

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
19 December 2002 (19.12.2002)

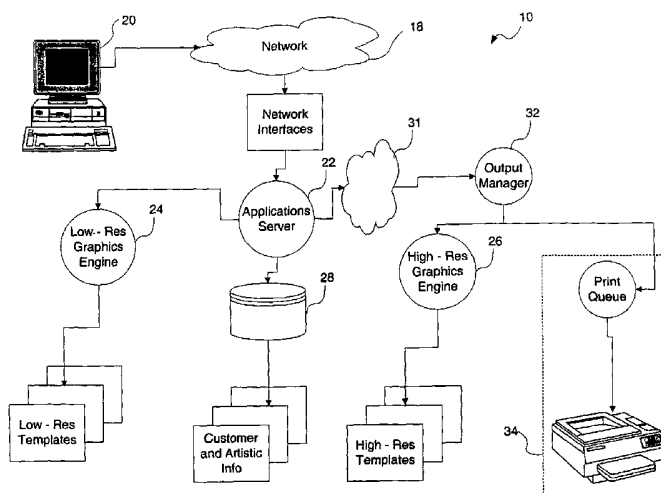
PCT

(10) International Publication Number
WO 02/101530 A1

- (51) International Patent Classification⁷: **G06F 3/00**
- (21) International Application Number: PCT/US02/18728
- (22) International Filing Date: 12 June 2002 (12.06.2002)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
60/297,947 13 June 2001 (13.06.2001) US
10/011,536 30 October 2001 (30.10.2001) US
- (63) Related by continuation (CON) or continuation-in-part (CIP) to earlier application:
US 10/011,536 (CON)
Filed on 30 October 2001 (30.10.2001)
- (71) Applicant (for all designated States except US): **BANNERGALAXY.COM, L.L.C.** [US/US]; 2322 Cass Road, Traverse City, MI 49684 (US).
- (72) Inventors; and
(75) Inventors/Applicants (for US only): **BRITTEN, Paul, J.** [US/US]; 4000 Incochee Crest Commons, Traverse City, MI 49684 (US). **BARRONS, Tom** [US/US]; 6810 E. Lake Bluffs Drive, Traverse City, MI 49684 (US). **BARRONS, Tim** [US/US]; 626 West 8th Street, Traverse City, MI 49684 (US).
- (74) Agents: **STOBBS, Gregory, A.** et al.; Harness, Dickey & Pierce, P.L.C., P.O. Box 828, Bloomfield Hills, MI 48303 (US).
- (81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZM, ZW.
- (84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW),

[Continued on next page]

(54) Title: SYSTEM AND METHOD FOR INTERACTIVITY DESIGNING AND PRODUCING CUSTOMIZED ADVERTISING BANNERS



(57) Abstract: A computer-implemented system (10) is provided for designing and producing customized display articles. The system generally includes at least one user interface (20), an applications server (22), a storage medium (28), a low resolution graphics engine (24), a high-resolution graphics engine (26) and an output subsystem (30). The user interface (20) displays a customizable display article to a customer as well as captures information relating to the customization of the display article from the customer. The storage medium (28) stores the customized data for the display article. The low resolution graphics engine (24) builds a low resolution representation of the display article which is displayed on and used to facilitate the customization of the display article at the user interface (20). After the customer has customized the display article, the high-resolution graphics engine (26) builds a high-resolution representation of the display article which is used by the output subsystem (30) to generate the customized display article onto the appropriate medium.



Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),
European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR,
GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent
(BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR,
NE, SN, TD, TG).

Declarations under Rule 4.17:

- *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii)) for the following designations AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG,*

UZ, VN, YU, ZA, ZM, ZW, ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG)

- *of inventorship (Rule 4.17(iv)) for US only*

Published:

- *with international search report*

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

SYSTEM AND METHOD FOR INTERACTIVELY DESIGNING AND PRODUCING CUSTOMIZED ADVERTISING BANNERS

[0001] This application claims priority under 35 U.S.C. §119(e) to United States Provisional Application No. 60,297,947 filed on June 13, 2001, and entitled "A System and Method for Interactively Designing and Producing
5 Customized Advertising Banners" the specification and drawings of which are hereby expressly incorporated by reference.

BACKGROUND OF THE INVENTION

[0002] The present invention relates generally to customized
10 display articles, and, more particularly, to a computer-implemented system for interactively designing and producing advertising banners.

[0003] Designing and producing commercial artwork, such as advertising banners, has historically been a time consuming and labor intensive process. For instance, a customer would work with an artist or
15 group of artists in an iterative process to design the artistic content for the banner. The customer might put forth various specifications as to what the artistic content should be or how it should appear on the banner. The artist would then interpret the specifications and create an original piece of artwork representing the desired content for the banner. Often the creation of the
20 artwork would involve the aid of computer-implemented design tools. The customer would then examine the artwork and, if unsatisfied, request changes to the artwork. This cycle might be repeated until the artwork adequately reflects the customer's requirements.

[0004] Next, the customer would decide on the proper fabrication
25 requirements necessary to produce the banner. For instance, the customer specifies a size and medium for the banner. The artist would then create a properly scaled representation of the artwork in accordance with the fabrication requirements, thereby creating an original custom banner.

[0005] Once an original banner was created, duplicate copies of the
30 banner may need to be generated. Prior to generating replicas of the banner,

the customer may desire to customize certain aspects of the banner. The conventional design process is not conducive to making such modifications to the design of the banner. Alternatively, the customer may desire to use the same original artwork on different banners.

5 **[0006]** For instance, a beer distributor prefers that each of its advertising banners display the same company logo. However, if the banners are for use at independently owned retailers, then the banner may also need to display the name of the particular retailer who is displaying the banner. In this case, the customized artwork, such as the company logo, could not be
10 easily replicated for subsequent banners using the conventional design process. In other words, the conventional design process creates unnecessary expense for large commercial customers who desire large quantities of customized banners having similar logos or artwork displayed on each of the banners.

15 **[0007]** Therefore, it is desirable to provide a computer-implemented system to facilitate interactively designing and producing customized advertising banners.

SUMMARY OF THE INVENTION

20 **[0008]** In accordance with the present invention, a computer-implemented system is provided for designing and producing customized display articles. The system generally includes at least one user interface, an applications server, a storage medium, a low-resolution graphics engine, a high-resolution graphics engine and an output subsystem. The user interface
25 displays a customizable display article to a customer as well as captures information relating to the customization of the display article from the customer. The storage medium stores the customized data for the display article.

[0009] In operation, the applications server manages the
30 customization of the display article. The low-resolution graphics engine builds a low resolution representation of the display article which is displayed on and used to facilitate the customization of the display article at the user interface.

After the customer has customized the display article, the high-resolution graphics engine builds a high-resolution representation of the display article which is used by the output subsystem to generate the customized display article onto the appropriate medium.

- 5 **[0010]** For a more complete understanding of the invention, its objects and advantages, reference may be had to the following specification and to the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

- 10 **[0011]** Figure 1 is a block diagram of a computer-implemented system for interactively designing and producing display articles in accordance with the present invention;

- [0012]** Figures 2A-2C illustrate exemplary user interfaces for interactively designing and purchasing a customized banner in accordance
15 with the present invention; and

- [0013]** Figure 3 is a diagram of an order data record in accordance with the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

- [0014]** A computer-implemented system 10 for designing and
20 producing customized display articles is depicted in Figure 1. In a preferred embodiment, the system 10 is used to interactively design advertising banners which are in turn produced on a printable medium. While the following description is provided with reference to advertising banners, it is readily understood that the system may also be used to design and produce
25 other types of display articles.

- [0015]** The system 10 generally includes an user interface 20, an applications server 22, a low-resolution graphics engine 24, a high-resolution graphics engine 26, a storage medium 28 (e.g., a file server) and an output subsystem 30. In a preferred embodiment, the user interface 20 is remotely
30 connected via a computer network 18 (e.g., the Internet) to the applications server 22. The user interface 20 is a web browser application residing on a

personal computer. As will be further described below, the web browser application interacts with various web pages hosted by the applications server 22. It is also envisioned that the user interface 20 is directly connected to the applications server 22.

5 **[0016]** The applications server 22 functions as an interface with the remaining components of the system 10. For instance, the applications server 22 is connected to the low-resolution graphics engine 24. In response to requests to display certain artistic banner content, the low-resolution graphics engine is operable to render low resolution representations of the
10 artistic banner content and communicate it to the user interface 20. The low-resolution graphics engine 24 further includes a storage mechanism for storing low resolution templates for a plurality of customizable banners.

[0017] Likewise, the applications server 22 is connected to the high-resolution graphics engine 26. In this case, the high-resolution graphics
15 engine 26 is operable to render high resolution representations of the artistic banner content which are in turn communicated to the output subsystem 30. The high-resolution graphics engine 26 also includes a storage mechanism for storing high resolution templates for a plurality of customizable banners. It is envisioned that the storage mechanism associated with either graphics
20 engine may be independent from or an integrated part of the storage medium 28 accessible to the applications server 22. As will be more fully explained below, the system 10 is used to interactively design and produce customized advertising banners.

[0018] In order to design and purchase an advertising banner, a
25 customer may interact with the system as shown in Figures 2A-2C. First, the customer enter an applicable domain name at step 202 to retrieve an introductory web page from the applications server 22. The introductory web page may present the customer with a list of banner categories from which a particular type of banner can be chosen. For instance, the introductory web
30 page may relate to custom sports banners and thus provide the user with a list of different sports banner categories, such as football, baseball, hockey, etc. If the customer chooses a banner category, they are brought to another

web page that displays each of the different types of available banners associated with that banner category. In this case, the customer has selected the hockey category at step 204, and thus is shown two hockey related banner designs.

5 **[0019]** Next, the customer can choose a particular banner design at step 206 from amongst the displayed banners. Once the customer has selected a particular banner design, they are given the option of personalizing or customizing the banner (step 208). To do so, the customer is shown a low resolution representation of the banner. The representation is derived from a
10 template for the particular banner.

[0020] Each template includes fixed content elements and at least some customizable elements. Fixed content elements may include (but are not limited to) text messages, pictures, logos, and other types of artistic banner content. The fixed content elements are pre-composed and cannot
15 be altered or distorted in any way by the customer.

[0021] On the other hand, some aspects of the banner content are customizable by the customer. For instance, the template may allow the customer to edit a pre-composed text message or to enter a new text message which is to be displayed on the banner. Each customizable element
20 may itself be highly customizable. In the case of a text block, the customer may not only edit the text message, but also modify the font style, the size of the font, or the color of the font. It is envisioned that certain templates may be highly customizable whereas other templates will be very tightly controlled. In other instances, modifications permitted to the customizable element may
25 be very tightly controlled by the content provider to ensure a certain "look and feel" for the banner. In these instances, the customizable options are limited by the content provider. The customer may also be given the option to change other aspects of the banner content, such as foreground colors, background colors, etc. Various graphical user interface tools allow the
30 customer to make changes to the customizable portions of the banner as is well known in the art.

[0022] After the customer has customized the banner, they are then given the option to review the changes they have made to the banner at step 212. A low resolution representation of the banner incorporating the customer's changes is then displayed to the customer (at step 214). If the customer is not satisfied with the banner, additional changes can be made to the banner in the manner described above. This interactive design process may be repeated until the customer is satisfied with the appearance of the banner.

[0023] Once the customer approves of or accepts the customized banner design, the customer is prompted to provide additional information relating to the fabrication of an actual banner. For instance, the customer may specify the size of the banner as shown at step 216. Likewise, the customer may specify the material (e.g., vinyl, paper, etc.) upon which to generate the banner. The customer may also specify other fabrication-related features such as trim options, hemming options, grommet option, webbing options, and pole pocket options as shown at step 218. The customer is then shown a low resolution representation of the banner as it will appear in final form including the specified fabrication features (step 220).

[0024] At this point, the customer is asked if they would like to purchase the customized banner. If the customer is satisfied with the customized banner, they are navigated through a series of web pages in order to finalize the purchase transaction (step 222). The customer is required to provide various customer information, payment information, and shipping information as is well known in the art.

[0025] Returning to Figure 1, the applications server 22 manages the interactive design and production of the advertising banners. In particular, the applications server 22 interacts with the low-resolution graphics engine to display low resolution representations of the banner to the customer. A plurality of templates for each customizable banner are stored in the database associated with the low-resolution graphics engine 22. In response to a request for a particular banner, the low-resolution graphics engine 22 renders a low resolution representation of the banner based on the stored

template and communicates it to the applications server 22. The applications server 22 in turn displays the low resolution representation to the customer. Although it is presently preferred to display a low resolution representation of the banner, high resolution representations may also be suitably used to interactively design a customized banner.

[0026] When the customer selects a particular banner, the applications server 22 also creates an order data record for storing information relating to the customer's online transaction. For example, if the customer interactively customizes a banner, the order record is used to store the customized information relating to the banner. The data record may also be used to store customer information, medium information, and fabrication information relating to the customer's transaction. As will be apparent to one skilled in the art, the order record is updated and/or augmented as the customer navigates through the above-described interactive design process. In a preferred embodiment, this data record is stored in a temporary storage medium until the customer's purchase transaction is finalized. The order record can then be stored in a persistent storage medium 28 which is accessible to the applications server 22.

[0027] A preferred embodiment of the order data record is depicted in Figure 3. The order record 300 contains customer data 302, banner content data 304, banner medium data 306 and banner fabrication data 308. Customer data 302 includes at least a customer identification field, such as a unique customer number or the customer's name. The customer data may also include additional customer identification information (such as the customer's home address, customer's email address, customer's phone number, etc.), order information customer (such as an order number, the order date, purchase price, etc.), payment information (such as credit card type, credit card number, expiration date, etc.) as well as customer shipping information (e.g., delivery method, preferred carrier, shipping address etc.).

[0028] The banner content data 304 includes information about the content displayed on the banner. In a preferred embodiment, the banner content data is defined as a reference value or a pointer to the template

which serves as the basis for the customized banner. The banner content data may further include the customized data which will be used to augment the pre-defined content associated with template. As will be more further described below, the banner content data is sufficient to allow the customized
5 banner to be reconstructed by the output subsystem. Alternatively, the banner content data may be defined as a graphics file that can be directly sent to a printing device associated with the output subsystem.

[0029] Banner medium data provides information about the medium for the customized banner; whereas the banner fabrication data provides
10 information about how to produce the customized banner. It is envisioned that other types of information relevant to placing a customized banner order may also be incorporated into the above-described order record 300. Although a preferred format for the order record has been described, this is not intended as a limitation on the broader aspects of the present invention.

[0030] Referring to Figure 1, the customer initiates fabrication of the customized banner by issuing a command through the user interface 20. The applications server 22 in turn transmits the command to the output subsystem 30. The output subsystem 30 includes an output manager 32 and at least one output device 34. The output manager 32 coordinates the
20 production of customized banners by the output device.

[0031] In a preferred embodiment, the output subsystem 30 is remotely located from the remainder of the system. For instance, the output subsystem 30 may be connected across a network 31 to the applications server 22. In this case, the command to generate a banner is transmitted
25 across the network to the output manger 32. More specifically, the command is transmitted in form of the previously described order record embodied in a carrier wave. It is also envisioned that the output subsystem 30 may be directly connected to the remainder of the system 10.

[0032] In this preferred embodiment, the high-resolution graphics engine 26 is also connected across the network 31 to the remainder of the
30 system. In response to a request from the applications server 22, the output manager 32 instructs the high-resolution graphics engine to render a high

resolution representation of the banner. As noted above, the high-resolution graphics engine 26 includes a storage mechanism for storing high resolution templates for each of the plurality of customizable banners. In other words, each template associated with the low-resolution graphics engine 24 has a
5 corresponding template associated with the high-resolution graphics engine 26. As a result, the order record transmitted to the output manager 32 only needs to include a reference to the applicable template residing in the storage mechanism associated with the high resolution graphics engine 26. The high resolution graphics engine then builds a high resolution representation of the
10 banner using the corresponding high resolution template and augmenting it with any additional customized banner content data as embodied in the order record.

[0033] The output manager 32 then coordinates the fabrication of the customized banner. In a preferred embodiment, the output device 34 is
15 further defined as a printer 34. The output manager 32 formulates a print request using the high resolution representation of the banner. In order to properly configure the printing device, the output manager 32 may further configure the print request based on the banner medium and fabrication data embodied in the order record. Lastly, the print request is sent to the printer
20 34, thereby generating the customized banner.

[0034] Although the above-described output subsystem 30 is presently preferred, this is not intended as a limitation of the broader aspects of the present invention. For instance, the order record may merely serve as a visual input to an operator of a more conventional banner fabrication
25 process. In this instance, the user interface of a personnel computer may serve as the output device. In another instance, it is envisioned that the output device may be adapted to output the banners onto a digital media.

[0035] While the invention has been described in its presently preferred form, it will be understood that the invention is capable of
30 modification without departing from the spirit of the invention as set forth in the appended claims.

CLAIMS

1. A computer-implemented system for designing and producing customized display articles, the system comprising:

5 an user interface for displaying a customizable display article and receiving information relating to the customization of the display article;

an applications server connected to the user interface for managing the customization of the display article;

10 a storage medium connected to the applications server for storing the customized data for the display article;

15 a low-resolution graphics engine connected to the applications server and to the storage medium, the low-resolution graphics engine operable to build a low resolution representation of the display article and to transmit the low resolution representation of the display article to the user interface;

an output subsystem connected to the applications server for producing the customized display article; and

20 a high-resolution graphics engine connected to the applications server and the output subsystem, the high-resolution graphics engine operable to build a high-resolution representation of the display article and transmit the high resolution representation of the display article to the output subsystem.

25 2. The computer-implemented system of Claim 1 wherein the customized display article is further defined as an advertising banner.

30 3. The computer-implemented system of Claim 1 wherein the user interface is remotely connected via a computer network to the applications server and the applications server is adapted to interact over the computer network with the user interface.

4. The computer-implemented system of Claim 3 wherein the user interface is further defined as a web browser residing on a personal computing device.

5 5. The computer-implemented system of Claim 3 wherein the applications server is a

6. The computer-implemented system of Claim 1 further comprises a first graphics storage mechanism associated with the low resolution
10 graphics engine for storing pre-composed, low resolution data files for a plurality of customizable display articles, such that the low resolution representation of the display article is based on the corresponding low resolution data file in the first graphics storage mechanism.

15 7. The computer-implemented system of Claim 6 wherein the low resolution representation of the display article is in part based on customized data stored in the storage medium.

8. The computer-implemented system of Claim 1 further comprises
20 a second graphics storage mechanism associated with the high resolution graphics engine for storing pre-composed, high resolution data files for a plurality of customizable display articles, such that the high resolution representation of the display article is based on the corresponding high resolution data file in the second graphics storage mechanism.

25

9. The computer-implemented system of Claim 8 wherein the high resolution representation of the display article is in part based on customized data stored in the storage medium.

30 10. The computer-implemented system of Claim 1 wherein the high resolution representation of the display article is transmitted via an order record to the output subsystem, such that the order record includes customer

data for identifying the customer ordering the display article, content data for constructing the artistic content displayed on the display article, medium data for defining the medium of the display article, and fabrication data defining how to produce the display article.

5

11. The computer-implemented system of Claim 1 wherein the output subsystem is further defined as a printing device, wherein the printing device is operable to print the high resolution representation of the display article onto a given medium, thereby producing the customized display article.

10

12. A computer-implemented system for generating customized advertising banners, comprising:

an user interface operable to display at least one customizable banner to a system user and to capture customized data relating to the customizable banner from the system user;

15

a data structure for storing the customized data relating to the customizable banner;

20

a first graphics engine in data communication with the user interface and the data structure, the first graphics engine is operable to render a low resolution representation of the customizable banner and to communicate the low resolution representation of the customizable banner to the user interface;

a printing device for generating customizable banners; and

25

a second graphics engine in data communication with the user interface and the data structure, the second graphics engine is operable to render a high resolution representation of the customizable banner and to communicate the high resolution representation of the customizable banner to the printing device.

30

13. A data record for ordering a display article, the data record embodied in a carrier wave, comprising:

customer data that stores information about a customer that is ordering the display article;

content data that stores information about artistic content on the display article;

5 medium data that stores information about a medium for the display article; and

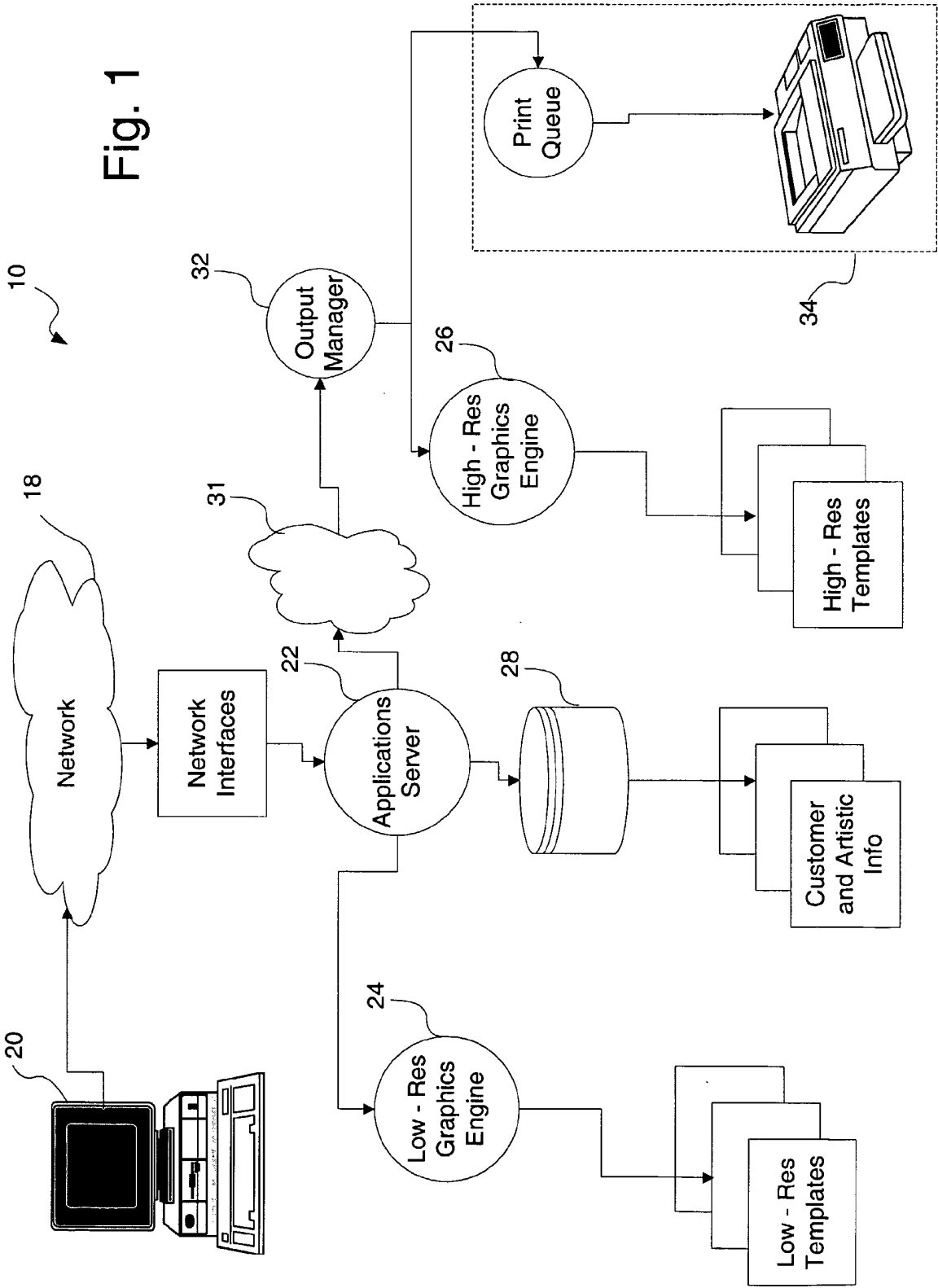
fabrication data that stores information about how to generate the display article.

10 14. The data record of Claim 13 wherein the content data is further defined as a template identification field that identifies a pre-composed artistic content template for the display article.

15 15. The data record of Claim 14 wherein the content data is further defined to include customizable display data for augmenting the artistic content template for the display article.

20 16. The data record of Claim 15 wherein the customizable display data includes information for one or more customizable elements associated with the artistic content template, where each customizable element is defined by an element type, an element text block, an element text font, and an element color.

25 17. The data record of Claim 13 wherein the fabrication data includes information selected from the group consisting of hem information, grommet information, sewn in rope information, sewn in webbing information, and pole pockets information.



2/5

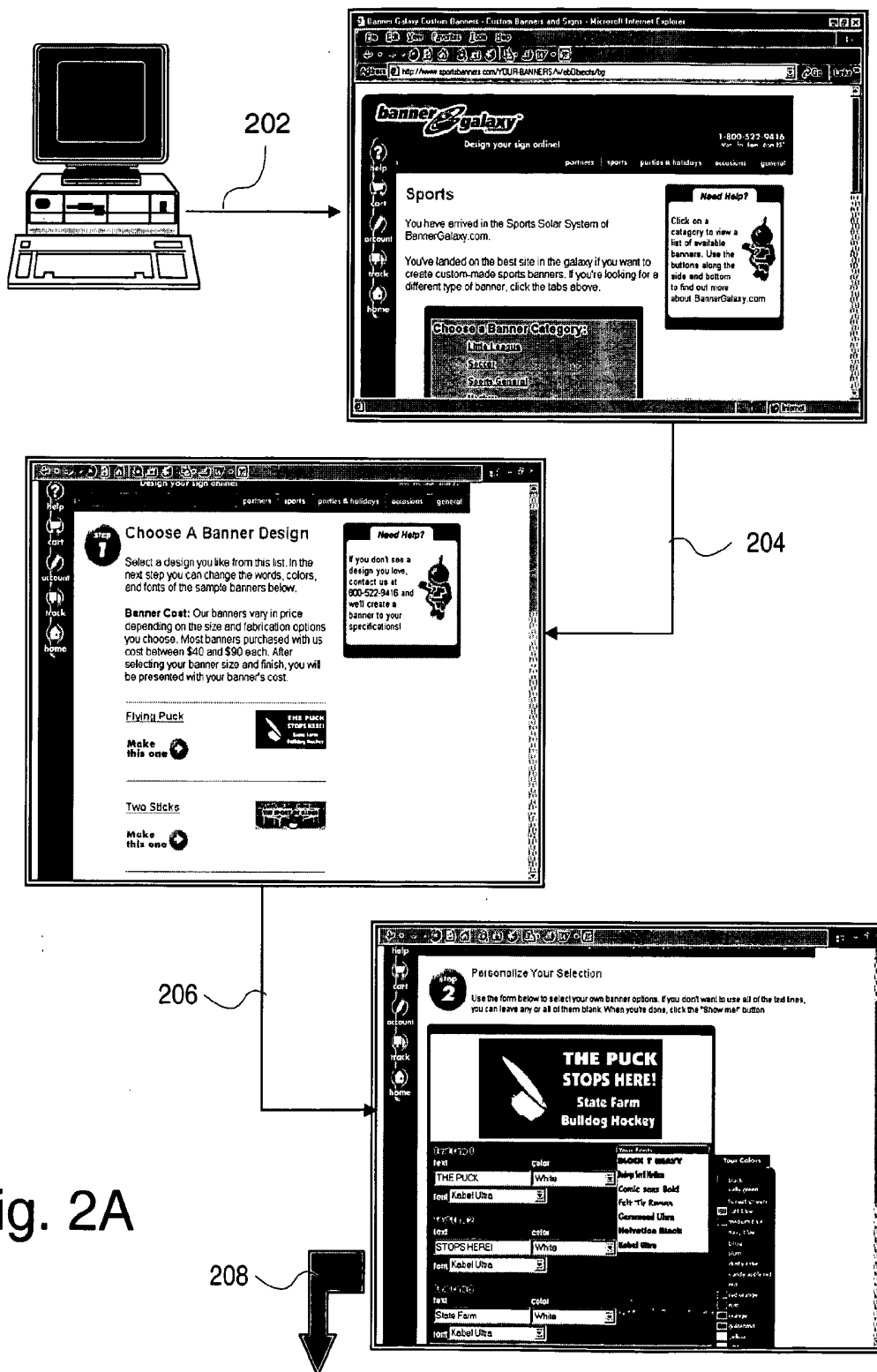


Fig. 2A

3/5

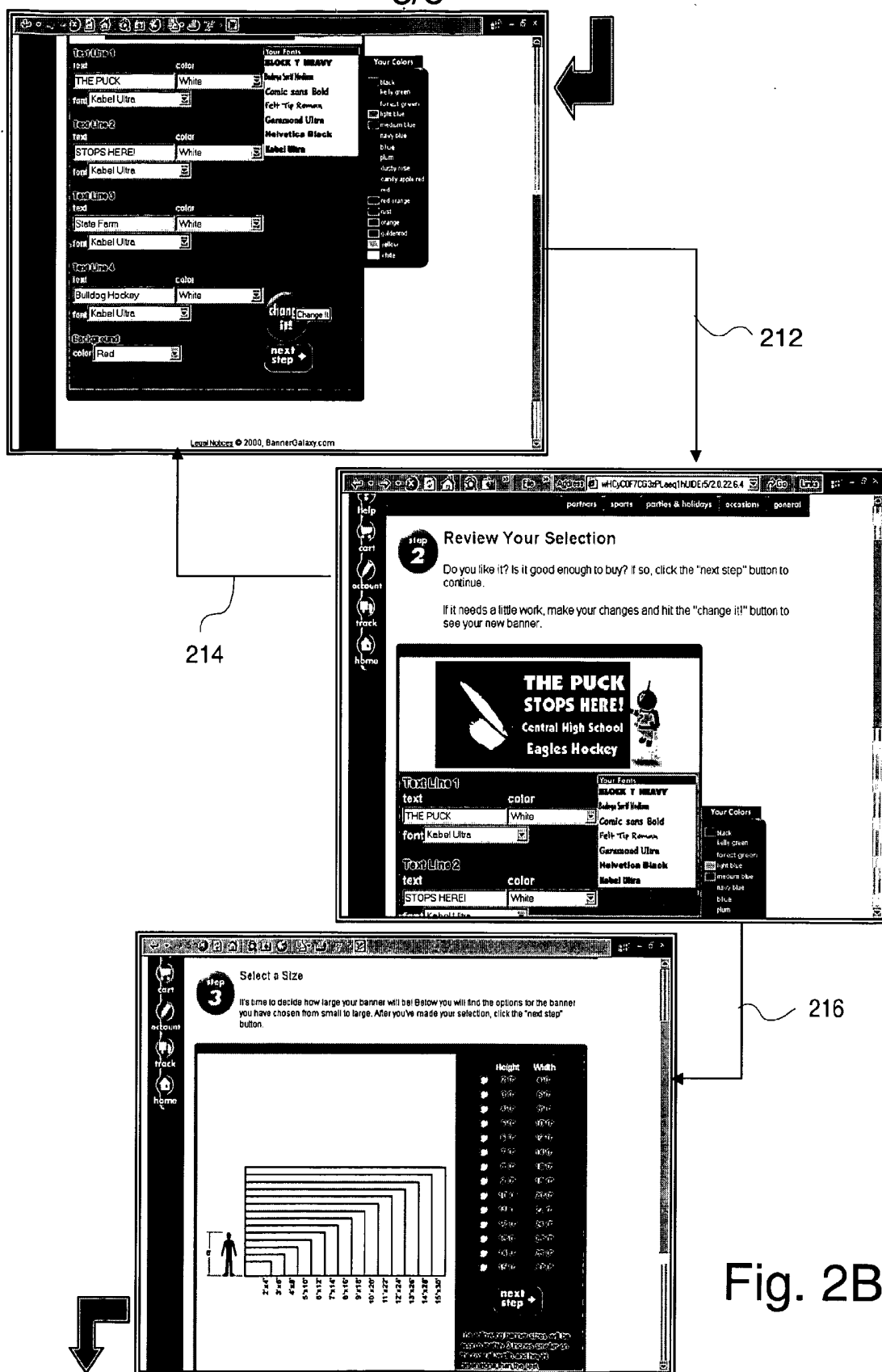


Fig. 2B



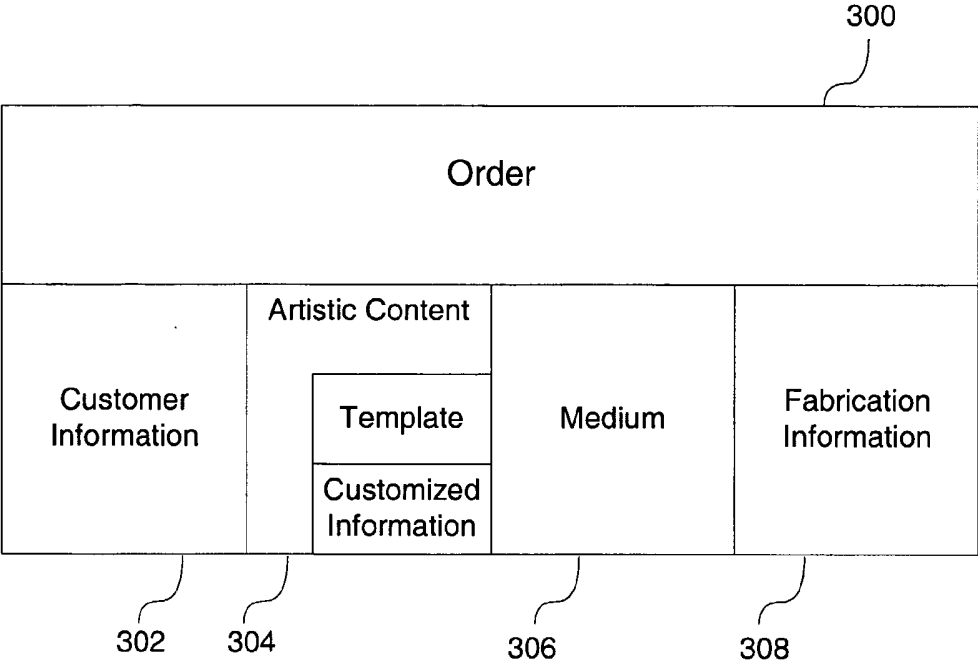


Fig. 3

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US02/18728

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : G06F 3/00

US CL : 345/629, 634, 733, 764; 358/1.18; 707/517, 530; 709/201

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. : 345/428, 629, 634, 636, 641, 731, 733, 740, 760, 764; 358/1.15, 1.18; 707/10, 517, 522, 526, 527, 530; 709/201, 203, 217, 219.

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

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 6,128,663 A (THOMAS) 03 OCTOBER 2000 (03.10.2000), abstract; col. 1. lines 66-67; col. 2, lines 1-67; col. 3, lines 1-29.	1-17
A	US 6,128,655 A (FIELDS et al) 03 OCTOBER 2000 (03.10.2000), abstract; col. 2, lines 36-67; col. 3, lines 1-23.	1-17
A	US 6,295,061 B1 (PARK et al) 25 SEPTEMBER 2001 (25.09.2001), abstract; col. 1, lines 30-33; col. 2, lines 63-67; col. 3, lines 1-67; col. 4, lines 1-39.	1-17
A	US 6,243,104 B1 (MURRAY) 05 JUNE 2001 (5.6.2001), abstract; col. 3, lines 10-67; col. 4, lines 1-67.	1-17
A	US 5,911,145 A (ARORA et al) 08 June 1999 (08.06.1999), abstract; col. 2, lines 16-67; col. 3, lines 1-16.	1-17
A	US 6,011,537 A (SLOTZNICK) 04 JANUARY 2000 (04.01.2000), abstract; col. 1, lines 60-67; col. 2, lines 1-9, 58-67; col. 3, lines 1-3; col. 4, lines 38-67.	1-17

☐ 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 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

06 August 2002 (06.08.2002)

Date of mailing of the international search report

05 SEP 2002

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

John W Caheca

Telephone No. (703) 305-3900

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US02/18728

Box I Observations where certain claims were found unsearchable (Continuation of Item 1 of first sheet)

This international report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claim Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☒ Claim Nos.: 5
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
The claim is incomplete.
3. ☐ Claim Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of Item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
☐ No protest accompanied the payment of additional search fees.