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

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
9 October 2008 (09.10.2008)

PCT

(10) International Publication Number
WO 2008/121600 A1

(51) International Patent Classification:
G06Q 50/00 (2006.01) *G06F 17/00* (2006.01)
G06F 15/16 (2006.01)

(21) International Application Number:
PCT/US2008/058062

(22) International Filing Date: 24 March 2008 (24.03.2008)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/920,679 28 March 2007 (28.03.2007) US
11/932,562 31 October 2007 (31.10.2007) US

(71) Applicant *(for all designated States except US)*: **YAHOO! INC.** [US/US]; 701 First Avenue, Sunnyvale, CA 94089 (US).

(72) Inventors; and

(75) Inventors/Applicants *(for US only)*: **WEBER, Karon, A.** [US/US]; 246 28th Avenue, San Francisco, CA 94121 (US). **MARTINEZ, Ron** [US/US]; 1111 Green Street, San Francisco, CA 94109 (US). **TRIPODI, Samantha, M.** [US/US]; 278 Moultrie Street, San Francisco, CA 94110 (US). **SADRI, Pasha** [IR/US]; 1132 Pleasant Hill Way, San Jose, CA 95120 (US). **REDFERN, Jonathan, J.** [US/US]; 561 Center Drive, Palo Alto, CA 94301 (US). **BORENSTEIN, Lorna** [CA/US]; 19635 Redberry Drive, Los Gatos, CA 95030 (US). **SCOTT, Bill, W.** [US/US]; 2130 Treewood Lane, San Jose, CA 95132 (US).

(74) Agents: **ELLENBERGER, Ernest** et al.; Morrison & Foerster LLP, 425 Market Street, San Francisco, CA 94105-2482 (US).

(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MT, NL, NO, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

[Continued on next page]

(54) Title: A DISTRIBUTED COLLABORATIVE KNOWLEDGE GENERATION SYSTEM

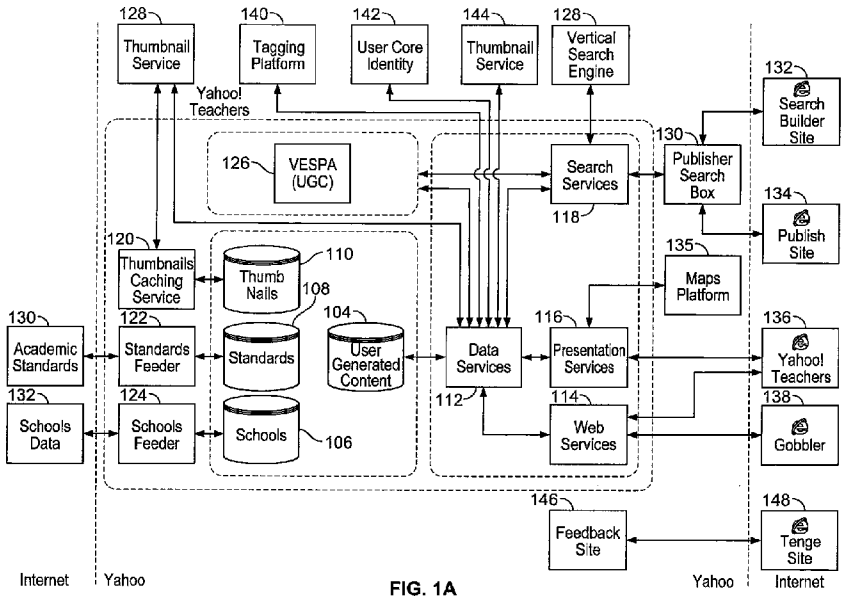

FIG. 1A

(57) Abstract: System and method related to a distributed collaborative knowledge generation system are disclosed. The distributed collaborative knowledge generation system includes one or more databases configured to store content information related to the distributed collaborative knowledge generation system, a search services module configured to search for the content information, a web services module configured to retrieve and gather the content information, a presentation services module configured to share the content data with multiple users, and a data services module configured to manage the content information by providing interfaces between the one or more databases, the search services module, the web services module, and the presentation services module.

WO 2008/121600 A1

Published:
— *with international search report*
— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

A Distributed Collaborative Knowledge Generation System

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application claims the benefit of application no. 60/920,679, "A Distributed Collaborative Learning System," filed March 28, 2007, which is incorporated herein in its entirety by reference.

FIELD OF THE INVENTION

[0002] The present invention relates to the field of Internet applications. In particular, the present invention relates to a distributed collaborative knowledge generation system.

BACKGROUND OF THE INVENTION

[0003] In recent years, there are many online courses offered on the Internet. Many of these courses allow students to learn subjects of their interests at their own pace and in the comfort of their home. However, one of the problems with such conventional online courses is that they are practically a one-way transmission of information from the school's website to the student's computer terminal. There is no interaction between the students and the teacher and there is no discussion of the course materials among the teachers and the students. Another problem with the conventional online courses is that the course materials are typically stagnant throughout the duration of the course and often unchanged for months and years after the courses are offered. Yet another problem with the conventional online courses is that the quality and currency of course materials may be rooted in an individual or in a fixed small group of individuals. This model of course material development and authoring has not changed for decades. Yet another problem with the conventional online courses is that the course materials are not adapted to variations in certification or municipality requirements.

[0004] Therefore, there is a need for a distributed collaborative knowledge generation system that can address the above shortcomings of the current online educational programs.

SUMMARY

[0005] The present invention relates to a distributed collaborative knowledge generation system. In one embodiment, the distributed collaborative knowledge generation system includes one or more databases configured to store content information related to the distributed collaborative knowledge generation system, a

search services module configured to search for the content information, a web services module configured to retrieve and gather the content information, a presentation services module configured to share the content data with multiple users, and a data services module configured to manage the content information by providing interfaces between the one or more databases, the search services module, the web services module, and the presentation services module.

[0006] In another embodiment, a method for facilitating sharing of knowledge on the Internet includes gathering information about a subject from the Internet, generating a knowledge database for storing the information gathered, improving the knowledge database by incorporating inputs from one or more users, publishing the knowledge database on the Internet, performing a search of the subject against the knowledge database, and continuously improving the knowledge database using results of the search.

[0007] In yet another embodiment, a method for assisting an educational project includes providing a knowledge database for storing user-generated content, providing a website for sharing the user-generated content related to the educational project, and facilitating collaborations among multiple users to communicate or improve the user-generated content.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] The aforementioned features and advantages of the invention, as well as additional features and advantages thereof, will be more clearly understandable after reading detailed descriptions of embodiments of the invention in conjunction with the following drawings.

[0009] Figure 1A illustrates a distributed collaborative knowledge generation system according to embodiments of the present invention.

[0010] Figure 1B illustrates a method for facilitating sharing of knowledge on the Internet according to embodiments of the present invention.

[0011] Figure 2A illustrates a presentation of a student assignment according to an embodiment of the present invention.

[0012] Figure 2B illustrates standards-based educational assets according to an embodiment of the present invention.

[0013] Figure 2C illustrates a method for searching and browsing community and partner content according to an embodiment of the present invention.

[0014] Figure 2D illustrates tools for publishing user-generated content according to an embodiment of the present invention.

[0015] Figure 2E illustrates an example of teacher-prepared project materials according to an embodiment of the present invention.

[0016] Figure 2F illustrates a method of distributed collaborative knowledge generation through student group instant messaging asset exchange according to an embodiment of the present invention.

[0017] Figure 2G illustrates a method of distributed collaborative knowledge generation through geographical query and display according to an embodiment of the present invention.

[0018] Figure 2H illustrates a method of distributed collaborative knowledge generation through real-time communications with other students according to an embodiment of the present invention.

[0019] Figure 2I illustrates a method of distributed collaborative knowledge generation through real-time annotations according to an embodiment of the present invention.

[0020] Figure 3A illustrates a method for global collaboration and sharing according to an embodiment of the present invention.

[0021] Figure 3B illustrates a method for generating a collaborative knowledge collection according to an embodiment of the present invention.

[0022] Figure 3C illustrates another method for generating a collaborative knowledge collection according to an embodiment of the present invention.

[0023] Figure 4A illustrates a student calendar for managing school activities according to an embodiment of the present invention.

[0024] Figure 4B illustrates a family academic calendar for managing family activities according to an embodiment of the present invention.

[0025] Figure 5A illustrates a user device for accessing the distributed collaborative knowledge generation system according to an embodiment of the present invention.

[0026] Figure 5B illustrates a method for accessing educational materials on demand according to an embodiment of the present invention.

[0027] Figure 6 illustrates a system for running map applications on a website according to an embodiment of the present invention.

DESCRIPTION OF EMBODIMENTS

[0028] Disclosures are provided for a distributed collaborative knowledge generation system. The following descriptions are presented to enable any person skilled in the art to make and use the invention. Descriptions of specific embodiments and applications are provided only as examples. Various modifications and combinations of the examples described herein will be readily apparent to those skilled in the art, and the general principles defined herein may be applied to other examples and applications without departing from the spirit and scope of the invention. Thus, the present invention is not intended to be limited to the examples described and shown, but is to be accorded the widest scope consistent with the principles and features disclosed herein.

[0029] Some portions of the detailed description that follows are presented in terms of flowcharts, logic blocks, and other symbolic representations of operations on information that can be performed on a computer system. A procedure, computer-executed step, logic block, process, etc., is here conceived to be a self-consistent sequence of one or more steps or instructions leading to a desired result. The steps are those utilizing physical manipulations of physical quantities. These quantities can take the form of electrical, magnetic, or radio signals capable of being stored, transferred, combined, compared, and otherwise manipulated in a computer system. These signals may be referred to at times as bits, values, elements, symbols, characters, terms, numbers, or the like. Each step may be performed by hardware, software, firmware, or combinations thereof.

[0030] Figure 1A illustrates a distributed collaborative knowledge generation system according to embodiments of the present invention. In the example shown in Figure 1A, the distributed collaborative knowledge generation system includes a database 102 for storing content information related to the distributed collaborative knowledge generation system, and various service modules for retrieving, gathering, managing, and presenting the content information. The database 102 includes a user-generated content database 104 for storing user-generated content, a schools database 106 for storing school data, a standards database for storing information related to educational standards, and a thumbnails database 110 for storing information of certain websites of interest. Each of the databases may be updated periodically according to a predetermined schedule or may be updated on demand. The service modules include data services module 112, web services module 114, presentation

services module 116, search services module 118, thumbnails caching service module120, standards feeder module 122, and schools feeder module 124, and a vertical search platform (VESPA) 126.

[0031] The thumbnails caching service module 120 may be supported by a thumbnail service 128 that obtains image snapshots of a website and makes a thumbnail image of the webpage. It allows a user to see an archived webpage before gathering information from that webpage. The standards feeder module 122 may be supported by an academic standards service 130 that provides academic standards information of various sources to the distributed collaborative knowledge generation system. For example, the academic standards information may include the customized requirements for curriculum for mathematics for grade 7. This may be delivered either as a national standard or meet the varied standards set by the individual states across the nation. The standards enable a policy setting body to enforce certain educational requirements for schools as established by the No Child Left Behind Act of 2001. The schools feeder module 124 may be supported by a schools data service 132 that provides school data from various schools. For example, a teacher may post assignments and lesson plans to the distributed collaborative knowledge generation system through the schools data service 132.

[0032] The search services module 118 may be supported by a vertical search engine 128 and a publisher search box 130 to provide targeted searches for the users. The vertical search engine 128 performs vertical searches against the knowledge database of the distributed collaborative knowledge generation system. The publisher search box 130 provides the capability for a user to search the user's own website. For example, the publisher search box 130 may use a search builder site 132 to generate code for searching a specific website. The publisher search box 130 may further use a publisher site 134 for conducting the targeted search.

[0033] The presentation services module 116 drives the maps platform 135 and the Yahoo! Teacher website 136, which provide two of the user interfaces for the distributed collaborative knowledge generation system. The presentation services module 116 is configured to display content information from the database 102 in one or more of calendar view, map view, grid view, and list view. A method for presenting information in multiple views on a user device is described in U.S. Patent Application No.11/656,052, entitled "Method and System for Presenting Information with Multiple Views," which is incorporated herein by reference in its entirety. The

web services module 114 includes a data collection module 138 (also referred to as the gobbler application) that is configured to gather and annotate content information with implicit and explicit metadata. A method for collecting information on the Internet is described in U.S. Patent Application No. 11/508,596, entitled "Persistent Saving Portal," which is incorporated herein by reference in its entirety.

[0034] The data services module 112 bridges between the databases 102, the web services module 114, the presentation services module 116, and the search services module 118 for managing the use of content information among the multiple service modules. The data services module 112 further interfaces with a tagging platform 140 for tagging the content information from one or more input sources, a user identity module 142 for identifying users of the distributed collaborative knowledge generation system, and a user profile module 144 for managing a user database of the distributed collaborative knowledge generation system. The data services module 112 further interfaces with a feedback service website 146, which collects users' feedback through a website (tango site) 148 on the Internet.

[0035] Figure 1B illustrates a method for facilitating sharing of knowledge on the Internet according to embodiments of the present invention. In this example, a portal may be used to gather, annotate, organize, and share materials from the World Wide Web to supplement the curriculum for the classroom through the gobbler application 138. A method for gathering, annotating, organizing, and sharing materials from the web is described in U.S. application no. 11/508,596, entitled "Persistent Saving Portal," which is incorporated herein in its entirety by reference. The information may be annotated based on user-specified metadata or based on contextual metadata of a user's environment either manually or automatically.

[0036] The method consumes the information and generates a knowledge database, also referred to as the user-generated content/assets 104, for storing the information gathered. The assets 139 may include websites, images, and quotes related to the subject of interest. Then, the knowledge database is improved by incorporating inputs from one or more users. For example, content data in the knowledge database may be tagged based on user-provided metadata. Content data in the knowledge database may also be rated using a predefined ranking method and user comments. In addition, content data in the knowledge database may be categorized according to a set of predetermined categories.

[0037] The method may use the user-generated assets 104 in combination with educational standards, school data to create projects, lesson plans, and assignments 150. Note that using this method, any type of documents may be created, including but not limited to rubrics, worksheets, tests, etc. These projects, lesson plans, and assignments are published on the Internet as knowledge documents 152, which may be versioned and shared by multiple users. The published knowledge document 152 may then be browsed on the Internet, and targeted searches may be performed against the knowledge database via the publisher's website 134 or via the Yahoo! Teachers website 136, for example. The method improves the knowledge database by repeating the above process continuously. Note that with this iterative process, deeper knowledge may be accumulated. Specifically, the more metadata associated with the knowledge documents, the more contextual information is made available to the knowledge documents, which allows users to conduct a more meaningful and intelligent search of the knowledge database.

[0038] Figure 2A illustrates a presentation of a student assignment according to an embodiment of the present invention. As shown in Figure 2A, the webpage displaying the student assignment Mitosis includes a project summary section 200, a project assets section 201, a due date reminder 202, a detailed description section 203, project team members 204, and a link to additional resources 205. The project assets section 201 further includes information the student gathered from the Internet or from other sources, such as websites 206, photo images 207, and quotes 208 in the form of text. In this example, the due date reminder 202 indicates that this assignment is due in two days on January 18. The detailed description section 203 includes descriptions on objectives, materials, procedures, assignments and evaluations, vocabularies, adaptations, and extensions of the project. Details about each of the above topics may be further displayed by clicking on an arrow next to a topic. In this example, more information about the objectives of the project is displayed.

[0039] Figure 2B illustrates standards-based educational assets according to an embodiment of the present invention. In this example, the Mitosis webpage includes a link to teacher's lesson plan 210 and a link to student assignment 211. The webpage further includes a view project information section 212, where subjects to be learned are matched to the required educational standards according to the student's state and grade level. For instance, the teacher enters the topic(s) to be learned in

column 213, and the corresponding educational standards are provided in column 214. Note that there are several tags 214 (key words) associated with the topic that are also displayed. These tags are useful for providing contextual information and improving relevance of returned search results.

[0040] Figure 2C illustrates a method for searching and browsing community and partner content according to an embodiment of the present invention. In the example shown in Figure 2C, the webpage provides a search box 220 to enable vertical search against the Yahoo! Teachers database. In addition, the webpage provides a project finder section 221, where a user may search for information based on the state 222, grade level 223, and subject area 224 of interest. Furthermore, the webpage enables search of partner content, in this case provided by the National Science Digital Library (NSDL). Users can search for information on the NSDL website by entering a search query. In response to the search query, a search results page 225 is displayed.

[0041] Figure 2D illustrates tools for publishing user-generated content according to an embodiment of the present invention. As shown in Figure 2D, the student may employ a suite of tools for publishing her projects on the Internet. For example, the project may be published in text form or in multimedia form, such as podcast, vlog, remix, video, slide show, blog, and wiki. Figure 2E illustrates an example of teacher-prepared project materials according to an embodiment of the present invention. A student may access teacher-prepared project materials via the Lesson Info link 230. In this case, the assignment is to create a Cell Division Remix as shown in the image 231. The teacher has provided an example for the student to use as reference.

[0042] Figure 2F illustrates a method of distributed collaborative knowledge generation through student group instant messaging asset exchange according to an embodiment of the present invention. As shown in Figure 2F, the webpage provides a platform for distributed collaborative knowledge generation among a group of students 235. Geographic locations of the group members may be displayed on a map. A method for presenting one or more users on a user-defined map is described by U.S. Patent Application No. 11/361,268, entitled "User-Defined Private Maps," which is incorporated herein by reference in its entirety. The group members can communicate with each other through instant messaging (IM). A method for communicating with instant messaging is described in U.S. Patent Application No.

11/375,802, entitled "Method and System for Premium Access," which is incorporated herein by reference in its entirety. In this case, a member has found some interesting videos related to Mitosis and sends an IM 236 to the group stating "4 videos check them out!"

[0043] Figure 2G illustrates a method of distributed collaborative knowledge generation through geographical query and display according to an embodiment of the present invention. In this example, a user may conduct a geographical query 240 of locations of people who have published information related to Mitosis in the United States. In response to the geographical query 240, a map 241 showing different clusters of people who have published information related to Mitosis are displayed. Each cluster of people is represented by a circle and the size of the circle is proportional to the number of people in the cluster. If the user decides to find out more information from a particular cluster, she may click on that cluster and further information about Mitosis 242 may be displayed from that cluster. Note that the Mitosis project by the user (Ammymerz) has earned a score of 12; it has been copied 2,436 times; and it has received 3 comments. These ratings and reviews may be used to determine the relevance of this project against future searches for other users. This dynamic online rating system may also be used to show the reputation, expertise of the user in a particular area of knowledge, and the quality of the collection.

[0044] Figure 2H illustrates a method of distributed collaborative knowledge generation through real-time communications with other students according to an embodiment of the present invention. In this example, a first group member (Ammymerz) and a second group member (Nealeo) may learn from each other interactively in real time. After viewing and learning from the second group member's Mitosis project 247, the two users may exchange information asking further questions and provide comments to each other's projects. A group member can provide pointers to additional information on the subject.

[0045] Figure 2I illustrates a method of distributed collaborative knowledge generation through real-time annotations according to an embodiment of the present invention. In the example shown in Figure 2I, the white line 250 indicates an annotation drawn by the pencil 251. The webpage shows the second user 252 owns the pencil 251, and the first user 253 may communicate with the second user through Instant Messenger (IM). In this manner, the method supports real-time collaboration among multiple users for creating and sharing knowledge on a particular subject of

interest. In other embodiments multiple pencils (pens) may be supported such that multiple users can draw/write on the same display area together and the IM may be augmented by Skype of VOIP (voice-over-Internet protocol) or video.

[0046] Figure 3A illustrates a method for global collaboration and sharing according to an embodiment of the present invention. In this example, a group of teachers and students may work on a project in a collaborative manner globally. This group is named the 7th Grade Human Anatomy Project Group. The locations of the group members are displayed on a world map. The numeral 302 indicates such a teacher-student pair located in Europe, who can collaborate and exchange ideas, resources, and data in real time as well as asynchronously.

[0047] Figure 3B illustrates a method for generating a collaborative knowledge collection according to an embodiment of the present invention. In this case, members from different locations of the world may work collaboratively to build a worksheet for their students. Multiple pens 311 and 312 may be employed by each group and the pens may operate independent of each other. In addition, the group members may be able to communicate with other in real time via instant messages 313, 314, and 315. A small window 316 shows the groups that are currently online. Figure 3B also shows the group project webpage. The project assets are arranged hierarchically in different folders under the project assets section. Other images and drawings are also collected as parts of the projects assets. In the Lesson Info section, information about lesson plans 316, assignments 317, slideshows 318, remixes 319, and worksheets 320 are provided. The lesson plans are the repository for the curriculum materials generated collectively by the group, which are further categorized into lessons directed to different subsystems of the human body. Teachers may use these lesson plans directly with their students, and they may continue to add or refine the materials over time.

[0048] Figure 3C illustrates another method for generating a collaborative knowledge collection according to an embodiment of the present invention. Teachers can directly link objects together and collaboratively build multimedia document. For example, the webpage 330 illustrates the skeletal system of the lesson plans shown in Figure 3B, where different skeletal parts are shown in multimedia format. The diagram on the left hand side provides a full-view of the skeletal system 334. The group members may communicate with each other via IM 335 to build the

collaborative knowledge collection for the group. Similar to Figure 3B, the small window 336 indicates which groups are currently online.

[0049] Figure 4A illustrates a student calendar for managing school activities according to an embodiment of the present invention. In the example shown in Figure 4A, the student calendar 400, which may receive its data from the distributed collaborative knowledge generation system set up by a teacher, may be accessed from a desktop 402 or from a mobile device any time and anywhere. A student may view major events and activities by selecting a particular date for display 404. For example, for January 16, the student has activities in subject areas of history, biology, algebra, American literature, and French. In particular, for the biology project, the student has the action item of "present Mitosis media project with your group" on January 18. In addition, the calendar also displays a reminder of the January 17 field trip. An expanded view of a day's events is shown with the numeral 406, where additional information about each event is shown, and reminders of other events are also displayed. A method for presenting information with multiple views is described by U.S. Patent Application No. 11/656,052, entitled "Method and System for Presenting Information with Multiple Views," which is incorporated herein by reference in its entirety.

[0050] Figure 4B illustrates a family academic calendar for managing family activities according to an embodiment of the present invention. Similar to the student calendar shown in Figure 4A, the family academic calendar 410 may be accessed from a desktop 412 or from a mobile device any time and anywhere. A parent may view major events and activities by selecting a particular date for display 404. For example, for January 16, the student has activities in subject areas of history, science, math, English, PE, etc. In particular, for the biology project 416, the action item of "present Mitosis media project with your group" is due on January 18. In addition, the calendar also displays a reminder of the January 17 field trip and other events related to the student's school activities.

[0051] Figure 5A illustrates a user device for accessing the distributed collaborative knowledge generation system according to an embodiment of the present invention. This mobile device 500 allows a user to access calendar and school project information any time and anywhere. The mobile device contains a calendar 501 and allows a user to access calendar events for any date. For example, the mobile device 500 displays a list of events 502 on January 16. It displays all the projects that

need the user's attention for that date, and displays more details about any project of interest, in this case the Biology project. Furthermore, the mobile device displays any upcoming event 508 (1/17 field trip) and the action items relate to the event (bring bag lunch).

[0052] Figure 5B illustrates a method for accessing educational materials on demand according to an embodiment of the present invention. The method implements a context-aware application, which knows about the multiple inputs that a mobile device may receive data from the system, the museum, the teacher, or other students in the class, etc. In the example of Figure 5B, the mobile device 500 is used on a field trip to a dinosaur's exhibit in a natural history museum. A map (floorplan) of the museum 510 can be retrieved by the mobile device over a wireless network. As the user navigates through the museum, the user device 500 is able to detect various information hot-spots around the museum and display such information 512 on the screen of the mobile device. The user is then given the option to download relevant educational materials on demand. In one example, a teacher may design a lesson plan to include a series of information hot-spots that students need to visit in the museum. By guiding the students through the museum with interactive information display and on-demand download of educational materials, the distributed collaborative knowledge generation system can provide more interesting and efficient learning experience to the students. A method for communicating with multiple users via a map is described by U.S. Patent Application No. 11/361,268, entitled "Method and System for Communicating with Multiple Users via a Map over the Internet," which is incorporated herein by reference in its entirety.

[0053] Figure 6 illustrates a system for running map applications on a website according to an embodiment of the present invention. The system includes one or more Internet content provider servers 602, databases 605, and one or more clients 604. The servers 602 interface with the clients 604 via a communication network 603. The Internet content provider servers 602 are host servers operable to provide content to clients 604 via the network 603. One or more of the servers host websites and include the map functions. The databases 605 are operable to store data provided by the servers 602 and/or clients 604. The databases can communicate with the servers 602 or clients 604 via the network 603. The databases can store data items included in the web pages, such as maps and user information.

[0054] Alternatively, the servers 602 may include the databases, processors, switches, routers, interfaces, and other components and modules. Each of the servers 602 may comprise one or more servers, or may be combined into a lesser number of servers than shown, depending on computational and/or distributed computing requirements. The servers 602 may be located at different locations relative to each other. The databases may also be separately connected to the servers 602. There may be more or fewer than two databases, depending on computational and/or distributed computing requirements. The databases may be located at different locations relative to each other and the servers 602.

[0055] Each of the clients 604 may be a general-purpose computer, such as a personal computer, having a central processing unit (CPU), a memory, an input device, an output device, and a display. Other computer system configurations, including Internet appliances, hand-held devices, wireless devices, portable devices, wearable computers, cellular or mobile phones, portable digital assistants (PDAs), multi-processor systems, microprocessor-based or programmable consumer electronics, set-top boxes, network PCs, mini-computers, and the like may also be implemented as the clients 604. Each of the clients 604 may also implement analog and digital baseband circuitry, power management circuitry, radio frequency (RF) transceiver, and battery interface and charging circuitry. Clients 604 may include one or more applications, program modules, and/or sub-routines. As an example, clients 604 may include a browser application (e.g., Internet Explorer, etc.) and a graphical user interface (GUI) to access websites and web pages provided by the servers 602 and data stored at the databases 605. Clients 604 may be remote from each other, the servers 602, and/or the databases 605. The databases 605 can be implemented MySQL databases.

[0056] The network 603 is a communications network, such as a local area network (LAN), a wide area network (WAN), or the Internet. When the network 603 is a public network, security features (e.g., VPN/SSL secure transport) may be included to ensure authorized access within the system.

[0057] The servers 602 further include a plurality of individual domains, for example, Teachers domain 606, news domain 608, My Web domain 610, Maps domains 612, etc. A domain is a computer system implemented with different hardware and software for a specific application, such as the Teachers applications, news applications, and maps applications. The Teachers domain implements Web 2.0

functionalities using a combination of DHTML, CSS, JavaScript, Widget Engine, and "Asynchronous JavaScript and XML" (AJAX).

[0058] It will be appreciated that the above description for clarity has described embodiments of the invention with reference to different functional units and processors. However, it will be apparent that any suitable distribution of functionality between different functional units or processors may be used without detracting from the invention. For example, functionality illustrated to be performed by separate processors or controllers may be performed by the same processors or controllers. Hence, references to specific functional units are to be seen as references to suitable means for providing the described functionality rather than indicative of a strict logical or physical structure or organization.

[0059] The invention can be implemented in any suitable form, including hardware, software, firmware, or any combination of these. The invention may optionally be implemented partly as computer software running on one or more data processors and/or digital signal processors. The elements and components of an embodiment of the invention may be physically, functionally, and logically implemented in any suitable way. Indeed, the functionality may be implemented in a single unit, in a plurality of units, or as part of other functional units. As such, the invention may be implemented in a single unit or may be physically and functionally distributed between different units and processors.

[0060] One skilled in the relevant art will recognize that many possible modifications and combinations of the disclosed embodiments may be used, while still employing the same basic underlying mechanisms and methodologies. The foregoing description, for purposes of explanation, has been written with references to specific embodiments. However, the illustrative discussions above are not intended to be exhaustive or to limit the invention to the precise forms disclosed. Many modifications and variations are possible in view of the above teachings. The embodiments were chosen and described to explain the principles of the invention and their practical applications, and to enable others skilled in the art to best utilize the invention and various embodiments with various modifications as suited to the particular use contemplated.

What is claimed is:

1. A distributed collaborative knowledge generation system, comprising:

one or more databases configured to store content information related to the distributed collaborative knowledge generation system;

a search services module configured to search for the content information;

a web services module configured to retrieve and gather the content information;

a presentation services module configured to share the content information with multiple users; and

a data services module configured to manage the content information by providing interfaces between the one or more databases, the search services module, the web services module, and the presentation services module.

2. The system of claim 1, wherein the one or more databases comprise at least one of:

a user-generated content database configured to store content information provided by users; and

a thumbnails database configured to store thumbnail images of snapshots of web pages.

3. The system of claim 1, wherein the one or more databases further comprise at least one of:

a standards database configured to store information related to educational standards; and

a schools database configured to store information provided by one or more schools.

4. The system of claim 1 further comprising:

a thumbnail caching module configured to obtain thumbnail images of web pages from a thumbnail service.

5. The system of claim 1 further comprising:

a standards feeder module configured to obtain educational standards from an academic standards source.

6. The system of claim 1 further comprising:

a schools feeder module configured to obtain school information from a schools data source.

7. The system of claim 1, wherein the search services module comprises at least one of:

a vertical search engine configured to perform searches against the content information within the system; and

a publisher search module configured to perform searches against a user-specified website.

8. The system of claim 1, wherein the presentation services module comprises at least one of calendar view, map view, grid view, and list view for presenting the content information.

9. The system of claim 1, wherein the web services comprises a data collection module configured to annotate the content information with metadata.

10. The system of claim 1, wherein the data service module comprises:

a tagging platform configured to tag the content information from one or more input sources;

a user identity module configured to identify users of the system; and

a user profile module configured to manage a user database of the system.

11. The system of claim 10, wherein the data service module further comprises:

an advertising module configured to share revenues between the one or more input sources.

12. The system of claim 10, wherein the tagging platform comprises:

a sponsorship module configured to tag the content information with an attribution of a sponsor.

13. The system of claim 10, wherein the tagging platform further comprises:

a geographical module configured to tag users according to their corresponding geographical locations.

14. The system of claim 1 further comprising:

a feedback module configured to gather user-generated feedbacks about the system.

15. A method for facilitating sharing of knowledge on the Internet, comprising:

gathering information about a subject from the Internet;

generating a knowledge database for storing the information gathered;

improving the knowledge database by incorporating inputs from one or more users;

publishing the knowledge database on the Internet;

performing a search of the subject against the knowledge database; and

continuously improving the knowledge database using results of the search.

16. The method of claim 15, wherein gathering information comprises at least one of:

annotating the information in accordance with user-specified metadata; and

annotating the information in accordance with contextual metadata of a user's environment.

17. The method of claim 15, wherein the knowledge database comprises at least one of:

user-generated content; and

thumbnail images of web pages.

18. The method of claim 15, wherein improving the knowledge database by incorporating inputs from one or more users comprises:

tagging content data in the knowledge database in accordance with user-provided metadata.

19. The method of claim 15, wherein improving the knowledge database by incorporating inputs from one or more users further comprises:

organizing ratings about content data in the knowledge database in accordance with a predefined ranking method; and

organizing comments about the content data in the knowledge database.

20. The method of claim 15, wherein improving the knowledge database by incorporating inputs from one or more users further comprises:

categorizing content data in the knowledge database in accordance with a set of predetermined categories.

21. The method of claim 15, wherein improving the knowledge database by incorporating inputs from one or more users further comprises:

selecting a work product from the knowledge database; and

modifying a part of the work product to create a new work product.

22. The method of claim 15, wherein improving the knowledge database by incorporating inputs from one or more users further comprises:

selecting a work product from the knowledge database; and

combining a part of the work product with other work products from the knowledge database to create a new work product.

23. A method for assisting an educational project, comprising:

providing a knowledge database for storing user-generated content;

providing a website for sharing the user-generated content related to the educational project; and

facilitating collaborations among multiple users to communicate with each other using the website and the user-generated content.

24. The method of claim 23, wherein facilitating collaborations among multiple users comprises at least one of:

grouping the multiple users according to common interest;

grouping the multiple users according to membership of an organization; and

grouping the multiple users according to a set of parameters identifying extend of connectedness among the multiple users.

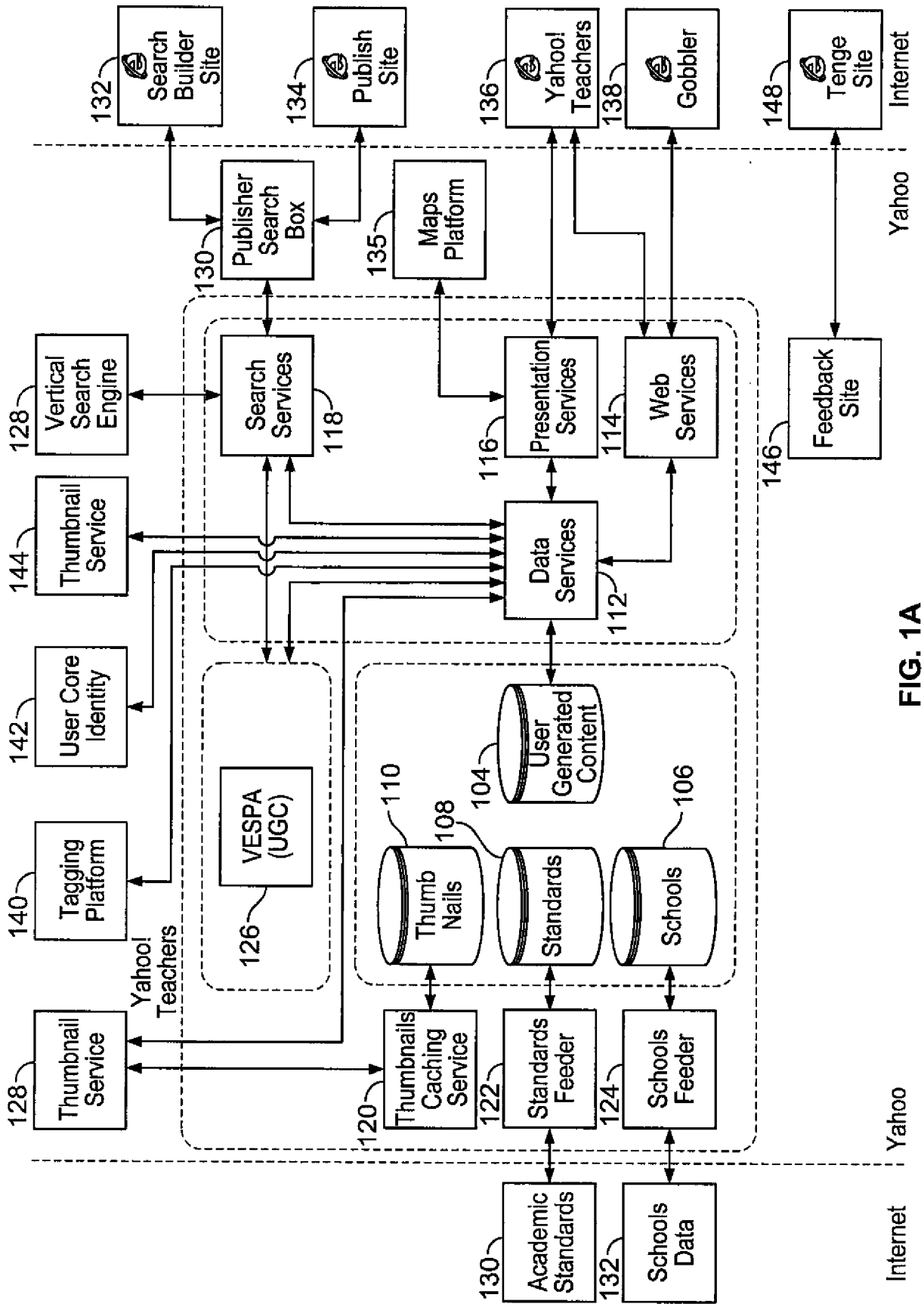
Internet
Yahoo
Search Builder Site
132
Publish Site
134
Yahoo! Teachers
136
Gobbler
138
Tenge Site
148
Publisher Search Box
130
Maps Platform
135
Vertical Search Engine
128
Search Services
118
Presentation Services
116
Web Services
114
Feedback Site
146
Thumbnail Service
144
Data Services
112
User Core Identity
142
VESPA (UGC)
126
User Generated Content
104
110
108
106
Tagging Platform
140
Thumb Nails
Standards
Schools
Yahoo! Teachers
Thumbnail Service
128
Thumbnails Caching Service
120
Standards Feeder
122
Schools Feeder
124
Academic Standards
130
Schools Data
132
Internet
Yahoo

FIG. 1A

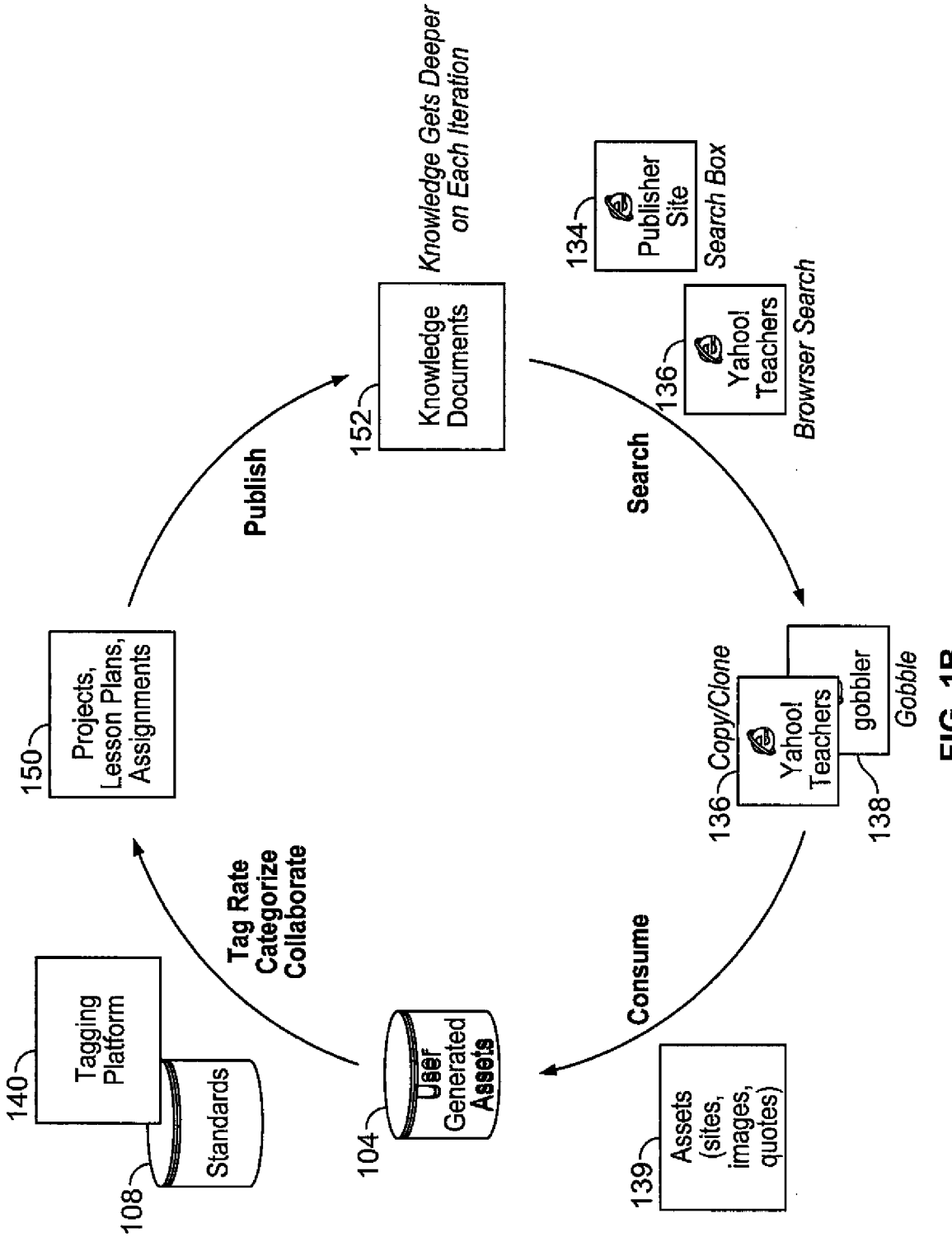
Knowledge Gets Deeper on Each Iteration
152
Knowledge Documents
Publish
150
Projects, Lesson Plans, Assignments
Tag Rate Categorize Collaborate
140
Tagging Platform
108
Standards
104
User Generated Assets
Consume
139
Assets (sites, images, quotes)
Search
134
Publisher Site
Search Box
136
Yahoo! Teachers
Browrser Search
136
Copy/Clone
Yahoo! Teachers
138
gobbler
Gobble

FIG. 1B

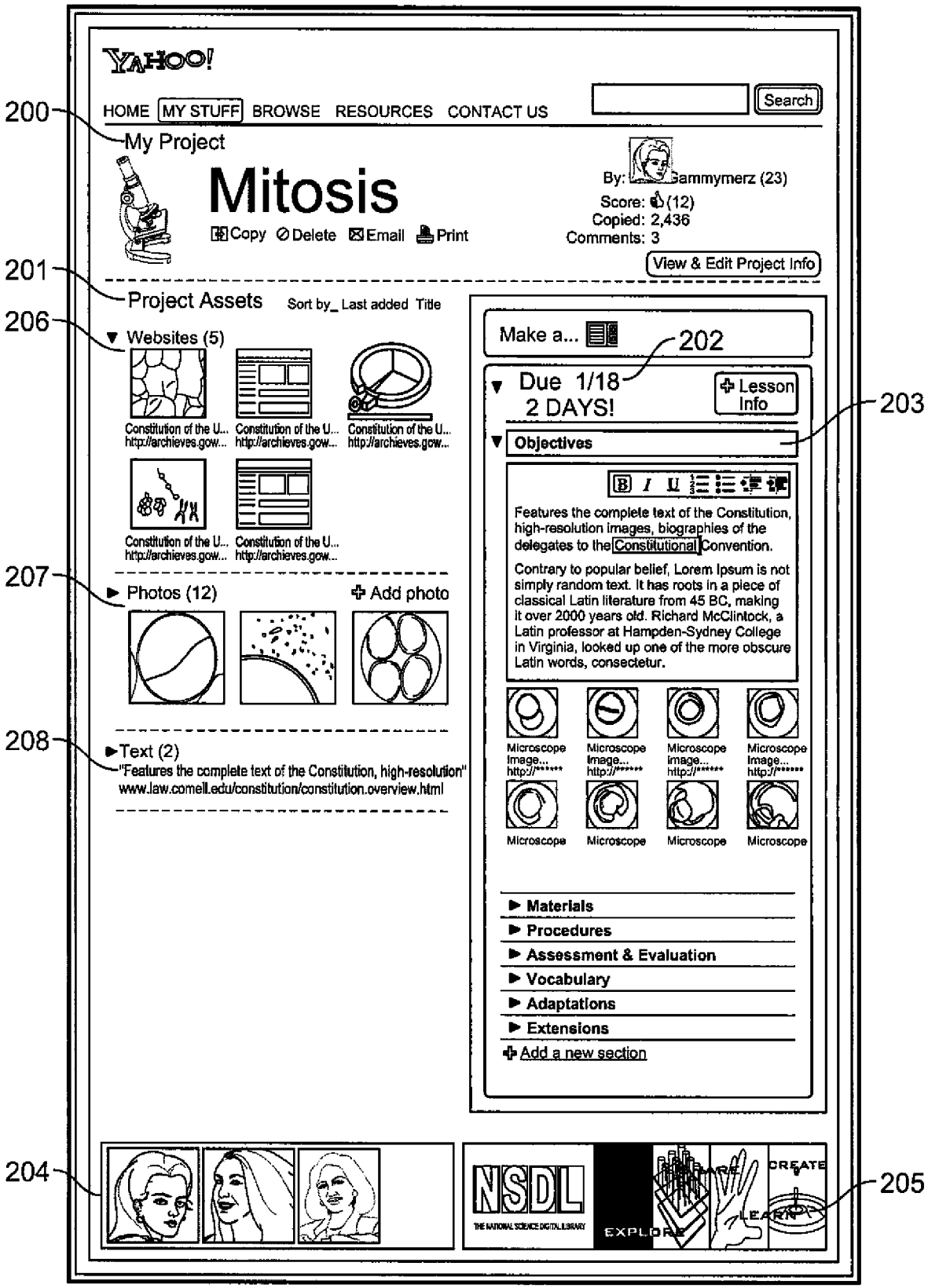
YAHOO!
HOME MY STUFF BROWSE RESOURCES CONTACT US
Search
200
My Project
Mitosis
Copy Delete Email Print
By: Sammymerz (23)
Score: (12)
Copied: 2,436
Comments: 3
View & Edit Project Info
201
Project Assets
Sort by_ Last added Title
206
Websites (5)
Constitution of the U... http://archieves.gow...
207
Photos (12)
Add photo
208
Text (2)
"Features the complete text of the Constitution, high-resolution"
www.law.comell.edu/constitution/constitution.overview.html
Make a...
202
Due 1/18
2 DAYS!
Lesson Info
203
Objectives
Features the complete text of the Constitution, high-resolution images, biographies of the delegates to the Constitutional Convention.
Contrary to popular belief, Lorem Ipsum is not simply random text. It has roots in a piece of classical Latin literature from 45 BC, making it over 2000 years old. Richard McClintock, a Latin professor at Hampden-Sydney College in Virginia, looked up one of the more obscure Latin words, consectetur.
Microscope Image... http://******
Microscope
Materials
Procedures
Assessment & Evaluation
Vocabulary
Adaptations
Extensions
Add a new section
204
NSDL
THE NATIONAL SCIENCE DIGITAL LIBRARY
EXPLORE
SHARE
LEARN
CREATE
205

FIG. 2A

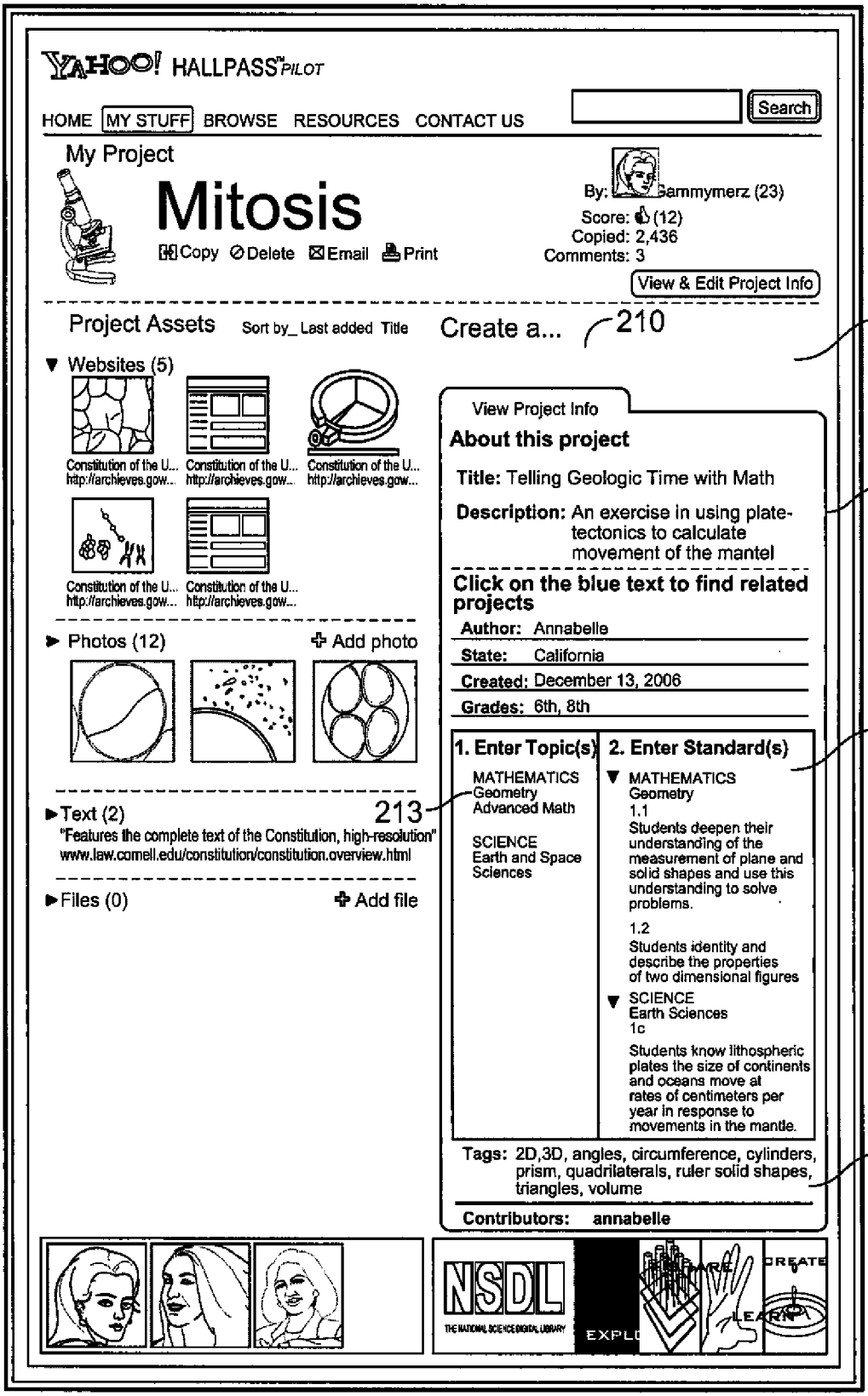
YAHOO! HALLPASS PILOT
HOME MY STUFF BROWSE RESOURCES CONTACT US
Search
My Project
Mitosis
Copy Delete Email Print
By: Sammymerz (23)
Score: (12)
Copied: 2,436
Comments: 3
View & Edit Project Info
Project Assets Sort by_ Last added Title
Create a...
210
211
Websites (5)
Constitution of the U... http://archieves.gow...
Photos (12)
Add photo
Text (2)
213
"Features the complete text of the Constitution, high-resolution"
www.law.comell.edu/constitution/constitution.overview.html
Files (0)
Add file
View Project Info
About this project
Title: Telling Geologic Time with Math
Description: An exercise in using plate-tectonics to calculate movement of the mantel
212
Click on the blue text to find related projects
Author: Annabelle
State: California
Created: December 13, 2006
Grades: 6th, 8th
1. Enter Topic(s)
2. Enter Standard(s)
214
MATHEMATICS
Geometry
Advanced Math
SCIENCE
Earth and Space Sciences
MATHEMATICS
Geometry
1.1
Students deepen their understanding of the measurement of plane and solid shapes and use this understanding to solve problems.
1.2
Students identity and describe the properties of two dimensional figures
SCIENCE
Earth Sciences
1c
Students know lithospheric plates the size of continents and oceans move at rates of centimeters per year in response to movements in the mantle.
Tags: 2D,3D, angles, circumference, cylinders, prism, quadrilaterals, ruler solid shapes, triangles, volume
215
Contributors: annabelle
NSDL
THE NATIONAL SCIENCE DIGITAL LIBRARY

FIG. 2B

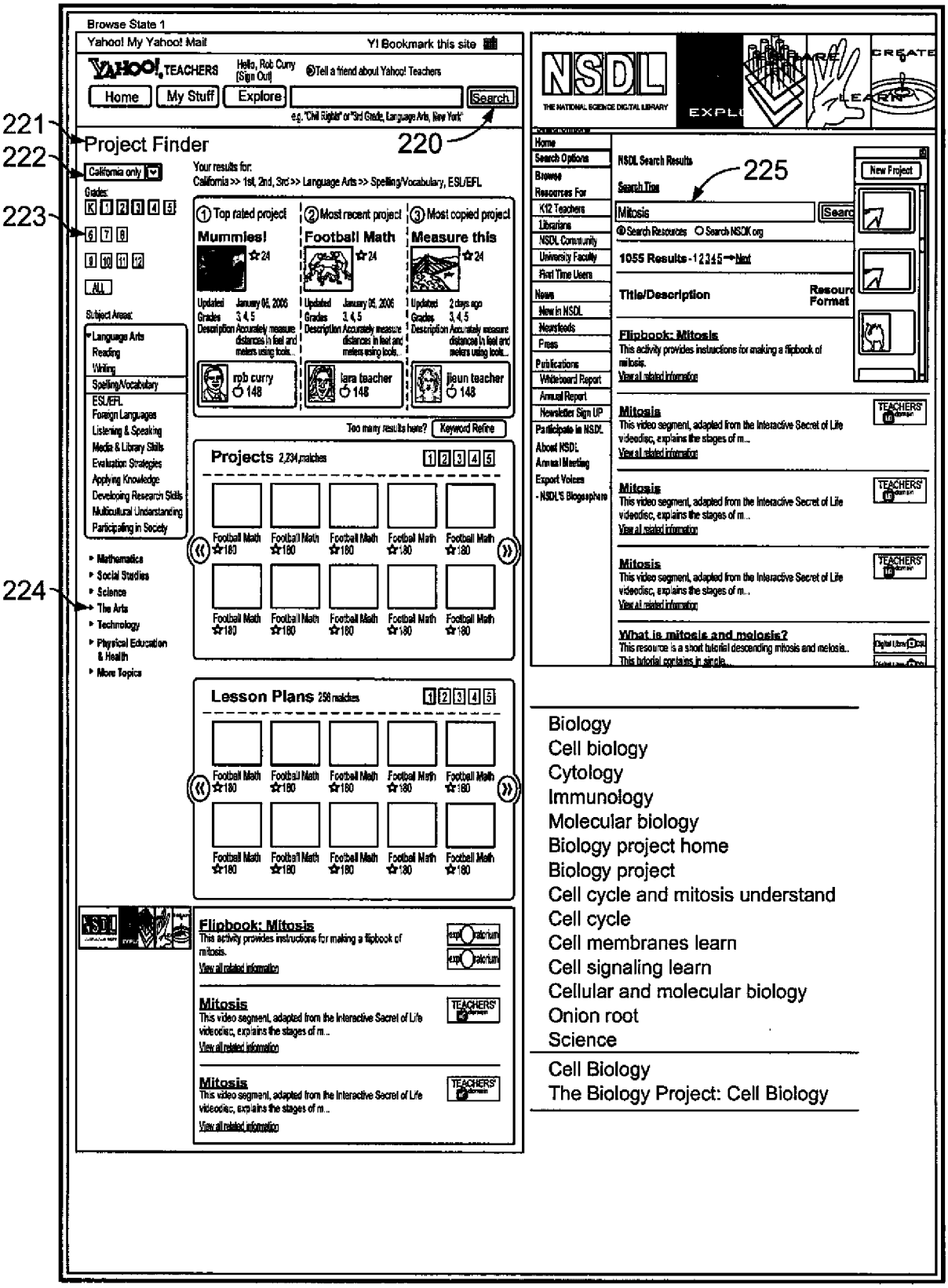
221
222
223
224
220
225
Browse State 1
Yahoo! My Yahoo! Mail
Y! Bookmark this site
Home
My Stuff
Explore
Search
Project Finder
California only
Your results for:
California >> 1st, 2nd, 3rd >> Language Arts >> Spelling/Vocabulary, ESL/EFL
Top rated project
Most recent project
Most copied project
Mummies!
Football Math
Measure this
Projects
Lesson Plans
Flipbook: Mitosis
Mitosis
NSDL
NSDL Search Results
Mitosis
1055 Results
Title/Description
Flipbook: Mitosis
Mitosis
What is mitosis and melosis?
Biology
Cell biology
Cytology
Immunology
Molecular biology
Biology project home
Biology project
Cell cycle and mitosis understand
Cell cycle
Cell membranes learn
Cell signaling learn
Cellular and molecular biology
Onion root
Science
Cell Biology
The Biology Project: Cell Biology

FIG. 2C

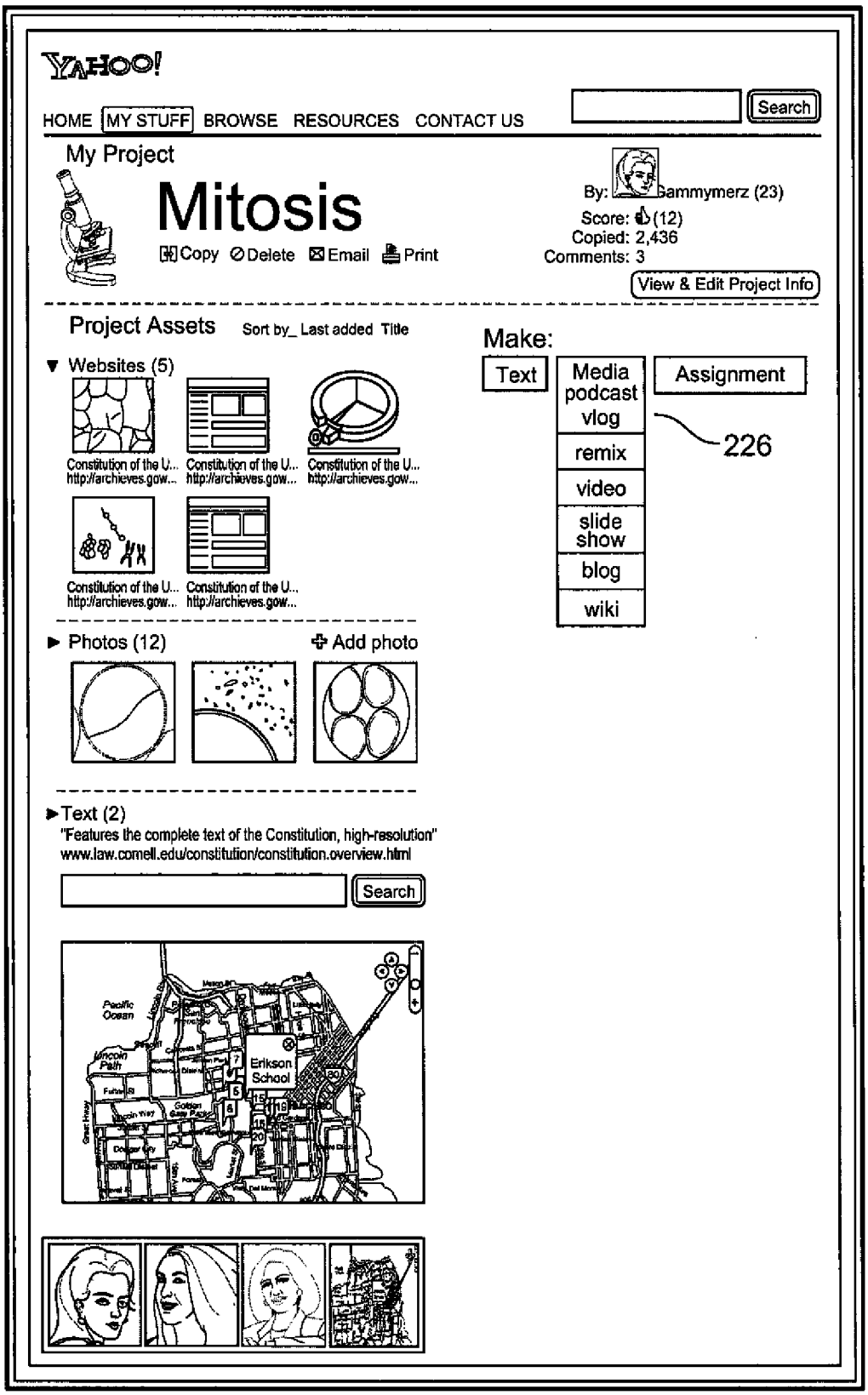
YAHOO!
HOME
MY STUFF
BROWSE
RESOURCES
CONTACT US
Search
My Project
Mitosis
Copy
Delete
Email
Print
By: Sammymerz (23)
Score: (12)
Copied: 2,436
Comments: 3
View & Edit Project Info
Project Assets
Sort by_ Last added Title
Websites (5)
Constitution of the U...
http://archieves.gow...
Photos (12)
Add photo
Text (2)
"Features the complete text of the Constitution, high-resolution"
www.law.comell.edu/constitution/constitution.overview.html
Search
Make:
Text
Media
podcast
vlog
remix
video
slide show
blog
wiki
Assignment
226
Pacific Ocean
Lincoln Park
Golden Gate Park
Erikson School

FIG. 2D

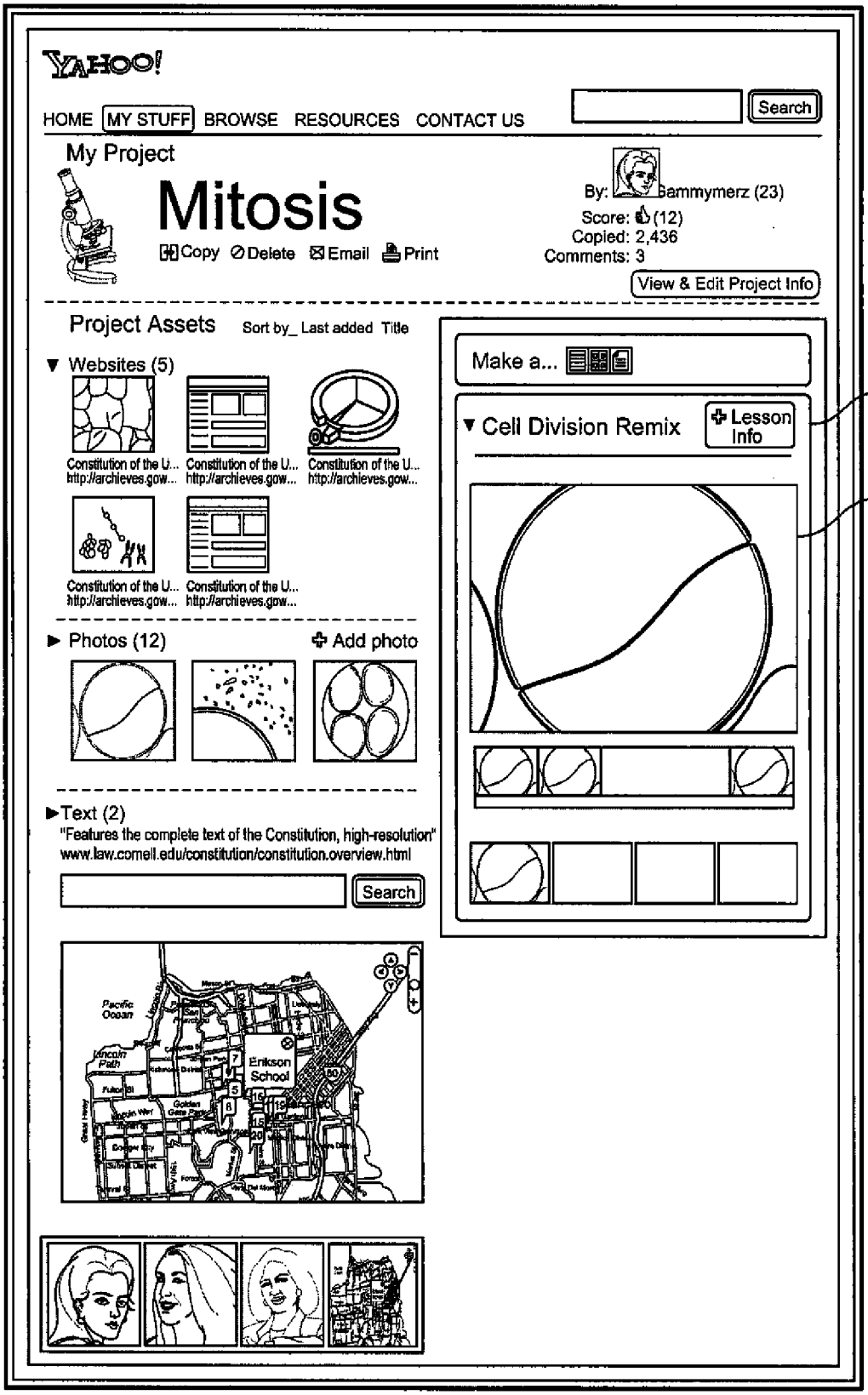
YAHOO!
HOME
MY STUFF
BROWSE
RESOURCES
CONTACT US
Search
My Project
Mitosis
Copy
Delete
Email
Print
By: Sammymerz (23)
Score: (12)
Copied: 2,436
Comments: 3
View & Edit Project Info
Project Assets
Sort by_ Last added Title
▼ Websites (5)
Constitution of the U... http://archieves.gow...
Constitution of the U... http://archieves.gow...
Constitution of the U... http://archieves.gow...
Constitution of the U... http://archieves.gow...
Constitution of the U... http://archieves.gow...
► Photos (12)
Add photo
►Text (2)
"Features the complete text of the Constitution, high-resolution"
www.law.cornell.edu/constitution/constitution.overview.html
Search
Make a...
▼ Cell Division Remix
Lesson Info
230
231
Pacific Ocean
Lincoln Park
Golden Gate Park
Erikson School

FIG. 2E

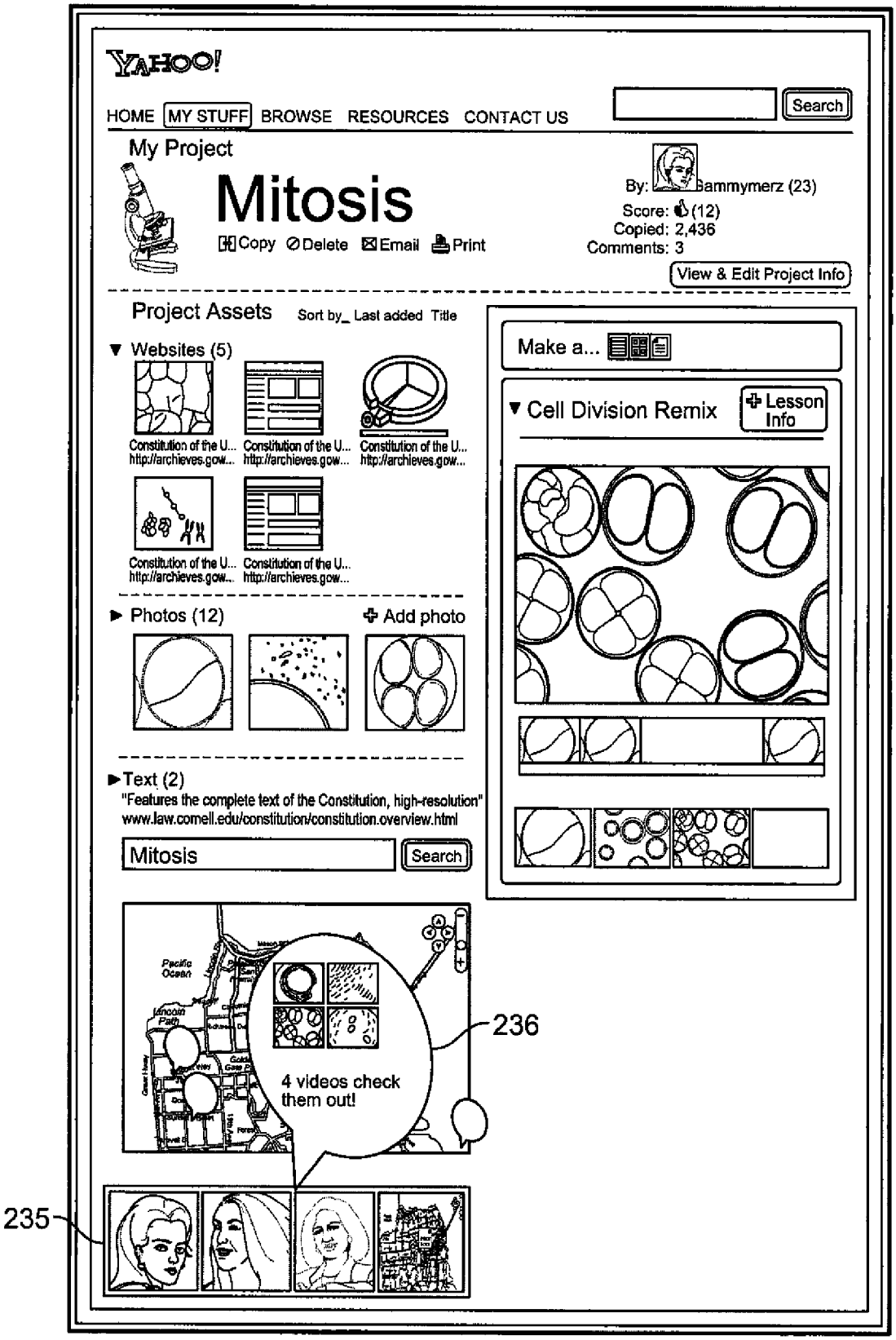
YAHOO!
HOME
MY STUFF
BROWSE
RESOURCES
CONTACT US
Search
My Project
Mitosis
Copy
Delete
Email
Print
By: sammymerz (23)
Score: (12)
Copied: 2,436
Comments: 3
View & Edit Project Info
Project Assets
Sort by_ Last added Title
Websites (5)
Constitution of the U... http://archieves.gow...
Photos (12)
Add photo
Text (2)
"Features the complete text of the Constitution, high-resolution"
www.law.cornell.edu/constitution/constitution.overview.html
Mitosis
Search
Make a...
Cell Division Remix
Lesson Info
Pacific Ocean
Lincoln Park
4 videos check them out!
236
235

FIG. 2F

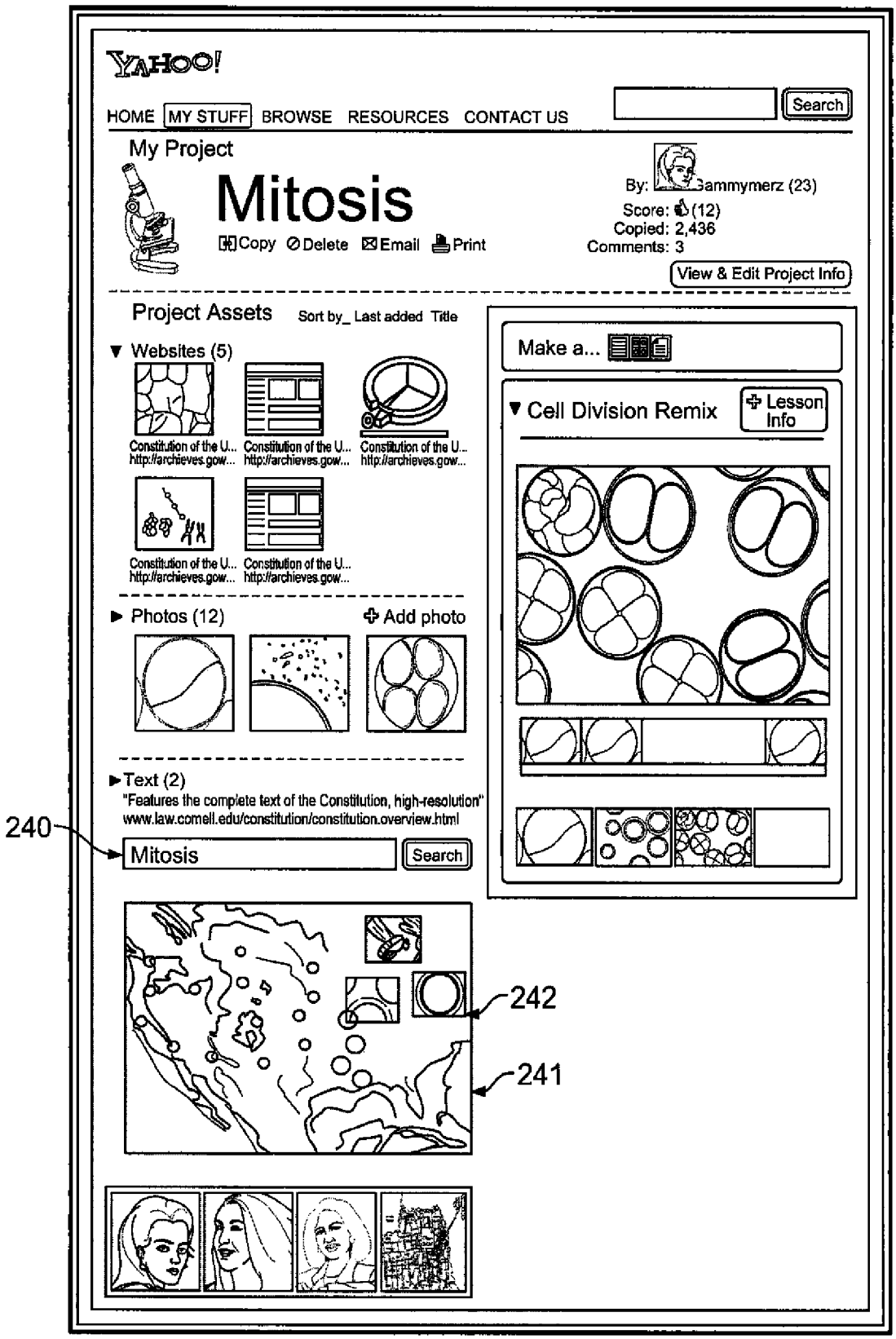
YAHOO!
HOME
MY STUFF
BROWSE
RESOURCES
CONTACT US
Search
My Project
Mitosis
Copy
Delete
Email
Print
By: Sammymerz (23)
Score: (12)
Copied: 2,436
Comments: 3
View & Edit Project Info
Project Assets
Sort by_ Last added Title
Websites (5)
Constitution of the U... http://archieves.gow...
Photos (12)
Add photo
Text (2)
"Features the complete text of the Constitution, high-resolution"
www.law.comell.edu/constitution/constitution.overview.html
Mitosis
Search
Make a...
Cell Division Remix
Lesson Info
240
242
241

FIG. 2G

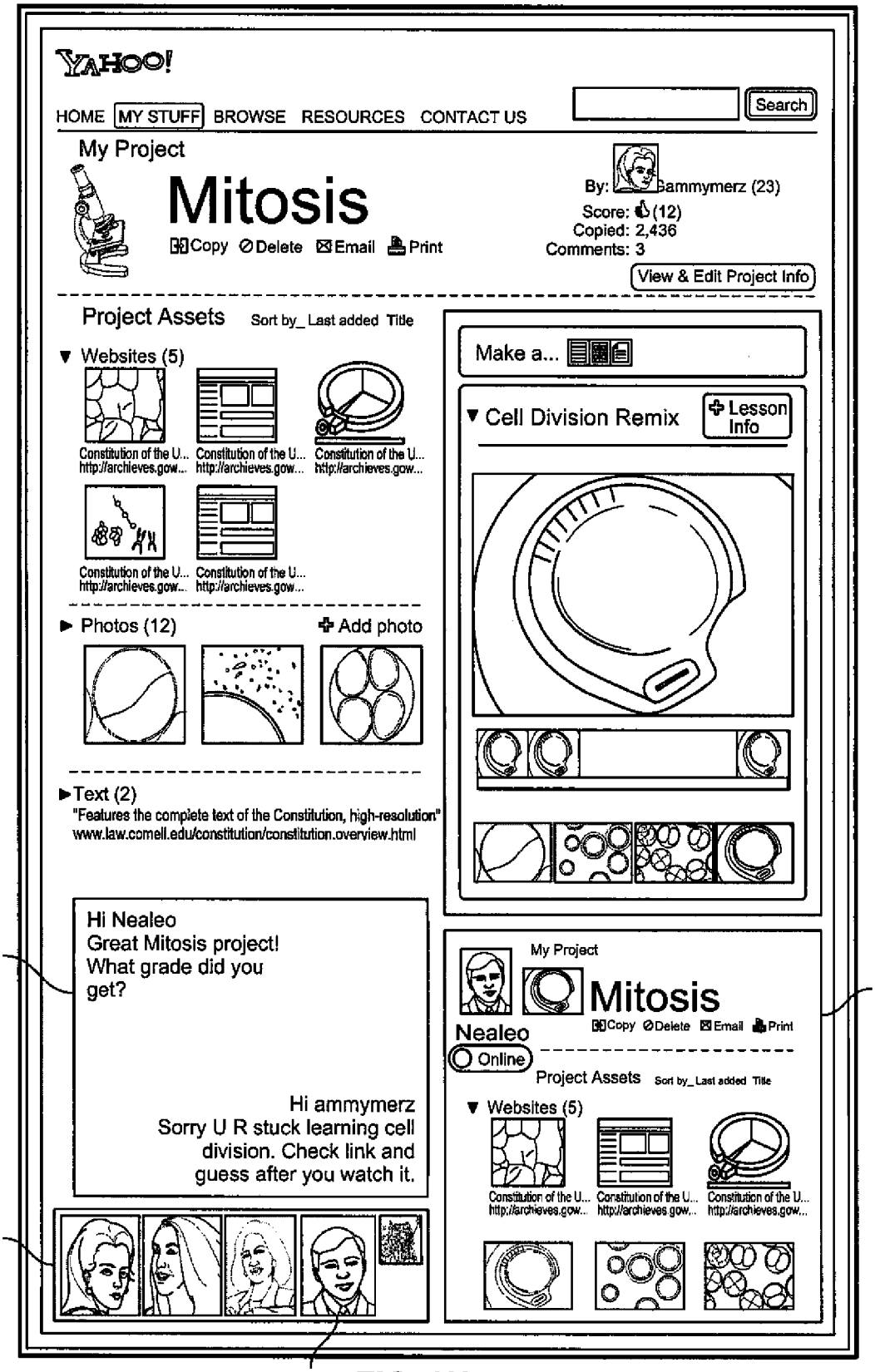
YAHOO!
HOME
MY STUFF
BROWSE
RESOURCES
CONTACT US
Search
My Project
Mitosis
Copy
Delete
Email
Print
By: ammymerz (23)
Score: (12)
Copied: 2,436
Comments: 3
View & Edit Project Info
Project Assets
Sort by_ Last added Title
Websites (5)
Constitution of the U...
http://archieves.gow...
Photos (12)
Add photo
Text (2)
"Features the complete text of the Constitution, high-resolution"
www.law.comell.edu/constitution/constitution.overview.html
Make a...
Cell Division Remix
Lesson Info
Hi Nealeo
Great Mitosis project!
What grade did you get?
Hi ammymerz
Sorry U R stuck learning cell division. Check link and guess after you watch it.
My Project
Mitosis
Nealeo
Online
Project Assets
Sort by_ Last added Title
Websites (5)
248
247
245
246

FIG. 2H

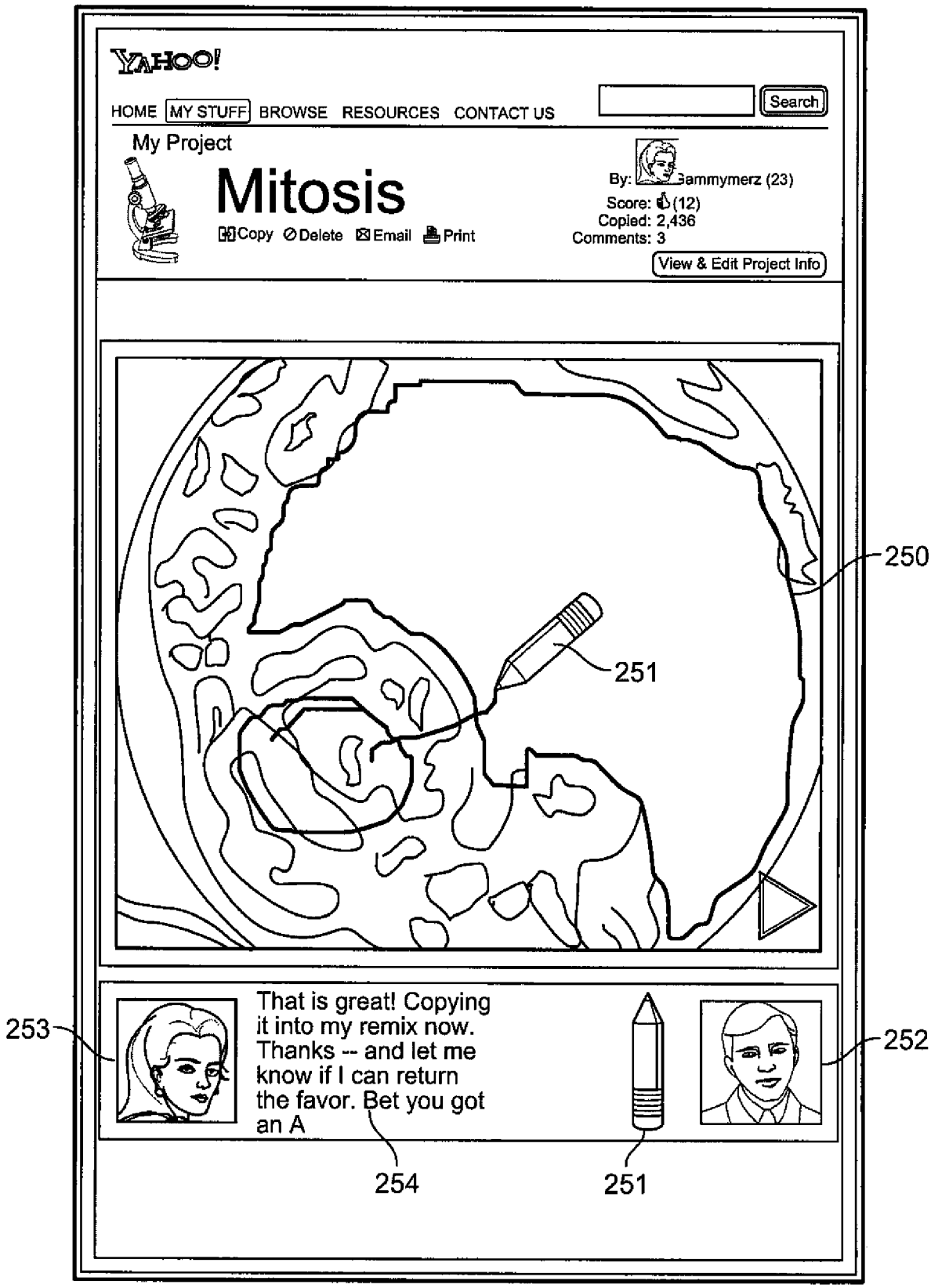
YAHOO!
HOME
MY STUFF
BROWSE
RESOURCES
CONTACT US
Search
My Project
Mitosis
Copy
Delete
Email
Print
By: Sammymerz (23)
Score: (12)
Copied: 2,436
Comments: 3
View & Edit Project Info
250
251
That is great! Copying it into my remix now. Thanks -- and let me know if I can return the favor. Bet you got an A
253
252
254
251

FIG. 2I

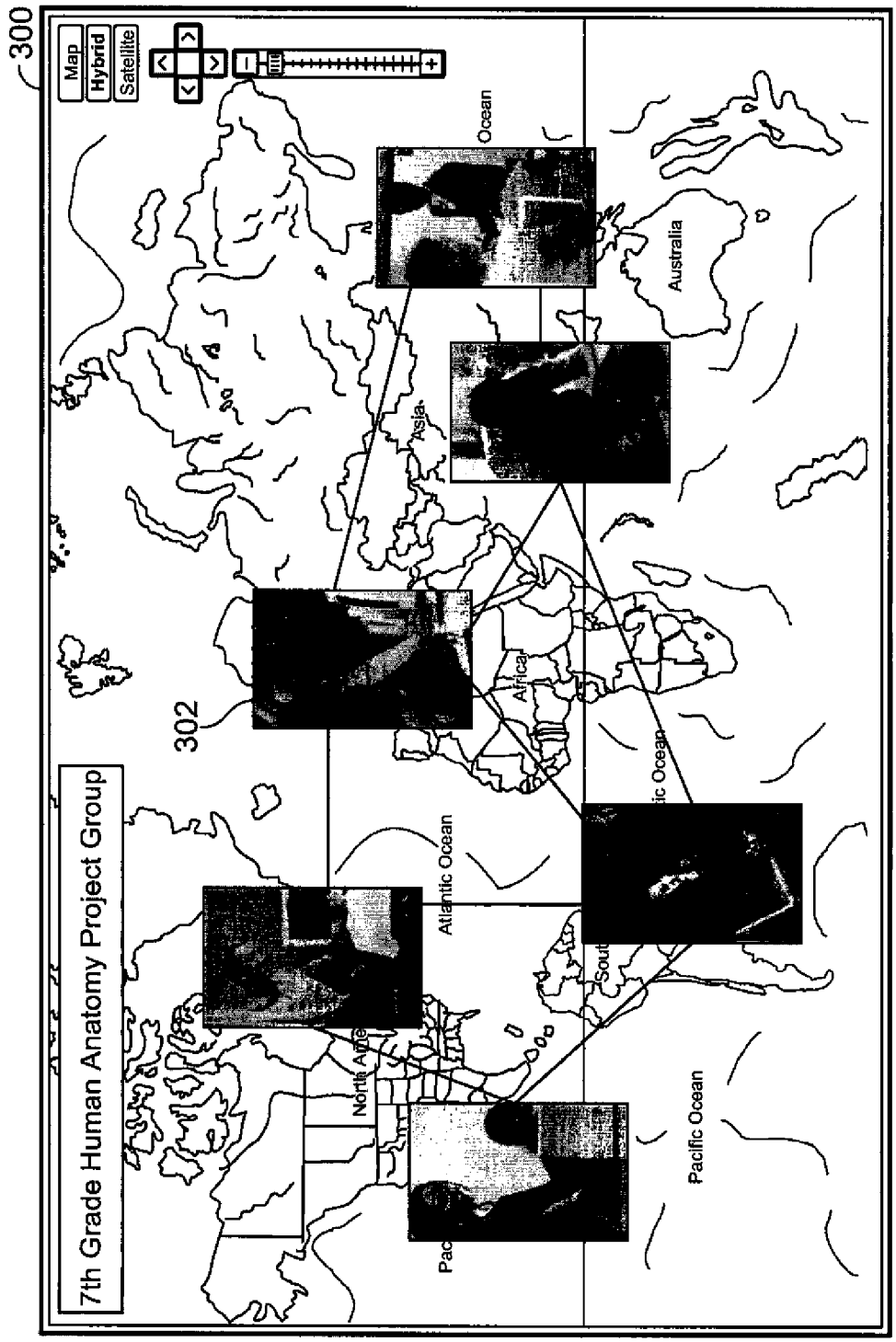
300
Map
Hybrid
Satellite
7th Grade Human Anatomy Project Group
302
Atlantic Ocean
Pacific Ocean
Asia
Australia
Ocean

FIG. 3A

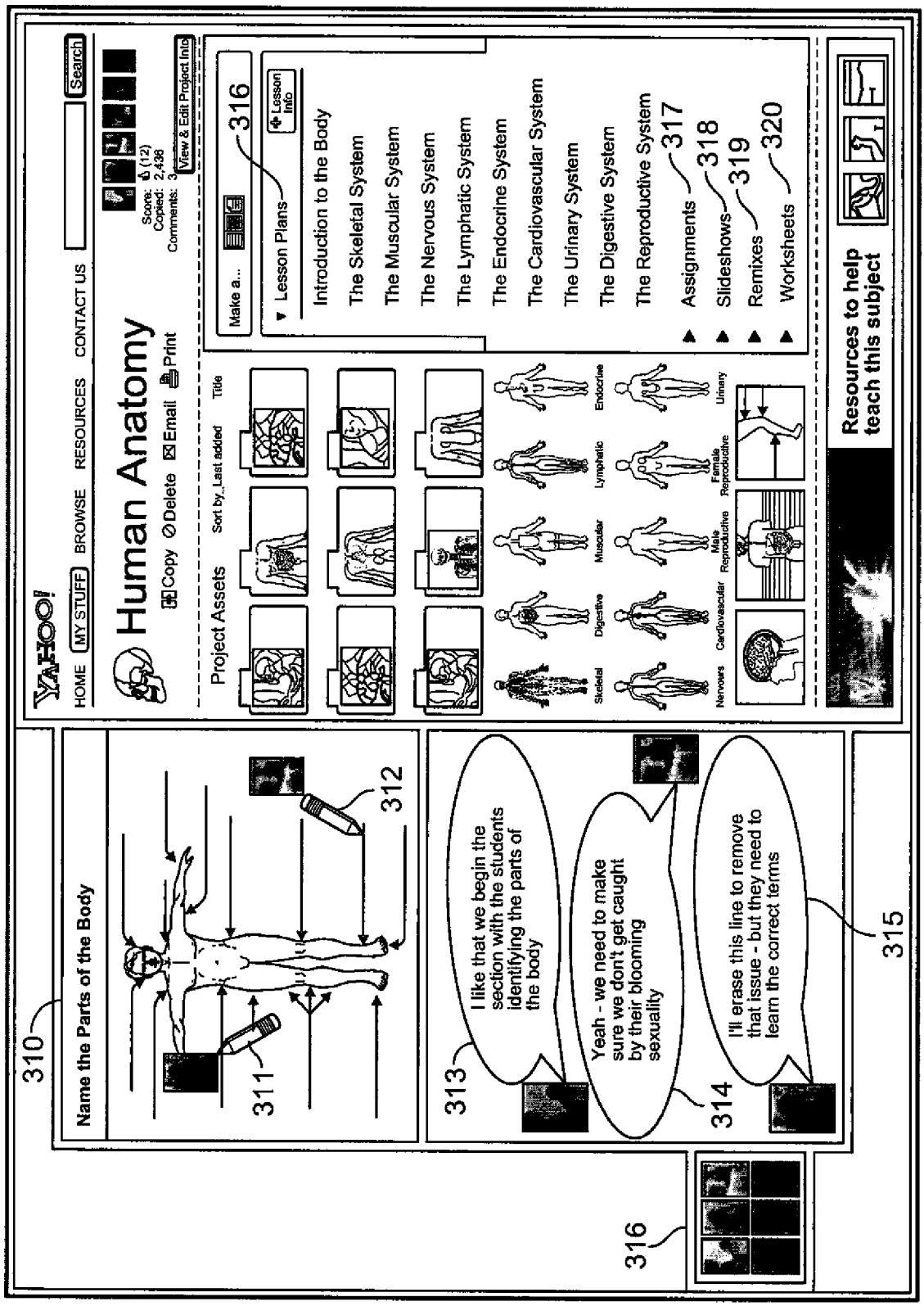
YAHOO!
HOME
MY STUFF
BROWSE
RESOURCES
CONTACT US
Search
Human Anatomy
Copy
Delete
Email
Print
Scores: 0 (12)
Copied: 2,436
Comments: 3
View & Edit Project Info
Project Assets
Sort by: Last added
Title
Make a...
316
Lesson Plans
Lesson Info
Introduction to the Body
The Skeletal System
The Muscular System
The Nervous System
The Lymphatic System
The Endocrine System
The Cardiovascular System
The Urinary System
The Digestive System
The Reproductive System
317
Assignments
318
Slideshows
319
Remixes
320
Worksheets
Resources to help teach this subject
Nervous
Cardiovascular
Digestive
Skeletal
Muscular
Male Reproductive
Lymphatic
Female Reproductive
Endocrine
Urinary
310
Name the Parts of the Body
311
312
313
I like that we begin the section with the students identifying the parts of the body
314
Yeah - we need to make sure we don't get caught by their blooming sexuality
315
I'll erase this line to remove that issue - but they need to learn the correct terms
316

FIG. 3B

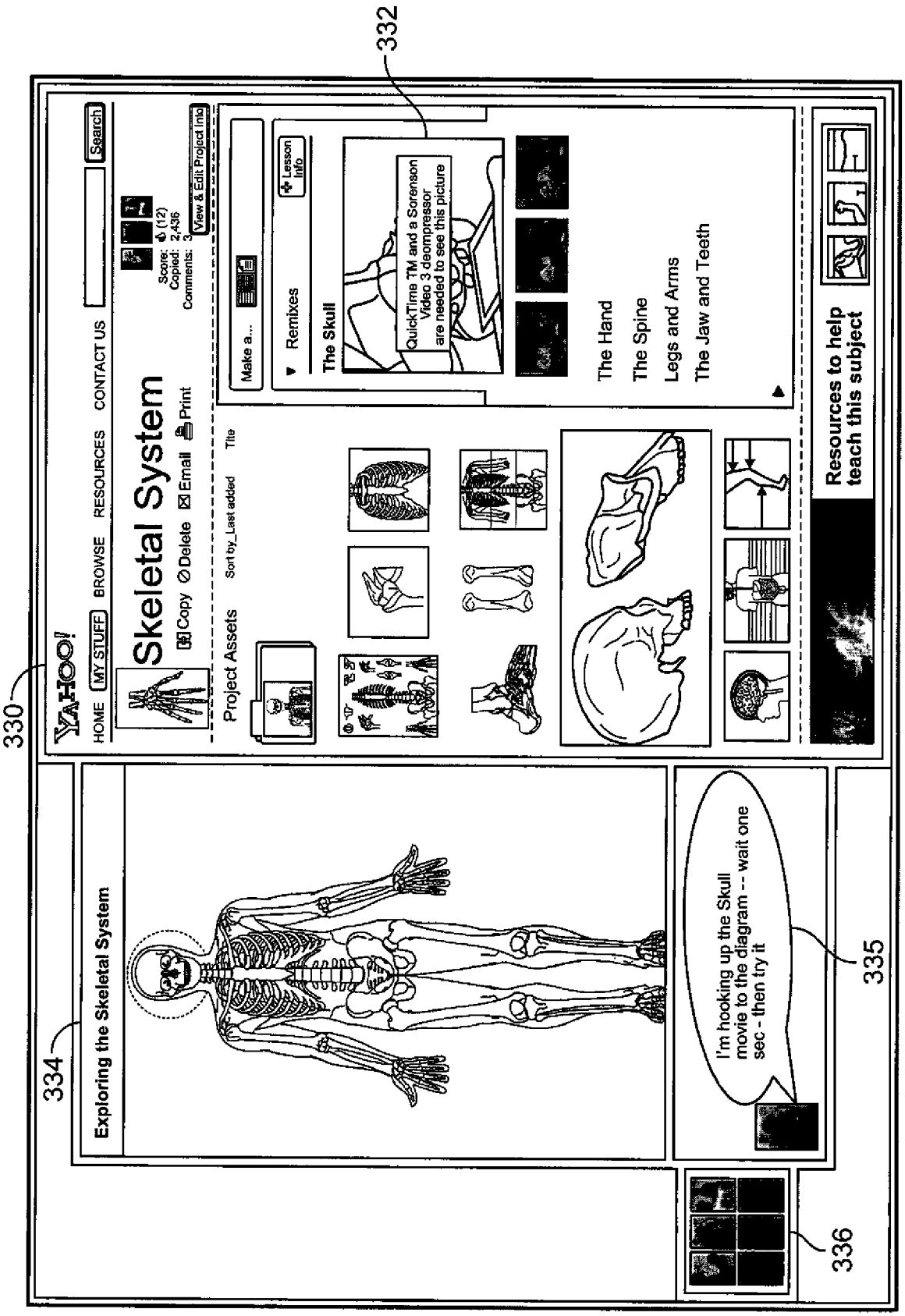
330
332
334
335
336
YAHOO!
HOME
MY STUFF
BROWSE
RESOURCES
CONTACT US
Search
Skeletal System
Copy
Delete
Email
Print
Score: (12)
Copied: 2,436
Comments: 3
View & Edit Project Info
Project Assets
Sort by_Last added
Title
Make a...
Remixes
Lesson Info
The Skull
QuickTime TM and a Sorenson Video 3 decompressor are needed to see this picture
The Hand
The Spine
Legs and Arms
The Jaw and Teeth
Resources to help teach this subject
Exploring the Skeletal System
I'm hooking up the Skull movie to the diagram -- wait one sec - then try it

FIG. 3C

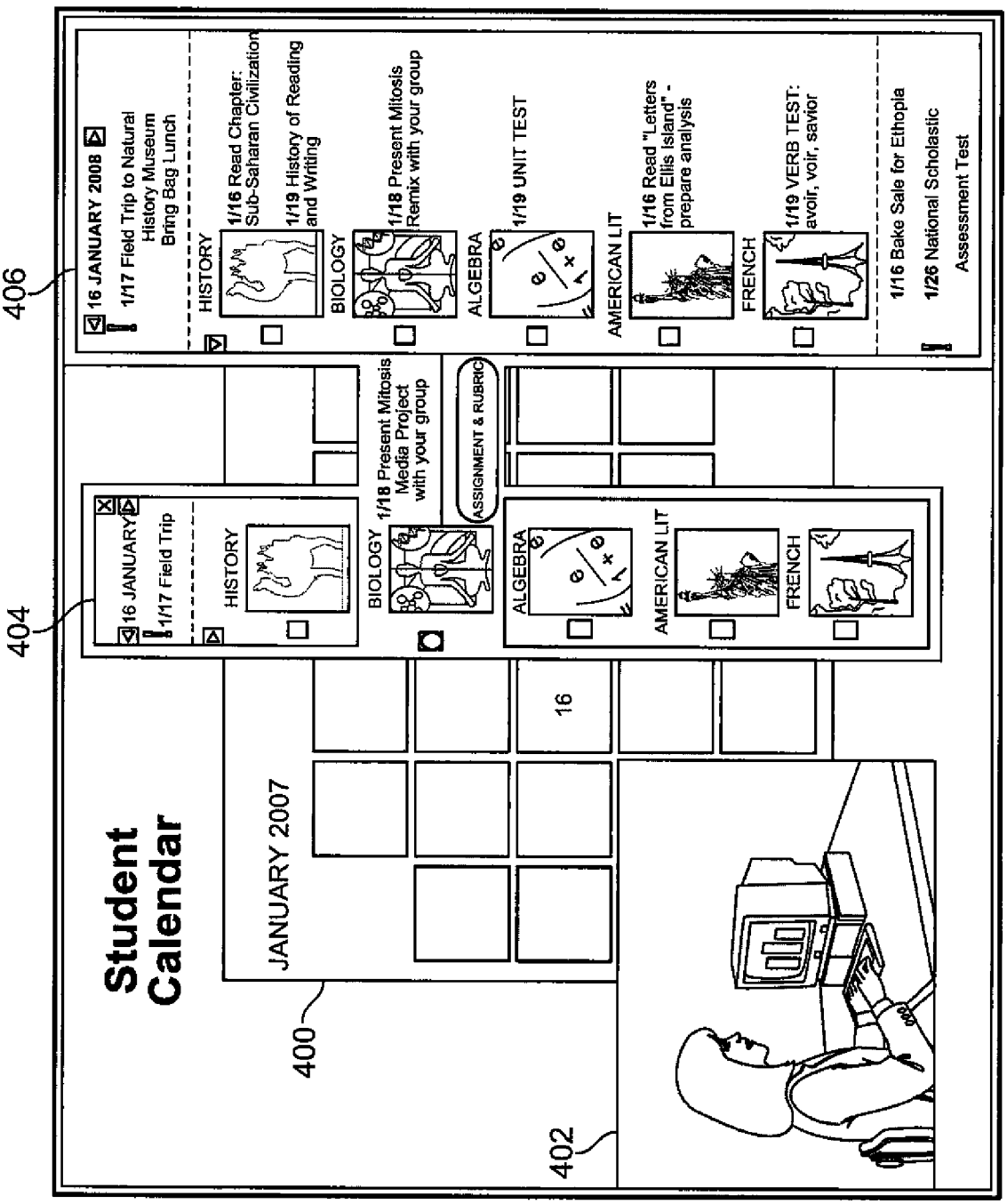
Student Calendar
JANUARY 2007
16
16 JANUARY
1/17 Field Trip
HISTORY
BIOLOGY 1/18 Present Mitosis Media Project with your group
ASSIGNMENT & RUBRIC
ALGEBRA
AMERICAN LIT
FRENCH
16 JANUARY 2008
1/17 Field Trip to Natural History Museum Bring Bag Lunch
HISTORY
1/16 Read Chapter: Sub-Saharan Civilization
1/19 History of Reading and Writing
BIOLOGY
1/18 Present Mitosis Remix with your group
ALGEBRA
1/19 UNIT TEST
AMERICAN LIT
1/16 Read "Letters from Ellis Island" - prepare analysis
FRENCH
1/19 VERB TEST: avoir, voir, savior
1/16 Bake Sale for Ethopia
1/26 National Scholastic Assessment Test
400
402
404
406

FIG. 4A

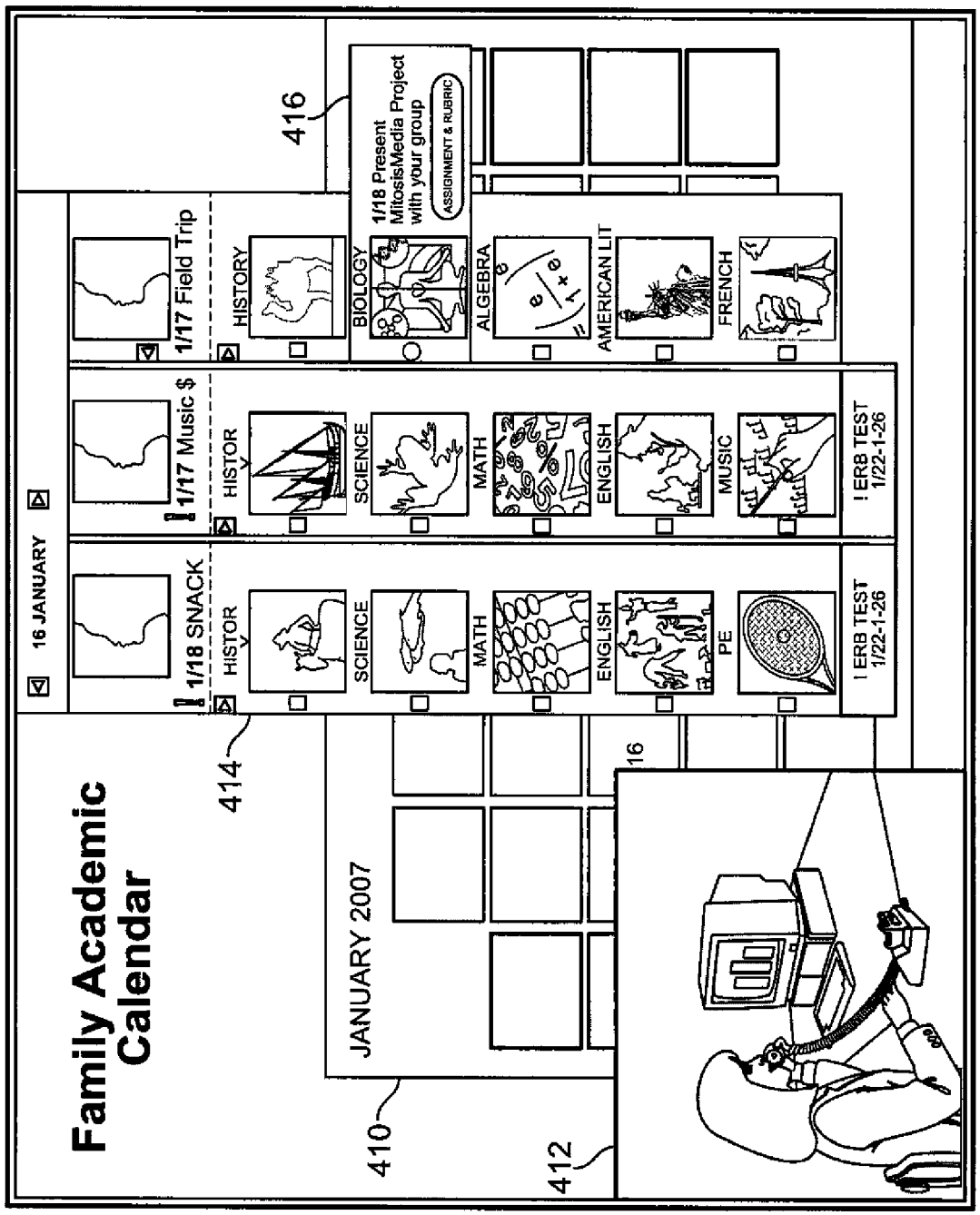
Family Academic Calendar
16 JANUARY
JANUARY 2007
1/18 SNACK
HISTOR
SCIENCE
MATH
ENGLISH
PE
! ERB TEST 1/22-1-26
1/17 Music $
HISTOR
SCIENCE
MATH
ENGLISH
MUSIC
! ERB TEST 1/22-1-26
1/17 Field Trip
HISTORY
BIOLOGY
1/18 Present MitosisMedia Project with your group
ASSIGNMENT & RUBRIC
ALGEBRA
AMERICAN LIT
FRENCH
414
410
412
416

FIG. 4B

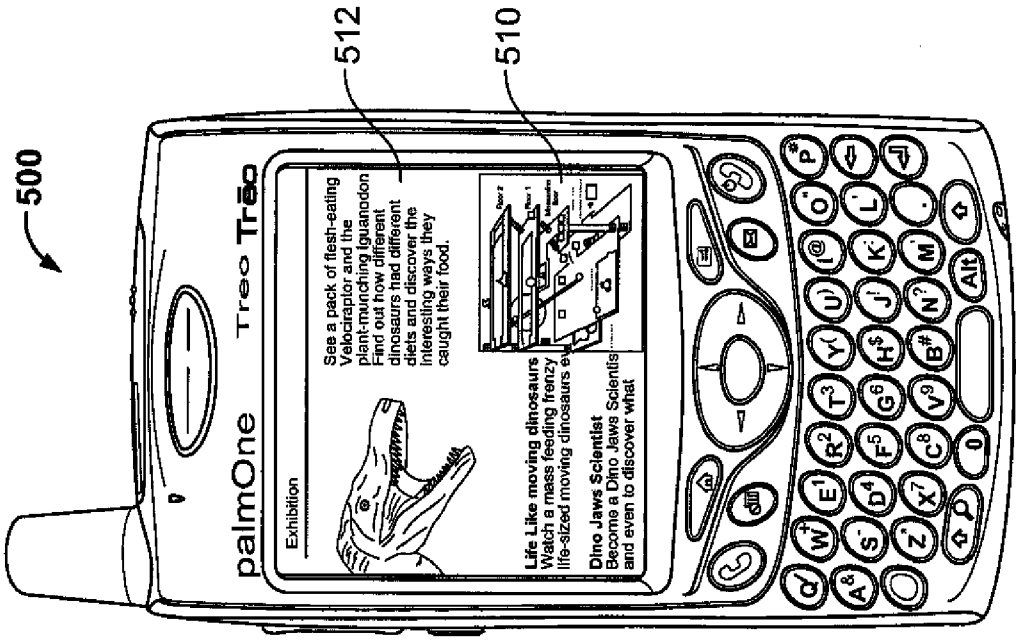
500
512
510
palmOne Treo Trēo
Exhibition
See a pack of flesh-eating Velociraptor and the plant-munching Iguanodon
Find out how different dinosaurs had different diets and discover the interesting ways they caught their food.
Life Like moving dinosaurs
Watch a mass feeding frenzy life-sized moving dinosaurs
Dino Jaws Scientist
Become a Dino Jaws Scientis and even to discover what

FIG. 5B

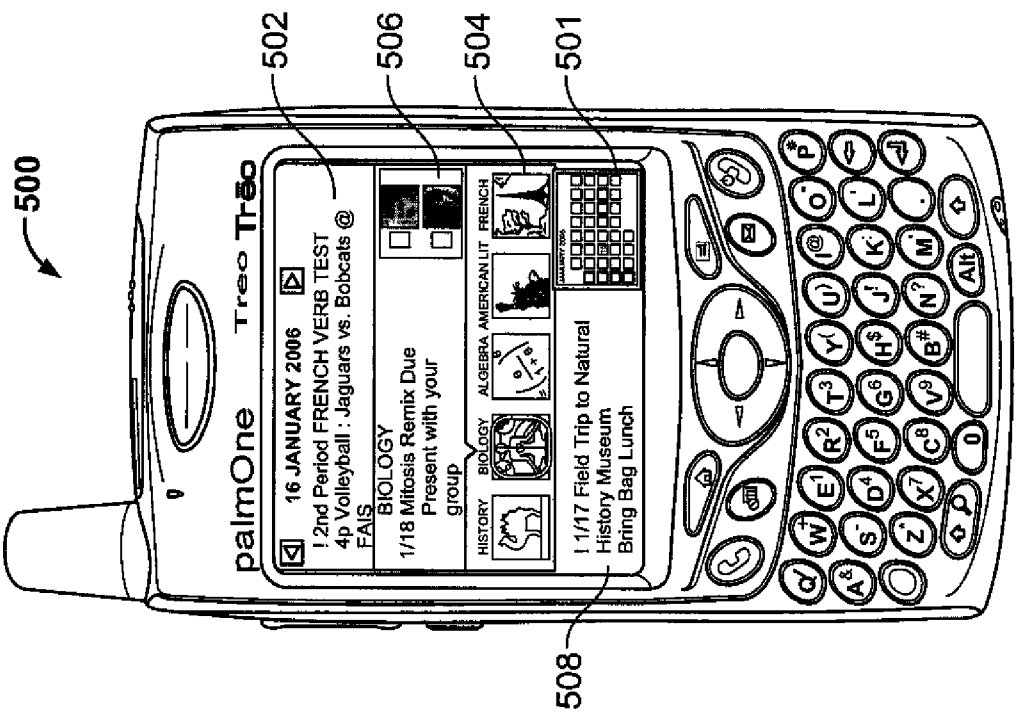
500
502
506
504
501
508
palmOne Treo Trēo
16 JANUARY 2006
! 2nd Period FRENCH VERB TEST
4p Volleyball : Jaguars vs. Bobcats @ FAIS
BIOLOGY
1/18 Mitosis Remix Due
Present with your group
HISTORY
BIOLOGY
ALGEBRA
AMERICAN LIT
FRENCH
! 1/17 Field Trip to Natural History Museum
Bring Bag Lunch

FIG. 5A

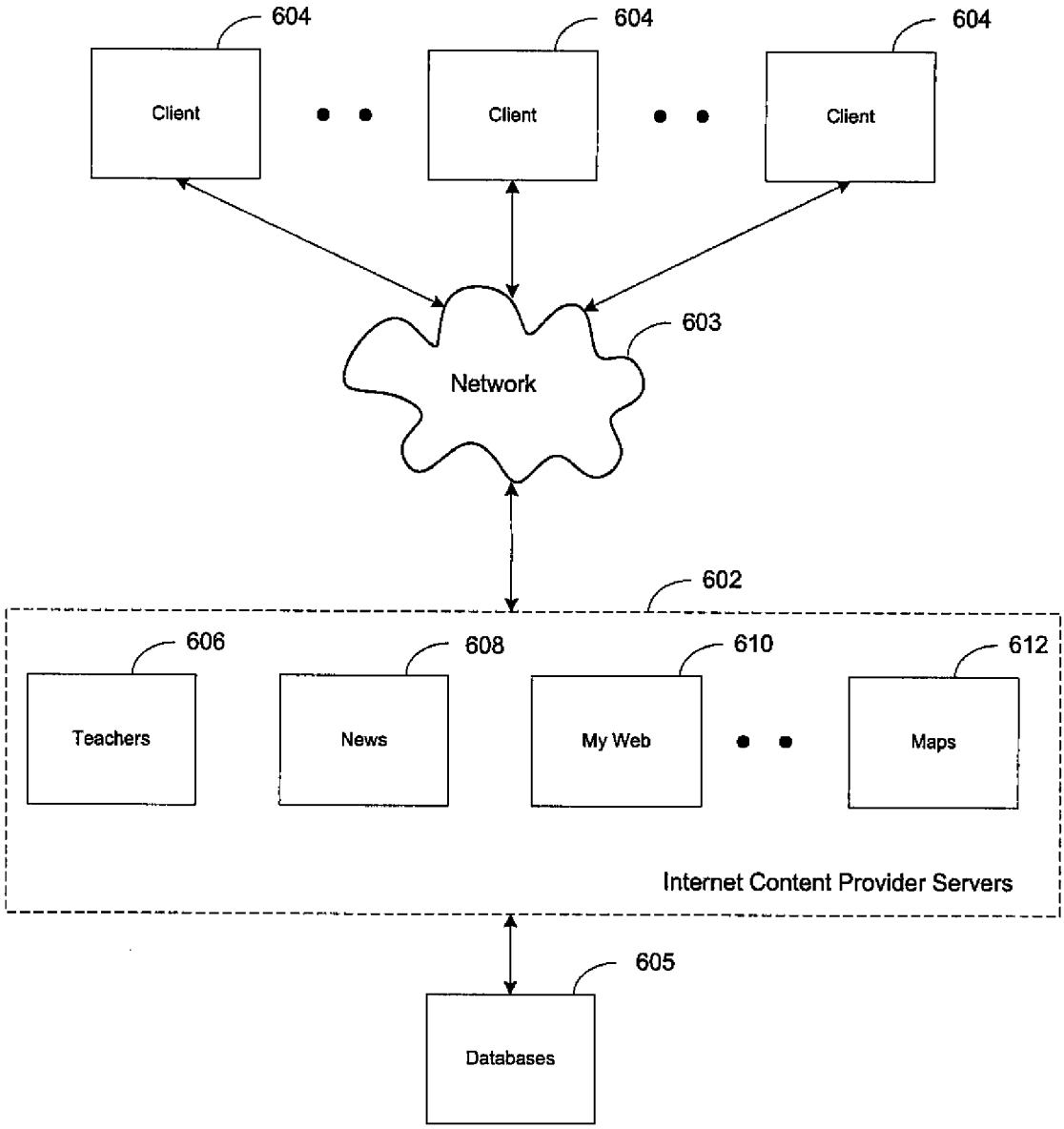
604
604
604
Client
Client
Client
603
Network
602
606
608
610
612
Teachers
News
My Web
Maps
Internet Content Provider Servers
605
Databases

Fig. 6

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2008/058062

A. CLASSIFICATION OF SUBJECT MATTER

G06Q 50/00(2006.01)i, G06F 15/16(2006.01)i, G06F 17/00(2006.01)i

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)
IPC 8 G06Q 50/00, G06F 15/16, G06F 17/00

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
Korean utility models and applications for utility models since 1975.
Japanese utility models and applications for utility models since 1975.

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
e-KIPASS(KIPO internal) "distributed, knowledge, information, contents, search, generation, sharing, internet, interface"

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	KR 10-2003-0081200 A (PARK, JIN WOO) 17 OCTOBER 2003 See abstract; pages 2-5; figures 1-3; claims 1-3.	1-24
Y	KR 10-2001-0107007 A (ONE & ONE SYSTEM CO., LTD.) 07 DECEMBER 2001 See abstract; pages 2-4; figures 2-6; claims 1-7.	1-22
Y	KR 10-2002-0026202 A (BLACKBOARD, INC.) 06 APRIL 2002 See abstract; pages 2-19; figures 1-8; claims 38-46.	23,24
A	EP 1638047 A1 (MICROSOFT CORPORATION) 22 MARCH 2006 See abstract; figures 1-4; claims 1-18.	1-24
A	KR 10-2003-0000932 A (NEXTER INFORMATION TECHNOLOGY CO., LTD.) 06 JANUARY 2003 See abstract; figure 1; claims 1-3.	1-24

☐ 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 application or patent but 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 citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents,such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
20 AUGUST 2008 (20.08.2008)	**20 AUGUST 2008 (20.08.2008)**

Name and mailing address of the ISA/KR
Korean Intellectual Property Office
Government Complex-Daejeon, 139 Seonsa-ro, Seo-gu, Daejeon 302-701, Republic of Korea
Facsimile No. 82-42-472-7140

Authorized officer
KIM, MYOUNG CHAN
Telephone No. 82-42-481-5783

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2008/058062

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
KR 10-2003-0081200 A	17.10.2003	None	
KR 10-2001-0107007 A	07.12.2001	None	
KR 10-2002-0026202 A	06.04.2002	AU 2000-63396 A1	31.01.2001
		AU 2000-63396 B2	31.01.2001
		AU 2000-63396 A5	31.01.2001
		AU 2005-203324 AA	25.08.2005
		AU 780938 B2	28.04.2005
		BR 200012207 A	23.07.2002
		CA 2378200 AA	04.01.2001
		CA 2378200 A1	04.01.2001
		CN 1371510	25.09.2002
		CN 1371510 T	. .T
		CN 1371510 A	25.09.2002
		EP 1192615 A1	03.04.2002
		IL 147231 A0	14.08.2002
		JP 2003-503780	28.01.2003
		JP 2003-503780 T2	28.01.2003
		PA 01013399 A	04.11.2002
		NZ 516437 A	27.02.2004
		US 2004-030781 A1	12.02.2004
		US 2004-030781 AA	12.02.2004
		US 2004-153508 A1	05.08.2004
		US 2004-153508 AA	05.08.2004
		US 2004-153509 A1	05.08.2004
		US 2004-153509 AA	05.08.2004
		US 2006-168233 AA	27.07.2006
		US 2007-130339 A1	07.06.2007
		US 2007-130339 AA	07.06.2007
		US 6988138 BA	17.01.2006
		WO 01-01372 A1	04.01.2001
		WO 2001-01372A 1	04.01.2001
		WO 2001-01372C 2	06.09.2002
EP 1638047 A1	22.03.2006	CN 1752960 A	29.03.2006
		EP 1638047 A1	22.03.2006
		JP 2006-092538	06.04.2006
		JP 2006-092538 A2	06.04.2006
		KR 10-2006-0050486	19.05.2006
		KR 2006050486 A	19.05.2006
		US 2006-064431 AA	23.03.2006
KR 10-2003-0000932 A	06.01.2003	None	