple profiles. They can have per-VC profiles in addition to their systemwide profile. These per-VC profiles are active only in the VC they are defined in. Possible per-VC profile can include professional/amateur, level of experience, member since, past position, current position, credits, expert status, contribution level, and many other VC-specific attributes.

The profiles of registered users are private information and are never used in ways other than to direct the matching operation (see below) of the system. Although the system administrator has full access to user attributes, no user or entities may examine any information about any other user unless that user explicitly permits it. In another words, the attributes for each user are normally private, but that user can make certain parts of their attributes public. For example, a user can make their profession public but their income private; or a user can make their age and physical location private but their e-mail address public.

Attributes can be public, private, and controlled. Public and private attributes are as described above. Controlled attributes are attributes which may be accessed by others, but only with the explicit permission of their "owner".

Certain active entities such as users or advertisements may have a set of filters attached. These filters establish a focus. Focus clearly specifies what is expected and/or what is of interest to that particular entity. Common filters include expected language(s) capability, geographical areas of interest, relationships (e.g., friend or enemy), past experiences (e.g., users/vendors/posts/others to be ignored), and others.

Again, a user may have a systemwide focus as well as per-VC focuses.

A third aspect for any entity is an optional action list. This list specifies one or more actions to be taken when there is a match. Actions are generally in the categories of either "collect" or "record". Collect is always an action to collect certain user attributes. Record, on the other hand, is an action to deposit new (or update existing) attributes into the user's profile

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that may be useful later. These recorded attributes are always public in nature and cannot be changed by their "owner".

For instance, a paid poll may seek to know more about those polled, and thus it attaches the "collect" action to collect things such as in which VC the poll is taken, the user's age, the user's income level, and/or other personal attributes of the user. Poll is a common service available to any VC and is generally free. A paid poll can be set up to serve interests outside of the system e.g., it may be set up to serve an advertiser.

Another action can relate to "click-through". For example, an advertiser may wish to record the "click-through" rate of a particular advertisement, so that they can assess the user's interest in that advertisement.

The system is configured so that a controlled attribute cannot be collected until the "owner" of that attribute gives permission for it to be collected. Such permission may be granted or declined after the system explicitly asks the user for such permission.

Action lists are very valuable tools for Web advertising and polling. They can also be useful for free services as well. For example, a user can set up a "hail list" in a VC so that whenever anyone on the hail list (e.g., friends) enter the VC, an automatic "hello" will be generated.

The system works by applying focus to profile. In other words, the system passes information only when there is a match of profile and focus between any two entities. Once there is a match, should there be any actions attached to the entity with the match, the actions will be performed.

It should also be appreciated that the user does not control some of the attributes discussed above. Some attributes are earned (e.g., expert status awarded by the system as a result of peer reviews) and some attributes are recorded as part of an action list. These attributes can be categorized into either state (i.e., earned) or status (i.e., recorded) attributes.

The following are some simple examples of how the focus/profile matching process works.

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Example 1:

A help-wanted message, posted from Boston, may have the following profile:

Salary: \$70,000

Job location: Boston

Title: software engineer

The same help-wanted ad might also “pre-screen” potential candidates with the following focus:

Experience: 3+ years

Familiarity: web portal design

Degree: master

Major: computer science

Candidate location: CONUS (Continental U.S.), will help relocate

Example 2:

An Intellectual Property (“IP”) lawyer in the United States, who understands English and French, wishes to learn more about IP-related laws and regulations in Germany. This user can set their focus accordingly in the IP Law VC, so that they can start reading all postings in either French or English coming from Germany on a daily basis; the user can also chat or talk with IP lawyers from Germany currently roaming in the same VC who understand French and/or English.

To accomplish this, the user might use the following focus in that VC:

Location: Germany

Language: French or English

Example 3:

A local car dealership in Boston selling sports utility vehicles wishes to announce a monthly sale of a vehicle particularly suited for campers. The user may post an ad with the following:

profile:

Location: Boston

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Duration: during June of 1999

focus:

Preferred income level: over \$80,000 annually

Example 4:

A single Chinese female wishes to meet unmarried young males who can speak Spanish from all over the world.

This user could accomplish this by entering the Social/Single VC and use the following focus:

Sex: male

Age: < 30

Marriage status: unmarried

Language: Spanish

Example 5:

A poll might be conducted to identify the best satellite TV to be targeted at young electrical engineer professionals in the United States. This poll might have these focus and action list:

focus:

Age: 20-35

Location: USA

Profession: electrical engineer

Action List:

Collect: sex, age, location, income level

6. VC Services and Environment

Major services include discussion forums, news, calendars, resources, polls, votes, classifieds, contest/match, chat, talk, hot buys, hot vendors, ratings, and games, as well as some administrative and group and individual customization types of services.

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Most of the services listed above have their contents archived into an easily searchable form. This not only helps cut down on repeats and the waste of bandwidth, but also helps establish a historical prospective on various activities of the VC.

Each VC evaluates its own needs and enables a subset of all available services as it deems appropriate. For instance, a VC about archery might like to hold a target-shooting contest each month. And it might like to let users check the scores of the best archer in 1999 some time in the next millennium.

Avatar is a representation of a registered user. It can be as simple as the user's id, an icon, or a small thumbnail-sized picture.

Avatars can be explicitly shown in chat/talk screens, or embedded in messages, or feedback, or just about any other type of input from the user. Clicking on the avatar brings up a card of information about the user which the avatar represents. This may be followed by an action appropriate to the context (e.g., a talk session may be initiated).

The amount and type of information shown on the avatar's information card are controlled by its "owner" - in fact, this information is derived from the personal profile which the user explicitly entered into the system.

Whenever a registered user enters a VC, their avatar may show up on one or more other member's screens, e.g., members who are waiting for friends or some specific fellow members to chat, talk or play games with. By recognizing a specific avatar, friends may "hello" each other, engage in chat or perform other social functions. These social functions mirror those of a real world setting.

A registered user can earn 3 types of credits: recruit (new members) credits, posting (thumb-up messages) credits, and helper (e.g., working as administrators) credits.

Preferably, each avatar shows not only a picture and a name, but also the number of credits the associated user has accumulated. It may include both the credits earned in the current VC and the total credits earned anywhere in the system. This configuration is preferred, since it

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not only bestows a sense of honor to those who contribute heavily, but also clearly identifies those users as being experts to others who may need help.

Those users who are identified as experts are frequently more than willing to help out others. This is because, in addition to a sense of honor felt, these experts may set up their own services or businesses right within that VC and receive financial and/or other rewards from other users or guests.

It is also possible for the system to reward those with a high number of credits in cash or stock, either on a continuing basis or as some sort of special recognition.

The avatar may also be configured so as to show if it is a friend, an enemy, or neither, e.g., by different color-lining schemes. The user can track friends and enemies with the tracking feature described in Section 6.13.4 below.

The foregoing arrangements tend to produce a more trustworthy, as well as interesting, system in which the users know each other at a glance.

6.1 Discussion Forums

Users are able to post multimedia types of messages with embedded graphics, audio and video clips. Each posted message will be identified, with their worthiness constantly evaluated by its readers. The reputation of its author, in terms of accumulated credits, can also be easily checked.

From time to time, some members may get distracted from the main topic, or they might simply like to make small talk as a part of the VC's social function. These off topic postings will be marked as such in their profile so that they can be filtered out without distracting other users who would prefer to stay on the main topic.

In addition to housing postings originating within the VC, discussion forums can also house postings forwarded from other VC's, as well as postings forwarded from external legacy systems such as newsgroups and mailing list.

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The administrator has the responsibility of forwarding relevant postings to related VC's. The administrator is also responsible for correcting postings that are not properly marked with the right profile.

As part of the tracking feature discussed in Section 6.13.4 below, at a member's request, a daily summary of all the postings in any of the forums may be sent directly to a mailbox specified by that member, and an embedded link can be provided to quickly and easily bring the user to the right place. The member may also choose to get an alert, e.g., whenever there is new message in the external forum.

6.2 News

News relevant to the VC must be selected and presented to the users in a timely and orderly fashion. Most commonly, this news will be collected by the members elsewhere and then posted into a VC. Additionally, the system can collect the news from selected news sources which are identified by the members or administrators of the service. The administrator is solely responsible for keeping irrelevant news off the VC.

6.3 Calendar

The VC's calendar lists all group-related, as well as community-related, events. Calendar items should be clearly marked (e.g., color coded) as local or external items.

This service is set up to facilitate marking the same events into the user's own personal calendar. If there is any change in the calendar, the changes will generate a warning, e.g., possibly in the form of an e-mail, to alert the users who marked the event as to what has been changed.

The administrator of this service is responsible for keeping track of all the events.

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6.4 Resources

It is necessary to give the governing body the option of building a group Web site that can provide group-specific services, as well as compile and maintain a well organized list of relevant links.

This list can answer a lot of user questions and thus save a lot of bandwidth and frustration. Also, this list represents the level of dedication which the members have put into building the virtual world they share.

By delegating this function to the members, duplicated, outdated, inferior, and false Web pages will eventually be dismissed or consolidated.

It has been found that this self-service not only satisfies the desire of members to publish things, but it also encourages the members to collaborate and come up with a superior information base.

6.5 Poll

Polling is a regular function in the modern world to gather opinions about things. It is a desirable feature for most VC's. For example, the governing body of a certain VC may wish to start a new service, or put new contents into the group environment, and it may wish to poll the members of the VC for opinions.

A poll can be initiated within the VC or it can be passed down through the VC hierarchy from a higher VC. A poll can also be initiated as a paid service for companies or entities outside of the system.

A poll administrator is responsible for setting up, accepting (from outside sources), and/or maintaining the proper function of the poll.

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6.6 **Vote**

Voting will typically be used to decide major issues such as reorganizing community hierarchy, accepting/expelling members, electing administrators, and coping with other important issues. Voting is frequently the easiest way to perform these functions.

Once the membership of a VC has reached a certain level, it generally needs administrators. In fact, the VC may require teams of administrators to handle things such as different languages and possibly different locales as well. Voting can be a closed (i.e., for members only) or it can be open (i.e., for all members in the community including the current VC and any derived VC's further down the chain).

6.7 **Classifieds**

Trade is a service which helps members job-hunt, recruit help, buy, sell, auction, or exchange personal goods or services among themselves. The system is preferably configured to record these transactions as the basis for future research and/or reference.

If desired, the system may impose a fixed fee or percentage charge for all transactions occurring within the VC, with or without any further involvement in the transaction.

For example, the system may withhold payment (e.g., credit card charges or some kind of e-credit) from the buyer until the goods or services are received in good order. This will guarantee payment to the seller, while ensuring that the buyer receives the expected product.

6.8 **Match and Contest**

It is common knowledge that human society improves itself through two major forces - cooperation and competition. Almost every group can benefit from healthy competition.

Contest/Match may be set up periodically to promote healthy competition among the members. It is possible to set up a judge/review panel to determine the winner. But the ideal competitions are those that can be measured independently and objectively. For example, an

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archery contest that can be clearly scored, a footrace that can be easily timed, or some scholastic achievement that can be clearly measured.

Match can be based on an honor system (similar to postal match/contest) or this can be locally witnessed, submitted, and reviewed by the administrators or some form of committee.

The system is configured to maintain a detailed archive of each contest, and to record the winning status in the winner's profile. The winner may also be invited to post a detailed message about how they won, e.g., equipment used, pre-contest preparation, helpful tips, etc. This can help the other members of the group, and may help the system in identifying possible sponsors for the group.

With the details of a contest archived, future users will be able to find out scores, winners, and other information that may have historical value.

6.9 Chat and Talk

Chat/Talk is supported in text, audio and/or video. Talk is a one-on-one activity, while chat is more of a multi-party activity.

Talk can be initiated by clicking on the avatar representing the user to whom you wish to talk, while a chat session is conducted in a virtual chat room. Multiple chat rooms may be created within any given VC, and whoever creates a chat room may control its function, including sending an invitation to other registered users who are presently in the VC. Users may also join and leave those chat rooms at will.

Users may set up their focus to indicate if, and to whom, they are willing to talk. In addition to common filters such as language and locale, the users may also indicate to whom they may be willing to talk, e.g., some possible options are

1. No talk;
2. Friends only;
3. Talk ok.

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Both chat and talk use a "text-box" as their basic form of communication. In addition, there is a "white board" that can be used to post pictures or diagrams or freehand drawings. For users with a more advanced setup, one-to-one and many-to-many audio and/or video conferencing facility are available as an alternative to, or in addition to, the basic text-box service.

It is also possible to add a voice recognition system to help generating minutes or transcripts from verbal chat and talk sessions. Furthermore, a real-time language translation feature (either textual or spoken) can help facilitate communication between users speaking different languages and/or dialects.

6.10 Hot Buys, Hot Vendors, and Ratings

Hot buys, hot vendors and ratings are all derived services. Whenever an external poll or advertisement is in effect, feedback is collected from the users who may care to comment (typically in a simple form, such as "thumbs up" or "thumbs down") and these results are tallied periodically.

Those who earn the most positive feedback over a given period of time (e.g., weekly or monthly) are automatically entered as hot buys/vendors. As a result, users who are interested in buying merchandise or services can find opinions in a relevant VC very quickly and easily.

Ratings is more of a reflection of past consumer experience than of a current popular impression like hot buys and hot vendors. Ratings are collected over time from the real consumers and/or clients of goods and services after those individuals have had more in-depth knowledge and/or experience with the goods or services which have been acquired.

6.11 Games

On-line games, such as chess, role-playing adventures, education, training or others, can help with relaxation and learning, as well as fostering friendship. As a result, single and multi-player games are typically available as a group service.

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For multi-player games, interested players may register and wait for their preferred partner(s), depicted by their focus, to enter the VC.

6.12 VC Information

Administrative services provide information about the VC, such as the charter, the list of members, currently logged-in members (preferably shown in the form of avatars), administrators, contacts, and other VC-specific information. Administrative services also help sponsors (advertisers, pollsters, etc.) to determine where, and how many users in any given VC, are of interest to them.

6.13 Customizations

The system provides interfaces to let each VC's governing body modify the system's default environment and thereby create their own ideal environment. The same provision is extended to individual members so that they can customize a personalized on-line environment on top of the group environment.

There are also tools to help the user set up their per-VC profiles and focuses.

6.13.1 Private and Public Resources

Users may wish to store links under the related VC's. There may be links that they visit periodically or even daily, and which they may wish to access from anywhere on the Internet. For example, the user may wish to store their personal finances under the VC Finance/Investment, using encryption for security. There can be links to check bank, stock and mutual fund accounts, links to read subscriptions of on-line financial magazines such as the Wall Street Journal, and other links naturally associated with this VC. With a click on the link the system can negotiate the user name and password and thus automate the login process into those paid/protected services. These types of links are generally private and typically protected by encryption.

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Users may also wish to publish or share things with their fellow VC members, either in the form of self-standing documents and/or pictures, or in the form of full-blown Web sites. These links appear as Resources as discussed in Section 6.4 above.

6.13.2 Auto Search

Search is an important tool, as is evident in today's search engine-based Web portals. The members who are interested in certain things have access to context-sensitive search tools.

For things that the user has a recurring interest in, they can set up a search criteria in a related VC, e.g., the Computer/Software VC, so that each time the user enters the VC, the search criteria automatically brings up a list of new links of interest to the user. Thus, by following those links upon each visit to the VC, the user is kept up-to-date on certain computer software issues.

The auto search feature is primarily focused on publications associated with the VC. Provision is also made to search sites on the Internet too. Of course, the search criteria must be more specific in such Internet searches, so as to keep the number of links manageable.

6.13.3 Social Lists

Inasmuch as there may be many members in any given VC, and inasmuch as these members may come from any part of the world, it can be difficult for a user to remember who is who. This can be detrimental to the development of social functions within the VC.

As a solution to this problem, the system permits the user to set up reject/enemy and friend lists so that social interaction can be tracked and brief notes recorded about the relationship and activities (e.g., summaries of chat sessions).

6.13.4 Tracking

Tracking is one of the more important services. Tracking is like putting flags on things or events of interests. Tracking can be used to watch for a variety of different events, as when a follow-up message is posted to a tracked thread/message, new advertisements appear from a

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specific vendor, a friend is entering the system, stocks in the portfolio jump up 20%, weather changes, a daily summary of all message headers in a tracked VC is prepared, or just about anything else that can be tracked.

This tracking feature informs the user via e-mail and/or some forms of on-line alert systems.

Regardless of which alert system is used to deliver the message, it is easy for the recipient to turn off, either temporarily or permanently, any specific tracking. This can be implemented as an on-off switch built right inside of the alert message. The rationale behind this is simple: users may change their mind or interests of the things they tracked, and the system must give them a fast and easy way to reflect their current state of mind.

The major difference between tracking and auto search (see Section 6.13.2 above) is that tracking works all the time and auto search is performed only when the user is visiting the VC where the search is defined.

6.13.5 User Interface

Members usually have very different tastes and needs as individuals. Items such as the language the system is operating in, and the look-and-feel of the system, may affect the usability of the system immensely. For instance, teenagers may have different tastes from that of grown-ups.

Since the user interface is an important factor in determining the usability of the system, the system provides a number of different user interface "themes" to suit different user tastes.

Inasmuch as the VC is a group, it is desirable to share some form of common features among the members, such as group-related "wallpapers" and background music, and personalized portal pages. This not only instills a sense of group spirit, but also gives the member a refreshing sense of mental and/or spatial shift.

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6.13.6 Others

The user is also given the option to turn off some, or most, of the less relevant advertisements, external polls, etc., as well as other group or standard services.

7. Feedback, Credits and Bonuses

In any forum or system, the information is only as good as the people participating. Without feedback, the incentive to be responsible and provide good and helpful information to others is low. This is why the system has a formal, extensive feedback mechanism which applies to many aspects of the system, e.g., messages posted, advertisements displayed, the helpfulness of a user who was just chatted with, etc. Feedback is always voluntary, and occurs naturally when there is a strong feeling involved, either good or bad.

In this respect it should be appreciated that the hot buys and hot vendor feature (discussed in Section 6.10 above) are derived from the same feedback system.

To make things simpler, feedback is preferably in the form of either "thumbs up" or "thumbs down" or in the scale 0 to 10, optionally accompanied by a short comment, an option to provide additional information elsewhere on the Internet, and the identity of the feedback member. Thumbs-up and thumbs-down from different users can cancel each other out.

Feedback is recorded as a positive or negative credit into the entities evaluated. For instance, a well thought-out article in the discussion forum may receive a lot of thumbs-up feedback from the readers. These feedback votes are credited to both the article and its poster. The end result is that the article will be clearly marked as "Great" or "Must read", and the author receives more points which may eventually make that author an "Expert" or "Most Valuable Member".

Conversely, those that receive too many thumbs-down votes will be marked "Bad" or "Under Perform", and the authors or originators may be warned, and eventually denied some or all of the system's services.

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There is a formal policy and procedure to resolve conflict or disagreement between the feedback initiator and feedback recipient. This is done by the VC's governing body.

The administrator of any given service may determine that only postings or entities that have earned a certain level of positive credits get archived.

The member can earn 3 types of credits: recruit (new members) credits, posting (thumbs-up messages) credits, and helper (e.g., working as administrators) credits. Credits are redeemable for specific system resources (e.g., disk space), for certain privileged services (e.g., creating a Virtual Bubble - see Section 10 below) for cash, or for other forms of reward.

Any registered users can earn bonus credits when they bring in paid sponsors (e.g., advertisers, pollsters, etc.) to the system. Once the sponsor's request is deemed appropriate and thus fulfilled, a percentage of the income received from the sponsor is given to the registered user as a referral bonus. The bonus can be paid in cash, stock or in some form of credits.

8. Sponsorship

The sponsors financially support the operation of the system. Potential sponsors include advertisers, pollsters, companies, institutions, organizations, schools, and possibly other paid or unpaid entities.

Alternatively, the system may generate revenue by catering to the users directly. These kinds of activities may involve auctions, direct sales and other forms of e-commerce.

It is important to provide the most desirable services to the users. It is also important to match the right sponsors to the right VC's (and hence the right members within those VC's). Inasmuch as the natures of the VC's are so diversified, and inasmuch as potential sponsors may come from all over the world, this is not an easy task for the system.

Accordingly, members are encouraged to present the system with a list of vendors they wish to receive information from. Even more preferably, the users may act as salesmen and bring paid sponsors directly into the system.

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With little or no work on the part of the system, these vendors or advertisers may sign-up through the sponsor interface and automatically become sponsors of the system.

Although there are some self-serving reasons for users to voluntarily act as salesmen for the system, these reasons may not be strong enough to motivate everyone. As a result, the system is adapted to provide other incentives for these users.

One major incentive is to share the profit with the user who successfully solicits the business. This profit sharing can be at a fixed rate (e.g., 2%) or at a higher rate for the initial ad (e.g., 10%) and lower hereafter (e.g., 1%).

To ensure quality sponsorship, the system only rewards solicitors who bring in the right sponsor. Irrelevant ads only spoil the receptiveness of the members and hurt the system, and should be discouraged or even punished.

This type of user-based sales and marketing can cut down on operational and marketing costs while producing superior results.

8.1 Web Advertising

A major source of income for the system comes from Web advertising - advertisements from international conglomerates, national businesses and even local vendors, in short, advertisements from all over the world.

The advertisements may come from either indirect sources (e.g., agencies, etc.) or direct sources (e.g., vendors, manufacturers, etc.). Either way, the advertisements have to be carefully categorized, set up and directed to the relevant communities.

Unlike other systems, this invention can easily meet the advertiser's desire to deliver the right ad to the right people at the right time.

This is accomplished by recognizing that most users have multiple interests and roles to play, and may not be particularly receptive to some of the interests or roles at any given time.

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By way of example, suppose a user has interests in football and classical music. The present invention recognizes that when the user is thinking about football, they might not be very receptive to ads relating to classical music, and vice versa.

However, when that user is in the mood to enter a classical music VC, it is quite likely that a classical music advertisement would be well received. Thus, the "right time" is mapped into the time of the user visiting a certain VC.

The "right people" can be found by crossmatching the focus and profile of the advertisement with the focus and profile of the members. This works since the system's users, with the system's guarantee of their privacy, tend to be very cooperative in setting up their true personal profiles. This is also because setting up the correct profile and focus is the only way the user can receive the appropriate services from the system (e.g., meet the right people, read the right postings in the right language, etc.).

For instance, an automobile manufacturer, e.g., Ford, wishes to market their new model of sports coupe in the Asian market. Through research, Ford finds that the Hobby/Automobile/Sports Car VC, and all the VC's in the Hobby/Racing sub-community except the Hobby/Racing/Miniature VC and Hobby/Racing/Daytona VC, to be the most appropriate VC's. Also, Ford believes that any VC with a given set of keywords (e.g., "automobile", "car", and "racing") in their charters could be a good match.

In this case, Ford might set up the advertisement's focus as follows:

Location: Asia

Age: under 30

Click-through rate: above 5% in 60 days

And Ford might set up the profile of the advertisement as follows:

Available languages: Chinese, Japanese, Korean, and English

And Ford might set up the following action when there is a crossmatch with an appropriate user:

Collect: marriage status, income level, profession

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Some attributes denote the capability of the advertisement. For instance, "available languages" in the above example denotes how many language versions the advertisement is in so the Chinese version will be presented if (1) the current user has their language filter set to Chinese or (2) one of the user's language attributes is Chinese.

In the foregoing example, "Age" is a filter that is used to match the profile of the potential audiences to the ad.

The "click-through rate", and other unlisted but similar filters, represent the expected past history or experience of the user in the VC.

In the above example, the ideal user is depicted as someone having an active interest in buying cars, which is evident from the fact that the user clicked 5% of the car ads presented to that user in the past 60 days.

The action "collect" serves an important function in marketing research. In addition to trying to sell a sports car, the vendor may also want to collect certain information about those potential buyers. The action "collect" addresses this goal.

Thus it will be seen that an advertisement must first be posted to the right VC(s), and then it must be matched with the right users. Normally the advertisements will be posted into one or more VC's and then retrieved and viewed by selected members of the VC(s). The entry points of any advertisement will be recorded as one of its attributes.

To schedule the delivery of advertisements, for any given user, the system may show the most relevant advertisements (i.e., those explicitly entered into the current VC) first. When these are exhausted, the advertisements explicitly entered in the immediate parent VC(s) are retrieved and displayed. This retrieval process goes on all the way up the hierarchy if necessary.

The user has the option of limiting "pull" (see Section 13 below) or the relevancy of the advertisement displayed. This is done by limiting the level of retrieval of advertisements entered from the current VC. The minimum level is 1, which means that only those ads entered in the current VC will be displayed. System default is to retrieve ads all the way up to the root of the system.

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Where it is desired to display advertisements numerous times to the same user, various algorithms may be used to determine how many times an advertisement from a given level should be displayed. In general, the more relevant the advertisement to the VC (i.e., the closer it is explicitly entered to the VC), the more frequent it should be displayed to appropriate users in that VC.

Users also have the option to retrieve a specific advertisement, the last few advertisements displayed, advertisements from a specific vendor or a category of vendors, or the entire list of advertisements. This list of advertisements can be limited to a given VC, to a given community of VC's, or to a list of communities of VC's. This advertisement retrieval can be displayed on-line as well as off-line.

Some users wish to track certain types of products, models or things from certain vendors. The present system makes this easily possible.

The system is configured so that it can automatically stop delivering certain advertisements to certain VC(s), providing that the thumbs-down count reaches a set threshold, or if the "click-through" rate is not above a certain percentage. For instance, if a given advertisement has a less than 1% click-through rate after delivering 50% of the total scheduled impressions, then the system may stop delivering the remainder of the advertisements.

On the other hand, if the thumbs-up rate reaches a set threshold, or if the click-through rate is above certain percentage for certain advertisements, then the system can give priority to the advertisements, both in terms of the delivery of those advertisements or the frequency of repetition of those advertisements.

Priority may also be given to time-critical advertisements such as weekly sale, new product debut, those that have to be displayed during certain time-of-day or day-of-week, or those paying a premium on top of regular rate.

Once the user has clicked-through, or given feedback to, certain advertisements, then those advertisements may not be redisplayed to the same user. Again, the user is in control of this feature. Some users may wish to see the same advertisement more than once.

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The effectiveness of the advertisement is an important index to the advertisers, and the advertisement relevancy/appropriateness is equally important to the users, as well as to the system administrator. These two factors can be measured by the number of impressions in, as well as feedback from, any given VC.

As an incentive for achieving a good match between the advertisement and the users, the advertisements and their advertiser(s) may enjoy free publicity if the advertisement is showered by thumbs-up votes. These thumbs-up votes will make them hot buys and hot vendors in these VC's (see Section 6.10 above).

In order to protect the users' interests with respect to advertisements, the system is configured to penalize any advertiser that practices bait-and-switch tactics or other types of unfair business practices. In addition, the system is configured to give rate discounts to advertisers if they offer their best deals in terms of lower prices or better services to the users. The advertisers are also encouraged to provide free samples to the users, as a promotion of both their products and the new system.

The pricing of the advertisement can be based on:

- Advertisement type

- Number of filters applied

- Fixed number of exposures

- Fixed number of exposures, plus click-through rate (as extra)

- Fixed duration

- Fixed exposures and duration, whichever is reached first.

Regular advertisements can be prepared, entered, published, analyzed with a report and then billed entirely through the system's advertiser interface. In other words, the advertisement comes in, and goes out, through an on-line automated advertisement mechanism. There is no human contact involved and it can be very efficient.

For those advertisers less savvy, and/or in need of more handholding in Web advertising, an extensive set of support materials is available to educate and guide the advertisers through the

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preparation process. The advertiser interface is also adapted to provide more traditional services through alliances with Web advertising agencies all over the world.

8.2 Polls

Polls are very important to the system. A VC poll administrator, seeking public opinions on things, can initiate them internally within the VC. A poll can also be set up by paid sources outside of the system and then directed to selected groups of users within the system.

Polls operate similarly to advertisements with several differences: they omit the normal thumbs-up, thumbs-down type of relevancy feedback, and they typically need to record more personal information about the users who have been polled. And, of course, the nature of polls is to collect opinions about things, rather than trying to sell something to the users.

The one thing that is never collected by the poll is the identity of the participants. This is to protect their privacy.

8.3 Directory Services

Companies, organizations, institutions or other social entities must pay a fee to have their names, services, or Web sites listed, on a long-term basis and in an organized way, in corresponding VC's. This directory is something like the Yellow Pages, and can serve both person-to-business activities and business-to-business activities. These directory listings include locale and other attributes so as to help users find the appropriate organizations more easily.

To promote better business practices, a review/feedback system, similar to the credit system discussed above, is implemented as a collection of attributes into each listing. This not only helps the potential customers in their evaluation process, but also helps current or past clients in resolving problems and disputes.

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8.4 Private Communities

Companies or others may be charged a fee, either based on the number of users involved, resources consumed, or other measures, to create their own private, closed communities, or to acquire other specific premium services such as video conferencing provided by the system.

8.5 Brokerage Services

The system supports a wide range of transactions between users and businesses. Sometimes one or both parties may wish to go through the transaction via a broker.

This service is most desirable during non-local and international transactions. However, it may also involve trading between two members in any given VC, as is mentioned in Section 6.7 above.

8.6 Direct Retails

The system is also arranged to carry some 3rd party merchandise (e.g., books, music CD, toys, etc.) and/or services (e.g., auctions, real estate listing services, etc.) under its own banner. The transaction may occur locally within the system or pass through directly to the 3rd party.

8.7 Virtual Bubbles

As discussed in Section 10 below, virtual bubbles ("VB's") may be set up for corporations, institutions, and many other types of social entities with a flat or usage fee. These VB's provide services similar to VC's to a special interest group, and they can be used as a intranet, extranet, or customer service front, or simply a club, corporation, or member gathering and social place.

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9. Backward Compatibility

Part of the system's design goal is to remedy the shortcomings of newsgroups, mailing lists, and other existing forums ("legacy systems"). As a result, it is desirable for the system to provide a way for the users of these services to migrate to the present system.

To provide a gradual and smoother migration path from these legacy services, the system utilizes gateways between VC's and those services. Multimedia content embedded in the messages has to be filtered or separated and then delivered as links to the storage in the system.

Since the VC's are very accommodating, in terms of geographical, language and other local differences, compared to those legacy services, it is necessary to set up filters to direct the information in the VC's into the appropriate legacy systems (e.g., newsgroups).

For example, the "Law" VC may be mapped into multiple newsgroups such as

Misc.legal

Uk.legal

Alt.uk.law

Alt.lawyers

as well as several different mailing lists such as

Usa.tx-law-mailing-list

Usa.ma-legislation-mailing-list

Correspondingly, on the incoming side, it is necessary to attach preset profile, depending on the source, so that the information can be properly aligned with the focuses of the appropriate VC users.

Each outgoing message may also carry other information such as a link to the corresponding Web page in the system, and some system promotional information.

The maintenance of these gateways is the duty of the governing body.

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10. Forming A Virtual Bubble

A Virtual Bubble ("VB") is an intimate and private group. It provides similar group level services, and can form hierarchies similar to those of the VC. In any given system, there is typically 1 root VC that is the root of the VC hierarchy. But there are many different hierarchy trees for VB's which reflects the privately-held nature of VB's – there can be many different business, organizational or institutional owners controlling VB's in their own tree hierarchy. VB and VC have completely separate tree hierarchies and should be viewed as disjoint and non-overlapping trees. There is no way to establish a parent/child or sister relationship between a VB and a VC.

The major difference between a VB and a VC is that VC's are public areas governed by their members whereas VB's are always privately held and owned. A second difference is that a VB usually has a geospatial and/or language and/or some other attribute(s) orientation that naturally forms its profile, while a VC is not associated with any attributes and has none. In other words, a VB has profile whereas a VC never has profile. Logically, a VB always resides within a VC that is the closest to it, in terms of the main interests. To the user of the enclosing VC, VB's can be regarded as another form of VC group resources or they can be viewed as sub-doors into narrower focused groups.

For instance, the American Bar Association may maintain an ABA VB within the Law VC.

Some common reasons for forming a VB are

- To maintain a closer affinity group among selected members in the VC.
- To establish a presence in the relevant VC to showcase products and/or services.
- To create a trading post, with surrounding VC members as potential customers.
- To create an intranet to take advantage of the system's service.
- To create an extranet to facilitate communication and trading amongst business partners.

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Looking next at Fig. 2, there is shown a plurality of VC's 100 and VB's 300. More particularly, the VC's 115, 145, 150, 155 and 160 from Fig. 1 are reproduced in Fig. 2; in addition, a Storage Technology VC 165 has been added in Fig. 2, where Storage Technology VC 165 is a child of the Hardware VC 150. Fig. 2 also shows a Compaq Computer VB 305 and a Compaq Hard Drive Division VB 310, where the Compaq Computer VB 305 is in the Computers VC 115, the Compaq Hard Drive Division VB 310 is in the Storage Technology VC 165, and where the Compaq Computer VB 305 is a parent of the Compaq Hard Drive Division VB 310.

11. Outside Of VC

After the login process, the registered user will be informed of the arrival of any new e-mails, new events in their personal calendar that need attention, important VC or system announcements, as well as any other issues and events that the user explicitly requested with the tracking facility (see Section 6.13.4 above).

This notification system is always in effect as long as the user stays logged on.

The user can find other registered users, interesting topics, VC's, sponsors, or just about any entity in the system, through a flexible search facility. This search facility is a system-wide facility, unlike that of the VC's.

12. System Architecture

Thus, and looking now at Fig. 3, it should be appreciated that the novel system of the present invention utilizes, and implements, an architecture consisting of:

- (1) virtual associations which, for some purposes, can be considered to be virtual meeting places or virtual places;
- (2) users; and
- (3) postings.

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Virtual Associations. Virtual associations are the voluntary groupings established within the system to bring together users having similar interests. Virtual associations or groups come in two basic forms:

- (1) a virtual circle, or "VC"; and
- (2) a virtual bubble, or "VB".

Both VC's and VB's are organized in a hierarchy structure. This hierarchy structure permits the subject matter of the groups to be subdivided into progressively more detailed groupings, whereby users can readily locate an appropriate group reflecting their particular level of interest in a subject. VB's are substantially the same as VC's, except as noted above.

Users. Users are the individuals utilizing the system. Users can be classified into three basic categories:

- (1) guests;
- (2) registered users; and
- (3) administrators.

A guest is someone who has not been identified by the system. Guests can enter and use the system, but they have restricted privileges within the system. For example, a guest might be able to read an informational posting, but they might not be able to post information.

Registered users are the standard user category. Registered users normally have all of the standard privileges associated with the system. For example, a registered user can typically read informational postings, make informational postings, talk or chat with another user, etc.

A registered user can join a particular VC, in which case they become a member of that VC.

Administrators have all of the privileges associated with being a registered user, plus they have the special privileges associated with their administrative authority. There is an administrator for the overall system which is the system administrator, and there is one or more administrators for each group (i.e., VC or VB) which are called group administrators. The authority of an administrator depends on the domain that they are responsible for administering.

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For example, the administrator for the overall system can create a new VC; the administrator for a particular VC can push postings downward (i.e., to a child VC) or laterally (i.e., to a sister VC), etc.

Registered users can have focus and profile. Focus is the filter which acts as a discriminator to limit the content which is presented to the user by the system. Profile is a set of attributes characterizing the user. Focus and profile are defined by the user, according to the degree of specificity which that particular user desires to declare. For convenience, the system permits the user to declare their focus and profile in the context of categories established by the system.

Postings. Postings are the medium through which information, or "content", is passed to and from users. Postings can be in one of two forms:

- (1) a passive posting; or
- (2) an active posting

A passive posting has both profile and content. In other words, a passive posting has the information which is to be passed (i.e., the "content") and a tag (or "profile") which sets forth some attributes associated with that information. This profile is then used by the system to determine which users should be shown the passive posting. In particular, the profile of the passive posting is compared with the focus of different users: where the profile of the passive posting "matches" the focus of a given user, the passive posting will be displayed to that user. Passive postings are typically things like news postings, calendar event postings, etc.

An active posting has profile, focus and content. More particularly, an active posting has the information which is to be passed (i.e., the advertising message, or "content"), a tag (or "profile") which sets forth some attributes associated with that information, and another tag (or "focus") which sets forth a filter to limit whom the advertisement should be shown to. This profile and focus is then used by the system to determine which users should be shown the active posting (i.e., the advertisement). In particular, the profile and focus of the active posting is compared with the focus and profile of different users: where the profile and focus of the active

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posting "crossmatches" the focus and profile of a given user, the active posting will be displayed to that user. Passive postings are typically things like advertisements or polls, etc.

13. An Example Of System Operation

Further details regarding the architecture and implementation of the present invention will be revealed through the following example of system operation.

Creating A New VC. As noted above, the present invention is based on the concept of VC's. Thus, a good starting point for this example is with the creation of a new VC.

A new VC is typically created by the system administrator. At the time of creation, the system administrator needs to integrate the new VC into the existing hierarchy of VC's. This means that the relationship of the new VC, vis-à-vis the existing VC's, must be identified. As noted above, the hierarchy of VC's is defined in the context of parent, child and sister relationships.

Thus, for example, and looking now at Fig. 4, there is shown a new VC 170 being integrated into an existing hierarchy of VC's. More particularly, Fig. 4 shows new VC 170 being added to the hierarchy so that new VC 170 is a child of the existing VC 175, the parent of the existing VC 180, and the sister of the existing VC 185. For convenience, when defining the relationship of new VC 170 to the currently existing VC's in the hierarchy, the new VC can be identified as being the parent (P) of certain VC's, the child (C) of other VC's, and the sister (S) of still other VC's. Thus, for the example shown in Fig. 4, the following nomenclature might be used:

VC 170 = P (VC 180)
 = C (VC 175)
 = S (VC 185)

If desired, the system or group administrator can add special, VC-specific categories to the system for use in content tagging, i.e., the system administrator can establish VC-specific categories for the profile of any postings made in the VC.

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Adding Content To The New VC. Once the new VC has been created, it is generally desirable to add some content to the VC, so that users coming to the VC can obtain information.

Content typically comes from one of two sources, i.e.:

- (1) internally generated sources (i.e., the system administrator and/or other users); and
- (2) externally generated sources.

Content From Internally Generated Sources. The content from internally generated sources typically comprises postings from the system administrator and/or other users. For example, a posting from an internal source might comprise a calendar posting.

Looking now at Fig. 5, a passive posting 400 typically has two parts: content 405 and profile 410.

Content 405 is the message itself, i.e., "There will be a meeting for all members of the Exxon Marketing Department on Friday, April 21, 2000 at 9:00 am."

Profile 410 is the classification attribute, or categorization, of the message. Profile is created by the poster at the time of posting. This is done by presenting the user with some pre-established categories to choose from: the user then selects the proper element for each pre-established category. Categories can be presented to the user by the system (in which case they are presented on a systemwide basis) or they can be presented to the user by a specific VC (in which case they are presented on a VC-specific basis).

Some examples of systemwide categories might be as follows:

- (1) language (e.g., English, Chinese, etc.);
- (2) geospatial (e.g. North America, United States, Massachusetts, etc.);
- (3) experience level (e.g., novice, intermediate, expert, etc.); and
- (4) relevance level (e.g., on topic, off topic, etc.).

Some examples of VC-specific categories might be as follows, for a gymnastics oriented VC:

- (1) floor exercises;
- (2) vault;

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- (3) beam;
- (4) parallel bars;
- (5) rules.

As noted above, the poster sets the profile for each posting by selecting the appropriate items from each category presented to the poster. In this respect it should be appreciated that all categories are offered for all postings. Furthermore, all postings are looked at in the context of all categories when applying the focus/profile test used to direct appropriate content to the user. And if the poster fails to declare an item in a category when the poster is setting the profile for the posting, the system is configured to automatically assume that the content has no identity in that category.

As noted above, an active posting is similar to a passive posting, except that it includes focus as well.

Content From Externally Generated Sources. The content from an externally generated source typically comprises an item from a legacy system such as a newsgroup or a mailing list.

In order to access an externally generated source, the system utilizes gateways.

More particularly, and looking now at Fig. 6, a gateway 500 must be established for each legacy system 505 (i.e. newsgroup or mailing list, etc.) which is to be connected to a VC 100. Each legacy system 505 has its own gateway 500 which is mapped to one or more VC's 100. Specifically, as seen in Fig. 6, a gateway 500 resides, in a logical sense, adjacent to each legacy system 505 and acts as a medium through which the legacy system 505 passes content to a VC 100 (gateway 500 can also serve to pass content from a VC to a legacy system, as noted below).

Each gateway 500 includes a profile tagger 510 which establishes the profile for the content of each posting passing from the legacy system 505 through the gateway 500. Thus, the content arrives at VC 100 with the profile needed for proper processing by the system. The party which sets up the gateway for a particular legacy system establishes the profile tagger which will

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be used to tag each message moving from the legacy system, through the gateway, to one or more VC's.

In other words, and looking now at Figs. 6 and 7, a posting consisting of just content 405 (Fig. 7) passes from the legacy system 500 (Fig. 6) to the gateway 500 (Fig. 6), where profile tagger 510 (Fig. 6) adds profile 410 (Fig. 7) to the content, before the tagged content is sent to a VC 100 (Fig. 6).

Passing Content From A VC Back To An External System. Just as gateways permit an externally generated source to pass content to a VC, they also permit a VC to pass information from a VC back to an external source. However, in this respect it should be noted that the process for sending content from a VC to the legacy system is quite different from the process for sending content from a legacy system to a VC.

More particularly, and looking next at Fig. 8, there is shown an architecture for passing content (e.g., postings) from VC 100 back to a legacy system 505. Specifically, the VC 100 is mapped, either at the time of creation or sometime thereafter, to specific gateways 500, each of which leads to an associated legacy system 505. Thus, for example, in Fig. 8 there is shown a single VC 100 which is mapped to three different gateways 500A, 500B and 500C, each of which leads, in turn, to its respective legacy system 505A, 505B and 505C.

When a user creates a message in VC 100, the user creates the content 405 (Fig. 5) and adds profile 410 (Fig. 5).

When a gateway 500 is mapped to a VC 100, a unique focus 505 is attached to that mapping. This focus acts as a filter for all messages coming out of the VC 100 and going into the gateway 500. Thus, for example, and looking now at Fig. 8, where VC 100 is mapped to three gateways 500A, 500B and 500C, each mapping has a unique focus 515A, 515B and 515C respectively.

As a result, when the user creates their posting (content plus profile), VC 100 sends that message out to every gateway 500 that VC 100 is mapped to. When the message arrives at each mapped gateway 500, it has its profile 405 (Fig. 3) compared with the gateway's focus 515. If

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the profile of the message matches the focus of the gateway, the message is passed through the gateway and out to the legacy system.

Alternatively, the user making the posting can be given explicit control of which matching gateway(s) the message shall be forwarded to.

It should also be noted that, as shown in Fig. 9, different VC's 100 may be mapped to the same gateway 500; however, a separate focus 515 is established for each such mapping. Thus, for example, in the system shown in Fig. 9, a focus 515'' is established for VC 190, whereas a focus 515' is established for the VC 195.

Fig. 10 shows a common configuration for VC's 100, gateways 500 (having profile taggers 510 and focus 515) and legacy systems 505.

At this point in this example, it will be seen that a new VC 170 (Fig. 4) has been created and set into its appropriate location within the VC hierarchy; and that this VC 170 has been filled with some content, i.e. either internally generated content or externally generated content.

New User. Suppose now that a new user wishes to join the system. The first thing that must be done is that the user must explicitly establish their focus and profile. This is necessary because the system does not automatically assign each new user a default focus and profile.

Focus. Focus is probably the single most important attribute for the user, because without focus, the user would be unable to filter out unwanted information from the system, and the user will be effectively overwhelmed by the huge quantity of information present in the system.

In essence, focus is the filter which is used as a discriminator to selectively pass to the user only the content desired.

Focus is defined in the context of categories. More particularly, at the time the user joins the system, the user is presented with various categories and declares their focus in the context of those categories. In this respect it should be noted that at this stage in this example, the user is simply joining the overall system and has not yet joined any specific VC; as a result, when the user is prompted to declare their focus, the system will present the user with just the systemwide categories.

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It should also be noted that if the user does not declare into a category, the system automatically assumes that the category is not important to that user, and it does not use that category to exclude messages from the user. In other words, if the user does not define into a category, the system assumes that all profiles will match that category.

Profile. Next, the user will declare their profile attributes. There are three primary uses for user profile: first, it is used as a time saver to establish a baseline for all of the postings by that user, e.g., the system uses the user's profile to establish a baseline profile for any messages that the user posts (however, the user can, of course, modify this baseline message profile if desired); second, it is used to match like users together; and third, it is used for advertisers to target advertisements to appropriate users.

The user declares their profile in the same way that they declare their focus, i.e., the system presents the user with various categories, and the user declares their focus in the context of those categories.

Subscribing To Selected VC's. Essentially, the user walks through the system's hierarchy of VC's to identify those VC's which best reflect that user's type, and degree, of interests. Alternatively, the user could follow a link into a certain VC, and decided whether to become a member of that VC.

Using The System. At this point in the example, the user is ready to use the system. This will typically involve logging into the system, and then selecting a particular VC to participate in. Such participation will typically involve receiving information from the system, or posting information to the system.

Receiving Information From The System. Looking now at Fig. 11, the particular VC 100 entered by the user has a supply of content associated with it. As noted above, this content can be internally generated content or externally generated content. Regardless of its source, this content is present in the VC and is tagged, i.e., it comprises both profile 410 and content 405. The user, on the other hand, has both focus and profile. The system compares the user's focus

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with the profile of all the content associated with the VC to determine precisely which content will pass through to the user.

Posting Information To The System. Looking next at Fig. 12, there is shown, in schematic form, how the user, in the course of posting a message into the circle, adds their profile to the content, whereby the content is rendered usable by the system. More particularly, profile is added to the content by (1) the system automatically establishing a default profile for the message, by taking the user's own profile, and then (2) the user may thereafter modify that default profile in accordance with explicit profile declarations made by the user, so as to arrive at the final profile for the content.

Pushing and Pulling. Thus, as shown in Fig. 12, it will be seen that the user normally receives information from postings who's profile matches the user's focus, and posts information by associating a profile with the content being posted.

Normally, the user has entered a VC before this information exchange begins. Thus, in the simplest case, when the user is receiving information, or when the user is posting information, the information transaction is taking place solely within the current VC.

However, through the system's pushing and pulling features, the user is able to move beyond their immediate VC and access information originated or residing elsewhere (ie: in other VC's) in the system.

More particularly, as noted above, VC's have a hierarchy of relationships. A VC may be a base VC, it may be a child of another VC, it may be a parent of another VC, or it may be a sister of another VC. The relationships of these VC's govern how information transactions may move beyond the immediate VC.

Pushing. Through the use of the system's push feature, the administrator for a given VC can push content to subordinate or sister VC's. Thus, the system administrator can push content downward (i.e., to a child VC) or sideways (i.e., to a sister VC). In this respect it should be appreciated that only the VC administrator (or system administrator) is permitted to push content to another VC.

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Furthermore, it should also be appreciated that when content is pushed downward to a child VC, the content can be passed to just the immediate child VC, or the content can be passed to anywhere below the originating VC (i.e., to the immediate child of the originating VC and to anything below that immediate child).

By way of further explanation, all messages associated with a given VC are held in a database for that VC, regardless of whether the message was generated internally to that VC (i.e., by the VC administrator or a user) or externally to that VC (i.e., from a gateway). Thus, when a message is pushed to another VC, the message is simply placed in the database for that other VC.

By way of further explanation, with respect to the expression "a database for that VC", this term can mean a self-standing database specifically dedicated to that VC, or it can mean a part of a larger database which has entries for multiple VC's contained therein, each entry being tagged to a specific VC.

Pull. The user is also able to pull content from beyond their immediate VC. In a way, this is somewhat like the user deciding that they wish to be part of a larger group without leaving their immediate VC. The user pulls content from outside their immediate VC by making an appropriate selection from the pull menu, e.g.,

1. show content from one level up
2. show content from two levels up
3. show content from one level down
4. show content from two levels down.
5. show content from all levels up, etc.

Advertisements. Looking next at Fig. 13, an advertisement comprises an active posting, which comprises focus, profile and content. When an advertiser runs an advertisement, the advertiser places the advertisement into a specific VC. This placement provides a first level of advertising targeting, since placing the advertisement into a specific VC effectively directs the advertisement to a specific audience interested in a specific topic (i.e., the topic of the group).

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In addition, however, the fact that each user has focus and profile, and each advertisement has focus and profile (as well as, of course, content), permits the system to crossmatch focus and profile, and profile and focus, so as to ensure that the advertisement is highly targeted. See Fig. 13. More particularly, the focus and profile test (i.e., testing the profile of the advertisement against the focus of the user) ensures that the advertisement contains content which is of interest to the user; conversely, the profile and focus test (i.e., testing the profile of the user against the focus of the advertisement) ensures that the advertisement is displayed only to the users who meet a target criteria. Thus, this crossmatch provides a second level of advertising targeting, since it ensures that advertisements are only directed to receptive and qualified users.

With respect to focus-profile crossmatch discussed above, it should be appreciated that an advertisement will successfully navigate the focus profile and profile focus test only if both tests are successful.

Matching Profile with Focus, and Crossmatching Focus with Profile and Profile with Focus. As noted above, the system uses focus and profile to determine which content is displayed to which users.

More particularly, profile is a group of characteristics which describe something about an object, e.g., a posting or a user.

Focus is the filter against which profile is applied in order to determine whether content should be passed to a user.

Registered users can have both focus and profile.

All postings have at least profile and content and, in some special cases such as advertisements and polls, focus as well. More specifically, passive postings have profile and content; active postings have focus, profile and content.

In order to determine whether a posting is displayed to a user, the system matches the profile of the posting against the focus of the user. If the profile of the posting matches the focus of the user, then posting is passed to the user, i.e., the content of the posting is displayed to the user.

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In the special case of an active posting (e.g., an advertisement), where the active posting has both profile and focus, the system crossmatches (1) the profile of the posting (i.e., the profile of the advertisement) against the focus of the user, and (2) the focus of the posting (i.e., the focus of the advertisement) against the profile of the user. If the profile of the posting (i.e., the profile of the advertisement) matches the focus of the user, and if the focus of the posting (i.e., the focus of the advertisement) matches the profile of the user, then the posting (i.e., the advertisement) is passed to the user, i.e., the content of the posting (i.e., the advertisement) is displayed to the user.

If desired, focus and profile can be expressed in a relatively loose and unstructured manner.

However, in the present invention, it is generally preferred that focus and profile be expressed in a relatively structured manner, in order to facilitate comparing focus and profile (in the case of passive postings), or focus and profile and profile and focus (in the case of active postings). In this respect it should also be appreciated, however, that even though the system uses a highly structured approach to express focus and profile, this structured approach is capable of being easily modified during use so as to accommodate a continuously-changing community of users and subject matter.

Categories. In particular, the system preferably uses a set of categories to help organize focus and profile within the system, with each category having its own hierarchy.

Categories can be established on two different levels:

- (1) systemwide vs. groupwide categories; and
- (2) generic vs. section/service-specific categories.

Visibility is the determining factor for categories. A category is said to be "visible" when the user can select an attribute from this category and the system will take it into consideration in the matching process.

Systemwide categories are established by the system administrator and is visible in all groups (VC's and VB's).

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Groupwise categories are established by the VC or VB administrator and only visible in the group they are defined in.

Most of the categories are visible in the scopes defined above. However, there are some categories that are visible only when the user is in certain section of the system. For example: some categories are only visible in Classifieds section and some categories are only visible in Poll section. These categories are not visible outside of the sections they are defined and thus have a more limited scope.

So, combining the effects of both levels, it will be seen that there are four different category scopes:

- Systemwide generic - a category of this type is visible everywhere in the system.
- Systemwide section/service-specific - a category of this type is visible in the section it is defined in every group.
- Groupwise generic - a category of this type is visible everywhere within the group it is defined.
- Groupwise section/service-specific - a category of this type is visible only in the section within the group it is defined.

The distinction of scopes is important so that users are not overburdened by categories that only make sense in certain sections and/or groups.

Each administrator establishes categories of attributes according to the subject matter of their particular domain. In other words, each administrator looks at the subject matter to be dealt with within their domain, and then establishes a logical structure, in the form of hierarchies of attributes, for characterizing items of focus and profile. Again, inasmuch as categories can be added and deleted and modified over time, the system can be continuously adapted to accommodate changes in the community.

By way of example but not limitation, a systemwide administrator might establish some of the general categories widely applicable within the system, e.g., a geospatial category, a language category, an experience category, etc.

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By way of further example but not limitation, a group administrator, administering a group relating to automobiles, might establish some general automobile categories, e.g., sedans, minivans, sports cars, etc.

In addition to creating categories, the administrator will typically create, either at the time of creation or some time thereafter, a hierarchy for each of the categories.

Thus, for the example of the system administrator discussed above, the geospatial and language categories might look something like that shown in Fig. 14. In this respect it should be appreciated that with the hierarchy structure for each category, everything lower on the hierarchy tree is a more specific instance of the node immediately higher on the hierarchy tree.

Focus and profile is defined within the system in the context of categories of attributes that have been established.

Thus, where a user is to establish their focus and profile, and where the appropriate administrator has created certain categories, these categories are presented to the user and the user defines their focus and profile in the context those categories established by the administrator.

Furthermore, postings must have their profile and, in the case of active postings (e.g., advertisements), their profile and focus, defined in the context of these same categories.

Using Categories To Test For Matches And Crossmatches. These category definitions then provide a common framework within which to match profile against focus (in the case of passive postings), or to crossmatch profile and focus against focus and profile (in the case of active postings, e.g., advertisements) in order to determine whether content is to be displayed to a user.

In order for there to be a match, there must be a match in all categories. If even one category fails to match, then the test fails and the content is not displayed to the user.

On the hierarchy tree of any given category, there are some relationships among the attribute nodes. One of the relationships is "overshadow". From Fig. 15, node 2 is said to overshadow node 4 since node 4 is a more specific instance, i.e., either a direct or indirect

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descendant, of node 2. And from Fig. 15, we can see node 2 not only overshadows node 4, but node 5, 6, 8, 9, and 10 as well. The nodes overshadowed by node 2 are said to be in node 2's "coverage" or "footprint".

In this respect, it should be appreciated that the term "match" on the node level is meant to be interpreted here in the sense of matching within the tree hierarchy - focus node and profile node can match, even if they are not literally the same, so long as focus is a more generic condition than profile (or, stated another way, so long as the focus node in question overshadows the profile node).

Example 1:

Suppose User X has the following of focus:

Geospatial: North America

Language: English, Chinese

And suppose that Posting 1 has the following profile:

Geospatial: Australia

Language: English

In this case, there is no match in the geospatial category, since the Posting's Geospatial profile item ("Australia") is not the same as, or a more specific instance of, the User's Geospatial focus item ("North America"). Therefore, the test fails and Posting 1 is not displayed to User X.

Example 2:

Suppose User X has the following of focus:

Geospatial: North America

Language: English, Chinese

And suppose that Posting 2 has the following profile:

Geospatial: World

Language: Chinese

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In this case there is no match in the geospatial category, since the Posting's Geospatial profile item ("World") is not the same as, nor a more specific instance of, the User's Geospatial focus item ("North America"). Therefore, the test fails, and Posting 2 is not displayed to User X.

Example 3:

Suppose User X has the following of focus:

Geospatial: North America

Language: English, Chinese

And suppose that Posting 3 has the following profile:

Geospatial: America

Language: Mandarin

In this case, there is a match in the Geospatial category, since the Posting's Geospatial profile item ("America") is a more specific instance of the User's Geospatial focus item ("North America"); and there is a match in the Language category, since the Posting's Language profile item ("Mandarin") is a more specific instance of one of the User's Language focus items ("English", "Chinese"). Therefore, the test succeeds, and Posting 3 is displayed to User X.

Example 4:

Suppose User X has the following of focus:

Geospatial: North America

Language: English, Chinese

And suppose that Posting 4 has the following profile:

Geospatial: America

Language: Chinese

In this case, there is a match in the Geospatial category, since User's Geospatial focus item ("North America") is more generic than the Posting's Geospatial profile item ("America"); and there is a match in the Language category, since there is exact match between one of the User's Language focus items ("Chinese") and the Posting's Language profile item ("Chinese"). Therefore, Posting 4 is displayed to User X.

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Explicit Category Declarations And The Absence Of The Same. Sometimes the user will make an explicit declaration into an established category, e.g., the user will explicitly declare the entry "Chinese" into the Language category, or the user will explicitly declare ("Vietnam") into the Geospatial category.

At other times, the user may not make such an explicit declaration into a visible category. This might be because the user does not have a preference or attribute for this category, or it could be because the category was created after the focus or profile was established, etc. In this case, the system applies the following rule:

(1) in focus, where nothing is explicitly declared in a category (or where the root of the category is explicitly declared), then all profiles will be considered to meet the focus for this category, i.e., everything passes the test for this category;

(2) in profile, where nothing is explicitly declared in a category, then this profile will be considered not to meet any focus for this category, i.e., the test always fails for this category (provided, of course, that there is a declared focus for this category).

So working from bottom-up in terms of the matching process:

(1) Focus node A matches profile node B if they are either the same node or A overshadows B.

(2) There is a match in a given category (or attribute hierarchy tree) if there is at least 1 node match in that category. A special case is that if there is no focus specified on a given category, that category is considered matched.

(3) There is a match between focus and profile if there is a match in every category currently visible.

(4) Where one of the entities is an active posting, there is a match between 2 entities if their profiles and focuses crossmatch each other.

Preferred Category Implementation. In one of the preferred forms of the invention, categories, and consequently focus and profile, are implemented as follows.

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First, as each new attribute node in a category is defined, that node is given a unique node number.

Thus, by way of example but not limitation, with respect to the Geospatial and Language categories shown in Fig. 14, these categories might have the corresponding structure shown in Fig. 15.

These node numbers can then be used to express profile and focus in a shorthand way.

For example, suppose User X has the focus:

Geospatial: North America

Language: English-based

Here, focus could be expressed as:

Geospatial: 4

Language: 12

Or, even more simply, the focus for User X can be expressed simply as focus (4, 12).

Similarly, suppose Posting 4 has the profile:

Geospatial: America

Language: Chinese

Profile could be expressed as:

Geospatial: 8

Language: 13

Or, more simply, the profile for Posting 4 can be expressed simply as profile (8, 13).

This information is stored in a database.

Testing For Matches And Crossmatches With The Preferred Category

Implementation. Next, when a user enters a VC and it is time to display appropriate content to that user, the system uses the following methodology for test for matches and crossmatches.

First, the focus list for that user is extracted from the database. In other words, for that user, for each focus item contained in the various categories, an entry is created. This entry is in the format: (root node, level, node ID).

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Thus, suppose User X has the focus:

Geospatial: North America

Language: English-based

In this case, User X would have the focus:

Geospatial: (1, III, 4)

Language: (11, II, 12)

Thus, User X would have the following focus list:

(1,III,4)

(11,II,12)

Next, the user's focus list is sorted on the basis of root node, and then level.

Therefore, User X would have the following sorted focus list:

(1,III,4)

(11,II,12)

Then the profile list of postings is tested one at a time against the sorted focus list for User

X.

Thus, for example, suppose Posting 4 is to be tested against the sorted focus list for User

X.

It will be recalled that, in the example, Posting 4 has the profile:

Geospatial: America

Language: Chinese

Alternative, profile can be expressed as:

Geospatial: 8

Language: 13

Or, more simply, the profile for Posting 4 can be expressed as profile (8, 13).

This profile is then compared against the focus for User X.

More particularly, the first entry in the profile for Posting 4, i.e., 8, is compared against the first item in the focus list for User X, i.e. (1, III, 4). If this comparison produces a match, then

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there is a match for the first category, and the system automatically moves on to the next category.

However, if this first comparison does not produce a match, the second profile node, i.e., 13, is tested against the first focus item, i.e., (1, III, 4). Again, if this comparison produces a match, then there is a match for the first category, and the system automatically moves on to the next category.

However, if this test also fails, then the third profile node (if any) is tested against the first focus item, etc.

If the entire list of profile nodes is exhausted against the first focus item without a match occurring, then it is necessary to determine whether any other focus items might be met by the profile of the posting. Therefore, the Posting's list of profile nodes is then tested, one by one, against the next item in the focus list, etc..

This process is continued until either (1) a match is obtained, in which case a match has been found for that category and it is possible to move on to the next category, or (2) both the profile and focus lists are exhausted without finding a match, in which case the test fails for that category, and hence for that Posting.

Again, it should be appreciated that focus and profile must match for all categories in order for content in question to be displayed to the user.

Further Refinements. Inasmuch as focus and profile are expressed in terms of categories, and inasmuch as these categories are constructed hierarchies, it is possible to expedite the search process. The sorting of focus nodes with the primary key of root node facilitates the skipping of any additional focus nodes in the matched category. This is possible since the associated root node represents categories.

Secondary level sorting of the focus nodes based on their hierarchy level ensures that within a given category, focus nodes that are higher in the hierarchy are tested against the profile nodes earlier than the focus nodes that are lower in the hierarchy. Since, in general, the higher the

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node, the broader its coverage (or the bigger its footprint). This increases the chance of having a match earlier in the category tree under examination.

Example:

Suppose User Y has the following focus: (17, 6, 237, 19476, 674).

And suppose further that User Y's focus generates the following focus list:

- (1, III, 17)
- (1, II, 6)
- (2, IV, 237)
- (5, I, 19476)
- (3, II, 674).

This focus list is then sorted in the manner previously described:

- (1, II, 6)
- (1, III, 17)
- (2, IV, 237)
- (3, II, 674)
- (5, I, 19476)

Then this sorted focus list is tested against the profile of all of the postings in the VC to determine which ones should be displayed to the user.

Suppose, for the sake of example, there are three postings:

Posting No. 10, with a profile 476, 351, 12

Posting No. 19, with a profile 43, 5, 10.

Posting No. 597, with a profile 15, 17, 12463

The test is then conducted by taking the profile of the first posting, i.e., Posting No. 10, taking the first node in that first posting's profile, i.e., 476, and comparing it against the focus of the user. This is done by testing that first profile node, 476, against the first sorted focus node, i.e., (1, II, 6).

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If there is a match, then there is a match for that category, and the process can go directly on to test for the next category. In the case of this example, this means that any other nodes in that first category can be skipped, i.e., the entry (1, III, 17) can be skipped, and the test can go directly on to test the first node in that second category, i.e., entry (2, IV, 237), in that user's focus list.

If there is not a match, then the process instead moves to the second node in the profile list, i.e., 351, and it is tested against the first element in the focus lists, etc.

If the profile list is exhausted without a match being found on the focus list, then there is no match for a category, the test fails, and the Posting is not displayed.

Trimming. Trimming applies to both focus and profile. In particular, trimming is a technique for speeding up the testing process. It is done to preserve the least number of nodes that can still represent the whole attribute set. The fewer the attribute nodes, the faster the matching process. As shown in the Fig. 16, if both category nodes have been marked, where node A overshadows node B, then it is not necessary to retain node A. In this case, the system drops the node A for it is of the more general condition and simply retains the node B for the more specific condition.

Root trimming. Root trimming applies to both focus and profile. As shown in Fig. 17, if the only marked node is the root node, then the system can trim the category by dropping the entire category. In other words, if this is a focus that just had its root node trimmed, then all profiles satisfy this category.

Recursive Combining. Recursive combining applies to focus only. This relates to the special condition where, if all nodes on a given level that are overshadowed by a common node are marked, it is possible to replace the markings for those nodes by marking the node immediately above. The goal here, again, is to reduce the node count in the matching process. See, for example, Fig. 18. The word recursive signifies that this combining process will be recursively applied upwards wherever possible. This process is applied after the trimming has taken place.

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Reverse Matching. Normally, for a focus node to match a profile node, the profile node has to be either the same as or overshadowed by the focus node. This guarantees that only the postings that have profiles falling entirely within the boundary of the user's focus will be visible to the user.

But this is not always desirable. Sometimes the user would simply like to "see" the world from where they "stand". For example, a user who has a geospatial filter of Massachusetts may want to see what is going on not only within Massachusetts, but also in the U.S., North America, and the world levels. This is accomplished by not only doing the "normal" type of matching on geospatial, but also deriving additional focus nodes by following the hierarchy tree upwards. For focus nodes derived this way, they have to be matched exactly and overshadowing is not considered for these nodes.

For example, in Fig. 19, the focus node 6 and 8 are marked. In the case of reverse matching, node 3, 1, 5, and 2 will be treated as derived marked nodes to be matched precisely (i.e.: no overshadowing) against any profile.

Postings with no focus at all are implicitly assumed to have the root node marked in all visible categories and thus will match every reverse matching focus.

Modifications of the Preferred Embodiments

Since this invention is particularly oriented towards housing multi-layered social constructs, it is very natural to adapt this system to any specific needs of, for example, large companies, organizations, and local governments.

As a result, some alternative embodiments may be a VB enhancement to serve as an intranet Web site, or a groupware system that serves a specific organization, company, town or even a city. An intranet or groupware model may even be preferred over the "open system" embodiment described above in that issues of security, confidentiality, performance, etc. may be more easily addressed.

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With more enhancement and changes, another embodiment can be a business-to-business or extranet type of e-commerce Web portal, within which corporate citizens replace the individual users of the preferred embodiment discussed above.

Advantages Of The Invention

This invention not only makes an on-line experience more productive and rewarding, but also helps users learn and understand each other better, even though they maybe coming from different geographical locations, speaking different languages, and from different cultural backgrounds.

This invention also gives the sponsors of the system the ability to non-intrusively deliver to, and/or collect from, the users highly targeted information at the right time, including advertisements, polls and other potentially lucrative services.

If properly executed, this virtual world model can effectively replace, in total or in part, a large portion of many real world activities such as conferencing, polling, elections, etc.

One such example is to replace the general discussion and voting processes in a modern society such as a town or city. People may never have to inconvenience themselves to participate in those civil functions.

Another example is that people may do business, make friends or conduct other activities confidently, in an international setting, from the front seat of their PC's or workstations.

With the capability of complementing or replacing various forms of communications and social functions in the real world, the potential of the present system is truly limitless.

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What Is Claimed Is:

1. A system comprising:
a first object having focus;
a second object having profile and content;
matching means for comparing the profile of said second object with the focus of said first object and, where the profile of said second object matches the focus of said first object, taking an action.
2. A system according to claim 1 wherein said first object is a user, said second object is a posting, and said action is displaying the content of the posting to the user.
3. A system according to claim 1 wherein said first object is a gateway, said second object is a posting, and said action is passing said posting through said gateway.
4. A system according to claim 1 wherein said first object further comprises profile, said second object further comprises focus, and wherein said matching means are adapted to compare the profile of said second object with the focus of said first object and the profile of said first object with the focus of said second object and, where the profile of said second object matches the focus of said first object and the profile of first object matches the focus of said second object, taking the action.
5. A system according to claim 4 wherein said first object is a user, said second object is a posting, and said action is displaying the content of the posting to the user.
6. A system according to claim 5 wherein said second object is an advertisement.

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7. A system according to claim 4 wherein said first object is a first user, said second object is a second user.

8. A system comprising a plurality of virtual circles, each of said virtual circles forming a virtual meeting place for users to interact with one another, said plurality of virtual circles being organized in a hierarchy.

9. A system according to claim 8 wherein said hierarchy comprises at least one from the group consisting of a parent-child relationship and a sister-sister relationship.

10. A system according to claim 9 wherein said system further comprises a mechanism for passing information from one virtual circle to another virtual circle.

11. A system according to claim 10 wherein said mechanism is adapted to pass information according to the hierarchy of virtual circles.

12. A system according to claim 11 wherein said mechanism is adapted to push information from one virtual circle to another virtual circle.

13. A system according to claim 11 wherein said mechanism is adapted to pull information from one virtual circle into another virtual circle.

14. A system according to claim 1 wherein said system further comprises a plurality of virtual circles, and wherein said first object is located within one of said virtual circles, said second object is located within one of said virtual circles, and further wherein said matching means are adapted to take the action only when said first object and said second object are located within the same virtual circle.

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15. A system according to claim 14 wherein said first object is a user, said second object is a posting, and said action is displaying the content of the posting to the user.

16. A system according to claim 14 wherein said system further comprises a virtual bubble, wherein said virtual bubble is located within one of said virtual circles, where said first object is located within one of said virtual circles or said virtual bubble, said second object is located within one of said virtual circles or said virtual bubble, and further wherein said matching means are adapted to take the action only when said first object and said second object are located within the same virtual circle or virtual bubble.

17. A system according to claim 1 wherein focus and profile are defined in the context of at least one category.

18. A system according to claim 17 wherein at least one category is organized in a hierarchy.

19. A system according to claim 17 wherein there are a plurality of categories, and further wherein focus and profile match only when there is a match between focus and profile in all categories.

20. A system according to claim 17 wherein there are a plurality of categories, each of said categories being organized in a hierarchy.

21. A system according to claim 20 wherein there is a match within a category when at least one element of the focus matches one element of the profile.

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22. A system according to claim 20 wherein, when focus has no element within a category, that category is automatically matched.

23. A system according to claim 21 wherein a focus element matches a profile element if they are the same element or if the focus element is a generic instance of the profile element.

24. A system according to claim 18 wherein, when multiple elements are placed in the hierarchy of a category, generic elements will be trimmed away in favor of those elements which are a more specific instance of the generic elements.

25. A system according to claim 18 wherein, when there is only one element in the category and it is the root of the hierarchy, then the root element will be trimmed away.

26. A system according to claim 18 wherein, when multiple focus elements are placed in the hierarchy of a category, whenever focus elements populate all of the direct child nodes of a hierarchy branch, those child focus elements are replaced with a new focus element in the immediate parent node.

27. A system according to claim 21 wherein the focus can be matched by deriving a list of focus elements that match the profile, wherein the list is derived by following the category hierarchy upward.

28. A system according to claim 17 wherein additional lists of focus elements can be derived from existing focus elements by following the category hierarchy upwards.

29. A method for identifying the matching of interests in a system, comprising the steps of:

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establishing focus for a first object;
establishing profile and content for a second object;
comparing the profile of said second object with the focus of said first object wherein,
when the profile of said second object matches the focus of said first object, a matching of
interests is identified.

30. A method according to claim 29 wherein focus and profile are defined in the context of at least one category, said at least one category is organized in a hierarchy, and wherein focus and profile match only when there is a match between focus and profile in that category.

31. A method according to claim 30 wherein a focus element matches a profile element if they are the same element or if the focus element is a generic instance of the profile element.

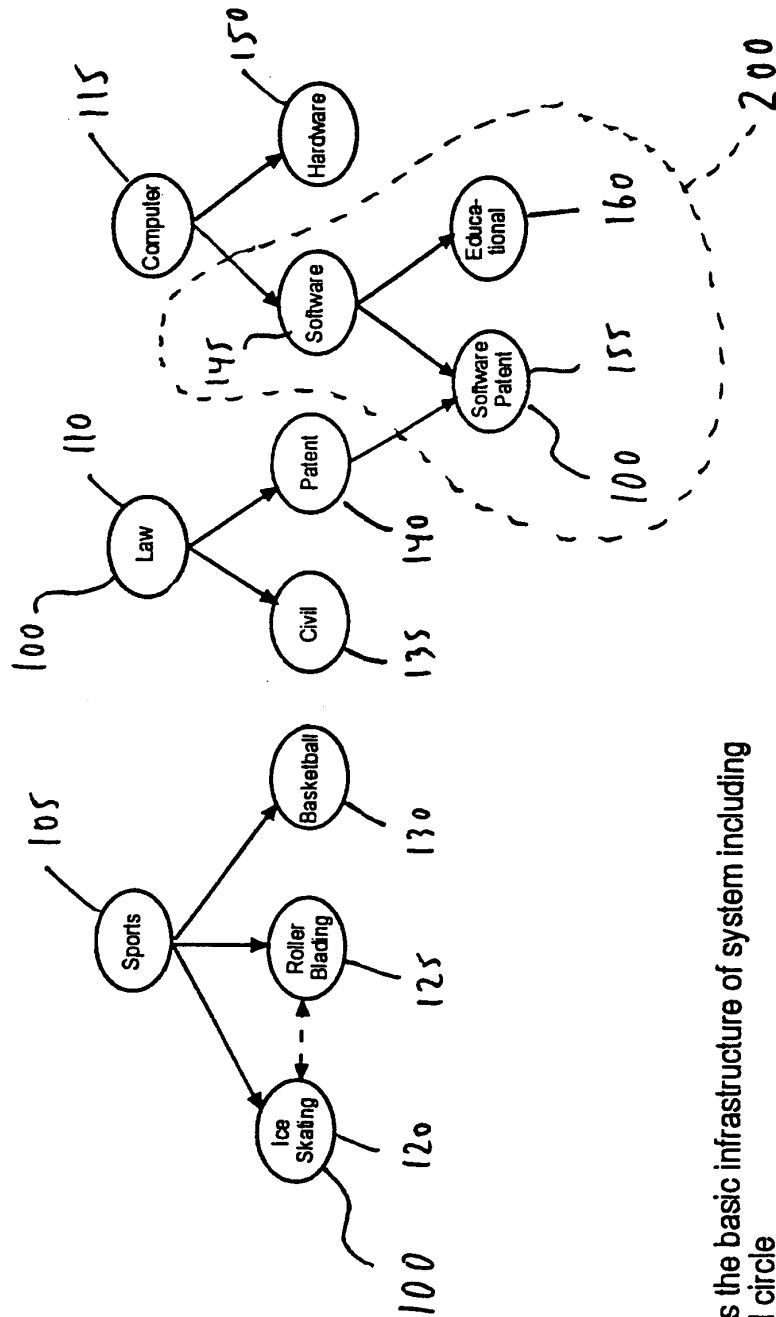
32. A method according to claim 30 wherein, when multiple elements are placed in the hierarchy of a category, generic elements will be trimmed away in favor of those elements which are a more specific instance of the generic elements.

33. A method according to claim 30 wherein, when there is only one element in the category and it is the root of the hierarchy, then the root element will be trimmed away.

34. A method according to claim 30 wherein, when multiple focus elements are placed in the hierarchy of a category, whenever focus elements populate all of the direct child nodes of a hierarchy branch, those child focus elements are replaced with a new focus element in the immediate parent node.

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35. A method according to claim 30 wherein the focus can be matched by deriving a list of focus elements that match the profile, wherein the list is derived by following the category hierarchy upward.



This shows the basic infrastructure of system including

- VC - oval circle
- Solid arrow line - derivation-link
- Dashed double arrow line - sister-link

FIG. 1

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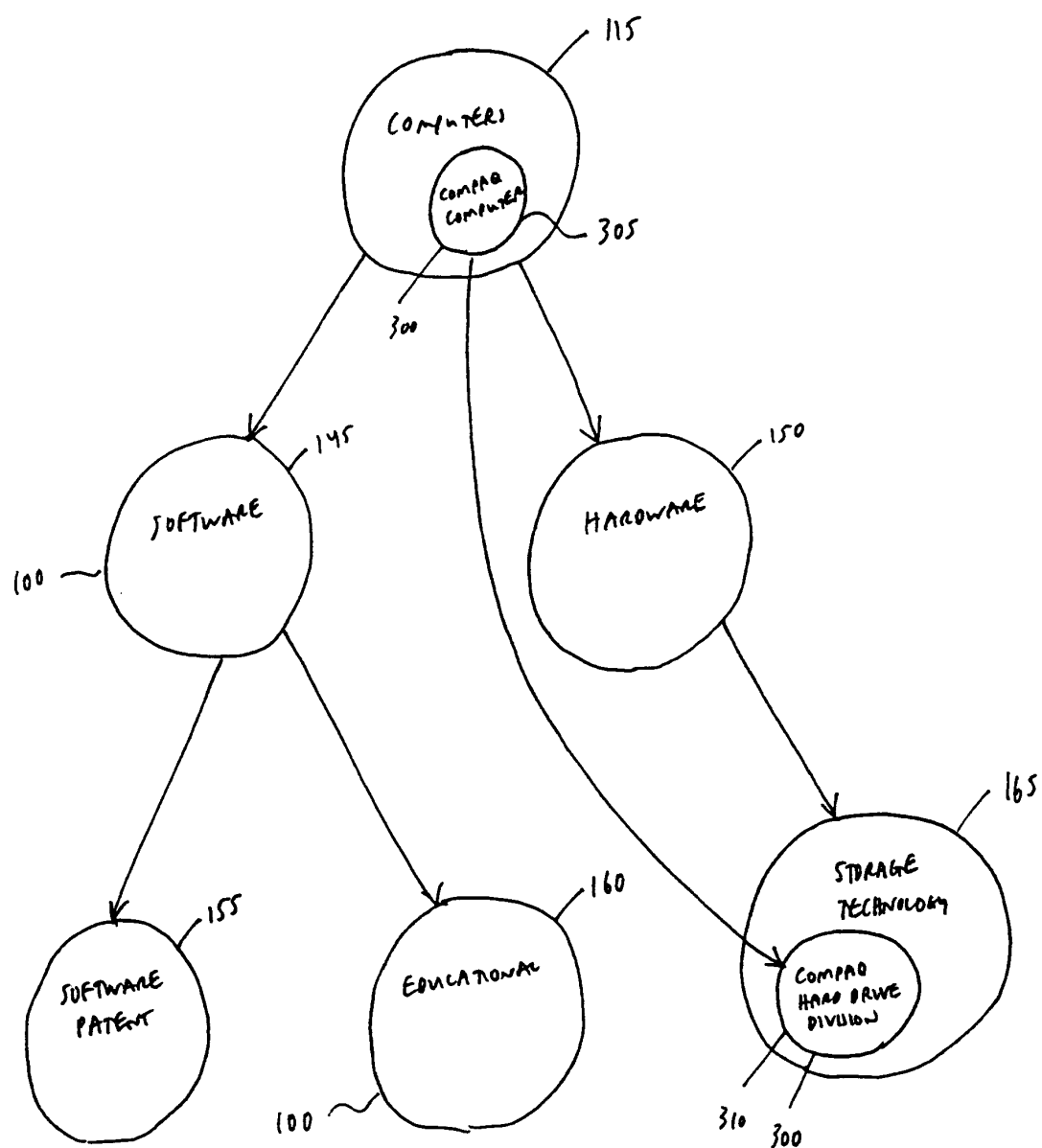
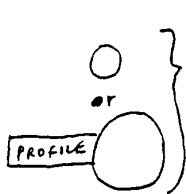
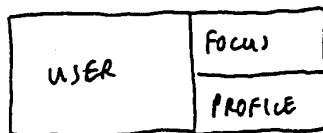
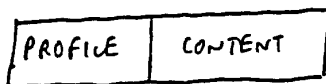


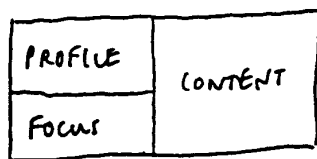
FIG. 2

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SYSTEM ARCHITECTURE"VIRTUAL ASSOCIATIONS" (OR "VIRTUAL MEETING PLACES" OR "VIRTUAL PLACES")
 = VIRTUAL CIRCLE (OR "VC")

 = VIRTUAL BUBBLE (OR "VB")
USERS
 = USER = GUEST
 REGISTERED USER
 SYSTEM ADMINISTRATOR
POSTINGS

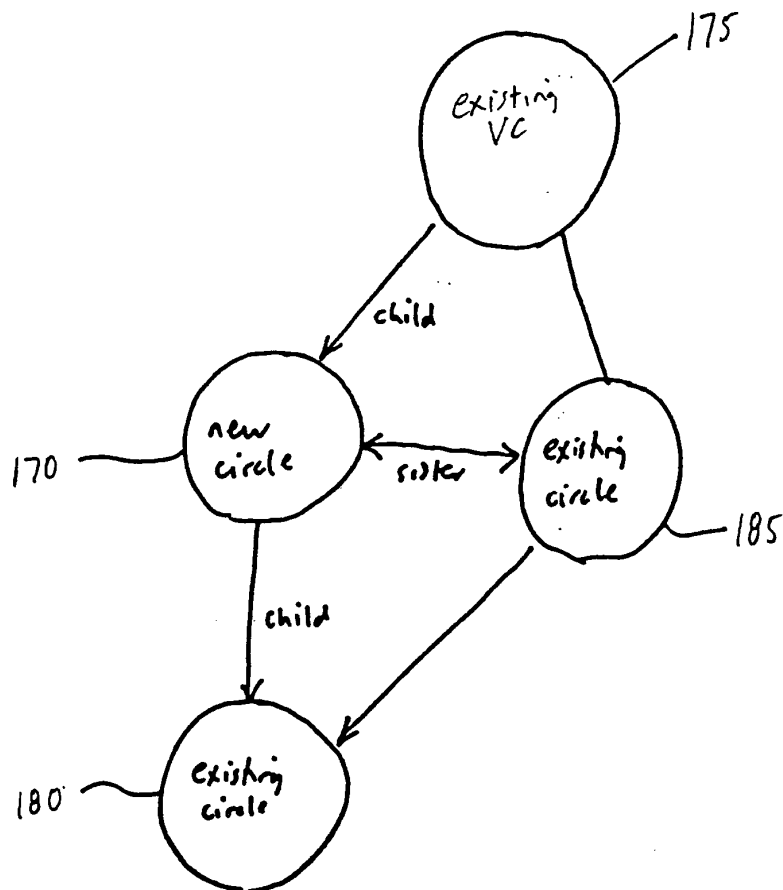
= PASSIVE POSTING



= ACTIVE POSTING

FIG. 3

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**FIG. 4**

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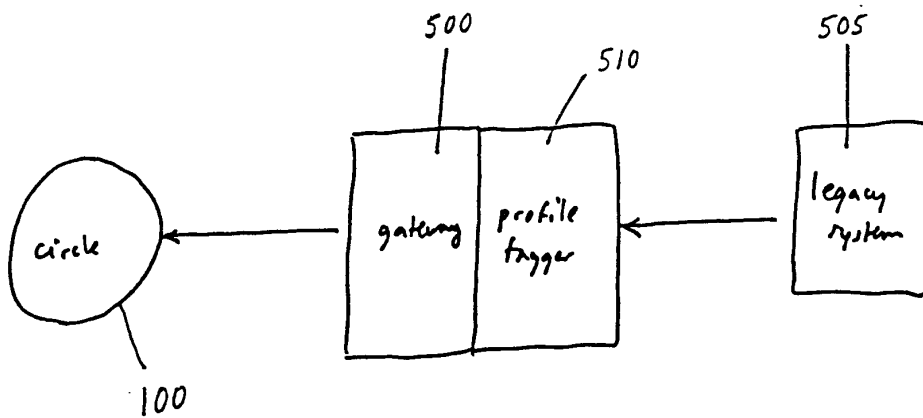
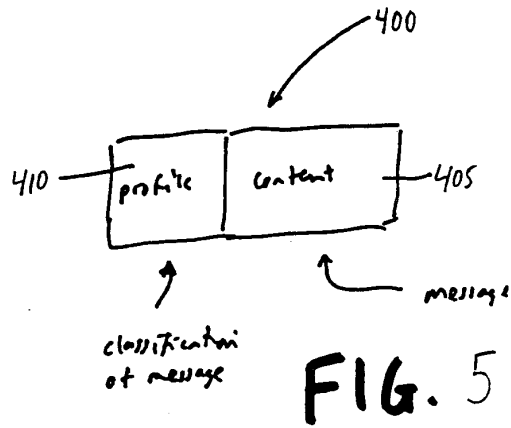
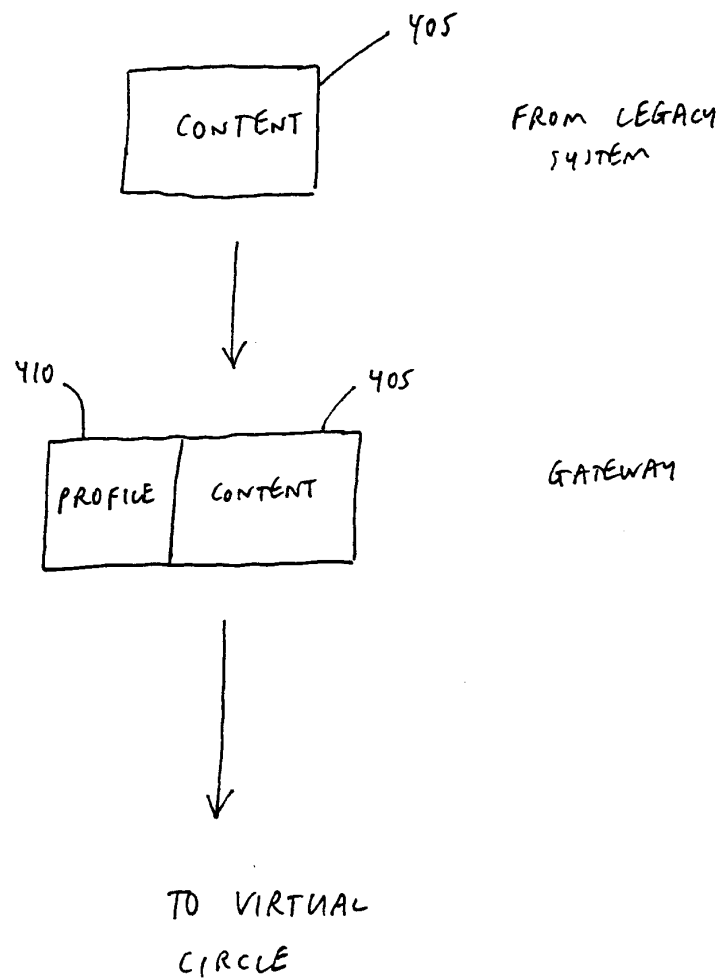


FIG. 6

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**FIG. 7**

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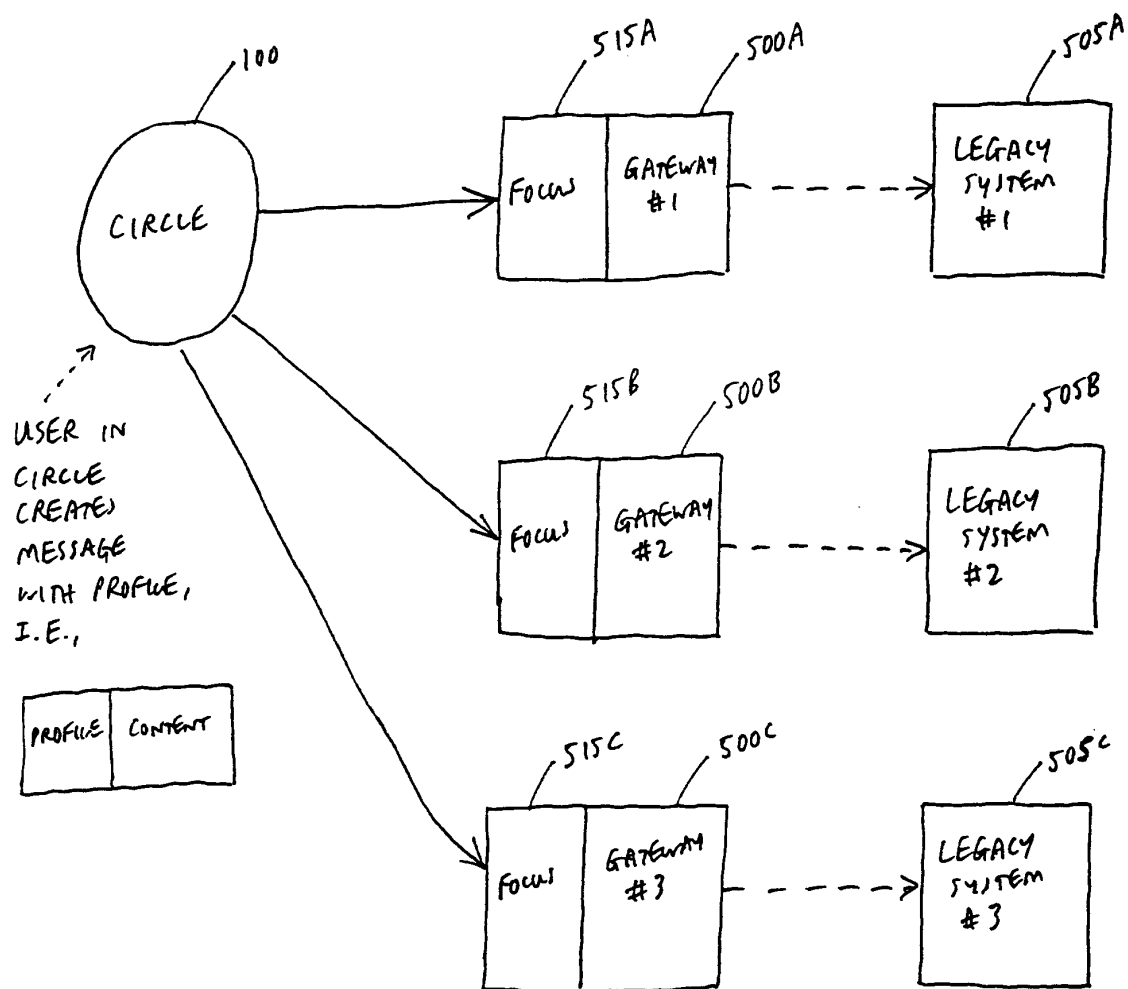


FIG. 8

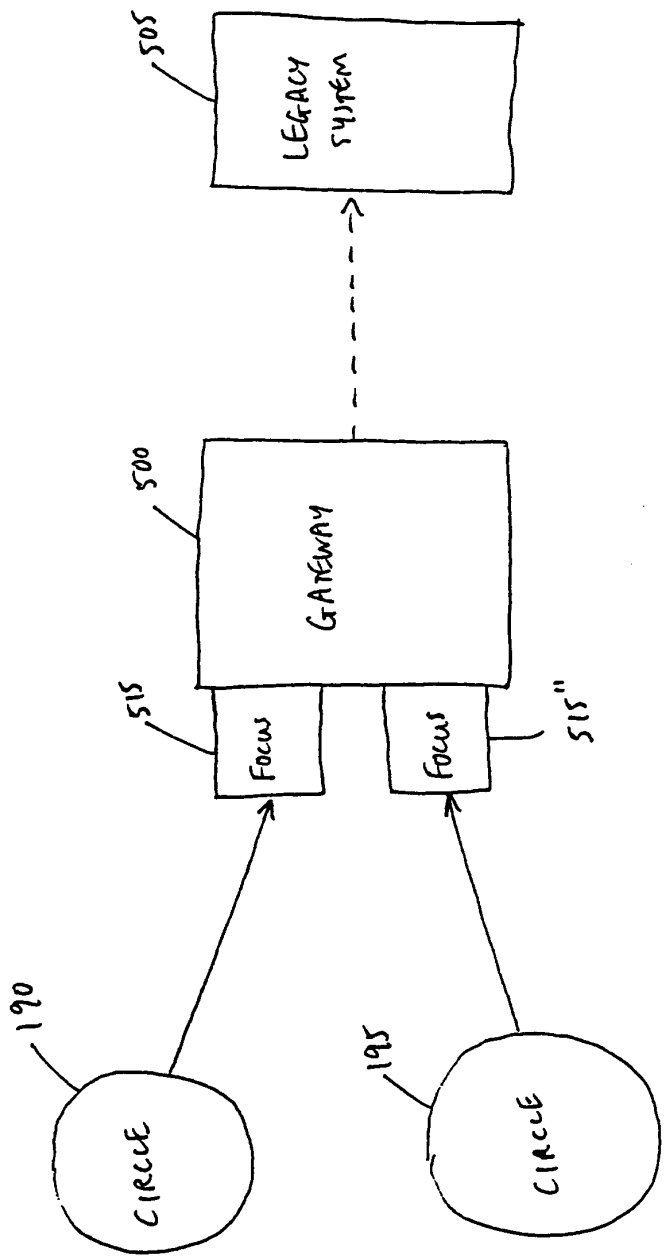


FIG. 9

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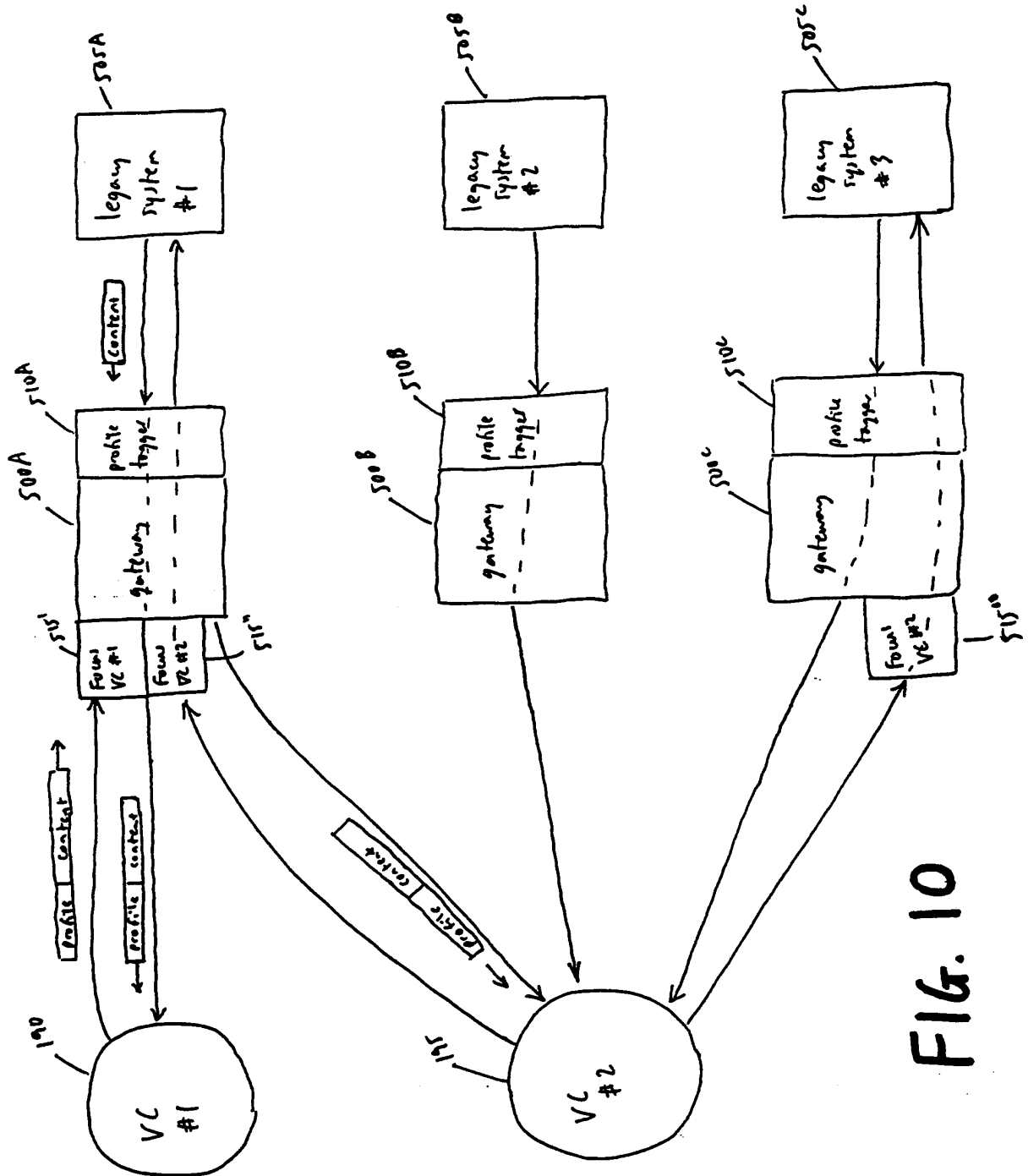


FIG. 10

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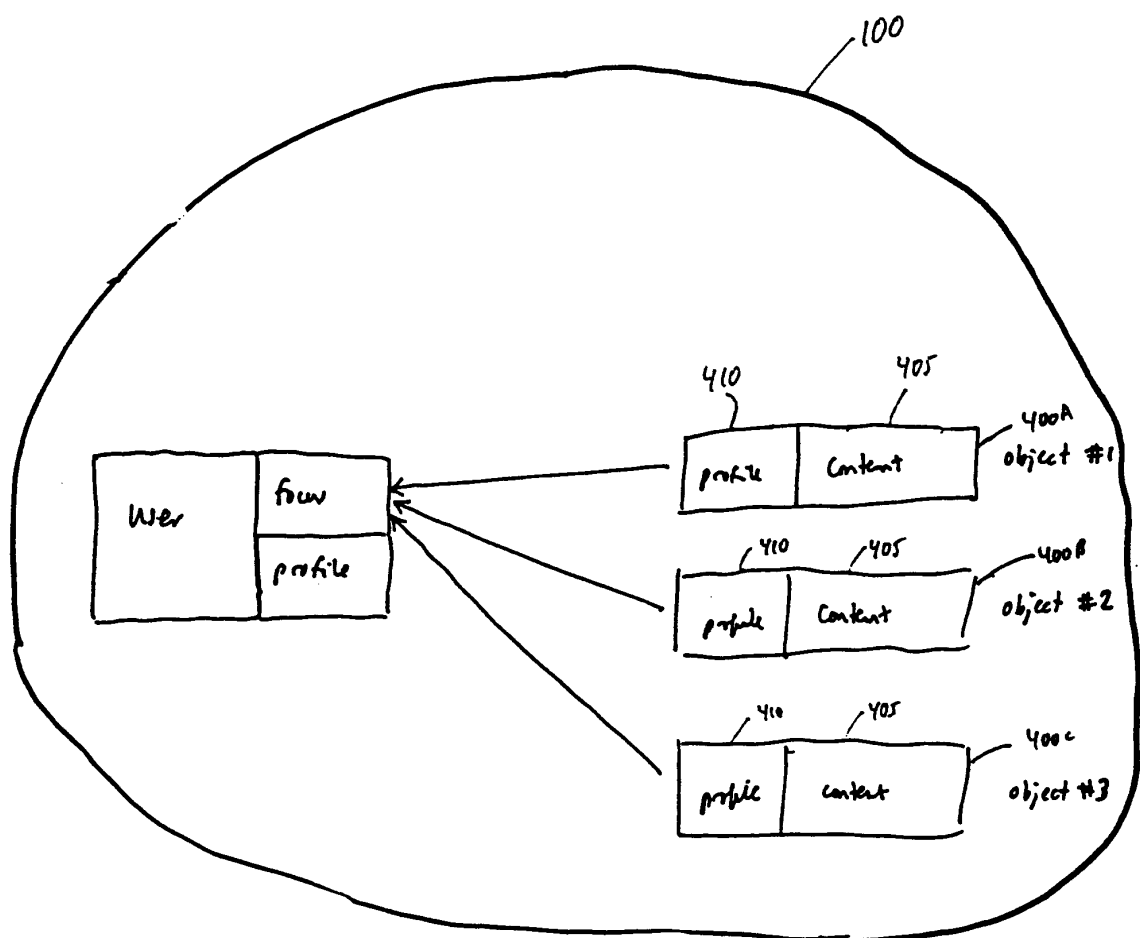


FIG. 11

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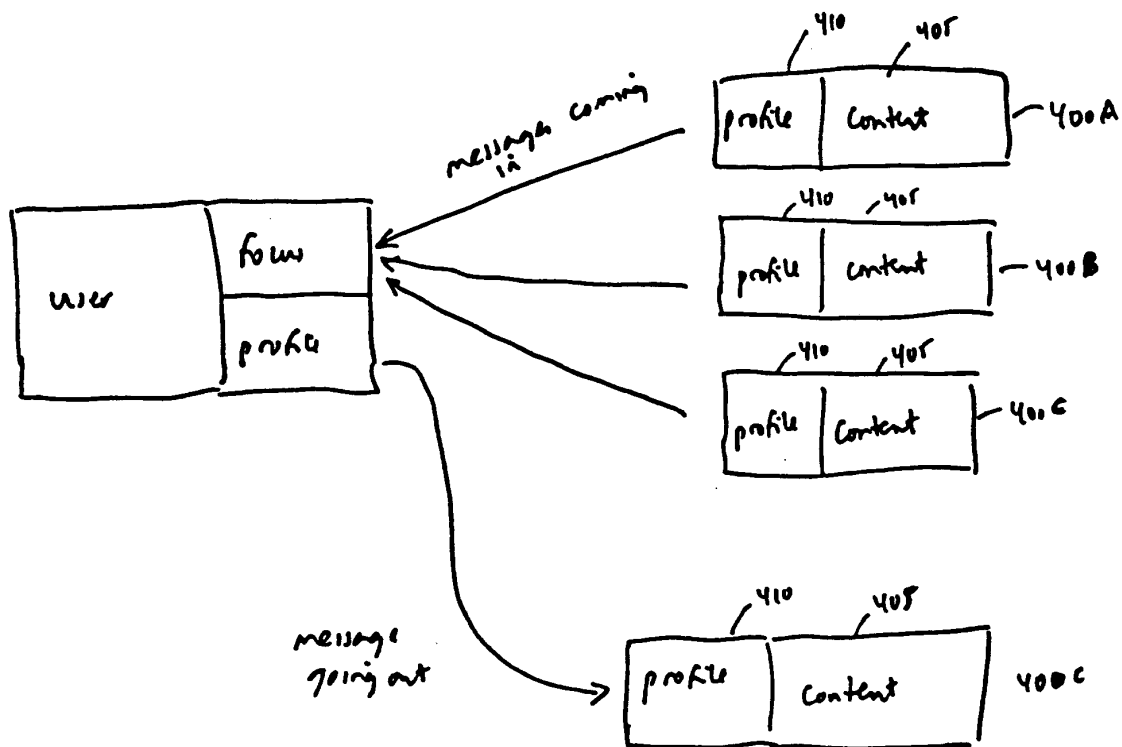


FIG. 12

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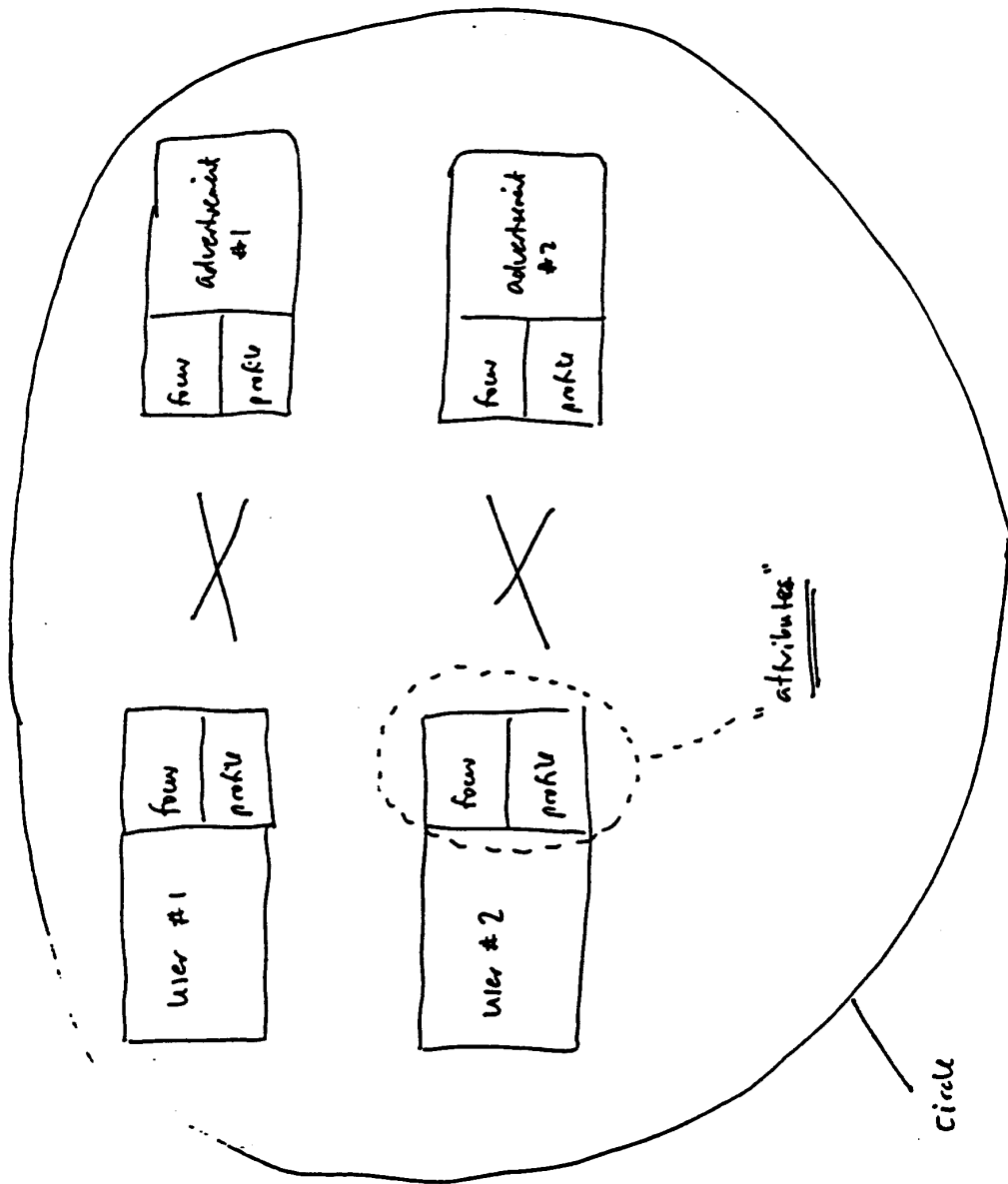


FIG. 13

circle

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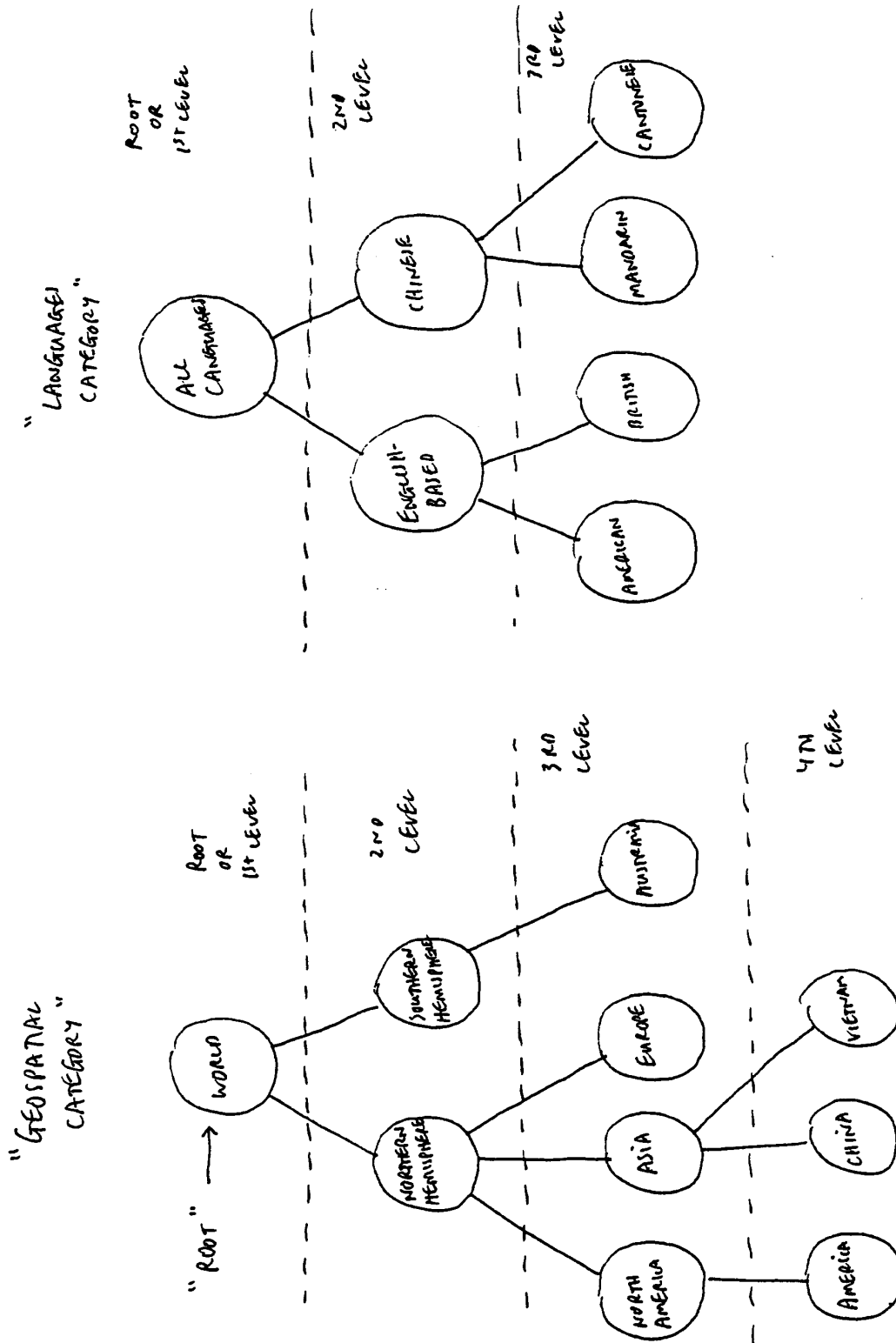


FIG. 14

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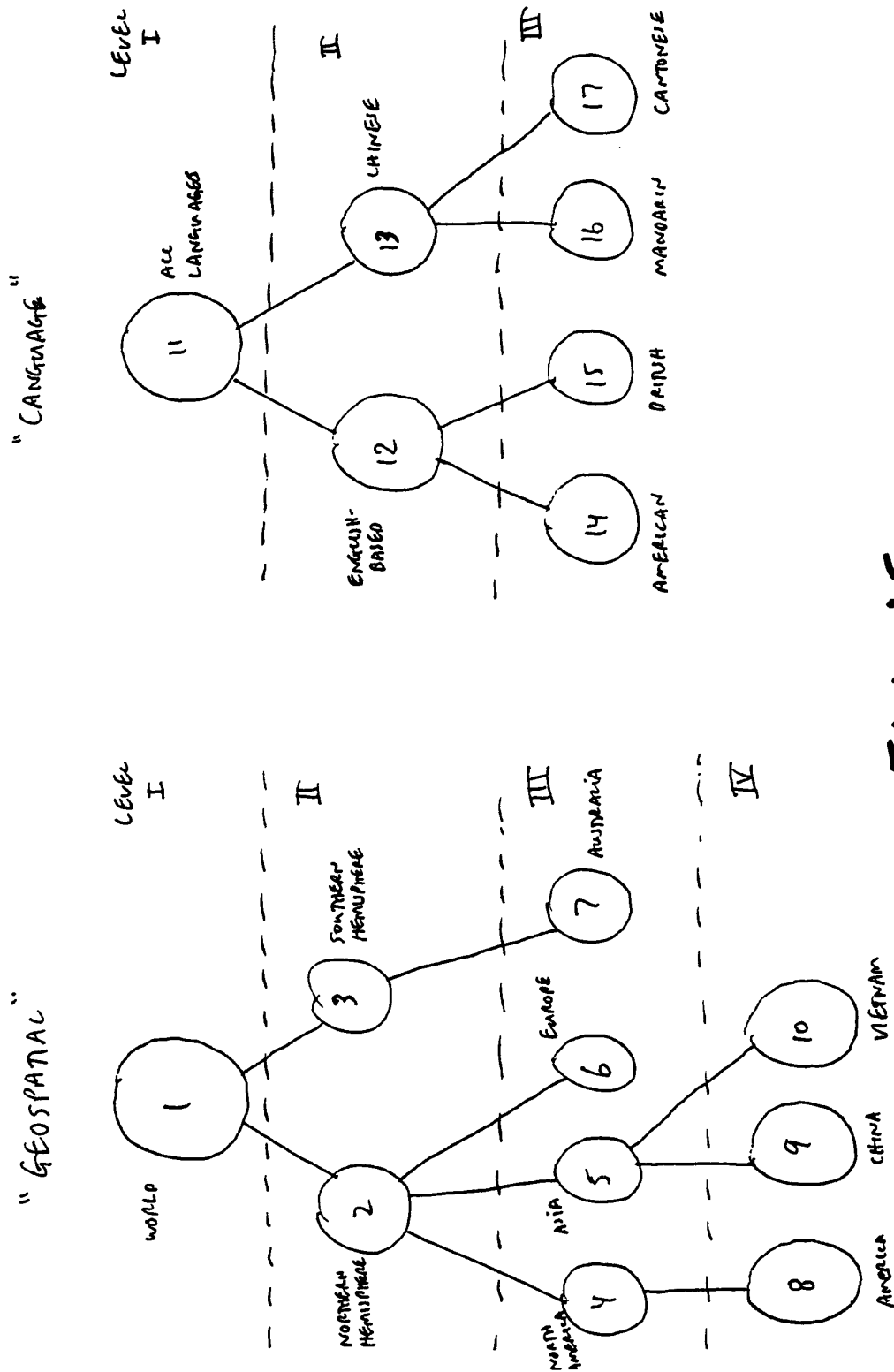


FIG. 15

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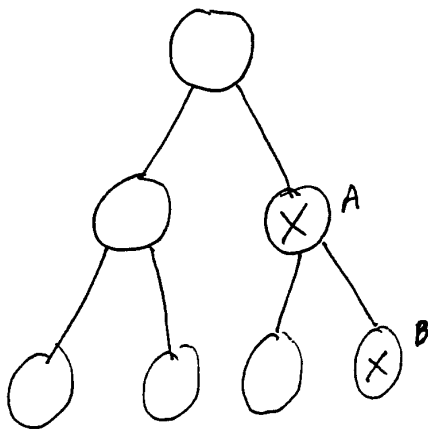


FIG. 16

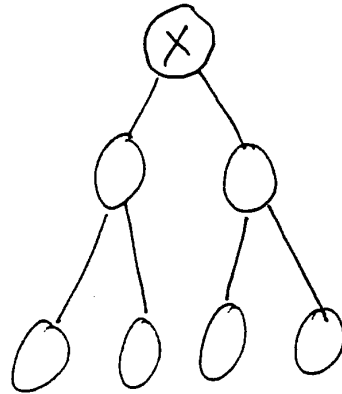


FIG. 17

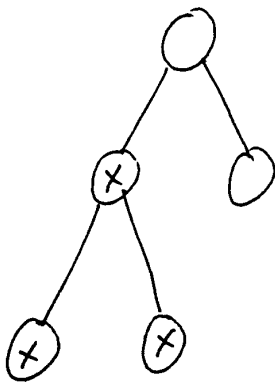


FIG. 18

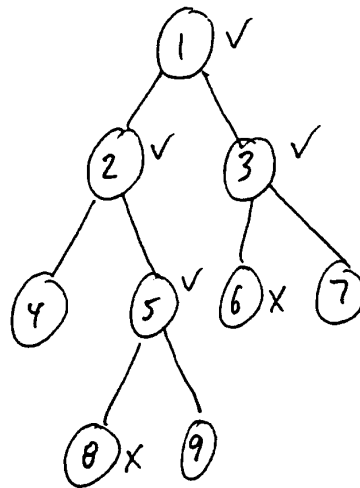


FIG. 19

X = marked
nodes✓ = derived
marked
node

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US00/19996

A. CLASSIFICATION OF SUBJECT MATTER IPC(7) : G06F 15 16, G06F 15/76 US CL : 709/1, 203, 311, 318, 331, 332; 705/51 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. : 709/1, 203, 311, 318, 331, 332; 705/51 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) STN-USPATFULL- push, pull, hierarchy, tree, object, network, data, information, network, profile, match.		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y, E	US 6,112,186 A (BERGH et al.) 29 AUGUST 2000, col. 3, Lines 16-24, col. 6, lines 2-23, col. 7, lines 8-30, col. 14, lines 49-52, col. 17, lines 23-54, col. 19, lines 17-24,	1-35
Y	US 5,838,970 A (THOMAS) 17 NOVEMBER 1998, col. 6, lines 1-17	1-35
A	US 5,835,758 A (NOCHUR et al.) 10 NOVEMBER 1998, abstract	1-35
A	US 5,867,799 A (LANG et al.) 02 FEBRUARY 1999, abstract	1-35
A, P	US 5,995,943 A (BULL et al.) 30 NOVEMBER 1999, abstract	1-35
☒ 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 05 SEPTEMBER 2000		Date of mailing of the international search report 14 NOV 2000
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 <i>Peggy Harwood</i> STEPHAN WILLETT Telephone No. (703) 305-4815

Form PCT/ISA/210 (second sheet) (July 1998)★

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US00/19996

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A, P	US 6,076,091 A (FOHN et al.) 13 June 2000, abstract	1-35

Form PCT/ISA 210 (continuation of second sheet) (July 1998)*